

**Scheme & Syllabus of  
Bachelor of Computer Applications  
(BCA)  
Batch 2015**



By  
Department of Academics

**IKG Punjab Technical University**

**Scheme and Syllabus**  
**Bachelor of Computer Applications, Batch-2015**

<b>SEMESTER-I</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>INT</b>	<b>EXT</b>	<b>TOTAL</b>	<b>Credits</b>
<b>BSBC101</b>	Communication-I	3	1	-	40	60	100	4
<b>HVPE101</b>	Human Values and Professional Ethics	3	-	-	40	60	100	3
<b>BSBC102</b>	Programming in C	4	1	-	40	60	100	5
<b>BSBC103</b>	Mathematics-I	4	2	-	40	60	100	6
<b>BSBC104</b>	Information Technology	3	1	-	40	60	100	4
<b>BSBC105</b>	Software Lab-I (Programming in C)	-	-	4	60	40	100	2
<b>BSBC106</b>	Software Lab-II (Information Technology)	-	-	4	60	40	100	2
	<b>Total</b>	<b>17</b>	<b>5</b>	<b>8</b>	<b>320</b>	<b>380</b>	<b>700</b>	<b>26</b>
<b>SEMESTER-II</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>INT</b>	<b>EXT</b>	<b>TOTAL</b>	<b>TOTAL</b>
<b>EVSC101</b>	Environmental Science	2	-	-	40	60	100	2
<b>BSBC201</b>	Communication-II	3	1	-	40	60	100	4
<b>BSBC202</b>	Mathematics-II	4	2	-	40	60	100	6
<b>BSBC203</b>	OOPS Using C++	4	1	-	40	60	100	5
<b>BSBC204</b>	Computer System Architecture	3	1	-	40	60	100	4
<b>BSBC205</b>	Workshop on Web Development	-	-	4	60	40	100	2
<b>BSBC206</b>	Software Lab-III (OOPS Using C++)	-	-	4	60	40	100	2
	<b>Total</b>	<b>16</b>	<b>5</b>	<b>10</b>	<b>320</b>	<b>380</b>	<b>700</b>	<b>25</b>
<b>SEMESTER-III</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>INT</b>	<b>EXT</b>	<b>TOTAL</b>	<b>TOTAL</b>
<b>BSBC301</b>	System Analysis & Design	3	1	-	40	60	100	4
<b>BSBC302</b>	Data Structures	4	1	-	40	60	100	5
<b>BSBC303</b>	Digital Circuits & Logic Design	4	1	-	40	60	100	5
<b>BSBC304</b>	Basic Accounting	4	1	-	40	60	100	5
<b>BSBC305</b>	Software Lab-IV (Data Structures)	-	-	6	60	40	100	3
<b>BSBC306</b>	Hardware Lab-I (Digital Circuits & Logic Design)	-	-	4	60	40	100	2
	<b>Total</b>	<b>15</b>	<b>4</b>	<b>10</b>	<b>280</b>	<b>320</b>	<b>600</b>	<b>24</b>
<b>SEMESTER-IV</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>INT</b>	<b>EXT</b>	<b>TOTAL</b>	<b>TOTAL</b>
<b>BSBC401</b>	Software Engineering	4	1	-	40	60	100	5
<b>BSBC402</b>	Microprocessors & Microcontrollers	4	1	-	40	60	100	5
<b>BSBC403</b>	Operating Systems	4	1	-	40	60	100	5
<b>BSBC404</b>	Database Management Systems	4	1	-	40	60	100	5
<b>BSBC405</b>	Hardware Lab-II (Microprocessors & Microcontrollers)	-	-	4	60	40	100	2
<b>BSBC406</b>	Software Lab-V (Database Management Systems)	-	-	4	60	40	100	2
	<b>Total</b>	<b>16</b>	<b>4</b>	<b>8</b>	<b>280</b>	<b>320</b>	<b>600</b>	<b>24</b>

**Scheme and Syllabus**  
**Bachelor of Computer Applications, Batch-2015**

17<sup>th</sup> June 2011

SEMESTER-V		L	T	P	INT	EXT	TOTAL	Credits
BSBC501	Data Warehousing & Mining	3	1	-	40	60	100	4
BSBC502	Programming in Java	4	1	-	40	60	100	5
BSBC503	Management Information System	3	1	-	40	60	100	4
BSBC504	Workshop on Advanced Web Development	0	0	6	60	40	100	3
BSBC505	Software Lab-VI (Programming in Java)	0	0	4	60	40	100	2
BSBC506	Project Work-I	0	0	6	60	40	100	6
	<b>Total</b>	<b>10</b>	<b>3</b>	<b>16</b>	<b>300</b>	<b>300</b>	<b>600</b>	<b>24</b>
SEMESTER-VI		L	T	P	INT	EXT	TOTAL	Credits
BSBC601	Principles of Management	3	1	-	40	60	100	4
BSBC602	Computer Graphics	4	1	-	40	60	100	5
BSBC603	Computer Networks	4	1	-	40	60	100	5
BSBC604	Information Security	3	1	-	40	60	100	4
BSBC605	Software Lab-VII (Computer Graphics)	0	0	4	60	40	100	2
BSBC606	Project Work- 2	0	0	6	120	80	200	6
	<b>Total</b>	<b>14</b>	<b>4</b>	<b>10</b>	<b>340</b>	<b>360</b>	<b>700</b>	<b>26</b>

# *First Semester*

## BSBC101 COMMUNICATION-I

### Objective and Expected outcome:

The objective of this course is to make students understand that both oral & written communications are equally important. The students should be comfortable with both verbal & written communication.

---

### SECTION-A

**English Language:** Sentence, Parts of speech, Tenses, Active passive voice, Direct Indirect speech, Creative writing & vocabulary, Comprehension passage, Reading of biographies of at least 10 IT business personalities (can be a home assignment or classroom reading).

**(9) SECTION-**

### B

**Business communication-** Types, Media, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers. **(9)**

### SECTION-C

**Presentation skills-** Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT & Complete set of required body language while delivering presentation.

**Reading & writing skills-** Importance of reading and writing, improving writing skills through understanding and practicing Notice, E-mail, Tenders, Advertisement, formal letter. **(9)**

### SECTION-D

**Listening skills-** Its importance as an individual and as a leader or as a worker, Its types, barriers to listening & remedies to improve listening barriers.

**Nonverbal Communication-** understanding what is called nonverbal communication, its importance as an individual, as a student, as a worker and as a leader, its types. **(9)**

### Suggested Readings/Books:

1. **Effective Business Communication**, M.V. RODRIGUEZ
2. **Business Communication**, Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press.

## HVPE101 Human Values & Professional Ethics

### Objective/s and Expected outcome:

To help the students to discriminate between valuable and superficial in life. To help develop the critical ability to distinguish between essence and form, or between what is of value and what is superficial, in life—this ability is to be developed not for a narrow area or field of study, but for every day situations in life, covering the widest possible canvas. To help students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability, it is important to act on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) – it concentrates on providing to its students the skill to do things. In other words, it concentrates on providing “How to do” things. The aspects of understanding “What to do” or “Why something should be done” is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort to fulfill our responsibility to provide our students this significant input about understanding. This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life. It has been experimented at IITH, IITK and UPTU on a large scale with significant results.

---

### SECTION-A

#### 1. Course Introduction – Need, Basic Guidelines, Content and Process for Value Education

- Understanding the need, basic guidelines, content and process for Value Education.
- Self Exploration – what is it? – its content and process; „Natural Acceptance” and Experiential Validation – as the mechanism for self exploration.
- Continuous Happiness and Prosperity – A look at basic Human Aspirations

- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels (8)

## 2. Understanding Harmony in the Human Being – Harmony in Myself!

- Understanding human being as a co-existence of the sentient, „I“ and the material „Body“
- Understanding the needs of Self („I“) and „Body“ – *Sukha and Suvidha*
- Understanding the Body as an instrument of „I“ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of „I“ and harmony in „I“
- Understanding the harmony of I with the Body: *Sanyam and Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure *Sanyam and Swasthya* (7)

## 3. Understanding Harmony in the Family and Society - Harmony in Human-Human Relationship

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- Understanding the meaning of *Vishwas*; Difference between intention and competence
- Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitvaas* comprehensive Human Goals

- Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha* )-from family to worldfamily! (8)

## PART B

### 4. Understanding Harmony in the Nature and Existence – Whole existence as Co-existence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
- Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
- Holistic perception of harmony at all levels of existence (5)

### 5. Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
  - Ability to utilize the professional competence for augmenting universal human order
  - Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems
  - Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
  - At the level of individual: as socially and ecologically responsible engineers, technologists and managers

○ At the level of society: as mutually enriching institutions and organizations

(8)

**Suggested Readings/Books:**

1. R R Gaur, R Sangal, G P Bagaria, 2009, *A Foundation Course in Value Education*.
2. Ivan Illich, 1974, *Energy & Equity*, The Trinity Press, Worcester, and Harper Collins, USA
3. E. F. Schumacher, 1973, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain.
4. A Nagaraj, 1998, *Jeevan Vidya ek Parichay*, Divya Path Sansthan, Amarkantak.
5. Susan George, 1976, *How the Other Half Dies*, Penguin Press. Reprinted 1986, 1991
6. P. L. Dhar, R. R. Gaur, 1990, *Science and Humanism*, Commonwealth Publishers.
7. A. N. Tripathy, 2003, *Human Values*, New Age International Publishers
8. Subhas Palekar, 2000, *How to practice Natural Farming*, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati.
9. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, *Limits to Growth – Club of Rome's report*, Universe Books.
10. E. G. Seebauer & Robert L. Berry, 2000, *Fundamentals of Ethics for Scientists & Engineers*, Oxford University Press
11. M. Govindrajran, S. Natrajan & V. S. Senthil Kumar, *Engineering Ethics (including Human Values)*, Eastern Economy Edition, Prentice Hall of India Ltd
12. B. P. Banerjee, 2005, *Foundations of Ethics and Management*, Excel Books.
13. B. L. Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.

## BSBC102 PROGRAMMING IN C

### **Objective and Expected Outcome:**

The objective of this course is to help the students in finding solutions to various real-life problems and converting the solutions into computer programs using C language (structured programming). Students will learn to write algorithms for solutions to various real-life problems. Converting the algorithms into computer programs using C language.

---

### **SECTION-A**

**Algorithm and Programming Development:** Steps in development of a program, Flow charts, Algorithm Development, Program Debugging, Compilation and Execution.

**Fundamentals of C:** I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers. (12)

### **SECTION-B**

**Control Structures:** Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement

**Functions:** Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Call-by-value/reference, Recursion, Global and Local Variables, Storage classes. (12)

### **SECTION-C**

**Arrays:** Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions.

**Structure and Union:** Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions (12)

### **SECTION-D**

**Pointers:** Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays

**Files:** Introduction, Creating a data file, opening and closing a data file, processing a data file.



**Preprocessor Directives:** Introduction and Use, Macros, Conditional Preprocessors,  
Header Files (12)

**Suggested Readings/Books:**

1. **Let us C**, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
2. **Programming in ANSI C**, E. Balagurusami, Fourth Edition, Tata McGraw Hill
3. **Programming in C**, Byron S. Gottfried, Second Edition, McGraw Hills.
4. **The C Programming Language**, Kernighan & Richie, Second Edition, PHI Publication
5. **Object Oriented Programming**, Lafore R, Third Edition, Galgotia Publications
6. **Problem Solving and Programming in C**, R.S. Salaria, Second Edition

## BSBC103 MATHEMATICS-I

### Objectives and Expected Outcome:

This syllabus of this course is specially designed for the beginners in computer science with the first exposure to mathematical topics essential to their study of computer science or digital logic. Topics like recursion and recurrence relations will help them in learning the important concepts of C language. The topic Graph Theory has applications in various fields of computer science like switching theory, logical designs, artificial language and computer graphics etc. These topics will help the students to understand various important concepts of the other subjects of the course. Further it will also provide ground for higher studies in these topics.

---

### SECTION-A

#### SET THEORY AND RELATIONS

**Sets**- Elements of a set, methods of describing a set, types of sets, Operations on sets-- union, intersection and difference of sets, Venn diagrams, statement problems, Associative Laws, Distributive laws, De Morgan's laws, duality, partitioning of a set. **Relation** - Basic definition of relation and types of relations, graphs of relations, properties of relations, (domain, range, inverse and composite relations), Matrix representation of a relation.

(12)

### SECTION-B

#### ALGEBRA OF LOGIC, MATHEMATICAL INDUCTION

Propositions and Logic operations, truth tables, arguments and validity of arguments, propositions generated by a set, equivalence and implication laws of logic, mathematical system and proposition over a universe, Quantifiers, Principle of Mathematical Induction.

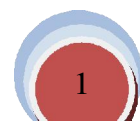
(12)

### SECTION-C

#### GRAPH THEORY

Various types of graphs- Simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, graph optimizations, graph coloring, Trees, spanning trees.

(12)



## SECTION-D

### RECURSION AND RECURRENCE RELATIONS

Recursion, many faces of recursion, recurrence relations, some common recurrence relations,  
Matrix Operations: Addition, Subtraction, Multiplication and Inverse

(12)

#### **Suggested Readings/Books:**

1. **Discrete Mathematical Structure with application to Computer Science**, Tremblay J.P. and Manohar R., McGraw Hill, 30th Reprint (2007)
2. **Text Book of Mathematics** (for XI Class), R.D. Sharma, Dinesh Publications
3. **Applied Discrete Structure of Computer Science**, Doerr A. & Kenneth L., Paperback Edition, Galgotia Publications Pvt. Ltd. New Delhi
4. **Graphics Networks and Algorithms**, Swami M.N.S & Thisiraman E., Second Edition, John Wiley & Sons

## BSBC104 INFORMATION TECHNOLOGY

### Objectives and Expected Outcome:

This course will enable the student to gain an understanding of the core concepts and technologies which constitute Information Technology. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology

---

### SECTION-A

**Computer Fundamentals:** Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation.

**Number System:** Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

**Binary Arithmetic:** Addition, subtraction and multiplication. (9)

### SECTION-B

**Memory Types:** Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.

**Input and Output Units:** Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touchscreen; OCR, OMR, MICR

**Overview of storage devices:** Floppy disk, hard disk, compact disk, tape.

**Printers:** Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.

**Computer languages:** Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software. (9)

### SECTION- C

**Operating system:** Batch, multi-programming, time sharing, network operating system, on-line and real time operating system, Distributed operating system, multi-processor, Multi-tasking.

**Graphical OS:** Fundamentals of windows, types of windows, anatomy of windows, windows explorer, customizing windows, control panel, taskbar setting, Network

Neighborhood.

**Personal Productivity Software:**

**Word processing:** Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.

**Spreadsheet :** Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs.

**Presentation Graphics Software:** Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slideshows. (9)

**SECTION-D**

**Computer Network and Communication:** Network types, network topologies, network communication devices, physical communication media.

**Internet and its Applications:** E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, Extranet, Gopher, Mosaic, WAIS.

**Security management tools:** PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers. (9)

**Suggested Readings/Books:**

1. “**Computers Today**”, D.H. Sanders, Fourth Edition, McGraw Hill, 1988.
2. “**Fundamentals of Computers**”, V. Rajaraman, Second Edition, Prentice Hall of India, New Delhi, 1996.
3. “**Information Technology**”, Satish Jain, Paperback Edition, BPB 1999.
4. “**Information Technology Inside and Outside**”, David Cyganski, John A. Orr, Paperback Edition, Pearson Education 2002.
5. “**Computer Fundamentals**”, B. Ram, Third Edition, Wiley, 1997.
6. “**Fundamentals of Information Technology**”, Chetan Srivastva, Third edition, Kalayani Publishers
7. **Computers**, Larry Long & Nancy Long, Twelfth edition, Prentice Hall

## BSBC105 SOFTWARE LAB-I (Programming in C)

### Objective and Expected Outcome:

The objective of this course is to help the students in finding solutions to various real-life problems and converting these solutions into computer programs using C language (structured programming). Students will learn to write programs for solving various real-life problems.

---

1. **Keywords and Identifiers:** introduction, purpose
2. **Variables and constants:** data types, Initialization, declaration, scope, memory limits
3. **Input-output statements:** formatted and non-formatted statements
4. **Operators:** Arithmetic, logical, conditional, assignment, bitwise, increment/decrement operators
5. **Decision Making:** switch, if-else, nested if, else-if ladder, break, continue, goto
6. **Loops:** while, do-while, for
7. **Functions:** definition, declaration, variable scope, parameterized functions, return statement, call by value, call by reference, recursive functions
8. **Pre-processor Directives:** Pre-processor directives like INCLUDE, #DEF, DEFINE, etc
9. **Header Files:** STDIO.H, MATH.H, STRING.H, PROCESS.H etc
10. **Arrays:** Array declarations, Single and multi-dimensional, memory limits, strings and string functions
11. **Pointers:** Pointer declarations, pointer to function, pointer to array/string,
12. **Files:** Creation and editing of various types of files, closing a file (using functions and without functions)

## **BSBC106 SOFTWARELAB-II(Information Technology)**

1. Familiarizing with PC and WINDOW S commands,
2. File creation,
3. Editing
4. Directory creation.
5. Mastery of DOS internal & external commands.
6. Learning to use MS Office: MSWORD, MSEXCEL & MSPowerPoint.

# *Second Semester*

## EVSC 101 ENVIRONMENTAL SCIENCE

### Objective/s and Expected outcome:

Upon successful completion of the course, students should be able to:

1. Measure environmental variables and interpret results
2. Evaluate local, regional and global environmental topics related to resource use and management
3. Propose solutions to environmental problems related to resource use and management
4. Interpret the results of scientific studies of environmental problems
5. Describe threats to global biodiversity, their implications and potential solutions

---

### SECTION-A

**Introduction:** Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness. (2)

**Natural Resources:** Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources. (4)

**Ecosystems:** Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity (4)

**Environmental Pollution:** Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. **Solid waste Management:** Causes, effects and control measure of urban and industrial wastes. Role of an individual in prevention of pollution. **Pollution case studies.** **Disaster Management:** Floods, earthquake, cyclone and landslides. (5)

### SECTION-B

**Social Issues and the Environment** From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rainwater harvesting, watershed management. Resettlement and rehabilitation of people; its problems and

concerns. Casestudies.Environmental ethics:Issuesand possible solutions.Climate change,globalwarming,acidrain,ozonelayerdepletion,nuclearaccidents and holocaust.Casestudies. Wastelandreclamation.Consumerismandwasteproducts. EnvironmentProtectionAct.Air(PreventionandControlofPollution)Act. Water (Preventionandcontrolofpollution)Act. WildlifeProtectionAct,ForestConservation Act, Issues involvedinenforcement of environmental legislation Public awareness

**(5)**

Human Populationand the Environment, Population growth, variation among nations. Population explosion– Family Welfare Programme. Environment andhuman health, Human Rights, Value Education, HIV/AIDS. Women andchild Welfare.RoleofInformationTechnologyinEnvironmentandhumanhealth.Case studies

**(4)**

**Suggested Readings/Books:**

1. Agarwal,K. C. 2001**EnvironmentBiology**,Nidi Publ.Ltd.Bikaner.
2. Jadhav,H&Bhosale,V.M.1995.**EnvironmentProtectionandLaws**.HimalayaPub House,Delhi 284p.
3. RaoM.N.&Datta A.K.1987.**Waste WaterTreatment**.Oxford & IBH Publ.Co.Pvt.Ltd. 345 p.
4. **Principle ofEnvironmentScience** byCunninghan,W.P.
5. **Essentials of EnvironmentScience** byJoseph.
6. **EnvironmentPollutionControl Engineering**byRao,C.S.
7. **Perspectives inEnvironmentalStudies**byKaushik,A.
8. **Elementsof EnvironmentScience&Engineering**byMeenakshi.
9. **Elementsof EnvironmentEngineering** byDuggal.

## BSBC 201 COMMUNICATION–II

**Objective & Expected Outcome:** The objective of this course is to make students understand the value of business communication, written & presentations skills in professional life. The students should be well equipped with business & written communication with effective presentations skills.

---

### SECTION-A

#### **Introduction to Business Communication (09)**

Meaning and Definition; process and classification of communication; elements & characteristics of communication; barriers to effective communication in business organization; Formal and Informal communication; grapevine, importance of effective communication in business house; Principles of effective communication

### SECTION-B

#### **Writing Skills (09)**

Inter-office memorandums; faxes; E-mails; writing effective sales letters to agents; suppliers; customers; report writing; project writing.

### SECTION-C

#### **Curriculum Vitae (CV) (09)**

Drafting a CV; writing job application and other applications; do's and don'ts while appearing for an interview; types of interview.

### SECTION-D

#### **Presentation Skills (09)**

Introduction; need of good presentations skills in professional life; preparing a good presentation; group discussion; extempore speaking.

#### **Suggested Readings/Books:**

1. **Effective Business Communication**-M.V. RODRIGUEZ
2. **Business Communication**-Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press

## BSBC202 MATHEMATICS–II

**Objectives & Expected Outcome:** This syllabus is specially designed to help the students of computer science to understand the mathematical concepts like matrices, differential calculus and integral calculus which have applications in various subjects of computer science. Also Statistics has been added to help them understand the topics like central tendency, deviations, and moments etc which are very useful in day today life. After learning these topics, students will be able to apply these concepts in designing the software applications for some specific devices.

---

### SECTION-A

#### **MATRIX ALGEBRA (12)**

Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Cramer's rule and matrix inversion method.

### SECTION-B

#### **STATISTICS & APPLICATIONS OF LOGARITHMS (12)**

**Statistics**- Introduction to statistics, measures of central tendency-mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.

**Applications of Logarithms**- Problems related to compound interest, depreciation and Annuities.

### SECTION-C

#### **DIFFERENTIAL CALCULUS (12)**

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.

### SECTION-D

#### **INTEGRAL CALCULUS (12)**

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial

fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson's  $1/3$  rule, Simpson's  $3/8$  rule.

**Suggested Readings/Books:**

- 1. Numerical Methods to Engineering**, B.S. Grewal, Seventh Edition, Khanna Publishers
- 2. Business Mathematics**, D.C. Sancheti, Eleventh Edition, Sultan Chand & Sons
- 3. Computer Oriented Numerical Methods**, Rajaraman, Third Edition, PHI Publications

## BSBC203 OOPS USING C++

**Objective & Expected Outcome:** The objective of this course is to learn programming from real world examples and understanding object oriented approach for finding solutions to various problems with the help of C++ language. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

---

### SECTION-A

**Introduction:** Object oriented programming approach, characteristics of object oriented languages, Bridging C & C++ (Overview of C Concepts).

**Structures and Unions:** Declaration of structures, Accessing structure members, Structure Initialization, Array of structure, nested structures, structure with pointers, functions & structures, Unions, Structure/Union Versus Class in C++.

**Class Declaration:** Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Array within a class. (12)

### SECTION-B

**Class Function Definition:** Member Function definition inside the class and outside the class, Friend Function, Inline Function, Static Members & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions.

Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

**Constructors and Destructors:** Declaration and Definition, Default Constructors, Parameterized Constructors, Constructor Overloading, Copy Constructors. Destructors: Definition and use. (12)

### SECTION-C

**Inheritance-** Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes : Private, public, protected; Single inheritance: Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.

**Function Overloading & Operator Overloading:** Binary & Unary. (12)

**SECTION-D**

**Polymorphism:** Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.

**Input/output files:** Streams, buffers & iostreams, header files, redirection, file input and output. (12)

**Suggested Readings/Books:**

1. **Object Oriented Programming with C++**, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill
2. **Object Oriented Programming in Turbo C++**, Robert Lafore, Fourth Edition Galgotia Publications.
3. **The C++ Programming Language**, Bjarna Stroustrup, Third Edition, Addison-Wesley Publishing Company.
4. **Object Oriented Programming Using C++**, Salaria, R.S, Fourth Edition, Khanna Book Publishing

## BSBC204 COMPUTER SYSTEM ARCHITECTURE

**Objectives and Expected Outcome:** To make students aware about the basic building blocks of computer system and how the different components are interfaced together. Students will know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.

---

### SECTION-A

**Introduction to Computer Organization:** Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept-Von Neumann Architecture. Introduction to Flynn's Classification- SISD, SIMD, MIMD

**Register Transfer and Microoperations-** Introduction to Registers, Register Transfer Language, Data movement among Registers and Memory.

**Microoperations:** Introduction to microoperations, Types of microoperations--Logic Operations, Shift operations, Arithmetic and Shift operations.

**Common Bus System:** Introduction to Common Bus System, Types of Buses (Data Bus, Control Bus, Address Bus), 16-bit Common Bus System--Data Movement among registers using Bus. **(09)**

### SECTION-B

**Basic Computer Instructions-** Introduction to Instruction, Types of Instructions (Memory Reference, I/O Reference and Register Reference), Instruction Cycle, Instruction Formats (Direct and Indirect Address Instructions, Zero Address, One Address, Two Address and Three Address Instructions)

**Interrupt:** Introduction to Interrupt and Interrupt Cycle.

**Design of Control Unit:** Introduction to Control Unit, Types of Control Unit (Hardwired & Micro programmed Control Unit).

**Addressing Modes-** Introduction & different types of Addressing Modes. **(09)**



### SECTION-C

**I/O Organization:** I/O Interface Unit, types of ports (I/O port, Network Port, USB port, Serial and Parallel Port), Concept of I/O bus, Isolated I/O versus Memory Mapped I/O.

**I/O Data Transfer Techniques:** Programmed I/O, Interrupt Initiated I/O, DMA Controller and IOP.

**Synchronous and Asynchronous Data Transfer:** Concept of strobe and handshaking, source and destination initiated data transfer. (09)

### SECTION-D

**Stack Organization:** Memory Stack and Register Stack

**Memory organization:** Memory Hierarchy, Main Memory (RAM and ROM chips, Logical and Physical Addresses, Memory Address Map, Memory Connection to CPU), Associative Memory

**Cache Memory:** Cache Memory (Initialization of Cache Memory, Writing data into Cache, Locality of Reference, Hit Ratio), Replacement Algorithms (LRU and FIFO).

**Cache Memory Mapping Techniques:** Direct Mapping, Associative Mapping and Set-Associative Mapping. Harvard Architecture, Mobile Devices Architecture (Android, Symbian and Windows Lite), Layered Approach Architecture. (09)

#### **Suggested Readings/Books:**

1. **Computer System Architecture**, M.M. Mano, Third Edition, PHI
2. **Computer Organization and Architecture**, J.P. Hayes, Third Edition, TMH
3. **Computer Organization and Architecture**, Stallings, Eighth Edition, PHI

## BSBC 205 WORKSHOP ON WEB DEVELOPMENT

**Objectives and Expected Outcome/s:** This course will enable the student to build and publish websites using Dreamweaver, a popular visual website production and management program, using HTML, DHTML, CSS and JavaScript. This course will enable the student to build and publish websites using Dreamweaver, a popular visual website production and management program. The intention is for the student to be able to:

1. Identify the entities responsible for implementing mark-up language standards.
2. Code and troubleshoot HTML and XHTML web pages, incorporating CSS and scripts.
3. Incorporate multimedia (images, animation, sound, and movies) into web pages.
4. Demonstrate effective use of Dreamweaver to build and publish professional web sites that employ best practices, adhere to current web standards, and pass validation.

---

### • Introduction to Web Development:

Website, Webpage, Static Website, Dynamic Website.

### • Introduction to HTML/DHTML:

HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Where to put Tables, Lists, Images, Forms, CSS in DHTML, Implementation of Web Pages using CSS.

### • Introduction to JavaScript:

How & Where to put the JavaScript Code, JavaScript Statements, Comments, Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

### • Introduction to Dreamweaver:

Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New Web Pages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

### • Purchasing a Domain Name & Web Space:

Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

**Suggested Readings/Books:**

1. **HTML & CSS: The Complete Reference**, Thomas Powell, Fifth Edition
2. **Sams Teach Yourself HTML and CSS in 24 Hours** Julie C. Meloni & Michael Morrison, Eighth Edition
3. **HTML A Beginner's Guide** Wendy L. Willard, Fourth Edition
4. **HTML, XHTML and CSS All-in-One For Dummies** Andy Harris, Second Edition
5. **JavaScript, A Beginner's Guide** John Pollock, Third Edition
6. **Professional JavaScript for Web Developers (Wrox Programmer)** Nicholas C. Zakas, Second Edition
7. **Dreamweaver CS5 For Dummies** Janine C. Warner, Paperback Edition
8. **Adobe Dreamweaver CS5 Bible** Joseph Lowery, Paperback Edition
9. **The Essential Guide to Dreamweaver CS4** David Powers

**Websites:**

1. [www.w3schools.com](http://www.w3schools.com)
2. [www.html.net](http://www.html.net)
3. [www.thesitewizard.com](http://www.thesitewizard.com)
4. [www.learn-dreamweaver-tutorials.com](http://www.learn-dreamweaver-tutorials.com)

## BSBC 206 SOFTWARE LAB-III(OOPS using C++)

**Instructions for candidates:** All the following concepts need to be practised with at least 10 programs per topic and sub-topical along with their algorithms. Practical file needs to be maintained.

---

### SECTION –A

**Structures:** Definition, declaration, scope, functions

**Union:** Definition, declaration, scope, functions

**Class:** Definition, declaration, members, scope of members.

### SECTION –B

**Class Function:** definition (Inside class, outside class), in-line functions, static function, friend functions, scope of functions (public, private), and nesting of member functions

**Class Data members:** creating objects, accessing member functions, array of objects, objects as arguments (Pass by value, pass by reference)

**Constructor and destructor:** creating default constructor, parameterized constructor, copy constructor, destructor

### SECTION –C

**Inheritance:** base class, derived class, visibility mode (public, private, protected), single inheritance, multi-level inheritance, multiple inheritance, nesting of classes, access control to functions (with different scope),

Function overloading and overriding, operator overloading,

### SECTION –D

Early binding, late binding, virtual functions, pure virtual functions

**Input/output files:** streams, buffers and io-streams, various input-output functions, processing files using class functions

# *Third Semester*

## BSBC301 SYSTEM ANALYSIS & DESIGN

**Objective/s & Expected Outcome:** To teach the analysis and practicality of various systems on which software systems can be developed. After completing this course students will be able to design and develop systems.

---

### SECTION-A

**System Development Life Cycle:** System Definition, characteristics, elements & types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

### SECTION-B

**System Design:** Process and stages of systems design, Input/Output and file design, Documentation (User Manual, Design Documentation, Training Manual), Case Study techniques in system design.

### SECTION-C

**System testing:** Unit Testing, System Testing, Integration Testing, Alpha & Beta Testing, Acceptance Testing, Regression Testing.

### SECTION-D

**System Implementation:** System implementation Process, Implementation methods, System maintenance, Post implementation maintenance.

### **Suggested Readings/Books:**

- **System Analysis and Design** Awad Elias N. *Second Edition*, Galgotia Publications
- **Analysis and Design of Information System** Sen James A. *Second Edition*, Tata McGraw Hill.

## BSBC302 DATA STRUCTURES

**Objective/s Expected Outcome:** Objective is to make the students understand how data is managed internally within any computer with the understanding of basic knowledge of C and C++. The students will gain the knowledge of basics of internal data structure.

---

### SECTION-A

**Introduction to Data Structures:** Basic concept of data, Problem analysis, algorithm complexity, Big O notation and time space tradeoff, Types of data structures: arrays, records, pointers, stack, queue, trees, linked list, packet, blocks, tracks, sector (in storage devices).

**Searching and Sorting:** Use of various data structures for searching and sorting, linear and binary search, bubble sort, insertion sort, selection sort.

### SECTION-B

**Stacks & Queues:** Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.

### SECTION-C

**Linked Lists:** Single linked list, Circular linked list, Doubly linked list and Dynamic storage management, generalized list, Garbage Collection.

### SECTION-D

**Trees:** Definition & Concepts, Basic trees, Binary tree representations, Binary tree traversals and application of trees.

### **Suggested Readings/Books:**

- **Data Structures**, Lipschutz Seymour, Second Edition, TMH
- **Algorithm + Data Structures = Programs**, Ni Claus Wirth, Prentice Hall
- **Data Structures**, Tanenbaum, Paperback Edition
- **An Introduction to Data Structures Applications**, Trembley & Soreson, Second Edition

## BSBC303 DIGITAL CIRCUITS & LOGIC DESIGN

**Objective/s & Expected Outcome:** To give knowledge about the various electronics components and digital circuits to the students and designing of various building blocks of computer system. After studying this subject students will be able to design small projects and can easily understand the internal working of digital electronic circuits.

---

### SECTION-A

**Number System:** Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Conversion from One Number System to another, Arithmetic Operation without Changing the Base, 1's Complement and 2's Complement. **Logic Gates:** AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND & NOR as Universal Gates, Logic Gates Applications.

### SECTION-B

**Boolean Algebra:** Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps. **Combinational Logic Circuits:** Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor.

### SECTION-C

**Combinational Logic Circuits:** Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders. **Sequential Logic Circuits:** Latch, Flip-Flops-R-S Flip-Flop, J-K Flip-Flop, Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.

### SECTION-D

**Counters:** Clock Pulse Generator using 555 Timer as Monostable and Multivibrator, Design of Asynchronous Counters, Design of Synchronous Counters, Up-Down Counters, MOD-N Counters.

**Suggested Readings/Books:**

- **Digital Computer Electronics**, Malvino, Second Edition, Mc-Graw Hill
- **Modern Digital Electronics**, R.P. Jain, Fourth Edition, TMH
- **Digital Logic & Computer Design**, D. Morris Mano, Second Edition, PHI
- **Digital and Electronic Circuits**, T.C. Bartee, McGraw Hill
- **Digital Fundamentals**, Floyd, Ninth Edition, PHI
- **Digital Integrated Electronics**, Taub & Schilling, Eighth Edition, Mc-Graw Hill

## BSBC304 BASIC ACCOUNTING

**Objective/s&Expected Outcome:** This course provides an orientation in the field of accounting and basic accounting fundamentals. After completion of this course, candidate would be able to record and post transactions in the basic accounting equation and maintain subsidiary ledgers.

---

### SECTION-A

**Basic Accounting Concepts:** Background of Accounting, Introduction, importance and scope, Accounts – Types and classification; basic terms – Capital, Income, Expenditure, Expenses, Assets, Liabilities and application to Problems., Accounting Equation, Double Entry System.

**Generally accepted accounting principles.**

### SECTION-B

**Journal and Ledger-** Journal and recording of entries in journal with narration; Ledger – Posting from Journal to respective ledger accounts. Basic concepts of purchase book, sales book and cash book. **Trial Balance:** Need and objectives; Application of Trial Balance; different types of errors escaped, trial Balance preparation.

### SECTION-C

**Final Accounts:** Final Accounts without adjustments. **Bank Reconciliation Statement:** Bank transactions, Preparation of simple bank reconciliation statement.

### SECTION-D

**Sources of raising of capital in corporate undertaking:** working Capital and Long term Capital. **Application of computers in accounting.**

### **Suggested Readings/Books:**

- Managerial Accounting, Jawahar Lal, First Edition
- Financial Accounting, Dr. R.K. Mittal & M.R. Bansal
- Basic Accounting, Rajni Sofat & Preeti Hiro, Second Edition
- Accounting for management, Bhattacharya & Deaden, Paperback Edition, Vikas 1986
- Financial Accounting (Part I and Part II), R.L Gupta & V.K Gupta
- Fundamental Accountancy, S.N. Maheshwari
- Accounting Principal, Antony & Reece, Sixth Edition.

## **BSBC305 SOFTWARE LAB-IV (Data Structures)**

**Note:** Program should be fully documented with sample I/O. Data Flowcharts should be developed wherever necessary.

**Write an Algorithm and Program using functions for:**

1. Program using Recursion.
2. Traversing the elements of an Array
3. Inserting an element in an Array
4. Deleting an element from an Array
5. Merging two Arrays
6. Linear Search
7. Binary Search
8. Insertion Sort
9. Bubble Sort
10. Selection Sort
11. Implementing PUSH & POP operations of a Stack
12. Array Implementation of a Queue and Circular Queue
13. Converting infix notation into postfix notation
14. Insertion in single and double Linked List
15. Deletion from single and double Linked List

## BSBC306 HARDWARE LAB-I (Digital Circuits & Logic Design)

**Basic Electronics:** Introduction to Diode, Diode Characteristics, Transistor as a Switch & Logical Element, Introduction to TTL and MOS Technology, Transistor Characteristics, Transistor as a Switch & Logical Element, Introduction to TTL and MOS Technology, Transformer.

### Practicals:

1. To study the function of basic logic gates and verify the truth table of AND, OR, NOT, XOR, NAND, NOR.
2. To study applications of AND, OR, NAND, X-OR gates for gating digital signals.
3. To develop the different Arithmetic Circuits:
  - a. Half-Adder and Subtractor.
  - b. Full-Adder and Subtractor.
4. To study the BCD to binary and binary to BCD Code converter.
5. Study of Decoder Circuits:
  - a. BCD-to-Decimal Decoder
  - b. BCD-to-7-Segment Decoder
6. Study of Encoder Circuits:
  - a. BCD-to-Decimal Encoder
  - b. Octal-to-Binary Encoder
7. To study the flip flop circuit using Gates:
  - a. R-S Flip Flop
  - b. J-K Flip Flop
  - c. Master Slave J-K Flip Flop
  - d. D-Flip Flop
8. To study R-S, J-K and D Flip Flop Using IC's.
9. Study of Ring Counter.
10. Study of Asynchronous and Synchronous Counters.

*Fourth Semester*

# SOFTWARE ENGINEERING

## BSBC401

**Objective:** The objective of this course is to make students familiar with all the software development principles, models and designing tools required to develop the software.

**Expected Outcome:** After completing this course, students will learn new techniques and models on which software development is based.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

### SECTION A

**Software:** Characteristics, Components Applications, **Software Process Models:** Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics And Measurement.

### SECTION B

**S/W Project Planning:** Objectives, **Decomposition Techniques:** S/W Sizing, Problem Based Estimation, Process Based Estimation, **Cost Estimation Models:** COCOMO Model, The S/W Equation, **System Analysis:** Principles of Structured Analysis, Requirement Analysis, DFD, Entity Relationship Diagram, Data Dictionary. **S/W Design:** Objectives, Principles, Concepts, **Design Methodologies:** Data Design, Architecture Design, Procedural Design, Object – Oriented Concepts.

## SECTION C

**Testing Fundamentals:** Objectives, Principles, Testability, **Test Case Design:** White Box & Black Box testing, **Testing Strategies:** Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.

## SECTION D

**Advanced topics in Software Engineering:**

**Reengineering:** Reverse Engineering, Restructuring, Forward Engineering.

**Computer Aided Software Engineering (CASE):** Taxonomy of CASE tools.

### **Suggested Books:**

1. Roger S. Pressman, "Software Engineering—A Practitioner's Approach", Sixth Edition, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", Paperback Edition, McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", Third Edition, Narosa Publishing House

# MICROPROCESSORS & MICROCONTROLLERS

## BSBC402

**Objectives:** To make students aware about the internal architecture of microprocessors and give the basic knowledge about the assembly level language programming.

**Expected Outcomes:** After studying this subject students will be able to understand the architecture of microprocessors and the various controllers used with it to enhance the performance of computer system. Students will be able to write assembly level programs for hardware interfacing.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all. Papers should be designed to emphasize the concepts of various technologies rather than memorizing.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

### SECTION-A

**Introduction to Microprocessors:** Historical Background of Microprocessors, Applications of Microprocessors, Introduction to 8085, Architecture of 8085, Pin Diagram of 8085.

### SECTION-B

Instruction Cycle, Timing Diagrams of Memory Read/Write Operations & timing diagrams of various Instructions, Addressing Modes, Instruction Set, Data Transfer Instructions, Arithmetic Instructions, Logical Instructions, Branch Instructions, Control Instructions, RISC & CISC Processors.

## SECTION-C

### **Introduction to Microcontrollers:**

Architecture of Microcontroller, Microcontroller Resources, Resources in Advanced and Next Generation Microcontroller, 8051 Microcontroller, Internal and External Memories, ROM Based Controller, Counters and Timers, Synchronous Serial and Asynchronous Serial Communication, Interrupts.

## SECTION-D

### **Peripheral Devices and Controllers:**

Introduction and Architecture of DMA Controller 8257, Architecture of Programmable Interrupt Controller 8259, Clock Generator, Architecture of 8284.

### **Suggested Books:**

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh. S. Gaonkar, Fourth Edition, Penram International Publishing
2. 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi Janice Gillispie Mazidi, Second Edition, PHI
3. Fundamentals of Microprocessors and Microcomputers, B. Ram, Fourth Edition, Dhanpat Rai Publications
4. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium Pro Architecture, Programming and Interfacing, B. Brey, Fifth Edition, Prentice Hall International

# OPERATING SYSTEMS

## BSBC403

**Objective:** The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design.

**Expected Outcome:** Upon successful completion of this course, the student shall be able to:

1. Exhibit familiarity with the fundamental concepts of operating systems;
2. Exhibit competence in recognizing operating systems features and issues; and
3. Apply a mature understanding of operating system design and how it impacts application systems design and performance.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

## SECTION A

**Introduction:** Application programs and system programs; functions of an operating system; classification of operating systems - Multi-user, multiprogramming, multiprocessing, time sharing, multi-threaded. Subsystems - Top Layer, Middle Layer, Bottom Layer, Bootstrap, Protection and security.

**Processes and Threads:** Program vs. Process; Process context, address space, identification, transition, state & management. Thread management - benefits, synchronization issues; applications of threads.

## SECTION B

**CPU Management:** Objectives, Pre-emptive vs. Non-pre-emptive, context switching, scheduling schemes; multi-processor scheduling, thread scheduling.

**Inter-process Communications:** Introduction, message passing model, shared memory model. Pipe, FIFO and Socket.

## SECTION C

**Memory Management:** Introduction, address binding, relocation, loading, linking, memory sharing and protection; Paging and segmentation; Virtual memory: basic concepts of demand paging, performance, page replacement. Thrashing.

**I/O Device Management:** I/O devices and controllers, device drivers; disk storage, scheduling and management.

## SECTION D

**File Management:** Basic concepts, file operations, access methods, directory structures and management, remote filesystems; file protection.

**Protection & Security:** Need, environments: software, hardware, unauthorized use, denial of services, access control and authentication. Application security, attacks, virus & anti-virus, firewall.

### Suggested Books:

1. Operating System Principles by Abraham Silberschatz and Peter Baer Galvin, Seventh Edition, Published by Wiley-India
2. Operating Systems by Sibsankar Haldar and Alex A. Aravind, Published by Pearson Education.
3. An Introduction to Operating Systems by Dietel H.M., Second Edition, Published by Addison Wesley.
4. Operating system by Milan Milenkovic, Second Edition
5. Operating system by Stalling, W., Sixth Edition, Published by Prentice Hall (India)

# DATABASE MANAGEMENT SYSTEMS

## BSBC404

**Objectives:** This course covers fundamentals of database architecture, database management systems, and database systems. Principles and methodologies of database design, and techniques for database application development.

**Expected Outcome:** Upon completion of this course, participants will have gained knowledge of database system concepts and the ability to:

- understand user requirements/views
- analyze existing and future data processing needs
- develop an enterprise data model that reflects the organization's fundamental business rules
- develop and refine the conceptual data model, including all entities, relationships, attributes, and business rules

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instruction for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

## SECTION A

**An overview of DBMS:** Concept of File Processing Systems and database systems, Database Administrator and his responsibilities. Physical and Logical data independence.

**Three level Architecture of Database System:** the external level, conceptual level and the internal level.

## SECTION B

**Introduction to Data Models:** Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

## SECTION C

**Relational data Model:** Relational database, relational algebra and calculus, SQL dependencies, functional dependency, multi-valued dependency and join, normalization.

## SECTION D

**Database protection:** Recovery, Concurrency Management, Database Security, Integrity and Control, Disaster Management

**Distributed databases:** Structure of a distributed database, design of distributed databases.

### Suggested Books:

1. "An Introduction to Database System", Bipin C. Desai, Galgotia Publications.
2. "An Introduction to Database Systems", C.J. Date, Eighth Edition, Narosa Publications.
3. "Database System Concepts", Henry F. Korth, Fifth Edition, McGraw Hill.
4. "Introduction to Database Management", Naveen Prakash, TMH
5. "Principles of Database Systems", Ullman, Second Edition, Galgotia Publications.
6. "Database Systems: Design, Implementation, and Management", Rob Coronel, Ninth Edition

## HARDWARE LAB-II(Microprocessors&Microcontrollers)

### BSBC405

Using **8085 Microprocessor kits** do the following programs:

1. To examine and modify the contents of a register and memory location.
2. To add two 8-bit hexadecimal numbers without considering the carry generated.
3. To add two 8-bit hexadecimal numbers considering the carry generated.
4. To subtract two 8-bit hexadecimal numbers without considering borrow.
5. To subtract two 8-bit hexadecimal numbers considering borrow.
6. To add two 8-bit hexadecimal nos. The result should not be greater than 199.
7. To add two 16-bit hexadecimal numbers without considering the carry generated.
8. To add two 16-bit hexadecimal numbers considering the carry generated.
9. To subtract two 16-bit numbers without considering borrow.
10. To subtract two 16-bit numbers considering borrow.
11. To find 2's complement of 8-bit hexadecimal number.
12. To add series of 8-bit hexadecimal numbers neglecting the carry generated.
13. To separate 8-bit hexadecimal number into two digits (Breaking the byte into two nibbles).
14. To arrange the series of 8-bit hexadecimal numbers in ascending order.
15. To arrange the series of 8-bit hexadecimal numbers in descending order.

**SOFTWARE LAB-V (Database Management  
Systems)  
BSBC406**

This laboratory course will mainly comprise of exercise on what is learnt under the paper:

**BSBC208**

**Familiarization with MS Access:** Features, Elements, Part of MS Access Window, Creating and Saving Database, and Tables.

**Using Queries:** Running various DDL and DML commands using SQL, Creating Views

**Using Forms and Reports in MS Access**

**Introductory Practical on using Crystal Reports**

*Fifth Semester*

# DATA WAREHOUSING & MINING

## BSBC501

**Objective:** The objective of this course is to get students familiar with the data mining techniques, softwares and tools being used in Industries.

**Expected Outcome:** After completing this course, students will learn various tools and techniques which are prominent from Industrial point of view.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

**Internal Assessment-40 Marks**  
**External Assessment-60 Marks**

### SECTION-A

Introduction to Data Warehousing, The need for data warehousing, Operational & Informational Data Stores, Data Warehouse Characteristics, Data Warehouse role & Structure, The cost of warehousing data.

Introduction to OLAP & OLTP, Difference between OLAP & OLTP. OLAP Operations

### SECTION-B

Building a Data Warehouse, Design/Technical/Implementation Considerations, Data Pre-processing Overview, Data Summarization, Data Cleaning, Data Transformation, Concept Hierarchy, Structure. Patterns & Models, Artificial Intelligence (Overview).

Multidimensional Data Model, Schemas for Multidimensional Data (Star Schema, Snowflake Schema, Fact Constellation), Data Warehouse Architecture, Data Warehouse Design, OLAP

Three-tierArchitecture,Indexing&QueryinginOLAP,OLAM,EfficientMethodsofCube  
Computation, DiscoveryDriven Exploration ofData Cubes, Attributed-OrientedInduction.

### SECTION -C

AssociationRuleMining,MarketBasketAnalysis,AprioriAlgorithm,Mining Multilevel  
AssociationRules, FromAssociationMiningtoCorrelationAnalysis, ConstraintBased  
AssociationMining,IntroductiontoClassification,Classification by decisionTree,Attribute  
Selection Measure.

### SECTION -D

IntroductiontoPredictiontechniques,Accuracy ofaClassifier,Cross-Validation,Bootstrap,  
Boosting,Bagging,IntroductiontoClustering,Classificationof VariousClustering Algorithms,  
SelectingandUsingRightDMTechnique,SelectingandUsing RightDMTechnique,Data  
Visualization.

#### **SuggestedBooks:**

1. Data Warehousing,Data Mining,andOLAP,AlexBerson,FirstEdition,TataMcGraw  
Hill
2. DataMiningConcepts&Techniques, JiaweiHan&MichelineKamber,SecondEdition,  
Morgan Kaufmann Publishers
3. ModernData Warehousing,Mining&VisualizationCoreConcepts,GeorgeMMarakas, First  
Edition, PearsonEducation
4. Data Warehousing, Architecture&Implementation,Hawkin, PrenticeHall
5. DataMining:ModellingDataforMarketing,RiskandCustomerRelationshipMgmt,  
Rud,Olivia, Paperback Edition
6. Data MiningTechniques,Berry,Michael, Third Edition
7. Data Mining,Data Warehousingand OLAP, Sharma, Gajendra, Second Edition
8. Data Mining with CaseStudies, GuptaGK, Second Edition
9. Principles of Data Mining, Hand,David

# PROGRAMMING IN JAVA

## BSBC502

**Objective:**The objective of this course is to let students understand basics of java programming language, development of programs and database connectivity.

**Expected Outcome:**Students will be able to create number of small applications in Java.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

-----  
Internal Assessment-40 Marks

External Assessment-60 Marks

### SECTION-A

**FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING:** -Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming Benefits of OOP; Applications of OOP.

**JAVA EVOLUTION:** -Java History; Java Features; How Java Differs from C and C++; Java and Internet, Java and World Wide Web, Web Browsers; Hardware and Software Requirements; Java Support Systems, Java Environment

**OVERVIEW OF JAVA LANGUAGE:**-Introduction;SimpleJavaProgram;Comments injava; An application with Two Classes; Java Program Structure; Java Tokens; Java Statements; ImplementingaJava Program;JavaVirtualMachine; Command Line Arguments;ProgrammingStyle.

**CONSTANTS,VARIABLESANDDATATYPES:**-Introduction;Constants; Variables;Data Types; Variables, Constants, Standard DefaultValues.

**OPERATORSANDEXPRESSIONS:**-Introduction toOperators,Expressions; OperatorPrecedence; MathematicalFunctions.

**DECISION MAKING, BRANCHING AND LOOPING:** - Decision making and Branching Statements, LoopingStatements, Labeledloops,JumpingStatements

## **SECTION-B**

**CLASSES,OBJECTSANDMETHODS:**-Introduction;Defining aClass;Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing ClassMembers;Constructors;Methods Overloading;Static Members;NestingofMethods;

Inheritance: Extending a Class; Overriding Methods; Final Variables and Methods; Final Classes; FinalizerMethods;AbstractMethods andClasses;VisibilityControl.

**ARRAYS,STRINGSANDVECTORS:**- Arrays;ZaggedArrays;;Strings; String functions;Vectors; WrapperClasses.

**INTERFACES:** Introduction;Defining Interfaces;ExtendingInterfaces;Implementing Interfaces; AccessingInterfaceVariables, ImplementingMultipleInheritance usingInterfaces.

**PACKAGES:** Introduction; SystemPackages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding aClass to aPackage;Hiding Classes.

## SECTION-C

**MANAGING ERRORSANDEXCEPTIONS:-** Introduction; TypesofErrors;Exceptions;Exception Handling using Try,CatchandFinally block:Throwing OurOwnExceptions;Using Exceptions for Debugging.

**APPLET PROGRAMMING:-** Introduction; How Applets Differ from Applications;Applet Life Cycle; Creating anExecutableApplet;PassingParameters toApplets;AligningtheDisplay;More aboutHTMLTags;DisplayingNumericalValues;Getting Input from the User.

**GRAPHICSPROGRAMMING:-**Introduction;The GraphicsClass;Lines and Rectangles;Circlesand Ellipses;Drawing Arcs;Drawing Polygons;LineGraphs;Using ControlLoopsinApplets;Drawing Bar Charts.

## SECTION-D

**JAVAAWT:** -Java AWTpackage Containers;Basic User Interface components;Layouts.

**EVENT HANDLING:** -Eventdelegation Approach;ActionListener;AdjustmentListener, MouseListener;MouseMotionListener;WindowListener;KeyListener;ItemListener

**JAVA I/O HANDLING :** I/O File Handling(InputStream &OutputStreams,FileInputStream &FileOutputStream,DataI/PandO/PStreams,FileClass,ReaderandWriterStreams,RandomAccess File).

### **SuggestedBook:**

1. Programming InJava, E-Balagurusami, Fourth Edition,TataMcGraw Hill
2. MasteringJava, Second Edition, BPBPublications
3. AdvanceJava, Ivan Bayross, BPBPublications

# MANAGEMENT INFORMATION SYSTEM

## BSBC 503

**Objective:** To familiarize students with different types of information systems used at different levels in organizations.

**Expected Outcome:** After the completion of this course students will be able to know the concepts and usage of different types of information systems at various managerial levels in the organizations.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective units of the syllabus and will carry 10 marks each.

Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

**Note:** Suitable Case Studies must be incorporated while teaching for better understanding of the concepts.

---

**Internal Assessment-40 Marks**

**External Assessment-60 Marks**

### SECTION-A

Introduction to Systems and Basic Systems Concepts, Elements (Components) of System, Characteristics of System, Types of Systems, System Approach. Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision-Making, Level of Management. Introduction to different kinds of Information Systems: ESS, EIS, DSS, MIS, KWS, TPS, OAS and EDP.

## **SECTION-B**

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Structured Vs Unstructured Decisions, Formal Vs Informal Systems, Pitfalls in MIS Development.

## **SECTION-C**

Simon's Model of Decision-

Making, DSS: Concept, Characteristics and Components, Gorry & Scott Morton Grid, Introduction to GDSS.

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation.

## **SECTION-D**

Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.

### **Suggested Books:**

1. Management Information Systems, Goyal, D.P., Third Edition, Macmillan.
2. Management Information Systems, Oz, Effy, Thomson Press Indian Edition.
3. "Management Information Systems", Kanter, J., Third Edition, PHI.
4. "Management Information Systems", Davis, Gordon B. & Olson, M.H, Second Edition
5. "Information Systems for Modern Management", Murdick, Robert G., & Ross, Joel E., & Claggett, James R., Third Edition, PHI.
6. "Analysis, Design & Implementation of Information System", Lucas, Fourth Edition
7. Management Information Systems, Laudon K.C., Eleventh Edition, Pearson

# WORKSHOP ON ADVANCED WEB DEVELOPMENT

## BSBC 504

**Objective:** Objective of this course to learn modern web development technology using Microsoft ASP.Net and its various controls.

**Expected Outcome:** Students will develop a website in ASP.NET and make it online by the end of the semester.

**Internal Assessment-60 Marks**

**External Assessment-40 Marks**

### SECTION-A

#### **Introduction to ASP.NET:**

.NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle.

#### **Controls:**

HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

### SECTION-B

#### **State Management:**

ViewState, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State, Profile Properties, Master Pages, Themes, Site Navigation.

Introduction to ADO.NET, Data Binding, Importing the SqlClient Namespace, Defining the Database Connection, Managing Content Using Grid View and Details View.

#### **Security and User Authentication:**

Basic Security Guidelines, Securing ASP.NET Applications, ASP.NET Memberships and Roles.

#### **Working with Files and Email:**

Writing and Reading Text Files, Uploading Files, Sending Email with ASP.NET.

Introduction to Web Services, Ajax, Silverlight.

**SuggestedBooks:**

1. BeginningASP.NET4: in C# andVB(Wrox),ImarSpaanjaars, PaperbackEdition
2. Sams Teach Yourself ASP.NET4 in 24 Hours, Complete Starter Kit ScottMitchell
3. Microsoft ASP.NET4 Step byStep(Microsoft),GeorgeShepherd, Paperback Edition

**Websites:**

- [www.asp.net](http://www.asp.net)
- [www.w3schools.com](http://www.w3schools.com)
- [www.learn-asp.net](http://www.learn-asp.net)
- [www.aspnetutorials.com](http://www.aspnetutorials.com)

# **SOFTWARE LAB-VI(Programming in Java)**

**BSBC505**

**Internal Assessment-60Marks**

**External Assessment-40Marks**

**Implementation of all the programs related to theory concepts studied in Programming in Java Paper [ BSBC 502 ].**

1. Operators and Mathematical Functions.
2. Decision making, Branching and Looping Statements.
3. Classes, Objects and Methods.
4. Arrays, Strings and Vectors.
5. Interfaces.
6. Packages.
7. Exception handling.
8. Applet Programming.
9. AWT.
10. Event Handling.
11. I/O Handling.

# **BSBC506 PROJECT WORK-I**

**Internal Assessment-60Marks**

**External Assessment-40Marks**

Starting of Major Project named as Minor Project (Feasibility Study, Requirement Analysis and Design)

## **Tools for Minor Projects**

<b>Frontend</b>	<b>VB or .NET (Either VB .Net or ASP.Net) or Java</b>
<b>Backend</b>	<b>Sql Server or Oracle</b>

In Minor Projects 2 normal applications and one database related application is must

**Note: The break up of marks for the External practical will be as under**

Viva Voce                      15 marks

System Development              25 marks

*Sixth Semester*

# PRINCIPLES OF MANAGEMENT

## BSBC601

**Objective:** To have in-depth knowledge about different types of business organizations, practical applicability of the concepts of management across the different functions in organizations.

**Expected Outcome:** After the completion of the course students will have insights about the existence and practical functioning of business organizations.

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

**Internal Assessment-40 Marks**  
**External Assessment-60 Marks**

### SECTION-A

**Forms of Business Organizations and Ownership:** Sole Proprietorship, Partnership, Joint Stock Company, Public & Private undertakings, Government Companies.

**Management:** Meaning & Definition of Management, Nature, Scope and its various functions.

### SECTION-B

**Planning:** Nature and purpose, types, steps in planning process.

**Decision Making:** Strategic, tactical and Operational decision, decision making process, rationality in decision making.

**Organizing:** Nature, importance, the organizing process, organizational objectives, formal and informal Organization, organization chart

**Span of Management:** Factors determining effective span

### **Section- C**

**Departmentation:** Definition, Departmentation by function, by territory, product/service customer group, Management by objectives (MBO).

**Authority:** Delegation of Authority, Decentralization v/s Centralization.

**Staffing:** Definition, Manpower Management, factors affecting staffing, Recruitment and Selection, Performance Appraisal, Importance of Training.

### **SECTION-D**

**Motivation:** Theories of Motivation, Hierarchy of needs theory, Theory of X and Theory of Y. **Leadership:** Styles, Theories of Leadership, Trait Approach and situational approach, Managerial Grid. **Controlling:** Meaning & nature, Steps in Controlling, Essentials of Effective Control Systems.

#### **Suggested Books:**

1. Essentials of Management, Koontz, Tenth Edition
2. Principles & Practices of Management, L.M. Prasad, Third edition
3. Management, Y.K. Bhushan, Fourth Edition
4. An Executive's Encyclopedia of Management Practices, Prof. Parag Diwan

## **Computer Graphics BSBC 602**

**Objective:** The objective of the study is to let students understand basics of computer graphics, Input/output primitive and basic transformations, which can be applied on objects of graphics.

**Expected Outcome:** Practical applications of graphics, Program development and basic animations without using graphical softwares.

### **Instructions for Paper-Setter**

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### **Instructions for Candidates**

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

**Internal Assessment-40 Marks**  
**External Assessment-60 Marks**

### **SECTION-A**

Introduction to Active and Passive Graphics, Applications of Computer Graphics.

Input devices: light pens, Graphic tablets, Joysticks, Trackball, Data Glove, Digitizers, Image scanner, Graphs and Types of Graphs.

Video Display Devices-- Refresh Cathode Ray Tube, Raster Scan displays, Random Scan displays, Architecture of Raster and Random Scan Monitors, Color CRT-monitors and Color generating techniques (Shadow Mask, Beam Penetration), Direct View Storage Tube, Flat-Panel Displays; 3-D Viewing Devices, Raster Scan Systems, Random Scan Systems, Graphics monitors and workstations, Color Models (RGB and CMY), Lookup Table.

### **SECTION-B**

Process and need of Scan Conversion, Scan conversion algorithms for Line, Circle and Ellipse, effect of scan conversion, Bresenham's algorithms for line and circle along with their derivations, Midpoint Circle Algorithm, Area filling techniques, flood fill techniques, character generation.

### **SECTION-C**

2-Dimensional Graphics: Cartesian and need of Homogeneous co-ordinate system, Geometric transformations (Translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text), Cohen Sutherland, Sutherland Hodgeman and Liang Barsky algorithm for clipping.

### **SECTION-D**

Introduction to 3-dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation, Reflection, Shearing), Mathematics of Projections (parallel & perspective). Introduction to 3-D viewing transformations and clipping.

#### **Suggested Books:**

1. D. Hearn and M.P. Baker, "Computer Graphics", PHI New Delhi; Second Edition, 1995
2. J.D. Foley, A.V. Dam, "Introduction to Computer Graphics", S.K. Feiner, J.F. Hughes, Addison-Wesley Publishing Company, R.L. Phillips. N.Y.; Second Edition, 1994.
3. R.A. Plastock and G. Kalley, "Computer Graphics", Second Edition, McGraw Hill, 1986.

# COMPUTER NETWORKS

## BSBC603

**Objective:** This course provides an in-depth discussion of computer networks. It includes a detailed discussion of the different Network Models. Concepts that have a direct effect on the efficiency of a network (e.g. collision and broadcast domains, topology) are also discussed.

**Expected Outcome:** Towards the end of the course, students are expected to /able to:

- Be familiar with the different Network Models.
- Understand different network technologies
- Understand the effects of using different networking topologies
- Be updated with different advanced network technologies that can be used to connect different networks
- Be familiar with various hardware and software that can help protect the network

### Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

---

**Internal Assessment-40 Marks**

**External Assessment-60 Marks**

### SECTION-A

**Data communications concepts:** Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of multiplexing, De-multiplexing.

**Types of Networks:** LAN, MAN, WAN

**Network Topologies:** Bus, Star, Ring, Mesh, Tree, Hybrid

**Communication Channels: Wired transmissions:** Telephonelines, leasedlines, switchline, coaxial cables- baseband, broadband, optical fiber transmission.

### **SECTION-B**

**Wireless Transmission:** (Standards and Specification) Microwavetransmission, Infraredtransmission, Laser transmission, Radio transmission and Satellite transmission and BlueTooth, FrequencySpectrum.

**Communication Switching Techniques:** CircuitSwitching, MessageSwitching, Packet Switching.

**Network Reference Models:** OSI Reference Model, TCP/IP Reference Model, Comparison of OSI and TCP/IP Reference Models.

### **SECTION-C**

**Data Link Layer Design Issues:** Services provided to the Network Layer, Framing, Error Control (error detection and correction code), Flow Control, Data Link Layer in the Internet (SLIP, PPP).

**Types of Multiplexing:** FDM, TDM, CDMA

### **SECTION-D**

**MAC sublayer:** CSMA/CD/CA, IEEE standards (IEEE 802.3 Ethernet, Gigabit Ethernet, IEEE 802.4 Token Bus, IEEE 802.5 Token Ring)

**The Network Layer:** Design Issues, Routing Algorithms: Optimality Principle, Shortest Path Routing, Congestion Control Policies, Concept of Internetworking.

### **Suggested Books:**

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition
3. Computer Today, S.K. Basandra, First Edition, Galgotia
4. Data Communication System, Black, Ulysse, Third Edition, PHI
5. Data and Computer Communications, Stalling, Ninth Edition, PHI

## BSBC604 Information Security

### Section A:

Information Security Concepts : Information Security Overview: Background and Current Scenario, Principles of Security- Information Classification, Policy Framework, Role based Security in an organization, Components of Information Systems, Balancing Information Security and Access, Approaches to information Security Implementation, Security Systems Development Life Cycle.

### Section B:

Security Threats and Vulnerabilities: Overview of Threats and Vulnerabilities-Intruders, Malicious Software, Viruses and related Threats, Desktop Security, Email Security: PGP and S/MIME, Web Security: Web authentication, SSL and SET, Database Security. Firewalls- Overview, Design principles and Types.

### Section C:

Security Management and Laws: Introduction to Security Management, Access Control and Intrusion Detection, Overview of Identification and Authorization, Intrusion Detection Systems and Intrusion Prevention Systems, Security Procedures and Guidelines, Business Ethics and Best Practices, Security Assurance, Security Laws, IPR, International Security Standards, Security Audit, SSE-CMM/COBIT etc.

### Section D:

Cryptography: Concepts and Techniques, Symmetric and Asymmetric Key Cryptography, Steganography, Symmetric Key Ciphers-DES, AES (Structure and Analysis). Asymmetric Key Ciphers- Principles of Public Key cryptosystems, RSA Algorithm and its Analysis. Digital Signatures.

### **Suggested Books**

- 1) Introduction to Information Security and Cyber Laws Paperback-by Surya Prakash Tripathi (Author), Ritendra Goel (Author), Praveen Kumar Shukla (Author)
- 2) Principles of Information Security. Paperback-by Whitman (Author)
- 3) Cryptography and Information Security Paperback-by Pachghare V. K. (Author)

## **SOFTWARE LAB-VII(Computer Graphics)**

**BSBC605**

**Internal Assessment-60Marks**  
**External Assessment-40Marks**

**Implement theFollowing Algorithms using C/C++:-**

Useof basicfunctions ofgraphic available in C++like circle, putpixel, rectangle, arc, ellipse, floodfill, setcolor etc.

Useof basic primitive functions to show some animations.

Line DrawingAlgorithm likeDirect method, DDA and Bresenham's linealgorithms.

Drawa circleusingpolynomial, trigonometrymethod and Bresenham'sAlgorithm.

Drawan ellipse using Bresenham's Algorithm.

To movea character alongcircle.

To show 2DClippingand Windowing.

## **PROJECT WORK-II**

### **BSBC606**

Continuation to Project Work-I started in V semester (Code Generation, system testing, Installation and Operations & maintenance)

**Internal Assessment-120 Marks**

**External Assessment-80 Marks**

#### **Tools for Project Work-II**

<b>Frontend</b>	<b>VB or .NET (Either VB .Net or ASP.Net) or Java</b>
<b>Reports</b>	<b>Crystal Reports</b>
<b>Backend</b>	<b>SqlServer or Oracle</b>

**Note: The break up of marks for the external practical will be as under**

<b>Viva Voce</b>	<b>20 marks</b>
<b>System development</b>	<b>60 marks</b>

# MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

## BCA (1<sup>st</sup> YEAR)

Total Contact Hours = 25

Total Marks = 1050

Total Credits = 21

SEMESTER 1 <sup>st</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BCAP1-101	Problem Solving using C	3	1	0	50	100	150	4
BCAP1-102	Information Technology and Office Automation	3	1	0	50	100	150	4
BCAP1-103	Digital Electronics	3	1	0	50	100	150	4
BCAP1-104	Software Lab-I (Problem Solving using C based on BCAP1-101)	0	0	4	100	50	150	2
BCAP1-105	Software Lab-II (Information Technology and Office Automation based on BCAP1-102)	0	0	4	100	50	150	2
BHUM0-101	Communicative English	2	1	0	50	100	150	3
BHUM0-103	Human Values and Professional ethics	2	0	-	50	100	150	2
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>13</b>	<b>4</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>21</b>

## BCA (1<sup>st</sup> YEAR)

Total Contact Hours = 28

Total Marks = 1050

Total Credits = 24

SEMESTER 2 <sup>nd</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BCAP1-206	Object Oriented Programming Using C ++	3	1	0	50	100	150	4
BCAP1-207	Computer Organization and Architecture	3	1	0	50	100	150	4
BCAP1-208	Internet and its Applications	3	1	0	50	100	150	4
BCAP1-209	Multimedia and Applications	3	1	0	50	100	150	4
BCAP1-210	Software Lab-III (Object Oriented Programming Using C ++ based on BCAP1-206)	0	0	4	100	50	150	2
BCAP1-211	Software Lab-IV (Internet and its Applications based on BCAP1-208)	0	0	4	100	50	150	2
BMAT0-204	Fundamentals of Mathematics	3	1	0	50	100	150	4
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>15</b>	<b>5</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>24</b>

**MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS**

**BCA (2<sup>nd</sup> YEAR)**

**Total Contact Hours = 26**

**Total Marks = 1050**

**Total Credits = 22**

<b>SEMESTER 3<sup>rd</sup></b>		<b>Contact Hrs</b>			<b>Marks</b>			<b>Credits</b>
<b>Subject Code</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Int.</b>	<b>Ext.</b>	<b>Total</b>	
BCAP1-312	Data Structures	3	1	0	50	100	150	4
BCAP1-313	Web Technologies	3	1	0	50	100	150	4
BCAP1-314	Software Lab-V (Data Structures based on BCAP1-312)	0	0	4	100	50	150	2
BCAP1-315	Software Lab-VI(Web Technologies based on BCAP1-313)	0	0	4	100	50	150	2
BHUM0-106	Technical skills	2	1	0	50	100	150	3
<b>Departmental Elective - I (Select any one)</b>		3	1	0	50	100	150	4
BCAP1-356	Introduction to Microprocessors							
BCAP1-357	Emerging Trends in Information Technology							
<b>Open Elective (Select any One)</b>		3	0	0	50	100	150	3
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>14</b>	<b>4</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>22</b>

**BCA (2<sup>nd</sup> YEAR)**

**Total Contact Hours = 27**

**Total Marks = 1050**

**Total Credits = 23**

<b>SEMESTER 4<sup>th</sup></b>		<b>Contact Hrs</b>			<b>Marks</b>			<b>Credits</b>
<b>Subject Code</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Int.</b>	<b>Ext.</b>	<b>Total</b>	
BCAP1-416	Operating System	3	1	0	50	100	150	4
BCAP1-417	Programming in Java	3	1	0	50	100	150	4
BCAP1-418	Database Management Systems	3	1	0	50	100	150	4
BCAP1-419	Software Lab-VII (Programming in Java based on BCAP1-417)	0	0	4	100	50	150	2
BCAP1-420	Software Lab-VIII(Database Management Systems based on BCAP1-418)	0	0	4	100	50	150	2
<b>Departmental Elective – II (Select any one)</b>		3	1	0	50	100	150	4
BCAP1-458	Discrete Structures							
BCAP1-459	Embedded Systems							
<b>Open Elective (Select any One)</b>		3	0	0	50	100	150	3
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>15</b>	<b>4</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>23</b>

**MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS**

**BCA (3<sup>rd</sup> YEAR)**

**Total Contact Hours = 27**

**Total Marks = 1050**

**Total Credits = 23**

SEMESTER 5 <sup>th</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BCAP1-521	Mobile Computing	3	1	0	50	100	150	4
BCAP1-522	Programming in ASP.Net	3	1	0	50	100	150	4
BCAP1-523	Computer Networks	3	1	0	50	100	150	4
BCAP1-524	Software Lab-IX(Mobile Computing based on BCAP1-521)	0	0	4	100	50	150	2
BCAP1-525	Software Lab-X(Programming in ASP.Net based on BCAP1-522)	0	0	4	100	50	150	2
<b>Departmental Elective – III (Select any one)</b>		3	1	0	50	100	150	4
BCAP1-560	Network Security							
BCAP1-561	Artificial Intelligence							
<b>Open Elective (Select any One)</b>		3	0	0	50	100	150	3
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>15</b>	<b>4</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>23</b>

**BCA (3<sup>rd</sup> YEAR)**

**Total Contact Hours = 25**

**Total Marks = 1050**

**Total Credits = 21**

SEMESTER 6 <sup>th</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BCAP1-626	Computer Graphics	3	1	0	50	100	150	4
BCAP1-627	Software Engineering	3	1	0	50	100	150	4
BCAP1-628	Seminar	0	0	4	100	50	150	2
BCAP1-629	Software Lab-XI(Computer Graphics based on BCAP1-626)	0	0	4	100	50	150	2
<b>BESE0-101</b>	<b>Environmental Science</b>	2	0	0	50	100	150	2
<b>Departmental Elective - IV (Select any one)</b>		3	1	0	50	100	150	4
BCAP1-662	Wireless Communication							
BCAP1-663	Cloud Computing							
<b>Open Elective (Select any One)</b>		3	0	0	50	100	150	3
<b>Total</b>	<b>Theory = 5 Labs = 2</b>	<b>14</b>	<b>3</b>	<b>8</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>21</b>

**Overall**

Semester	Marks	Credits
1 <sup>st</sup>	1050	21
2 <sup>nd</sup>	1050	24
3 <sup>rd</sup>	1050	22
4 <sup>th</sup>	1050	23
5 <sup>th</sup>	1050	23
6 <sup>th</sup>	1050	21
<b>Total</b>	<b>6300</b>	<b>134</b>

**PROBLEM SOLVING USING C**

**Subject Code: BCAP1-101**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

**Course Objectives and Expected Outcomes**

1. The objective of this course is to help the students in finding solutions to various real life problems and converting the solutions into computer program using C language (structured programming).
2. Students will learn to write algorithm for solutions to various real life problems and converting the algorithms into computer programs using C language.

**UNIT-I (10 Hrs)**

**1. Problem Solving and Programming Languages**

Problem Solving Aspects, Program Development Steps, Introduction to Programming Languages, Types and Categories of Programming Languages, Program Development Environments.

**2. Logic development and algorithms**

Types of Problems, Data Centric and Process Centric, Problem Solving Strategies, Problem analysis, formal definition of problem, Top- Down design and Bottom-Up design, Algorithms, Flow charts, Flow chart symbols, Pseudo codes, illustrative examples.

**UNIT-II (11 Hrs)**

**3. Introduction to C Programming Language**

Introduction to C Language, Evolution and Characteristics of C Language, Compilation Model, Character Set, Keywords, Identifiers, Data Types, Variables, Constants, Operators, Expressions, Type conversion and Type Casting, Overview of Pre-processors, Structure of a C Program, Input and Output Statements.

**4. Control Statements**

Basic Programming Constructs, Sequence, Selection Statements 'if' Statement, Conditional / Ternary /?: Operator, Switch Statement, Iteration Statements, 'for' statement, 'while' statement, 'do - while' statement, break, continue Statement.

**UNIT-III (12 Hrs)**

**5. Arrays and Strings**

Need for an Array, Memory Organization of an Array, Declaration and Initialization, Basic Operations on Arrays, Multi-dimensional Array, Strings.

**6. Pointers**

Introduction, Declaration and Initialization, Pointer Arithmetic, Pointers and Arrays, Dynamic Memory Allocation.

**UNIT - IV (12 Hrs)**

**7. Functions and Storage Classes**

Need for Functions, Function Prototype, Function Definition, Function Call Passing Arguments, Functions and Arrays, Functions and Pointers, Command Line Arguments, Recursive Functions, String Functions, Automatic Storage Class, Register Storage Class, Static Storage Class, External Storage Class.

**8. Structures**

Declaration and Initialization, Structures and Arrays, Structures and Pointers, Structures and Functions, Introduction to Unions, Enumeration, Typedef Statement.

**9. Files**

Introduction, File Operations, Character I/O, String I/O, Numeric I/O, Formatted I/O, Block I/O.

**Recommended Books**

1. Shubhnandan Jamwal, "Programming in C", 6<sup>th</sup> Edn., Pearson, 2010.
2. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, 8<sup>th</sup> Edn., 2008.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

3. Brian Kernighan and Dennis Ritchie, "C Programming Language", 2<sup>nd</sup> Edn., PHI, 1988.
4. Byron Gottfried, "Programming with C", Tata McGraw Hill, 3<sup>rd</sup> Edn., 2006.
5. ISRD Group, "Programming and Problem Solving Using C", 3<sup>rd</sup> Edn., Tata McGraw Hill, 2008.
6. Yashvant P. Kanetkar, "Let us C", BPB Publications, 8<sup>th</sup> Edn., 2008.
7. R.S. Salaria, "Application Programming in C", 3<sup>rd</sup> Edn., Khanna Book Publishing, 2008.

### INFORMATION TECHNOLOGY AND OFFICE AUTOMATION

**Subject Code: BCAP1-102**

**L T P C**  
**3 1 0 4**

**Duration: 45 Hrs.**

#### Course Objectives and Expected Outcomes

1. This course will enable the student to gain and understanding of the core concepts and technologies which constitute Information Technology.
2. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology and Office Tools.

#### UNIT-I (11 Hrs)

##### 1. Computer Fundamentals

Block diagram of a computer, Characteristics of Computers, Hardware, Software, Machine Language, Assembly Language and Assembler, High Level Language and Compiler v/s Interpreter.

##### 2. Input Devices

Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR.

##### 3. Output Devices

Monitors, Impact Printers - Dot matrix, Character and Line printer, Non Impact Printers – Desk Jet and Laser printing, Plotter.

##### 4. Memories

Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk and DVD.

#### UNIT-II (10 Hrs)

##### 5. Windows

Installing Windows with set-up, Starting and Quitting windows, Basic Elements of Windows, working with menus dialogue boxes, Window Applications, Program Manager, File Manager, Print Manager, Control Panel, Write, Paint Brush, Accessories including Calculator, Calendar, Clock, Card file, Note pad, Recorder etc.

#### UNIT-III (12 Hrs)

##### 6. Word Processing Tool

Salient features of Word Processing, File, Edit, View, Insert, Format, Tools, Tables, Window, help options and all of their features, Options and Sub Options etc., Transfer of files between Word Processors and Software Packages.

##### 7. Presentation Tool

Making Presentations, Inserting objects, and Narration.

#### UNIT-IV (12 Hrs)

##### 8. Spreadsheet Tool

Excel Worksheet, Data Entry, Editing, Cell Addressing ranges, Commands, Menus, Copying & Moving cell content, Inserting and Deleting rows and column, Column formats, Cell Protection, Printing, Creating, Displaying and Printing Graphs, Statistical Functions.

##### 9. Introduction to Internet

Evolution of Internet, Internet Applications, WWW, E-mail, FTP, TELNET, Web Browsers.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

### Recommended Books

1. V. Rajaraman, "Fundamentals of Computers", 5<sup>th</sup> Edn., PHI, 2010.
2. Satish Jain, "Information Technology Concepts", 4<sup>th</sup> Edn., BPB Publications, 2006.
3. Turban, Mclean and Wetherbe, "Information Technology for Management", 4<sup>th</sup> Edn., John Wiley & Sons, 2006.
4. Courter G, "Mastering MS Office 2000 Professional", BPB Publication, 3<sup>rd</sup> Edition, 2006.
5. Steve Sagman, "MS- Office 2000 For Windows", 3<sup>rd</sup> Edn., Addison Wesley, 2008.
6. Indian Institute of Banking and Finance (IIBF), "Information Technology, Data Communication and Electronic Banking", Macmillan India Ltd., 2<sup>nd</sup> Edn., 2007.

## DIGITAL ELECTRONICS

Subject Code: BCAP1-103

L T P C  
3 1 0 4

Duration: 45 Hrs.

### Course Objectives and Expected Outcomes

1. Digital circuits, which are the basic building blocks of a computer, are introduced in this module to let the students know what activities it does behind the computing environment.
2. This course portrays excellent ideas of the logic gates available and data processing to make students understand the concept better with the analog and digital signals while computing.

### UNIT-I (11 Hrs)

#### 1. Number System & Logic Gates

Decimal, Binary, Octal and Hexadecimal number system and conversion, Codes: Straight Binary code, BCD Code, Excess-3 Code, Grey Code, ASCII, Integer and Floating point representation, Binary Arithmetic, 1's Complement and 2's Complement, Overflow and Underflow, Logic gates, Universal Gates.

### UNIT-II (12 Hrs)

#### 2. Boolean Algebra

Boolean Algebra Theorems, Truth-Table, Realization of switching functions using AND, OR, NOT logic gates, SOP and POS forms, 2-Variable, 3-Variable, 4-Variable, Karnaugh maps, Simplification of expressions.

### UNIT-III (12 Hrs)

#### 3. Combinational Circuits

Design of Binary Adder, Full Subtractor, Multiplexer, Demultiplexer, Decoder, Encoder.

#### 4. Sequential Circuits

R-S, J-K, D and T Flip-flops, Clocks and Timers, Registers, Counters.

### UNIT-IV (10 Hrs)

#### 5. Semiconductor Memories

Introduction, Static and Dynamic devices, read only & Random access memory chips, PROMS and EPROMS, Address selection logic, Read and write control timing diagrams for ICs.

### Recommended Books

1. R. P. Jain, "Modern Digital Electronics", 4<sup>th</sup> Edn., Tata Mcgraw-Hill, 2003.
2. M. Morris Mano, "Digital Logic and Computer Design", 10<sup>th</sup> Edn., Pearson, 2008.
3. Albert Malvino, "Digital Computer Electronics", 3<sup>rd</sup> Edn., Tata Mcgraw-Hill, 2008.
4. William H. Gothmann, "Digital Electronics: An Introduction to Theory and Practice", 2<sup>nd</sup> Edn., Prentice Hall, 1992.
5. Anil K. Maini, "Digital Electronics: Principles and Integrated Circuit", Wiley, 1<sup>st</sup> Edn., 2007.
6. T.C. Bartee, "Digital Computer Fundamentals", 3<sup>rd</sup> Edn., Tata Mcgraw-Hill, 1972.

**PROBLEM SOLVING USING C LAB  
(SOFTWARE LAB – I)**

**Subject Code: BCAP1-104**

**L T P C  
0 0 4 2**

**Duration: 20 Hrs.**

**Implement the following concepts in C Programming:**

- 1. Keywords and Identifiers:** Introduction, Purpose
- 2. Variables and constants:** Data Types, Initialization, Declaration, Scope, Memory limits
- 3. Input-output statements:** Formatted and Non-Formatted statements
- 4. Operators:** Arithmetic, Logical, Conditional, Assignment, Bitwise, Increment/Decrement operators
- 5. Decision Making:** Switch, if-else, nested if, else-if ladder, Break, Continue, Goto
- 6. Loops:** While, Do-while, For
- 7. Functions:** Definition, Declaration, Variable Scope, Parameterized Functions, Return statement, Call by value, Call by reference, Recursive functions
- 8. Pre-processor Directives:** Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc
- 9. Header Files:** STDIO.H, MATH.H, STRING.H, PROCESS.H etc
- 10. Arrays:** Array declarations, Single and Multi-dimensional, Memory limits, Strings and String functions
- 11. Pointers:** Pointer declarations, Pointer to Function, Pointer to Array/String
- 12. Files:** Creation and Editing of various types of files, closing a file (using functions and without functions).

**INFORMATION TECHNOLOGY AND OFFICE AUTOMATION LAB  
(SOFTWARE LAB – II)**

**Subject Code: BCAP1-105**

**L T P C  
0 0 4 2**

**Duration: 20 Hrs.**

**1. WINDOWS OPERATING SYSTEM**

Installing WINDOWS with set-up, Starting and Quitting WINDOWS, Basic Elements of WINDOWS, working with menus dialogue boxes, Window Applications, Windows Explorer, My Computer, Recycle bin, Programs, Favorites, My Documents.

Settings- Control Panel, Printers, Taskbar and Start menu, Folder Options, Active Desktop, Find, Help, Run.

Accessories – Entertainment, Games, System tools, Internet Tools, Calculator, Calendar, Clock, Card file, Note pad, Write pad, Recorder etc.

**2. WORD PROCESSING & PRESENTATION TOOL**

Salient Features of Word, Installation of Word, Starting and Quitting of Word, File, Edit, View, Insert, Format, Tools, Tables, Window, Help options and all of their features, Options and Sub Options etc. Transfer of files between Word Processors and Software Packages.

Salient Features of Power Point, Installation, Starting and Quitting, File, Edit, View, Insert, Format, Tools, Slide Show, Window, Help options and all of their features, Options and Sub Options etc. Transfer of files between Presentation Tool and Software Packages.

**3. SPREADSHEET TOOL**

Spread Sheet. Getting started with Excel worksheet, entering data into Work Sheet, editing cell addressing, Ranges and range names, Commands, Menus, Copying and Moving cell contents, Inserting and Deleting rows and columns, Column width control, Cell protection, Printing reports, Creating and Displaying Graphs, Statistical functions.

**4. INTERNET**

Internet Applications, WWW, compose an E-mail, Draft an E-mail, FTP, TELNET, Web Browsers.

COMMUNICATIVE ENGLISH

Subject Code: BHUM0-101

L T P C

Duration: 45 Hours

2 1 0 3

**Course Objectives and Expected Outcomes**

1. To expose the students to effective communication strategies and different modes of communication.
2. To enable the students to analyze his/her communication behavior and that of others.
3. To enable student to apply effective communication skills professionally and socially.

**UNIT-I (12 Hrs)**

**Communication:** Meaning, its types, Significance, Process, Channels, Barriers to Communication, Making Communication Effective, Role in Society.

**Business Correspondence:** Elements of Business Writing, Business Letters: Components and Kinds, Memorandum, Purchase Order, Quotation and Tenders, Job Application Letters, Resume Writing etc.

**UNIT-II (10 Hrs)**

**Discussion Meeting and Telephonic Skills:** Group Discussion, Conducting a Meeting, Telephone Etiquettes, Oral Presentation: Role of Body Language and Audio Visual Aids.

**Grammar:** Transformation of Sentences, Words used as Different Parts of Speech One Word Substitution, Abbreviations, Technical Terms etc.

**UNIT-III (11 Hrs)**

**Reading Skills:** Process of reading, Reading Purposes, Models, Strategies, Methodologies, Reading Activities.

**Writing Skills:** Elements of Effective Writing, Writing Style, Technical Writing: Report Writing.

**UNIT-IV (12 Hrs)**

**Listening Skills:** The process of Listening, Barriers to Listening, Effective Listening Skills and Feedback Skills.

**Speaking Skills:** Speech Mechanism, Organs of Speech, Production and Classification of Speech Sound, Phonetic Transcription, Skills of Effective Speaking, Components of Effective Talk.

**Course Outcomes**

The students after undertaking this course will be able to:

- i) Understand and appreciate the need of communication training.
- ii) Use different strategies of effective communication and select the most appropriate mode of communication for a given situation.
- iii) Speak effectively and assertively
- iv) Correspond effectively through different modes of written communication.
- v) Present himself/herself professionally through effective resumes and interviews.

**Recommended Books**

1. M. V, Rodrigues, 'Effective Business Communication', Concept Publishing Company New Delhi, 1992, reprint 2000.
2. Adhikari Sethi, 'Business Communication', McGraw Hill.
3. Indrajit Bhattacharya, 'An Approach to Communication Skills', Dhanpat Rai Co., (Pvt.) Ltd. New Delhi.
4. Chrissie Wright, 'Handbook of Practical Communication Skills', Jaico Publishing House, Mumbai.
5. L. Gartside, 'Modern Business Correspondence', Pitman Publishing, London.
6. Rizvi M. Ashraf, 'Effective Technical Communication', McGraw Hill.

Subject Code: BHUM0-103

L T P C

Duration: 24 Hrs

2 0 0 2

**Course Objectives and Expected Outcomes**

To help the students discriminate between what is valuable and what is superficial in the life. To help the students develop the critical ability to distinguish between essence and form in life - this ability is to be developed not for a narrow area or field of study, but for everyday situations in life, covering the widest possible canvas. To help the students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability; it is important to act on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) - it concentrates on providing to its students the skills to do things. In other words, it concentrates on providing "How to do" things. The aspects of understanding "What to do" or "Why something should be done" is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort to fulfill our responsibility to provide our students this significant input about understanding. This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life. It has been experimented at IIITH, IITK and UPTU on a large scale with significant results.

**UNIT-I (6 Hrs)****Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

Understanding the need, basic guidelines, content and process for Value Education. Self-Exploration-what is it? - its content and process; "Natural Acceptance" and Experiential Validation- as the mechanism for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario Method to fulfill the above human aspirations: understanding and living in harmony at various levels

**UNIT-II (8 Hrs)****Understanding Harmony in the Human Being - Harmony in Myself!**

Understanding human being as a co-existence of the sentient "I" and the material "Body"

Understanding the needs of Self ("I") and "Body" - *Sukhand Suvidha*

Understanding the Body as an instrument of "I" (I being the doer, seer and enjoyer)

Understanding the characteristics and activities of "I" and harmony in "I"

Understanding the harmony of I with the Body: *Sanyamand Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure *Sanyamand Swasthya*

**Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

Understanding harmony in the Family- the basic unit of human interaction; Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship; Understanding the meaning of *Vishwas*; Difference between intention and competence Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

### UNIT-III (6 Hrs)

#### **Understanding the Harmony in the Society (Society Being an Extension of Family)**

*Samadhan, Samridhi, Abhay, Sah-astitva*as comprehensive Human Goals Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha* )- from family to world family!

#### **Understanding Harmony in the Nature and Existence - Whole existence as Co-existence**

Understanding the harmony in the Nature; Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature; Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space; Holistic perception of harmony at all levels of existence

### UNIT-IV (4 Hrs)

#### **Implications of the above Holistic Understanding of Harmony on Professional Ethics**

Natural acceptance of human values Definitiveness of Ethical Human Conduct; Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order; Competence in professional ethics:

- Ability to utilize the professional competence for augmenting universal human order,
- Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
- Ability to identify and develop appropriate technologies and management patterns for above production systems;
- Case studies of typical holistic technologies, management models and production systems; Strategy for transition from the present state to Universal Human Order:
- At the level of individual: as socially and ecologically responsible engineers, technologists and managers
- At the level of society: as mutually enriching institutions and organizations

#### **Recommended Books**

1. R. R. Gaur, R. Sangal, G. P. Bagaria, 'A Foundation Course in Value Education', **2009**.
2. Ivan Illich, 'Energy & Equity', The Trinity Press, Worcester, and Harper Collins, USA, 1974.
3. E.F. Schumacher, 'Small is Beautiful: A Study of Economics as if People mattered', Blond & Briggs, Britain,1973.
4. A. Nagraj, 'Jeevan Vidyaek Parichay', Divya Path Sansthan, Amarkantak,1998.
5. Sussan George, 'How the Other Half Die's', Penguin Press. Reprinted 1986, 1991.
6. P.L. Dhar, R.R. Gaur, 'Science and Humanism', Commonwealth Publishers, 1990.
7. A.N. Tripathy, 'Human Values', New Age International Publishers, 2003.
8. Subhas Palekar, 'How to practice Natural Farming',Pracheen (Vaidik) Krishi Tantra Shodh, Amravati, 2000.
9. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 'Limits to Growth - Club of Rome's report', Universe Books, 1972.
10. E. G. Seebauer & Robert L. Berry, 'Fundamentals of Ethics for Scientists & Engineers', Oxford University Press, 2000.
11. M. Govindrajran, S. Natrajan & V.S. Senthil Kumar, 'Engineering Ethics (including Human Values)', Eastern Economy Edition, Prentice Hall of India Ltd.
12. B P Banerjee, 'Foundations of Ethics and Management', Excel Books, 2005.

**Course Objectives and Expected Outcomes**

1. The objective of this course is to learn programming from real world examples and understand object oriented approach for finding solutions to various problems with the help of C++ language.
2. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

**UNIT-I (10 Hrs)**

**1. Evolution of OOP**

Procedure Oriented Programming, OOP Paradigm, Advantages and Disadvantages of OOP over its predecessor paradigms.

**2. Characteristics of OOP**

Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types.

**3. Introduction to C++**

Identifier, Keywords, Constants

**4. Operators**

Arithmetic, Relational, Logical, Conditional, Assignment, Sizeof operator, Operator precedence and Associativity.

Type conversion, Variable declaration, Expressions, Statements, Manipulators, Input and Output statements, Stream I/O, Conditional and Iterative statements, Breaking control statements.

**UNIT-II (12 Hrs)**

**5. Storage Classes**

Automatic, Static, Extern, Register.

**6. Arrays**

Arrays as Character Strings, Structures, Unions, Enumerations and User defined types.

**7. Pointers**

Pointer Operations, Pointer Arithmetic, Pointers and Arrays.

**8. Functions**

Prototyping, Definition and Call, Scope Rules, Parameter Passing: by value, by address and by reference, Functions returning references, Const functions, Recursion, Function Overloading, Default Arguments, Const arguments.

**9. Classes**

Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control, this pointer.

**10. Objects**

Object as function arguments, Array of objects, Functions returning objects, Const member functions, Static data members, Static member functions, Friend functions and Friend classes.

**UNIT-III (12 Hrs)**

**11. Constructors**

Properties, Types of constructors (Default, Parameterized and Copy), Dynamic constructors, Multiple constructors in classes.

**12. Destructors**

Properties, Virtual destructors, Destroying objects, Rules for constructors and destructors. Array of objects, Dynamic memory allocation using new and delete operators, Nested and container classes.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

### 13. Inheritance

Defining derived classes, Inheriting private members, Single inheritance, Types of derivation, Function redefining, Constructors in derived class.

### 14. Types of Inheritance

Single, Multiple, Multilevel and Hybrid.

### 15. Types of Base classes

Direct, Indirect, Virtual, Abstract, Code Reusability.

### UNIT-IV (11 Hrs)

### 16. Polymorphism

Methods of achieving polymorphic behavior.

### 17. Operator Overloading

Overloading binary operator, overloading unary operators, Rules for Operator Overloading, Operator Overloading using friend function, Function Overloading: Early binding, Polymorphism with pointers, Virtual functions, Late binding, Pure virtual functions and Abstract base class.

### 18. Files and Streams

Classes for file stream operations, Opening and Closing of files, Stream state member functions, Binary file operations, Structures and file operations, Classes and File operations, I/O with multiple objects, Error handling, Sequential and Random access file processing.

### Recommended Books

1. E. Balagurusamy, "Object Oriented Programming with C++", 14<sup>th</sup> Edn., Tata McGraw-Hill, 2008.
2. Robert Lafore, "Object Oriented Programming in C++", 4<sup>th</sup> Edn., Galgotia Publications, 2001.
3. D. Ravichandran, "Programming in C", 1<sup>st</sup> Edn., New Age International, 1996, reprint 2011.
4. Herbert Schildt, "C++: The Complete Reference", 4<sup>th</sup> Edn., Tata McGraw-Hill, 2003.
5. Stanley B. Lippman, Josee Lajoie, "C++ Primer", 5<sup>th</sup> Edn., Pearson Education, 2011.
6. Deital and Deitel, "C++ How to Program", 7<sup>th</sup> Edn., Pearson Education, 2010.

## COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code: BCAP1-207

L T P C

Duration: 45 Hrs.

3 1 0 4

### Course Objectives and Expected Outcomes

1. To make students aware about the basic building blocks of computer system and how the different components are interfaced together.
2. Students will come to know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.

### UNIT-I (11 Hrs)

#### 1. Introduction to Computer Organization

Introduction to Computer and CPU (Computer Organization, Design and Architecture), Stored Program Concept - Von Neumann Architecture, Introduction to Flynn's Classification-SISD, SIMD, MIMD

#### 2. Register Transfer

Introduction to Registers, Register Transfer Language, Data movement among Registers and Memory.

#### 3. Micro operations

Introduction to micro operations, Types of micro operations - Logic Operations, Shift operations, Arithmetic and Shift operations.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

### 4. Common Bus System

Introduction to Common Bus System, Types of Buses (Data Bus, Control Bus, Address Bus), 16-bit Common Bus System, Data Movement among registers using Bus.

#### UNIT-II (10 Hrs)

### 5. Basic Computer Instructions

Introduction to Instruction, Types of Instructions, Instruction Cycle, Instruction Formats (Direct, Indirect, Zero, One, Two and Three-Address Instructions).

### 6. Interrupt

Introduction to Interrupt and Interrupt Cycle.

### 7. Design of Control Unit

Introduction to Control Unit, Types of Control Unit.

### 8. Addressing Modes

Introduction & different types of Addressing Modes

#### UNIT-III (12 Hrs)

### 9. I/O Organization

I/O Interface Unit, Types of ports (I/O port, Network Port, USB port, Serial and Parallel Port), Concept of I/O bus, Isolated I/O versus Memory-Mapped I/O.

### 10. I/O Data Transfer Techniques

Programmed I/O, Interrupt Initiated I/O, DMA Controller and IOP.

### 11. Synchronous and Asynchronous Data Transfer

Concept of strobe and handshaking, Source and Destination initiated data transfer.

#### UNIT-IV (12 Hrs)

### 12. Stack Organization

Memory Stack and Register Stack.

### 13. Memory organization

Memory Hierarchy, Main Memory (RAM and ROM chips, Logical and Physical Addresses, Memory Address Map, Memory Connection to CPU), Associative Memory.

### 14. Cache Memory

Cache Memory (Initialization of Cache Memory, writing data into Cache, Locality of Reference, Hit Ratio), Replacement Algorithms (LRU and FIFO).

### 15. Cache Memory Mapping Techniques

Direct Mapping, Associative Mapping and Set-Associative Mapping, Harvard Architecture, Mobile Devices Architecture (Android, Symbian and Windows Lite), Layered Approach Architecture.

### Recommended Books

1. M. Morris Mano, "Computer System Architecture", 3<sup>rd</sup> Edn., Pearson, 1993.
2. William Stallings, "Computer Organization and Architecture", 9<sup>th</sup> Edn., Pearson, 2013.
3. P.V.S. Rao, "Computer System Architecture", 1<sup>st</sup> Edn., PHI, 2008.

## INTERNET AND ITS APPLICATIONS

Subject Code: BCAP1-208

L T P C  
3 1 0 4

Duration: 45 Hrs.

### Course Objectives and Expected Outcomes

1. This subject covers computer concepts and internet skills.
2. It also uses a software suite which includes Emails, Internet Protocols, Search Engine, Introduction of Intranet and Extranet.

#### UNIT-I (10 Hrs)

### 1. Introduction

Internet and its working, Business use of Internet, Services offered by Internet, Evaluation of

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

Internet, Internet Service Provider (ISP), Windows environment for dial up networking (connecting to Internet), Audio on Internet, Internet Addressing (DNS) and IP addresses).

### UNIT-II (11 Hrs)

#### 2. E-Mail

Introduction, Advantage and Disadvantage, Structure of an e-mail message, working of e-mail (sending and receiving messages), Managing e-mail (creating new folder, deleting messages, forwarding messages, filtering messages), Implementation of Outlook Express.

#### 3. Internet Protocol

Introduction, File transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.

### UNIT-III (12 Hrs)

#### 4. WWW

Introduction, Working of WWW, Web browsing (opening, viewing, saving, printing a web page and bookmark), Web designing using HTML, DHTML with programming techniques.

### UNIT-IV (12 Hrs)

#### 5. Search Engine

About search engine, Component of search engine, working of search engine, Difference between search engine and web directory.

#### 6. Intranet and Extranet

Introduction, Application of Intranet, Business value of Intranet, working of Intranet, Role of Extranet, working of Extranet, Difference between Intranet and Extranet.

#### Recommended Books

1. Keith Sutherland, "Understanding the Internet", 1<sup>st</sup> Edn., Butterworth Heinemann, 2000.
2. S. K. Bansal, "Internet and Web Designing", 1<sup>st</sup> Edn., APH Publishing Corporation, 2013.
3. Behrouz A. Forouzan, "Data Communications and Networking", 4<sup>th</sup> Edn., Tata McGraw Hill, 2006.
4. Paul, "Multicasting on the Internet and Its Applications", 1<sup>st</sup> Edn., Springer, eBook, 1998.

## MULTIMEDIA AND APPLICATIONS

Subject Code: BCAP1-209

L T P C

Duration: 30 Hrs.

3 0 0 3

#### Course Objectives and Expected Outcomes

1. This Course introduces the multimedia systems and their applications to students.
2. This course covers the different compression standards used in multimedia, some current technology and related issues.

### UNIT-I (10 Hrs)

#### 1. Introduction

Multimedia and its types, Introduction to Hypermedia, Hyper Text, Multimedia Systems and their Characteristics, Challenges, Desirable Features, Components and Applications, Trends in Multimedia.

#### 2. Multimedia Technology

Multimedia Systems Technology, Multimedia Hardware devices, Multimedia software development tools, Multimedia Authoring Tools, Multimedia Standards for Document Architecture, Multimedia Software for different media.

### UNIT-II (06 Hrs)

#### 3. Storage Media

Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards, Multimedia Servers.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

### UNIT-III (08 Hrs)

#### 4. Audio

Basics of Digital Audio, Application of Digital Audio, Digitization of Sound, Sample Rates and Bit Size, Typical Audio Formats, Introduction to MIDI (Musical Instrument Digital Interface), Components of a MIDI System, Hardware Aspects of MIDI, MIDI Messages.

### UNIT-IV (06 Hrs)

#### 5. Image and Graphics Compression

Color in Images, Types of Color Models, Graphic/Image File Formats: TIFF, RIFF, BMP, PNG, PDF, Graphic/Image Data, and JPEG Compression, GIF Compression.

#### Recommended Books

1. Ralf Steinmetz and Klara Nahrstedt, "Multimedia Computing Communications and Applications", 3<sup>rd</sup> Edn., Pearson Educations, 2012.
2. Parag Havaldar, Gerard Medioni, "Multimedia Systems: Algorithms, Standards and Industry Practices", 1<sup>st</sup> Edn., Cengage Learning, 2009.
3. John F. Koegel Buford, "Multimedia Systems", 1<sup>st</sup> Edn., Pearson Educations, 1994.
4. Jeffcoate, "Multimedia in Practice", 1<sup>st</sup> Edn., Prentice Hall, 1995.

### OBJECT ORIENTED PROGRAMMING USING C ++ LAB (SOFTWARE LAB – III)

Subject Code: BCAP1-210

L T P C  
0 0 4 2

Duration: 20 Hrs.

#### Implement the following concepts in C++ Programming:

1. **Arrays:** Definition, declaration, scope, functions
2. **Structures:** Definition, declaration, scope, functions
3. **Union:** Definition, declaration, scope, functions
4. **Class:** Definition, declaration, members, scope of members.
5. **Class Function:** Definition (Inside class, Outside class), Inline functions, Static function, Friend functions, Scope of functions (public, private), and Nesting of member functions.
6. **Class Data members:** Creating objects, Accessing member functions, Array of objects, Objects as arguments (pass by value, pass by reference)
7. **Constructor and destructor:** Creating default constructor, Parameterized constructor, Copy constructor, Destructor.
8. **Inheritance:** Base class, Derived class, Visibility mode (public, private, protected), Single Inheritance, Multi-level Inheritance, Multiple Inheritance, Nesting of classes, Access control to functions (with different scope), Function Overloading and Overriding, Operator Overloading.
9. **Polymorphism:** Early binding, Late binding, Virtual functions, Pure virtual functions.
10. **Input/Output Files:** Streams, Buffers and I/O-streams, various input-output functions, processing files using class functions.

### INTERNET AND ITS APPLICATIONS LAB (SOFTWARE LAB – IV)

Subject Code: BCAP1-211

L T P C  
0 0 4 2

Duration: 20 Hrs.

#### Implement the following concepts in Lab:

**Introduction:** Internet, Use of Internet

**E-Mail:** Structure of an e-mail message, working of e-mail (sending and receiving messages), Managing e-mail (creating new folder, deleting messages, forwarding messages, filtering messages), Implementation of Outlook Express.

**Internet Protocol:** File transfer protocol (FTP), Gopher, Telnet, HTTP, TCP/IP.

## MRSPTU BCA SYLLABUS 2016 BATCH ONWARDS

**WWW:** Working of WWW, Web browsing (opening, viewing, saving, printing a web page and bookmark), Web designing using HTML, DHTML with programming techniques.

**Search Engine:** Working of Search Engine.

**Intranet and Extranet:** Working of Intranet, Working of Extranet.

### FUNDAMENTALS OF MATHEMATICS

**Subject Code: BMAT0-204**

**L T P C**

**Duration: 45 Hrs.**

**3 1 0 4**

#### Course Objectives and Expected Outcomes

1. This syllabus is specially designed to help the students to understand the mathematical concepts like matrices, differential calculus and integral calculus which have applications in various subjects of Computer Applications.
2. Also Statistics has been added to help them understand the topics like central tendency, deviations, and moments etc which are very useful in many computer applications.
3. After learning these topics, students will be able to apply these concepts in designing the software applications for some specific devices.

#### UNIT-I (11 Hrs)

##### 1. MATRIX ALGEBRA

Matrices, types of matrices, operations on matrices, determinants, inverse of a matrix, Elementary transformations, Rank of a matrix, solution of simultaneous linear equations using Cramer's rule and matrix inversion method.

Consistency of linear equations by Rank Method.

#### UNIT-II (10 Hrs)

##### 2. STATISTICS

Introduction to statistics, measures of central tendency - Mean, Median and Mode, measures of dispersion, mean deviation, standard deviation and coefficient of Variation, correlation and regression analysis. Definition of probability, Addition and Multiplication Laws. Simple problems.

#### UNIT-III (12 Hrs)

##### 3. DIFFERENTIAL CALCULUS

Introduction to differentiation, Differentiation of standard functions including trigonometric functions. Differentiation by method of substitution, maxima and minima.

#### UNIT-IV (12 Hrs)

##### 4. INTEGRAL CALCULUS

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial Fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson's 1/3 rules, Simpson's 3/8 rule.

#### Recommended Books

1. D.C. Sancheti and V.K. Kapoor, "Business Mathematics", Sultan Chand & Sons, 11<sup>th</sup> Edn., **2015**.
2. B.S. Grewal, "Higher Engineering Mathematics", 43<sup>rd</sup> Edn., Khanna Publishers, **2014**.
3. B.S. Grewal, "Numerical Methods in Engineering & Science", 10<sup>th</sup> Edn., Khanna Publishers, **2010**.
4. Rajaraman, "Computer Oriented Numerical Methods", 3<sup>rd</sup> Edn., PHI Publications, **2013**.

IKGPUNJABTECHNICAL  
UNIVERSITY  
KAPURTHALA

SchemeandSyllabus  
of  
Masters in Computer Applications (MCA)  
Batch2015Julyonwards

By  
Boardof StudiesComputer Applications

FirstSemesterContact Hours: 34 Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA101	InformationManagement	4	1	-	40	60	100	5
MCA102	ObjectOriented Programmingin C++	4	1	-	40	60	100	5
MCA103	ComputerOrganization and AssemblyLanguage	4	1	-	40	60	100	5
MCA104	Accounting&Financial Management	4	1	-	40	60	100	5
MCA105	TechnicalCommunication	3	1	2	40	60	100	5
MCA106	Software Lab-I (Information Management)	-	-	4	60	40	100	2
MCA107	Software Lab –II(ObjectOriented Programmingin C++)	-	-	4	60	40	100	2
<b>Total</b>		<b>19</b>	<b>5</b>	<b>10</b>	<b>320</b>	<b>380</b>	<b>700</b>	<b>29</b>

\* Therewill benopracticalalexaminationforTechnicalCommunication.Facultymustincludethe performanceininternalassessmentof theory.

SecondSemesterContact Hours: 35 Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA201	MathematicalFoundationsof ComputerScience	4	1	-	40	60	100	5
MCA202	RelationalDatabaseManagement System	4	1	-	40	60	100	5
MCA203	DataStructures	4	1	-	40	60	100	5
MCA204	Data CommunicationandNetworks	4	1	-	40	60	100	5
MCA205	LinuxOperatingSystem	4	1	-	40	60	100	5
MCA206	Software Lab –III(Relational DatabaseManagementSystem)	-	-	4	60	40	100	2
MCA207	Software Lab –IV(Data Structures)	-	-	4	60	40	100	2
MCA208	Software Lab –V(Based on-LinuxOperatingSystem)	-	-	2	60	40	100	1
<b>Total</b>		<b>20</b>	<b>5</b>	<b>10</b>	<b>380</b>	<b>420</b>	<b>800</b>	<b>30</b>

ThirdSemesterContact Hours: 33Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA301	DatabaseAdministration	4	1	-	40	60	100	5
MCA302	Information security	4	1	-	40	60	100	5
MCA303	Software Engineering & Project Management	4	1	-	40	60	100	5
MCA304	Java Programming	4	1	-	40	60	100	5
MCA305	Elective	4	1	-	40	60	100	5
MCA306	Software Lab-VI[Database Administration ]	-	-	4	60	40	100	2
MCA307	Software Lab-VII[Java Programming]	-	-	4	60	40	100	2

FourthSemesterContact Hours:32Hrs.

Course Code	CourseTitle	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA401	MobileApplicationDevelopment	4	1	-	40	60	100	5
MCA402	E-Commerce&Web ApplicationDevelopment	4	1	-	40	60	100	5
MCA403	InteractiveComputerGraphics	4	1	-	40	60	100	5
MCA404	AdvancedOperatingSystems	4	1	-	40	60	100	5
MCA405	SoftwareLab-VIII(Web& MobileApplication Development)	-	-	6	60	40	100	3
MCA406	SoftwareLab-IX(Interactive ComputerGraphics)	-	-	4	60	40	100	2
Total		16	4	10	280	320	600	25

\* Students will undergo 6-8 weeks industrial training after 4th semester. Examination will be conducted along with 5th semester practical.

FifthSemesterContact Hours:32Hrs.

Course Code	CourseTitle	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA501	Artificial Intelligence	4	1	-	40	60	100	5
MCA502	Design and analysis of algorithms	4	1	-	40	60	100	5
MCA503	WebTechnologies	4	1	-	40	60	100	5
MCA504	ObjectOrientedAnalysis& DesignwithUML	4	1	-	40	60	100	5
MCA505	SoftwareLab-XI(Web Technologies)	-	-	4	60	40	100	2
MCA506	SoftwareLab-XII(Object OrientedAnalysisand DesignwithUML)	-	-	4	60	40	100	2
MCA507	IndustrialTraining*	-	-	-	-	-	-	S/U
Total		16	4	8	280	320	600	24

SixthSemester

Contact Hours:34Hrs

Course Code	Course Title	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA601	DataWarehousing& Mining	4	1	-	40	60	100	5
MCA602	CloudComputing	4	1	-	40	60	100	5
MCA603	AdvancedComputer Architecture	4	1	-	40	60	100	5
MCA604	SoftwareTesting& QualityManagement	4	1	-	40	60	100	5
MCA605	SoftwareLab- XIII(SoftwareTesting)	-	-	2	60	40	100	1
MCA606	Project	-	-	8	180	120	300	8
Total		16	4	10	400	400	800	29

ListofElectives:

CourseCode	(MCA305) Elective	CourseCode	(MCA305)Elective
MCA305A	SystemProgramming	MCA305C	Embedded system
MCA305B	TheoryofComputation		

# MCA-101 Information Management

## Section-A

Introduction to Information Technology - Definition, Applications in various sectors, Different types of software, Generations of Computers, Input and output Devices, Various storage devices like HDD, Optical Disks, Flash Drives. Different Types of data file formats: Types and Applications.

## Section-B

IT Infrastructure in India – Telecommunication, Internet research and Broadband

Data Collection and Data Management, Data Models, Information vs. Knowledge, Various techniques to derive information, Information Management.

## Section-C

Management Information System – Definition, Strategic Management of Information, Decision Making, Development Process of MIS, Strategic Design of MIS, Business Process Reengineering.

Understanding Knowledge Management, Designing a Knowledge Management System, Nature and Scope of Business Intelligence, Information Security – Meaning and Importance, Organizational Security Policy and Planning, Access Control and Operations Security.

## Section-D

Office Automation (Word processing, Spreadsheet, Presentation, E-Mail Clients), Content Management System and Architecture.

### Suggested Readings/Books:

Introduction to Information Technology, Second Edition, Turban, Rainer, Potter, WSE, Wiley India.

Data Warehousing Fundamentals: A

Comprehensive Study for IT Professionals, Paulraj Ponnian, BWSTN, Wiley India.

Information Assurance For The Enterprise: A Roadmap To Information Security - Corey Schou, Daniel Shoemaker, Mc-Graw Hill Publications.

Management Information System: Text And Cases, Waman Jawadekar, Mc-Graw Hill Publications.





# MCA-103 Computer Organization and Assembly Language

## Section-A

Computer Organization: Basic Computer Organization, Bus & Memory Transfer, Stored Program Organization, Computer Registers, Computer Instructions, Timing and Control, Hardwired based design of Control Unit, Instruction Cycle, Formats of Various types of Instructions- Memory Reference Instructions, Register Reference Instructions & I/O Instructions, General Register Organization- Control word, Design of Adder & Logic Unit, Stack Organization- Register Stack, Memory Stack, Reverse Polish Notation, Addressing Modes, RISC vs CISC Architectures, Interrupts & types.

## Section-B

Pipeline & Vector Processing: Parallel Processing, Pipelining- Arithmetic & Instruction Pipeline, Vector Processing- Vector operations, Memory Interleaving, Array Processors.

Input – Output Organization: Input-Output Interface- I/O vs Memory Bus, Isolated vs Memory mapped I/O, Synchronous Data Transfer, Asynchronous Data Transfer- Strobe Control, Handshaking, Asynchronous Communication Interface, Modes of Transfer- Programmed I/O, Interrupt Initiated I/O, Interrupt Cycle, Priority Interrupt Controller, DMA Controller & DMA Transfer.

## Section-C

Memory Organization: Main Memory- Memory Address Map, Memory connection to CPU, Associative Memory- Hardware organization, Match Logic, Cache Memory- Levels of Cache, Associative Mapping, Direct Mapping, Set-Associative Mapping, writing into Cache, Cache coherence, Virtual Memory- Address space & Memory space, Address mapping using pages, Associative memory page table, Page replacement. Memory Management Hardware – Segmented page mapping, Multiport memory, Memory protection.



## Section-D

Multiprocessors: Characteristics of Multiprocessors, Interconnection structures—Time Shared Common Bus, Crossbar switch, Multistage Switching Network, Hypercube interconnection, Interprocessor communication & synchronization.

Assembly Language Programming: Example of a typical 8-bit processor (8085 microprocessor)—Registers, Addressing modes, Instruction Set—Data transfer Instructions, Arithmetic Instructions, Logical Instructions, Program Control Instructions, Machine Control Instructions, Use of an Assembly Language for specific programmes: Simple numeric manipulations, Sorting of a list and use of I/O instructions.

### Suggested Readings/Books:

Computer Organization—Car Hamacher, Zvonks Vranesic, Safwat Zaky, V Edition, McGraw Hill.

Computer System Architecture, Mano, M.M., 1986: Prentice Hall of India. Computer Architecture and Organization, John Paul Hayes: McGraw-Hill International Edition

Structured Computer Organization, Tanenbaum, A.S.: Prentice Hall of India.

---



## MCA-104 Accounting and Financial Management

### Section-A

Accounting: Principles, concepts and conventions, double entry system of accounting, introduction to basic books of account of sole proprietary concern, partnership, organization & company, closing of books of accounts and preparation of trial balance.

Final Accounts: Trading, Profit and Loss accounts and Balance sheet (without adjustment)

### Section-B

Financial Management: Meaning, scope and role, a brief study of functional areas of financial management. Introduction to various FM tools: Ratio Analysis, Fund Flow statement and cash flow statement (without adjustments)

### Section-C

Costing: Nature, importance and basic principles, Marginal costing: Nature, scope and importance, Breakeven analysis, its uses and limitations, construction of breakeven chart, Standard costing: Nature, scope and variances, Budgetary Control (only introduction)

### Section-D

Computerized Accounting: Advantages, Computer Programs for accounting, Computer based Auditing.

#### Suggested Readings/Books:

Principles: A Book-Keeping by J.C. Katyal

Principles of Accounting by Jain and Narang, .

Financial Management by I.M. Pandey, Vikas Publications.

Management Accounting, by Sharma, Gupta & Bhal, . Cost Accounting by Jain and Narang

Cost Accounting by Katyal, .

Basic Accounting, Second Edition by Rajni Sofat, Preeti Hiro, PHI.

---

# MCA-105 Technical Communication

## Unit-I

Basics of Technical Communication- Functions of Communication-Internal & External Functions, Models-Shannon & Weaver's model of communication, Flow, Networks and importance, Barriersto Communication, Essential of effective communication (7C's and other principles), Non-verbal Communication.

## Unit-II

Basic Technical Writing: Paragraph writing (descriptive, Imaginative etc.), Precise writing, reading and comprehension, Letters – Format & various types.

## Unit-III

Advanced Technical Writing: Memos, Reports, E-Mails & Net etiquettes, Circulars, Press Release, Newsletters, Notices. Resume Writing, Technical Proposals, Research Papers, Dissertation and Thesis, Technical Reports, Instruction Manuals and Technical Descriptions, Creating Indexes, List of References and Bibliography.

## Unit-IV

Verbal Communication- Presentation Techniques, Interviews, Group Discussions, Extempore, Meetings and Conferences.

## Unit-V

Technical Communication- MS-Word, Adobe Frame maker and ROBO Help

\* Lab Exercises based on Listening and Speaking skills

### Suggested Readings/Books

- Vandana R Singh, The Written Word, Oxford University Press, New Delhi  
K K Ramchandran, et al Business Communication, Macmillan, New Delhi  
Swati Samantaray, Business Communication and Communicative English, Sultan Chand, New Delhi.  
S.P. Dhanavel English and Communication Skills for Students of Science and Engineering (with audio CD)



## MCA-106 Software Lab-I (Information Management)

This laboratory course will mainly comprise of exercises on Section D of the Course MCA-101 [Information Management]

## MCA-107SoftwareLab-II(ObjectOrientedProgramminginC++)

Thislaboratorycoursewill mainlycomprise of exercises on what is learntunder paper: MCA 102  
[ObjectOrientedProgramminginC++]

Note:ProgramshouldbefullydocumentedwithsimpleI/Odata.Flowchartsshouldbedeveloped  
wherevernecessary.

Writeprogramin‘C++’language

Usinginputand outputstatements

Usingcontrol statements.

Usingfunctions.

Usingarray

UsingClasses andimplementation ofConstructor and Destructor.

Usingfiles.

UsingOOP’s Concepts(Inheritance, Polymorphism, Encapsulation, Friendand Static Functions)

# Second Semester

## MCA-201 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

### Section A

A general introduction, simple and multigraphs, directed and undirected graphs, Eulerian and Hamiltonian Graphs, Shortest path algorithms, Chromatic number, Bipartite graph, graph coloring.

### Section B

Sets and Relations: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

### Section C

Algebra of logic, Propositions, Connectives, Tautologies and contradiction, Equivalence and implication, Principle of Mathematical induction, quantifiers.

### Section D

Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, solving simultaneous equations using Gauss elimination, Gauss Jordan Methods, Matrix Inversion method.

### References:

Alan Doerr, "Applied Discrete Structures for Computer Science", Galgotia Publications.  
Kolman and Busby "Discrete Mathematical Structures for Computer Sciences" PHI.

## MCA202:RelationalDatabaseManagementSystems

### Section–A

#### ReviewofDBMS:

BasicDBMSterminology;ArchitectureofaDBMS:DataIndependence-PhysicalandLogical Independence, DegreeofData Abstraction, Initial Studyofthe Database, Database Design, ImplementationandLoading,TestingandEvaluation,Operation,MaintenanceandEvaluation.

#### ConceptualModel:

EntityRelationshipModel,ImportanceofERD,Symbols(Entity:TypesofEntities,weakEntity, Composite Entity, Strong Entity, Attribute: Types of Attribute, Relationship: Type of relationship,Connectivity,Cardinality).

### Section–B

#### DatabaseModelsandNormalization:

ComparisonofNetwork,HierarchicalandRelationalModels,ObjectOrientedDatabase,Object Relational Database,ComparisonofOOD&ORD;Normalizationanditsvariousforms,De-Normalization, Functional Dependencies, Multi-valued Dependencies, Database Integrity: Domain,Entity,ReferentialIntegrityConstraints.

#### TransactionManagementandConcurrencyControl:

Client/ ServerArchitecture and implementation issues, Transaction: Properties, Transaction Management with SQL, Concurrency; Concurrency Control: Locking Methods: (Lock Granularity,LockTypes,TwoPhaseLocking,Deadlocks),TimeStampingMethod,Optimistic Method,DatabaseRecovery Management.

### Section–C

#### DistributedDatabases:

Centralized Verses Decentralized Design; Distributed Database Management Systems (DDBMS): Advantage andDisadvantages; Characteristics, Distributed Database Structure, Components,DistributedDatabaseDesign,HomogeneousandHeterogeneousDBMS.

#### LevelofDataandProcessDistribution:

SPSD(Single–SiteProcessing,Single-SiteData),MPSP(Multiple-SiteProcessing,SingleSite Data),MPMD(Multiple–SiteProcessing,Multiple-SiteData),DistributedDatabaseTransaction Features,TransactionTransparency,Client/ServerVsDDBMS.

### Section–D

#### BusinessIntelligence andDecisionSupportSystem:

TheneedforDataAnalysis,BusinessIntelligence,OperationalDatavs.DecisionSupportData, DSSDatabasepropertiesandimportance,DSSDatabaseRequirements.

#### OLAPandDatabaseAdministration:

Introduction toOnline Analytical Processing (OLAP), OLAP Architecture Relational, Star Schemas,DatabaseSecurity,Databaseadministrationtools,DevelopingaDataAdministration Strategy.

#### References:

1. “DataBaseSystems”,PeterRobCarlosCoronel,CengageLearning,8<sup>th</sup>ed.

2. "Database System Concepts", Henry F. Korth, Abraham, McGraw-Hill, 4<sup>th</sup> ed.
3. "An Introduction To Database Systems", C.J. Date, Pearson Education, 8<sup>th</sup> ed.
4. "Principles of Database Systems", Ullman, Galgotia Publication, 3<sup>rd</sup> ed.
5. "An Introduction To Database Systems", Bipin C. Desai, Galgotia Publication

## MCA-203 DATASTRUCTURES

### SectionA

- IntroductiontoDataStructure:Conceptofdata,problemanalysis,datastructures anddatastructureoperations,notations,mathematicalnotationandfunctions,algorithmic complexity,Big-ONotationandtimespacetradeoff.
- OverviewofArrays,Recursion,Pointers,PointerArithmetic,Arrayof pointers, Arraysintermsofpointers,StaticandDynamicMemoryManagement, GarbageCollection.
- UnderstandingandImplementationofvariousDataStructureswithapplications
- Stack:operationslikepush,popandvariousapplicationslikeconversionfrom infixtopostfixandprefixexpressions,evaluationofpostfixexpressionusingstacks
- Queues:operationslikeenqueue,dequeueonsimple,circularandpriorityqueues.
- LinkedLists:operationslikecreations,insertion,deletion,retrievalandtraversalon single,circularanddoublylinkedlist.

### SectionB

- Treesdefinitionsandconcepts:Root,Node,LeafNode,Level,Degree,Heightand TreerepresentationusingLinkedListandArray
- TypesofTrees:Binary trees,Binarysearchtree,Heightbalanced(AVL)tree, B-trees,B+Tree
- Treeoperations:creation,insertion,deletionandtraversals(Preorder,In-order, Post-ordered)and searchingonvarioustypesoftrees

- Heap: Definition, Structure, Algorithms and applications

#### Section C

- Graph definitions and concepts: Edge, Vertices, and Graph representation using Adjacency matrix, Adjacency lists
- Types of graphs: Weighted, Unweighted, Directed, Undirected Graphs
- Graph operations: creation, insertion, deletion, traversals and searching (depth-first, breadth-first) of various types of graphs and Dijkstra's algorithm for shortest distance calculation.

#### Section D

- Searching: Concept and efficiency of linear and binary search algorithms.
- Sorting: Concepts, Order, Stability, Efficiency of various algorithms (Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Heap Sort, Radix Sort)
- Hashing: Definition, Implementation and applications

#### Note:

- Programs are to be implemented in C++

#### Books:

- Data Structures – A Pseudocode Approach with C++ - Gilberg and Forouzan by Cengage
- Schaum's Outline of Data Structures with C++ - Hubbard John. R by Tata McGraw-Hill
- Data Structures Using C and C++ - Langsam, Augenstein, Tanenbaum by Pearson Education

## MCA-204 DATA COMMUNICATION AND NETWORKS

Objectives: As part of this course, students will be introduced to Computer Networks and Data Communication paradigms, about Network models and standards, Network protocols and their use, wireless technologies.

### SECTION-A

Introduction to Data Communication: Components of Data Communication, Data Representation, Transmission Impairments, Switching, Modulation, Multiplexing.

Review of Network Hardware: LAN, MAN, WAN, Wireless networks, Internet networks.

Review of Network Software: Layer, Protocols, Interfaces and services.

Review of Reference Models: OSI, TCP/IP and their comparison.

Physical Layer

Transmission Media: Twisted pair, Coaxial cable, Fiber optics, Wireless transmission (Radio, Microwave, Infrared). Introduction to ATM, ISDN, Cellular Radio and Communication Satellites.

### SECTION-B

Data Link Layer

Services provided by DLL: FRAMING, ERROR CONTROL, FLOW CONTROL, MEDIUM ACCESS

Medium Access Sublayer

Channel Allocation, MAC protocols – ALOHA, CSMA protocols, Collision free protocols, Limited Contention Protocols, Wireless LAN protocols, IEEE 802.3, 802.4, 802.5 standards and their comparison.

### SECTION-C

Network Layer

Design Issues, Routing Algorithms (Shortest Path, Flooding, Distance Vector, Hierarchical, Broadcast, Multicast). Congestion Control Algorithms (Leaky bucket, Token bucket, Load shedding), Internetworking, IP Protocol, ARP, RARP.

Network Troubleshooting

Using Ping, Traceroute, IPconfig, Netstat, nslookup

## SECTION-D

TransportLayer

Addressing, Establishing and Releasing Connection, Flow Control, Buffering, Internet TransportProtocol(TCPandUDP).

ApplicationLayer

Domainnamesystem,E-mail,Filetransferprotocol,HTTP,HTTPS,WorldWideWeb.

### SuggestedBooks:-

- 1.Tanenbaum,AndrewS.,2009:ComputerNetworks(4thEdition),PHI.
2. Forouzan, B. A., 2009: Data Communications and Networking, Fourth Edition, Tata McGrawHill.
- 3.DouglasE.Comer,2004:InternetworkingwithTCP/IP(Vol.1,4thEdition),CPE.
- 4.Stallings,William2008:DataandComputerCommunications(8thEdition),PHI.
- 5.Nance,Bary,1997:IntroductiontoNetworking,PHI,4thEdition.

## MCA-205 LINUX OPERATING SYSTEM

### SECTION-A

#### INTRODUCTION TO LINUX OPERATING SYSTEM:

Introduction and Types of Operating Systems, Linux Operating System, Features, Architecture Of Linux OS and Shell Interface, Linux System Calls, Linux Shared Memory Management, Device and Disk Management in Linux, Swap space and its management. File System and Directory Structure in Linux. Multi-Processing, load sharing and Multi-Threading in Linux, Types of Users in Linux, Capabilities of Super Users and equivalents.

INSTALLING LINUX AS A SERVER : Linux and Linux Distributions ;Major differences between various Operating Systems (on the basis of: Single Users vs Multi users vs Network Users; Separation of the GUI and the Kernel; Domains; Active Directory;).

INSTALLING LINUX IN A SERVER CONFIGURATION: Before Installation; Hardware; Server Design; Dual-Booting Issues; Modes of Installation; Installing Fedora Linux; Creating a Boot Disk; Starting the Installation; GNOME AND KDE : The History of X Windows; The Downside; Enter GNOME; About GNOME; Starting X Windows and GNOME; GNOME Basics; The GNOME Configuration Tool.

### SECTION-B

INSTALLING SOFTWARE: The Fedora Package Manager; Installing a New Package using dpkg and RPM; Querying a Package; Uninstalling a Package using dpkg and RPM; Compiling Software; Getting and Unpacking the Package; Looking for Documentation; Configuring the Package; Compiling Your Package; Installing the Package, Driver Support for various devices in linux.

MANAGING USERS: Home Directories ; Passwords; Shells; Startup Scripts; Mail; User Databases; The / etc/passwd File; The / etc/ shadow File; The / etc/group File; User Management Tools; Command-Line User Management; User Linux Conf to Manipulate Users and Groups; Set UID and Set GID Programs

## SECTION-C

THE COMMAND LINE : An Introduction to BASH, KORN, C, A Shell etc. ; BASH commands:Job Control;EnvironmentVariables;Pipes;Redirection;Command-LineShortcuts; DocumentationTools;The manCommand;thetext infoSystem;FileListings;Ownershipsand permissions; Listing Files; File and Directory Types; Change Ownership; Change Group; Change Mode ; File Management and Manipulation; Process Manipulation;Miscellaneous Tools;VariousEditorsAvailablelike:Vianditsmodes,Pico, Joeandemacs,,SuCommand.

## SECTION-D

BOOTING AND SHUTTING DOWN: LILO and GRUB; Configuring LILO; AdditionalLILOoptions;Adding a NewKerneltoBoot;RunningLILO;TheStepsofBooting; EnablinganddisablingServices

FILE SYSTEMS: The MakeupFile Systems; Managing File Systems; Adding and PartitioningaDisk;NetworkFileSystems;QuotaManagement;

CORE SYSTEM SERVICES: The initService; The inetdand xinetdProcesses; The syslogdDaemon;ThecronProgram

PRINTING : The Basicof lpd; Installing LPRng; Configuring /etc/printcap; The /ETC/lpd.permsFile;Clientsoflpd,InterfacingPrinterthroughOperatingSystem.

### References:

1. [LinuxAdministration:ABeginner'sGuide](#)bySteveShah,WaleSoyinka,ISBN 0072262591(0-07-226259-1),McGraw-HillEducation
2. [UnixShellProgramming](#),YashavantP.Kanetkar
3. UNIXConceptsandApplicationsbySumitabhaDas
4. OperatingSystemConcepts8<sup>th</sup>edition,byGalvin

MCA206:SoftwareLab–III(RelationalDatabaseManagementSystem)

LearningObjectives:

1. ComparativestudyofvariousDatabaseManagementSystems
2. Data DefinitionLanguage (DDL), Data Manipulation Language (DML), and Data ControlLanguage(DCL)
3. HowtoapplyConstraintsatvariouslevels.
4. Viewdataintherequiredformusing Operators,FunctionsandJoins.
5. CreatingdifferenttypesofViewsfortailoredpresentationofdata
6. HowtoapplyConditionalControlsinPL/SQL
7. ErrorHandlingusingInternalExceptionsandExternalExceptions
8. UsingvarioustypesofCursors
9. HowtorunStoredProceduresandFunctions
- 10.CreatingPackagesandapplyingTriggers
- 11.CreatingArraysandNestedTables.

MCA-207 Software Lab–IV(DataStructures)

List of practical exercises, to be implemented using object-oriented approach in C++ Language.

- 1.[ARRAY] Write a menu driven program to Insert a new element at end as well as at a given position, Delete an element from a given position, To find the location of a given element using linear search, To display the elements of the linear array.
- 2.[LINKEDLIST] Write a menu driven program to Insert a new element, Delete an existing element, Display all the elements.
3. Write a program to implement PUSH & POP operation on stack.
4. Program to implement INSERT & DELETE operation on circular queue represented using a linear array.
5. Program to sort an array of integers in ascending order using bubble sort.
6. Program to sort an array of integers in ascending order using selection sort.
7. Program to sort an array of integers in ascending order using insertion sort.
8. Program to sort an array of integers in ascending order using merge sort.
9. Program to sort an array of integers in ascending order using quick sort.
10. Program to demonstrate the use of binary search algorithm to search a given element in a sorted array in ascending order.
11. Program to insert, delete and display operations on a binary search tree.
12. Program to illustrate the traversal of graph using breadth-first search.
13. Program to illustrate the traversal of graph using depth-first search.

MCA-208  
Software Lab-V(LINUXOPERATINGSYSTEM)

Learning Objectives:

1. How to install different distributions of Linux (Fedora, red Hat, Open Suse etc.).
2. Booting and Shutting down the system.
3. Learning the use of VI Editor for Shell programming, Searching & Sorting Processes.
4. User Management
5. Package management.
6. File/Directory Management.
7. Installing Printer and using Printer services.
8. Process Management.
9. Security and Protection of system.
10. Privilege management.
11. Managing various services (Cron & Quota etc) in Linux.
12. Running a project to learn overall Linux System Usage.

References:

1. Linux Administration: A Beginner's Guide by Steve Shah, Wale Soyinka, ISBN 0072262591 (0-07-226259-1), McGraw-Hill Education
2. Unix Shell Programming, Yashavant P. Kanetkar
3. UNIX Concepts and Applications by Sumitabha Das

# ThirdSemester

## MCA301 Database Administration

### Section-A (Introduction)

Understanding role and responsibilities of DBA, Database Environment management (network, CPU, disk and RAM), Installing and upgrading various database packages (MS SQL Server, Oracle, MySQL), Comparing various database packages, Configuring various services and components, Understanding the client/server model, Communication protocols, Database instance management, Creating and managing various database objects (tables, views, indexes)

### Section-B (Managing Database Servers)

Understanding client tools for administrative tasks, Task Automation, Implementing migration, consolidation, and upgrade strategy, Hardware resource allocation, Business policy implementation, Monitoring and trouble-shooting, Implementing database compression, Database Replication and multiple servers, Exporting and Importing data, Managing Data integrity

### Section-C (Security and Availability)

Understanding User Access and Security, Creating and modifying user accounts, Creating, Modifying and Using roles, Granting and Revoking Privileges, Querying role information, Auditing User activity, Implementing database encryption, Database backup, restoration and recovery, Types of failure, Defining a backup and recovery strategy, Testing the backup and recovery plan, RAID implementation, High-availability and disaster recovery

### Section-D (Performance Tuning)

Introduction to performance tuning and its requirement, performance tuning methodology and concepts, Monitoring status variables that affect performance, General Table Optimizations, Using indexes to improve performance, Monitoring and optimizing the performance of the database, Identifying full-table scans, Re-writing SQL queries, Tuning sub-queries, Database mirroring, clustering

Note: Subject Coverage will be preferably based on MySQL.

### Reference Books

- Microsoft SQL Server 2012 Bible by Adam Jorgensen, Jorge Segarra, Patrick Leblanc, Jose Chinchilla, Aaron Nelson (Wiley India Pvt Ltd)
- Pro SQL Server 2012 Administration, 2nd Ed by Ken Simmons, Sylvester Carstarphen (Dreamtech Press)
- Expert Oracle Database 11g Administration by Sam R. Alapati (Dreamtech Press)
- MySQL Administrator's Bible By Sheeri KCabral, Keith Murphy (John Wiley & Sons)

# MCA302 Information Security

## Section-A

Computer Security Concepts, Threats, Attacks, and Assets, Security Functional Requirements, A Security Architecture for Open Systems, Computer Security Trends, Computer Security Strategy

Cryptographic Tools: Confidentiality with Symmetric Encryption, Message Authentication and Hash Functions, Public-Key Encryption, Digital Signatures and Key Management, Random and Pseudorandom Numbers, Practical Application: Encryption of Stored Data

## Section-B

User Authentication: Means of Authentication, Password-Based Authentication, Token-Based Authentication, Biometric Authentication, Remote User Authentication, Security Issues for User Authentication, Practical Application: An Iris Biometric System

Access Control: Access Control Principles, Subjects, Objects, and Access Rights, Discretionary Access Control Example: UNIX File Access Control, Role-Based Access Control

Database Security: The Need for Database Security, Database Management Systems, Relational Databases, Database Access Control, Inference, Statistical Databases, Database Encryption, Cloud Security

## Section-C

Malicious Software: Types of Malicious Software (Malware), Propagation—Infected Content—Viruses, Propagation—Vulnerability Exploit—Worms, Propagation—Social Engineering—SPAM—mail, Trojans, Payload—System Corruption, Payload—Attack Agent—Zombie, Bots, Payload—Information Theft—Keyloggers, Phishing, Spyware, Payload—Stealth—Backdoors, Rootkits

Denial-of-Service Attacks: Denial-of-Service Attacks, Flooding Attacks, Distributed Denial-of-Service Attacks, Application-Based Bandwidth Attacks, Reflector and Amplifier Attacks, Defenses Against Denial-of-Service Attacks, Responding to a Denial-of-Service Attack

Buffer Overflow: Stack Overflows, Defending Against Buffer Overflows, Other Forms of Overflow Attacks

Software Security: Software Security Issues, Handling Program Input, Writing Safe Program Code, Interacting with the Operating System and Other Programs, Handling Program Output

## Section-D

Operating System Security: Introduction to Operating System Security, System Security Planning, Operating Systems Hardening, Application Security, Security Maintenance, Linux/Unix Security, Windows Security, Virtualization Security

Trusted Computing and Multilevel Security: The Bell-LaPadula Model for Computer Security, Other Formal Models for Computer Security, The Concept of Trusted Systems, Application of Multilevel Security, Trusted Computing and the Trusted Platform Module, Common Criteria for Information Technology Security Evaluation, Assurance and Evaluation

IT Security Management and Risk Assessment: IT Security Management, Organizational Context and Security Policy, Security Risk Assessment, Detailed Security Risk Analysis

IT Security Controls, Plans, and Procedures: IT Security Management Implementation, Security Controls or Safeguards, IT Security Plan, Implementation of Controls, Implementation Follow-up.

## Textbook

W. Stallings, "Computer Security: Principles and Practice," 2nd Edition, Prentice Hall, ISBN: 0132775069, 2011.

## Recommended Books

M. Stamp, "Information Security: Principles and Practice," 2nd Edition, Wiley, ISBN: 0470626399, 2011.

M.E. Whitman and H.J. Mattord, "Principles of Information Security," 4th Edition, Course Technology, ISBN: 1111138214, 2011.

M. Bishop, "Computer Security: Art and Science," Addison Wesley, ISBN: 0-201-44099-7, 2002.

G. McGraw, "Software Security: Building Security In," Addison Wesley, ISBN: 0321356705, 2006.

## MCA-303 Software Engineering & Project Management

### Section-A

Software Engineering: The software problem, Evolution of Software Engineering, Principles of software engineering, Software Development vs. Software Engineering.

Software Process: Software Process, Selection of appropriate process model, Software Process Models- Waterfall, Spiral, Prototyping, Agile Methodology- Scrum and XP.

### Section-B

Advanced Requirement Analysis & Design: Analysis Principles, SRS, Requirement Elicitation Techniques- FAST and QFD, Design Principles, Design Concepts, Data Design, Architectural Design- Architectural Styles, Procedural & Object Oriented Design.

### Section-C

Software Project Management: The Management Spectrum, Software Project Planning and its characteristics, Types of metrics, Effort Estimation- FP, LOC, FP vs. LOC, Schedule & Cost Estimation Models- Activity Networks- PERT/CPM, COCOMO-I, COCOMO-II, Risk Assessment- Probability Matrix, Risk Management.

Software Testing: Testing Fundamentals- Error/Fault/Failure, Testing Principles, Test Cases, Testing Techniques- White Box & Black Box, Unit Testing, Integration Testing, System Testing, Verification and Validation Testing, Acceptance Testing.

### Section-D

Software Quality Management: S/W Quality, Importance of S/W Quality, Quality Metrics, Quality Standards- ISO 9126, Change Control, Change Control Process.

Advanced S/W Engineering: CASE Tools, Reverse Engineering, Re-engineering, Web Engineering.

#### References:

1. Thayer, Software Engineering Project Management 2<sup>nd</sup> ed., Wiley
2. R.S. Pressman, Software Engineering: A Practitioner's Approach (6<sup>th</sup> ed.), McGraw-Hill, 2006
3. Peters, Software Engineering: An Engineering Approach, Wiley
4. Sommerville, Ian, Software Engineering, Addison-Wesley Publishing Company, (2006) 8<sup>th</sup> ed.
5. K.K. Aggarwal and Y. Singh, Software Engineering (revised 2<sup>nd</sup> ed.), New Age International Publishers, 2006.

## MCA-304 JAVA PROGRAMMING

Objective of the course: The objective of this course is to get insight of the subject and after completion of this course, students will be able to:

- ☒ Use the advanced features of Java Technology
- ☒ Develop good program to handle exceptions and errors in program.
- ☒ Work with collection API and develop fast programs.
- ☒ Use the java.io package in detail.
- ☒ Use the serialization concepts of java technology.
- ☒ Develop good multithreaded programs
- ☒ Work the latest JDBC technology
- ☒ Learn Java Generics and the development of Projects.

### Section A

Introduction: Object Oriented Concept overview, features and applications of Java, Differences between Java and C++, structure of Java Program, understanding class path. Building Blocks: Literals, Tokens, Keywords, constants, variables & Data types, scope of variables, Operators, Expressions, Flow Control statements.

Arrays, Vectors, Type Conversion, Command Line Arguments, Review of classes and methods, Access specifiers, constructors, Inheritance, static Classes, Abstract Classes, Final Classes, Wrapper Classes: Autoboxing and Unboxing, Garbage Collection & Finalize method, Enumerated types and annotations, Handling String and String Buffer classes, Method Overloading and Overriding, Nesting of methods and methods with varargs.

### Section B

Interfaces & Packages: Interfaces and implementing multiple inheritance through interfaces, Packages, Multithreaded Programming, Synchronization.

Exception Handling: Introduction, Handling System defined Exceptions, Creating and handling user defined exception.

Managing I/O: Introduction to streams, Handling and using various Stream Classes, Random, String Tokenizer, Scanner classes .

### Section C

Applet and Graphic Programming: Introduction to applets, Types of applets, Using Applet Applications, Passing Parameters to applets,

Introduction to Graphic Programming: Applying 2-D transformations on Objects, Event Handling , Layouts, Frames, Panels, Menu's, Pop up Menus, Swings, JDBC.

### Section D

Advanced Programming: Servlet Programming( Servlet Life Cycle, Generic Servlet, HttpServlet, HttpServletRequest, HttpServletResponse, service method, doGet method, doPost method, Servlet Exception), Introduction to JSP, Syntax, Semantics, Declaration and Expressions

Socket Programming: Overview, Difference between TCP and UDP Sockets, Various methods associated with TCP and UDP.

REFERENCES: -

1. Introduction to Java Programming, Comprehensive Version, Y. Daniel Liang, Pearson, 9/E
2. Java 2 The Complete Reference by Petric Noughton And Herbet Schildt, McGraw Hill Professional, 1999
3. Head First java by Kethy Seirra and Bert Bates, Oxford Publications.
4. Head First Sevlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates, O'Rielly Media.

## MCA-305A Elective System Programming

---

### Section-A

Assemblers and Macro Processors: Language processors, data structures for language processing, General Design Procedure, Single pass and two pass assembler and their algorithms, assembly language specifications (example MASM). Macro Instructions, Features of Macro Facility: Macro instruction arguments, Conditional macro expansion, Macro calls within macro.

### Section-B

Loaders and Linkers & Editors: Loader Schemes: Compile and go loader, general loader scheme, absolute loaders, subroutine linkages, relocating loaders, direct linking loaders, Relocation, Design of Absolute Loader, Bootstrap Loaders, Dynamic Linking, MS-DOS Linker, Text Editors, Line Editor, Steam Editors, Screen editor, Word processors, Structure editors.

### Section-C

Compiler Design: Introduction to various translators, interpreters, debuggers, various phases of compiler, Introduction to Grammars and finite automata, Bootstrapping for compilers, Lexical Analysis and syntax analysis, Intermediate Code Generation, Code optimization techniques, Code generation, Introduction to YACC, Just-in-time compilers, Platform Independent systems.

### Section-D

Operating System: Operating Systems and its functions, Types of operating systems: Real-time OS, Distributed OS, Mobile OS, Network OS, Booting techniques and subroutines, I/O programming, Introduction to Device Drivers, USB and Plug and Play systems, Systems Programming (API's).

### TEXTBOOKS:

- Donovan J.J., Systems Programming, New York, Mc-Graw Hill, 1972.
- Leland L. Beck, System Software, San Diego State University, Pearson Education, 1997.
- Dhamdhere, D.M., System Programming and Operating Systems, Tata Mc-Graw Hill 1996.

### REFERENCES:

1. Aho A.V. and J.D. Ullman Principles of compiler Design Addison Wesley/Narosa 1985.

Theory of Computation  
Elective  
MCA305B

Section-A

1. Introduction, Sets, Logic, Functions, Relations, Languages, Proofs Mathematical Induction, Strong Principle of Mathematical Induction, Recursive Definitions, Structural Induction

2. Regular Languages & Regular Expressions, Finite Automata (FA), Distinguishing Strings w.r.t. Language, Union, Intersection, & Complement of Languages

Section-B

3. Non-deterministic Finite Automata (NFA), NFA with Null-Transitions, Kleene's Theorem

4. A Criterion for Regularity, Minimal Finite Automata, Pumping Lemma for Regular Languages

5. Introduction to Context-Free Grammar (CFG), Regular Grammars, Derivation (Parse) Trees & Ambiguities, An Unambiguous CFG for Algebraic Expressions, Simplified Forms & Chomsky Normal Forms

Section-C

6. Introduction to Push Down Automata (PDA), Deterministic PDA (DPDA), PDA corresponding to a Given CFG, CFG corresponding to a Given PDA, Parsing

7. The Pumping Lemma for CFG, Intersection & Complement of CFGs, Decision Problems Involving CFGs

Section-D

8. Turing Machine (TM) Definition & Examples, Computing a Partial Function with a TM

9. Recursive Enumerable & Recursive Languages, Enumerating a Language, Context-Sensitive Languages & Chomsky Hierarchy

Reference Book:

"Introduction to Languages and the Theory of Computation", John C. Martin, Tata McGraw-Hill, (2003), 3rd Edition, ISBN: 007049939X

Suggested Additional Reading:

1. "Elements of the Theory of Computation", Harry Lewis & Christos H. Papadimitriou, IEEE (PHI), 2nd Edition, ISBN-978-81-203-2233-2.

2. "Theory of Computation", Michael Sipser, Cengage Learning (2007), ISBN-13: 978-81-315-0513-7

3. "Introduction to Automata Theory, Languages, and Computation", Hopcroft, Motwani & Ullman, Pearson Education, 3rd Edition, (2008), ISBN: 978-81-317-2047-9

MCA305 C Elective  
EMBEDDED SYSTEMS

Section A

Introduction to Embedded Systems: Overview of embedded systems, features, requirements and applications of embedded systems, recent trends in the embedded system design, common architectures for the ES design, embedded software design issues, introduction to development and testing tools.

Section B

Embedded System Architecture: Basics of 8-bit 40 Pin PIC microcontroller 16F877A, Memory Organization, Special Function Registers, GPIO, Timer Comparator and A/D Converter, Bus Architecture, Addressing Modes, Timers and Counters

Section C

Assembly language programming: Memory-Mapped I/O, Interrupt handling, PIC16F877A Instruction Set, Assembler Directives, Programming of PIC Microcontrollers

Section D

Applications of Embedded Systems: Industrial and control applications, networking and telecom applications, Digital Signal Processing and multimedia applications, Applications in the area of consumer appliances.

References:

1. "Embedded Systems Design" by Steve Heath
2. "Real-Time Systems" by Jane W S Liu, Prentice Hall
3. "Design with PIC Microcontrollers" by John B. Peatman Pearson Education, 1997
4. PIC16F877A Data Sheet

## MCA-306(Software LabVI–DatabaseAdministration)

Implementationof variousDBAroles/techniquesstudiedinMCA-301,like:

- Practicalimplementationofvariousindustryleadingdatabasepackages.
- Import/Exportdatabetweenvariousdatabasesandflatfiles.
- ImplementationDatabasereplication
- Backup/Restorestrategiesimplementation
- UserandRolescreationandmanagement

LearningObjectives:

- Tounderstand Basic Programming Constructs and the concepts of Object Oriented ProgramminganditsApplicationsPractically.
- Multithreading.
- InterfacesandPackagehandling.
- AppletandSwingsProgramming.
- DatabaseConnectivity.
- JavaServletsandJavaServerPages
- Strutsimplementation.
- IntroductiontoHibernate.

Semester4<sup>th</sup>

## MCA401 Mobile Application Development

### Section-A

Characteristics of mobile applications. Architecture and working of Android, iOS and Windows phone operating system. User-interface design for mobile applications and managing application data. Integrating cloud services, networking, OS and hardware into mobile-applications. Addressing enterprise requirements in mobile applications: performance, scalability, modifiability, availability and security.

### Section-B

Mobile Software Engineering (Design Principles, Development, Testing methodologies for mobile applications, Publishing, Deployment, maintenance, and management).

Introduction to Android Development Environment, What is Android? Advantages and Future of Android, Frameworks, Tools and Android SDK. Installing Java, Android Studio, SDK Manager Components and updating its platforms, AVD Manager, Genymotion Plugin: Fastest Virtual devices, Understanding Java SE and the Dalvik Virtual Machine.

The Directory Structure of an Android Project, Common Default Resources Folders, The Values Folder, Leveraging Android XML.

### Section-C

Application Development in Android: App Components (Intents and Intent Filters, activities, services, Content Providers, App Widgets, Processes and Threads), App resources, App Manifest and User interface, ActionBar, Content Sharing, Multi-Platform Designs, Animation and graphics, computation, Media and Camera, Location and sensors, Connectivity, Text and Input, Data Storage, Administration and Web Apps.

### Section-D

Introduction to iOS Application development: Overview of iOS, iOS Development Environment, iOS Layers, basic of Swift, Building an application for iOS.

Windows phone Environment: Overview of windows phone and its platform, Building windows phone applications.

### References/ Text Books

1. Professional Mobile Application Development, JEFF MCWHERTER, SCOTT GOWELL, Wiley.
2. Android Studio Application Development, Belen Cruz, Zapata, Packt Publishing
2. Professional Android 4 Application Development, Reto Meier, Wrox Publication
3. Beginning iPhone Development with Swift, David Mark, Apress Publication

### Web Resources

- Safari Textbooks Online: <http://library.ohio-state.edu/search/y?SEARCH=Safari>
- Android Developer Site: <http://developer.android.com/index.html>
- Stack Overflow: <http://www.stackoverflow.com>

## MCA402E-CommerceandWebApplicationDevelopment

### Section–A

IntroductiontoElectronicCommerce,Potentialbenefits& limitationsofE-Commerce,Traditional Commercevs.E-CommercevsM-Commerce,DifferentE-CommerceModels(B2B,B2C,C2C,P2P), E-Commerceapplications,SocialNetworks,Auctions& Portals,LegalandEthicalissuesinE-Commerce.IntroductiontoElectronicDataInterchange,TypesofEDI,BenefitsofEDI, OverviewofElectronicPayment system,Typesof Electronicpaymentschemes(Creditcards,Debit cards,Smartcards,Internetbanking),IssuesinElectronicpaymentsystems

### Section–B

WebBasedMarketingand Communications:OnlineAdvertising,E-MailMarketing,OnlineCatalogs, SocialMarketingandTargetedMarketing,TechniquesandStrategies WWWconcepts,Client/ServerComputing,WebServersand Clients,WebBrowsers,Protocolsand Ports, IPAddress, Domains &DNS,URL,ASystematic approachtoWebsite creation, Creating interactive and dynamic webpages, Factors in E-Commerce Website design, Web and Database integration,WebsiteOptimizationstrategies E-Commercesecurity,threats,managingsecurityissuessthroughinternetsecurity protocolsand standards,andFirewall.

### Section–C

HTML5:IntroductiontoHTML5,NewfeaturesinHTML5,API,HTML5documents,HTML5tags: text formatting,text styles, Lists(orderedandunordered), addinggraphics toHTML5page,creating tables,linkingdocuments,imagesas hyperlinks,forms,frames.CSS3:Introduction,consistentweb designingusingCSS3,IntroductiontoBootstrap-forms,grids,tables,Images

### Section–D

Java Script:Introduction:features,advantages,operators,datatypes,statements,controlstatements. writingjava scriptintoHTML5. documents,forms,functions,objects,clientsideinteractivewebpage design,input validation,eventhandling,databaseconnectivity.DOM:document,elements,attributes, event.

REFERENCES:-

- E-Commerce-Fundamentalsandapplicationsbychan,Wiley.
- WebTechnologiesBlackBook(HTML5.0,9789351192510)by Kogent,Wiley.
- E-CommerceEssentialsbyKennethLaudonandCarolTraver–PearsonPublication

- Frontiers of Electronic Commerce by Ravi Kalakota, Andrew B. Whinston - Addison Wesley Publication
  - E-Commerce, Fundamentals and Applications by Henry Chan, Raymond Lee, Tharam Dillon and Elizabeth Chang - Wiley India Publication
    - Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP by Ivan Bayross - BPB Publication
-

## MCA-403 Interactive Computer Graphics

### SECTION A

Review of Computer Graphics, Applications of computer graphics.

Introduction to Graphic devices like light pens, Graphic tablets, Graphic Cards, DataGlove, Digitizers, Graphs and types of Graphs.

Cathode-Ray tube, Raster Scan displays, Random Scan displays, Architecture of a Raster and Random Graphics System with display processor, Color generating techniques (shadow mask, beam penetration), Raster Scan Systems, Random Scan Systems, Graphics Monitors and Workstations, Color Models (RGB and CMY), color lookup Table.

### SECTION B

Input and Output primitives, Process and need of Scan Conversion, Scan conversion algorithms for line, circle and ellipse, effect of scan conversion, Bresenham's algorithms for line and circle along with their derivations, midpoint circle algorithm with derivation, area filling techniques, flood fill techniques, character generation techniques (like typography, vector and bitmap).

2-Dimensional Graphics: Cartesian and Homogeneous Co-ordinate System, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, affine transformation, Two dimensional viewing transformation and windowing and clipping (line, polygon and text). Concave and Convex Polygon, Cohen Sutherland line clipping and its algorithm, Sutherland Hodgeman polygon clipping.

### SECTION C

3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Parallel and Perspective Projections. Bezier curves and its properties, B-Spline curves. Fractals, Classification of fractals.

### SECTION D

Hidden line and surface elimination algorithms: Z-buffer, Painter's algorithm, scan-line, subdivision, Shading and Reflection: Diffuse reflection, Specular reflection, refracted light, Halftoning, Dithering techniques. Surface Rendering Methods: Constant Intensity method, Gouraud Shading, Phong Shading (Mush Band effect). Morphing of objects

Note: Graphics Programming using C/C++ with introduction to OpenGL.

References:

- 1.D.HearnandM.P.Baker,“ComputerGraphics”,PHINewDelhi;ThirdEdition.
  - 2.J.D.Foley,A.V.Dam,S.K.Feiner,J.F.Hughes,.R.LPhillips,“ComputerGraphicsPrinciples&Practices, SecondEdition”,PearsonEducation,2007.
  - 3.R.A.PlastockandG.Kalley,“ComputerGraphics”,McGrawHill,1986.
  - 4.F.S.Hill:ComputerGraphicsusingOpenGL-SecondEdition,PearsonEducation-2003.
-

## MCA-404 ADVANCED OPERATING SYSTEM

### Section A

Multi-Processor and Distributed Operating System: Introduction, Architecture, Organization, Resource sharing, Load Balancing, Availability and Fault Tolerance, Design and Development Challenges, Inter-process Communication, Distributed Applications – Logical Clock, Mutual Exclusion, Distributed File System.

### Section B

Real Time and Embedded Operating Systems: Introduction, Hardware Elements, Structure-Interrupt Driven, Nanokernel, Microkernel and Monolithic kernel based models. Scheduling- Periodic, Aperiodic and Sporadic Tasks, Introduction to Energy Aware CPU Scheduling

### Section C

Cluster and Grid Computing: Introduction to Cluster Computing and MOSIX OS, Introduction to the Grid, Grid Architecture, Computing Platforms: Operating Systems and Network Interfaces, Grid Monitoring and Scheduling, Performance Analysis, Case Studies

### Section D

Cloud Computing: Introduction to Cloud, Cloud Building Blocks, Cloud as IaaS, PaaS and SaaS, Hardware & Software Virtualization, Virtualization of OS – Hypervisor KVM, SAN & NAS back-end concepts.

Mobile Computing: Introduction, Design Principles, Structure, Platform and Features of Mobile Operating Systems (Android, IOS, Windows Mobile OS)

### References:

- Sibsankar Halder, Alex A. Arvind, “Operating Systems”, Pearson Education Inc.
  - Tanenbaum and Van Steen, “Distributed Systems: Principles and Paradigms”, Pearson, 2007.
  - M.L. Liu, “Distributed Computing: Principles and Applications”, Addison-Wesley, Pearson
  - Maozhen Li, Mark Baker, “The Grid-Core Technologies”, John Wiley & Sons, 2005
-

- 1.InstallingJava,Eclipse,andAndroid:AndroidStudioandGenymotion
- 2.Developing2Androidbasedapplications
- 3.Creatingorderedandun-orderedlistsinHTML5.
- 4.CreatingtablesinHTML5
- 5.Usingimagesashyperlinks.
- 6.CreatingformsandframesinHTML5.
- 7.DesigningwebpageusingCSS3.
- 8.Programusingifcontrolstatementin JavaScript.
- 9.ProgramusingloopcontrolstatementinJavaScript.
- 10.Webpageacceptinginputfromuserandhandlingdatabaseconnectivity.
- 11.WebpageDemonstratinginputvalidationandeventhandling.

---

Software LabIX(InteractiveComputerGraphics)

MCA-406

---

ThevariousalgorithmswillbeimplementedusingC/C++orOpenGL

---

FifthSemester

## MCA-501

### Artificial Intelligence

#### Section-A

Introduction: Intelligence, Foundations of artificial intelligence (AI). History of AI; Turing Test, The underlying assumption, and AI techniques, Level of Model.

Problems, Problem Space and Search: defining the problem as a state space search, Production System, Problem Characteristics, Production System and its characteristics. Water Jug problem and its space search.

#### Section-B

Un-informed Search: Depth First Search, Breadth First Search its advantages and disadvantages.

Informed Search Strategies: Heuristic functions Best first search, A\* algorithm, Depth first Search, Breadth first search, Best First Search, advantages and disadvantages of informed search techniques. Iterative deepening, Game playing- Perfect decision game, imperfect decision game, evaluation function, alpha-beta pruning.

#### Section-C

Knowledge Representation: Characteristics and knowledge representation Issues: representation and mapping. Reasoning: Propositional Logic, predicate logic (first order logic) FOPL, logical reasoning, forward chaining, backward chaining; representing simple facts in logic, representing instance and IS A relationships, resolution principle with examples. Clausal form Representation, Inference.

#### Section-D

Uncertainty: Basic probability, Bayes rule, Belief networks, Default reasoning, Fuzzy sets and fuzzy logic; Decision making- Utility theory, utility functions, Decision theoretic expert systems.

Weak-slot and filler structures: Frames, Strong slot and filler structures: Conceptual dependency, scripts.

Communication: Communication among agents, formal grammar, parsing, grammar. Natural Language processing and its problems, discourse and pragmatic processing.

#### Suggested/Readings & Books

1. Stuart Russell and Peter Norvig, Artificial Intelligence – A Modern Approach, Pearson Education Press, 2001.
2. Kevin Knight, Elaine Rich, B. Nair, Artificial Intelligence, McGraw Hill, 2008.
3. George F. Luger, Artificial Intelligence, Pearson Education, 2001.
4. Nils J. Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kaufman, 2002.

## MCA-502 Design & Analysis of Algorithms

### Section-A

Data Structures: Quick revision of Data Structures-stacks, queues, trees, heaps, sets and graphs. Trees: Binary Search trees, Optimal BSTrees, AVL Trees, RB Trees, Hashing

### Section-B

Algorithms: What is an algorithm? Analyzing algorithms, order arithmetic, Time and space complexity of an algorithm, comparing the performance of different algorithms for the same problem. Different orders of growth. Asymptotic notation. Polynomial vs. Exponential running time. Principles of Algorithm Design.

### Section-C

Basic Algorithm Design Techniques: Divide-and-conquer, Greedy, Randomization, backtracking, and dynamic programming. Example problems and algorithms illustrating the use of these techniques.

Sorting and searching: Insertion and selection sort, Binary search in an ordered array. Sorting algorithms such as Merge sort, Quicksort, Heapsort, Radix Sort, and Bubble sort with analysis of their running times. Lower bounds on sorting.

### Section-D

Graphs and NP-completeness: Graph traversal: breadth-first search (BFS) and depth-first search (DFS). Applications of BFS and DFS. Shortest paths in graphs: Dijkstra algorithm. Definition of class NP, P, NP-hard and NP-complete problems.

### Suggested Readings/Books:

1. Fundamentals of Computer Algorithms by Ellis Horowitz, S. Sahni, and S. Rajasekaran, University Press.
2. The Design and Analysis of Computer Algorithms by A. V. Aho, J. E. Hopcroft, and J. D. Ullman, Pearson Education India.
3. Algorithm Design by J. Kleinberg and E. Tardos, Pearson Education India .
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, PHI.

# MCA-503 WebTechnologies

## SECTION- A

XML:Introductionto XML,XMLBasics,XMLSyntaxandEditors,documents,Elements,Attributes.  
Creating: XMLdocuments,DocumentTypeDefinitions(DTD),XMLSchemas(XSD),XML  
Namespaces,XMLDocumentObjectModel,XSLT.UseofXSLTwithXML.

## SECTION- B

Introduction toAjax,UseofAjaxinWebsite. IntroductiontojQuery, Overview, retrieving page  
content,manipulatingpagecontent,workingwithevents.

## SECTION-C

PHP:Server-sidewebscripting,InstallingPHP,AddingPHPtoHTML,SyntaxandVariables,  
Passinginformatiobetweenpages,Strings,ArraysandArrayFunctions,Numbers,BasicPHPerrors/  
problems.

Advanced PHPandMySQL:PHP/MySQLFunctions,Displayingqueriesintables,BuildingForms  
fromqueries,StringandRegularExpressions,Sessions,CookiesandHTTP,TypeandType Conversions,E-  
Mail

## SECTION- D

IntroductiontoWebServices,UseofWebServices,TypesofWebServices,  
IntroductiontoContentManagementSystemCMS(Types,Usages,Benefits).

## TEXTBOOKS:

1. WebTechnologies:HTML,JavaScript,PHP,Java,JSP,XMLandAJAX blackbook  
(9789350045930),Wiley.
  2. ProfessionalXML,WroxPublications.
  3. WebServicesEssentials:DistributedApplicationswithXML-RPC,SOAP,
  3. Web ServicesEssentials:DistributedApplicationswithXML-RPC,SOAP,UDDI&WSDLBy  
EthanCerami,O'Reilly
-

## MCA-504 Object Oriented Analysis and Design using UML

### Section A

Object orientation and Development, OO Benefits, Abstraction, OO Modeling,

The Three Models: Class Modeling (Objects and Classes, Relationships, Generalization and Inheritance, Association, Aggregation, Constraints, Packages), State Modeling (Events, States, Transitions and Conditions, State and Behavior, Concurrency) and Interaction Modeling (Use case models, Sequence and Activity)

### Section B

System and Process, SDLC, Creation of SRS document: Requirement Specification, Documentation and SDLC Models. Domain and Application Analysis (Class, State and Interaction Models),

System Design (Subsystems, Global Resources, Conditions, Priorities)

Using design patterns (Abstraction-Occurrence, General Hierarchy, Player-Role, Singleton, Observer, Delegation, Adapter and Proxy Patterns), Class Design (Use cases, algorithms, refactoring, design optimization, inheritance adjustment)

### Section C

UML Diagram: Use case diagram, Class diagram, Object diagrams, Aggregation activities on real objects (Aggregation, Generalization relations, Association and multiplicity), Activity diagram (Activity and state diagram), Interaction Diagram (Sequence diagram, Collaboration diagram, Component diagram.)

### Section D

OO Methodologies (Structured Analysis, Structured Design (SA/SD), Jackson Structured Development (JSD), Information Modeling Notations), OMT as SE Methodology, OO Impact, OO Style (Reusability, Extensibility, Robustness, Programming-in-the-large), User centric design and usability principles, Reverse Engineering, Difficulties and risks in use-case modeling and UI design, System testing and maintenance. Use of open source tools for UML Designs such as PlantUML, ArgoUML.

TEXTBOOKS:

- FrederickEddy,JamesRumbaugh,MichaelBlaha,WilliamPremerlani,William Lorensen:Object-OrientedModelingandDesign,PearsonEducation.
- JamesRumbaugh,MichaelR.Blaha:Object-OrientedModelingandDesignwith UML,PearsonEducation.
- TimothyC.Lethbridge,RobertLaganiere:ObjectOrientedSoftwareEngineering, PracticalSoftwareDevelopmentusingUMLandJava,TataMcGraw-Hilledition.
- Hans-ErikEriksson,MagnusPenker,BrianLyons,DavidFado:UML2Toolkit, WILEY-DreamtechIndiaPvt.Ltd.

#### REFERENCEBOOKS:

- MeilirPage-Jones:FundamentalsofObjectOrientedDesigninUML,Pearson Education.
  - PascalRoques:ModelingSoftwareSystemsUsingUML2,WILEY-Dreamtech IndiaPvt.Ltd.
  - AtulKahate:ObjectOrientedAnalysis&Design,TheMcGraw-HillCompanies.
  - MarkPriestley:PracticalObject-OrientedDesignwithUML,TATAMcGrawHill.
  - Appling UMLandPatterns:AnintroductiontoObject-OrientedAnalysisand Designand
  - UnifiedProcess,CraigLarman,PearsonEducation.
-

## MCA-505 Software LabXI (WebTechnologies)

This software lab will be based upon the course WebTechnologies (MCA-503).

---

MCA–506 Software LabXII(Object Oriented Analysis&Designwith  
UML)

ThissoftwarelabwillbebasedonUML.

---

Semester6<sup>th</sup>

## MCA-601 Data Warehousing and Data Mining

### Section A

Review of Data Warehouse: Need for data warehouse, Bigdata, Data Pre-Processing, Three tier architecture; MDDM and its schemas, Introduction to Spatial Data warehouse, Architecture of Spatial Systems, Spatial: Objects, data types, reference systems; Topological Relationships, Conceptual Models for Spatial Data, Implementation Models for Spatial Data, Spatial Levels, Hierarchies and Measures Spatial Fact Relationships.

### Section B

Introduction to temporal Data warehouse: General Concepts, Temporality Data Types, Synchronization and Relationships, Temporal Extension of the Multi Dimensional Model, Temporal Support for Levels, Temporal Hierarchies, Fact Relationships, Measures, Conceptual Models for Temporal Data Warehouses: Logical Representation and Temporal Granularity

### Section C

Introduction to Data Mining functionalities, Mining different kind of data, Pattern/Context based Data Mining, Bayesian Classification: Bayes theorem, Bayesian belief networks Naive Bayesian classification, Introduction to classification by Back propagation and its algorithm, Other classification methods: k-Nearest Neighbor, case based reasoning, Genetic algorithms, rough set approach, Fuzzy set approach

### Section D

Introduction to prediction: linear and multiple regression, Clustering: types of data in cluster analysis: interval scaled variables, Binary variables, Nominal, ordinal, and Ratio-scaled variables; Major Clustering Methods: Partitioning Methods: K-Mean and K-Medoids, Hierarchical methods: Agglomerative, Density based methods: DBSCAN

References:

1. Data Mining: Concepts and Techniques By J. Han and M. Kamber  
Publisher Morgan Kaufmann Publishers
2. Advanced Data Warehouse Design (from conventional to spatial and temporal applications) by  
Elzbieta Malinowski and Esteban Zimányi  
Publisher Springer
3. Modern Data Warehousing, Mining and Visualization By George M Marakas,  
Publisher Pearson

### Section-A

OverviewofCloudComputing:Introduction,Definitionofcloud,Definitionofcloud,characteristics ofcloud,Why useclouds,Howcloudsarechanging,Drivingfactorstowardscloud,Comparinggrid withcloudandothercomputingsystems,workloadpatternsforthecloud,“BigData”,ITasaservice.

### Section-B

Cloud computing concepts:Conceptsofcloudcomputing,CloudcomputingleveragetheInternet, Positioningcloudto a gridinfrastructure,Elasticityandscalability,Virtualization,Characteristicsof virtualization, Benefits ofvirtualization, Virtualization incloudcomputing, Hypervisors, Multitenancy,Typesof tenancy,Applicationprogramminginterfaces(API),Billingand meteringof services , Economies of scale, Management, tooling, and automation in cloud computing, Management:DesktopsintheCloud,Security.

Cloudservicedelivery:Cloudservice,Cloudservicemodelarchitectures,Infrastructureasaservice (IaaS)architecture,Infrastructureasa service(IaaS)details,Platformasaservice(PaaS)architecture, Platform asaservice (PaaS) details, Platform asaservice (PaaS) ,Examples ofPaaS software, Softwareasaservice(SaaS)architecture,Softwareasaservice(SaaS)details,Examplesof SaaS applications, Trade-off incost toinstall versus ,Common cloud management platform reference architecture:Architectureoverviewdiagram,Commoncloudmanagementplatform.

### Section-C

Cloud deploymentscenarios:Clouddeploymentmodels,Publicclouds,Hybridclouds,Community, Virtualprivateclouds,Verticalandspecialpurpose,Migrationpathsfor cloud,Selectioncriteriafor clouddeployment.

Security inCloudcomputing:Cloudsecurityreferencemodel,securityintegration,securityrisks, Internalsecuritybreaches,Data Corruption or loss,Useraccountandservicehijacking,Stepstoreduce cloudsecuritybreaches,enhancingcloudsecurity,identitymanagement

### Section-D

CloudComputingplatforms:IBM SmartCloud, Amazon Web Services, Google Cloud platform, WindowsAzureplatform,A comparisonof CloudComputingPlatforms,CommonbuildingBlocks. Integrationofcloudcomputingwithmobileandadhocnetworktechnologies.

SuggestedReadings/Books

1. Raj Kumar Buyya, James Broberg, AndrezeiM.Goscinski, Cloud Computing: Principles and paradigms,2011,Wiley.
2. MichaelMiller,CloudComputing,2008.
- 3.JudithHurwitz,RobinBllor,MarciaKaufman,FernHalper,CloudComputingfordummies,2009.
4. AnthonyT.Velte,TobyJ.VelteandRobertElsenpeter,CloudComputing:ApracticalApproach, McGrawHill,2010.
- 5.BarrieSosinsky,CloudComputingBible,Wiley,2011.
- 6.BorkoFurht,ArmandoEscalante(Editors),HandbookofCloudComputing,Springer,2010.

## MCA-603 Advanced Computer Architecture

Course Objectives: To understand and analyze the functionality, connectivity and performance of various processors and memory types.

### Section-A

Fundamentals of Processors: Instruction set architecture; single cycle processors, hardwired and micro-coded FSM processors; pipelined processors, multi-core processors; resolving structural, data, control and name hazards; analyzing processor performance.

### Section-B

Fundamentals of Memories: Memory technology; direct-mapped, associative cache; write-through and write-back caches; single-cycle, FSM, pipe-lined cache; analyzing memory performance.

### Section-C

Advanced Processors: Superscalar execution, out-of-order execution, register renaming, memory disambiguation, dynamic instructions scheduling, branch prediction, speculative execution; multi-threaded, VLIW and SIMD processors.

### Section-D

Advanced Memories: Non-blocking cache memories; memory protection, translation and virtualization; memory synchronization, consistency and coherence.

### Recommended Books:

1. Computer Architecture: A Quantitative Approach, by J.L Hennessy and D.A Patterson.
2. Digital Design and Computer Architecture, by D.M Harris and S.L Harris.

# MCA-604 Software Testing & Quality Management

## Section-A

Software Testing Fundamentals- Terminology, error, fault and failures, objectives, principles, Purpose of testing, Debugging, Theoretical and practical limitations of testing, The problem of infeasible paths, Testability, Relationship of testing with other activities, Testing levels, Unit testing, Integration testing, System testing, Acceptance testing.

Testing Techniques and Strategies- Static and dynamic testing, Software technical reviews, Testing techniques and their applicability, Functional testing and analysis, Structural testing and analysis, Hybrid approaches, Transaction flow analysis, Stress analysis, Failure analysis, Concurrency analysis, Performance analysis.

## Section-B

Flow graphs and Path Testing: Path testing basics, Path predicates, Application of path testing.

Data Flow Testing: Basics of data flow testing, Data flow model, Data flow testing strategies, Applications.

Software Testing and Regular Expression: Path products, Path sums, Loops, Reduction procedure, Applications, Approximate number of paths, The mean processing time of any routine, Regular expression and Flow-anomaly detection

## Section-C

Software Quality: Software Quality Metrics, Standards, Certification and assessment, Quality management standards, Quality standards with emphasis on ISO approach, Capability Maturity Models-CMM and CMMI, TQM Models, The SPICE project, ISO/IEC 15504, Six Sigma Concept for Software Quality.

Quality Planning: Inputs, Tools and techniques, Outputs

## Section-D

Quality Assurance: Inputs, Quality management plan, Results of quality control measurements, Operational definitions, Quality planning tools and techniques, Quality audits, Quality improvements

Quality Control: Inputs, Tools and techniques: Inspection, Control charts, Pareto diagrams, Statistical sampling, Flowcharting, Trend analysis, Outputs: Quality improvements, Acceptance decisions, Rework, Completed checklist, Process adjustments.

Recommended Books:

1. Jeff Tian, Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Wiley.
2. Boris B. Bezier, Software Testing Techniques, Wiley Dreamtech Publication (2004).
3. William Perry, Effective Methods for Software Testing, John Wiley & Sons, Inc. (2006).
4. Glenford J. Myers, The Art of Software Testing, Wiley India Pvt. Ltd 2nd edition (2006).

## MCA-605 Software Lab XIII (Software Testing & Quality Management)

Developing applications to automate basis path testing, Boundary value analysis, Data flow testing, Branch and statement coverage, etc. Exposure to automated testing tools such as Rational test manager, Selenium, Loadrunner or any other similar tools.

**MRSPTU MCA STUDY SCHEME 2016 BATCH ONWARDS**

**MCA (1<sup>ST</sup> SEMESTER)**

**TOTAL CONTACT HRS. = 25, TOTAL CREDITS = 21.5**

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-101	Introduction to Information Technology	3	1	-	50	100	150	4
MCAP1-102	Problem Solving and Programming using C	3	1	-	50	100	150	4
MCAP1-103	Digital Electronics	3	1	-	50	100	150	4
MCAP1-104	Mathematical Foundations of Computer Science	3	1	-	50	100	150	4
MCAP1-105	Software Lab-I(Introduction to Information Technology based on MCAP1-101)	-	-	2	100	50	150	1
MCAP1-106	Software Lab-II(Problem Solving and Programming using C based on MCAP1-102)	-	-	4	100	50	150	2
<b>Open Elective-I</b>								
	Personality Development and Communication-I	2	-	-	40	60	100	2
	Personality Development and Communication-I Lab	-	-	1	60	40	100	0.5
<b>Total 5 Theory &amp; 3 Lab. Courses</b>		<b>14</b>	<b>4</b>	<b>07</b>	<b>500</b>	<b>600</b>	<b>1100</b>	<b>21.5</b>

**MCA (2<sup>nd</sup> SEMESTER)**

**TOTAL CONTACT HRS. = 27, TOTAL CREDITS = 23**

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-207	Computer Architecture & Organization	3	1	-	50	100	150	4
MCAP1-208	Relational Database Management System	3	1	-	50	100	150	4
MCAP1-209	Data and File Structures	3	1	-	50	100	150	4
MCAP1-210	Software Lab-III(Relational Database Management System based on MCAP1-208)	-	-	4	100	50	150	2
MCAP1-211	Software Lab-IV(Data and File Structures based on MCAP1-209)	-	-	4	100	50	150	2
<b>Departmental Elective-I</b>								
MCAP1-256	Software Engineering and Project Management	3	1	-	50	100	150	4
MCAP1-257	System Analysis and Design	3	1	-	50	100	150	4
MCAP1-258	Software Design Methodologies	3	1	-	50	100	150	4
<b>Open Elective-II</b>								
	Soft Skills	3	-	-	50	100	150	3
<b>Total 5 Theory &amp; 2 Lab. Courses</b>		<b>15</b>	<b>4</b>	<b>08</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>23</b>

MCA (3<sup>rd</sup> SEMESTER)

TOTAL CONTACT HRS. = 24, TOTAL CREDITS = 21

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-312	Computer Networks	3	1	-	50	100	150	4
MCAP1-313	Operating Systems	3	1	-	50	100	150	4
MCAP1-314	Object Oriented Programming using C++	3	-	-	50	100	150	3
MCAP1-315	Software Lab-V(Based on LINUX)	-	-	2	100	50	150	1
MCAP1-316	Software Lab-VI(Object Oriented Programming using C++ based on MCAP1-314 )	-	-	4	100	50	150	2
<b>Departmental Elective-II</b>								
MCAP1-359	Embedded Systems	3	1	-	50	100	150	4
MCAP1-360	Multimedia Technologies	3	1	-	50	100	150	4
MCAP1-361	Parallel and Distributed Computing	3	1	-	50	100	150	4
<b>Open Elective-III</b>								
	Accounting and Financial Management	3	-	-	50	100	150	3
	Environmental Education	3	-	-	50	100	150	3
<b>Total 5 Theory &amp; 2 Lab. Courses</b>		<b>15</b>	<b>3</b>	<b>6</b>	<b>450</b>	<b>600</b>	<b>1050</b>	<b>21</b>

MCA (4<sup>th</sup> SEMESTER)

TOTAL CONTACT HRS. = 30, TOTAL CREDITS = 24

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-417	Computer Graphics	3	1	-	50	100	150	4
MCAP1-418	Programming in Java	3	1	-	50	100	150	4
MCAP1-419	Internet Concepts & Web Technologies	3	1	-	50	100	150	4
MCAP1-420	Software Lab-VII (Computer Graphics based on MCAP1-417)	-	-	4	100	50	150	2
MCAP1-421	Software Lab-VIII (Programming in Java based on MCAP1- 418)	-	-	4	100	50	150	2
MCAP1-422	Software Lab-IX (Internet Concepts & Web Technologies based on MCAP1-419)	-	-	4	100	50	150	2
<b>Departmental Elective-II</b>								
MCAP1-462	Data Warehousing and Data Mining	3	-	-	50	100	150	3
MCAP1-463	Business Intelligence & Digital Marketing	3	-	-	50	100	150	3
MCAP1-464	Software Testing and Quality Assurance	3	-	-	50	100	150	3
<b>Open Elective-II</b>								
	Organization Behaviour and Management	3	-	-	50	100	150	3
	Human Resource Management	3	-	-	50	100	150	3
<b>Total 5 Theory &amp; 3 Lab. Courses</b>		<b>15</b>	<b>3</b>	<b>12</b>	<b>550</b>	<b>650</b>	<b>1200</b>	<b>24</b>

**MCA (5th SEMESTER)**

**TOTAL CONTACT HRS. = 31, TOTAL CREDITS = 26**

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-523	System Programming	3	-	-	50	100	150	3
MCAP1-524	Artificial Intelligence	3	1	-	50	100	150	4
MCAP1-525	Project(Planning & Design)	-	-	6	50	100	150	3
MCAP1-526	Theory of Computation	3	1	-	50	100	150	4
MCAP1-527	Information and Network Security	3	-	-	50	100	150	3
<b>Departmental Elective-II</b>								
MCAP1-565	LAMP Technologies	3	1	-	50	100	150	4
MCAP1-566	Database Administration	3	1	-	50	100	150	4
MCAP1-567	Network Administration	3	1	-	50	100	150	4
MCAP1-568	Software Lab-X( LAMP Technologies based on MCAP1-565)	-	-	4	100	50	150	2
MCAP1-569	Software Lab-XI(Database Administration based on MCAP1-566)	-	-	4	100	50	150	2
MCAP1-570	Software Lab-XII (Network Administration based on MCAP1-567 )	-	-	4	100	50	150	2
<b>Open Elective-II</b>								
	Enterprise Resource Planning	3	-	-	50	100	150	3
	Total Quality Management	3	-	-	50	100	150	3
<b>Total 6 Theory , 1 Project &amp; 1 Lab. Course</b>		<b>18</b>	<b>3</b>	<b>10</b>	<b>450</b>	<b>750</b>	<b>1200</b>	<b>26</b>

Note:

Student is to select a combination of subjects in departmental elective –II as below:

- i) MCAP1-565 and MCAP1-568
- ii) MCAP1-566 and MCAP1-569
- iii) MCAP1-567 and MCAP1-570

**MCA (6th SEMESTER)/-**

**TOTAL CONTACT HRS. = 26, TOTAL CREDITS = 19**

Course		Contact Hrs.			Marks			Credits
Code	Name	L	T	P	Int.	Ext.	Total	
MCAP1-628	Current Trends and Technologies	3	1	-	50	100	150	4
MCAP1-629	Project (Implementation & Execution)	-	-	10	50	100	150	5
<b>Departmental Elective-II</b>								
MCAP1-671	Big Data	3	1	-	50	100	150	4
MCAP1-672	Cloud Computing	3	1	-	50	100	150	4
MCAP1-673	Dot Net Framework	3	1	-	50	100	150	4
MCAP1-674	Mobile Computing & Android	3	1	-	50	100	150	4
MCAP1-675	Soft Computing	3	1	-	50	100	150	4
MCAP1-676	Software Lab-XIII (Big Data based on MCAP1-671)	-	-	4	100	50	150	2

**MRSPTU MCA STUDY SCHEME 2016 BATCH ONWARDS**

MCAP1-677	Software Lab-XIV (Cloud Computing based on MCAP1-672)	-	-	4	100	50	150	2
MCAP1-678	Software Lab-XV (Dot Net Framework based on MCAP1-673)	-	-	4	100	50	150	2
MCAP1-679	Software Lab-XVI(Mobile Computing & Android based on MCAP1-674)	-	-	4	100	50	150	2
MCAP1-680	Software Lab-XVII(Soft Computing based on MCAP1-675)	-	-	4	100	50	150	2
<b>Open Elective-II</b>								
	Practices and Principles of Management	3	1	-	50	100	150	4
	Computer Oriented Numerical & Statistical Methods	3	1	-	50	100	150	4
<b>Total</b> 3 Theory, 1 Project & 1 Lab. Course		<b>9</b>	<b>3</b>	<b>14</b>	<b>300</b>	<b>450</b>	<b>750</b>	<b>19</b>

**Note:**

Student is to select a combination of subjects in departmental elective -II as below:

- i) MCAP1-671 and MCAP1-676
- ii) MCAP1-672 and MCAP1-677
- iii) MCAP1-673 and MCAP1-678
- iv) MCAP1-674 and MCAP1-679
- v) MCAP1-675 and MCAP1-680

**Total Marks = 1100 + 1050 + 1050 + 1200 + 1200 + 750 = 6350**

**Total Credits = 21.5 + 23 + 21 + 24 + 26 + 19 = 134.5**

<b>CORES OF MCA MRSSTU, BATHINDA</b>		
<b>S.No.</b>	<b>Course Code</b>	<b>Course</b>
01	MCAP1-101	Introduction to Information Technology
02	MCAP1-102	Problem Solving and Programming using C
03	MCAP1-103	Digital Electronics
04	MCAP1-104	Mathematical Foundations of Computer Science
05	MCAP1-105	Software Lab-I(Introduction to Information Technology based on MCAP1-101)
06	MCAP1-106	Software Lab-II(Problem Solving and Programming using C based on MCAP1-102)
07	MCAP1-207	Computer Architecture & Organization
08	MCAP1-208	Relational Database Management System
09	MCAP1-209	Data and File Structures
10	MCAP1-210	Software Lab-III(Relational Database Management System based on MCAP1-208)
11	MCAP1-211	Software Lab-IV(Data and File Structures based on MCAP1-209)

**MRSPTU MCA STUDY SCHEME 2016 BATCH ONWARDS**

12	MCAP1-312	Computer Networks
13	MCAP1-313	Operating Systems
14	MCAP1-314	Object Oriented Programming using C++
15	MCAP1-315	Software Lab-V(Based on LINUX)
16	MCAP1-316	Software Lab-VI(Object Oriented Programming using C++ based on MCAP1-314 )
17	MCAP1-417	Computer Graphics
18	MCAP1-418	Programming in Java
19	MCAP1-419	Internet Concepts & Web Technologies
20	MCAP1-420	Software Lab-VII (Computer Graphics based on MCAP1-417)
21	MCAP1-421	Software Lab-VIII (Programming in Java based on MCAP1-418)
22	MCAP1-422	Software Lab-VIII (Internet Concepts & Web Technologies based on MCAP1- 419)
23	MCAP1-523	System Programming
24	MCAP1-524	Artificial Intelligence
25	MCAP1-525	Project(Planning & Design)
26	MCAP1-526	Theory of Computation
27	MCAP1-627	Information and Network Security
28	MCAP1-628	Current Trends and Technologies
29	MCAP1-629	Project (Implementation & Execution)

<b>DEPARTMENTAL ELECTIVES OF MCA MRSSTU, BATHINDA</b>		
<b>S.No.</b>	<b>Course Code</b>	<b>Course</b>
<b>DEPARTMENTAL ELECTIVE-I</b>		
56	MCAP1-256	Software Engineering and Project Management
57	MCAP1-257	System Analysis and Design
58	MCAP1-258	Software Design Methodologies
<b>DEPARTMENTAL ELECTIVE-II</b>		
59	MCAP1-359	Embedded Systems
60	MCAP1-360	Multimedia Technologies
61	MCAP1-361	Parallel and Distributed Computing
<b>DEPARTMENTAL ELECTIVE-III</b>		
62	MCAP1-462	Data Warehousing and Data Mining
63	MCAP1-463	Business Intelligence & Digital Marketing
64	MCAP1-464	Software Testing and Quality Assurance
<b>DEPARTMENTAL ELECTIVE-IV</b>		
65	MCAP1-565	LAMP Technologies
66	MCAP1-566	Database Administration
67	MCAP1-567	Network Administration
68	MCAP1-568	Software Lab-IX(LAMP Technologies based on MCAP1-565)
69	MCAP1-569	Software Lab-IX(Database Administration based on MCAP1-566)
70	MCAP1-570	Software Lab-IX(Network Administration based on MCAP1-567 )

<b>OPEN ELECTIVES OFFERED TO MCA MRSSTU, BATHINDA</b>		
<b>S.No.</b>	<b>Course Code</b>	<b>Course</b>
<b>OPEN ELECTIVE-I</b>		

**MRSPTU MCA STUDY SCHEME 2016 BATCH ONWARDS**

-		Personality Development and Communication-I
-		Personality Development and Communication-I Lab
<b>OPEN ELECTIVE-II</b>		
-		Soft Skills
<b>OPEN ELECTIVE-III</b>		
-		Accounting and Financial Management
-		Environmental Education
<b>OPEN ELECTIVE-IV</b>		
-		Organization Behaviour and Management
-		Human Resource Management
<b>OPEN ELECTIVE-V</b>		
-		Enterprise Resource Planning
-		Total Quality Management
<b>OPEN ELECTIVE-VI</b>		
-		Practices and Principles of Management
-		Computer Oriented Numerical & Statistical Methods

<b>OPEN ELECTIVES OFFERED BY APPLIED CHEMISTRY MRSSTU, BATHINDA</b>		
<b>S.No.</b>	<b>Course Code</b>	<b>Course</b>
<b>OPEN ELECTIVE-I</b>		
91	MCAP0-F91	Computer Applications in Business
92	MCAP0-F92	Software Lab(Computer Applications in Business based on MCAP0-F91)
93	MCAP0-F93	Fundamentals of Computer and C programming
94	MCAP0-F94	Software Lab(Fundamentals of Computer and C programming based on MCAP0-F93)

**F means that this Course can be opted by students of different semesters,**

**INTRODUCTION TO INFORMATION TECHNOLOGY**

**Subject Code: MCAP1-101**

**L T P C**

**Duration: 45 Hrs.**

**3 1 0 4**

**Learning Objectives**

1. This course will enable the student to gain and understanding of the core concepts and technologies which constitute Information Technology.

2. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology and Office Tools.

#### UNIT-1

##### **1. Computer Fundamentals (5 Hrs.)**

Block structure of a computer, Characteristics of computers, Problem solving with computers, Generations of computers, Classification of computers on the basis of capacity, Purpose and Generation, Input devices, Output devices, Memories.

##### **2. Number System (3 Hrs.)**

Bit, Byte, Binary, Decimal, Hexadecimal and Octal systems, Conversion from one system to the other.

##### **3. Representation of Information (2 Hrs.)**

Integer and Floating point representation, Complement schemes, and Binary codes.

#### UNIT-2

##### **4. Operating system (4 Hrs.)**

Batch, Multi-programming, Time sharing, Network operating system, On-line and Real time operating system, Distributed operating system, Multi-processor, Multi-tasking.

##### **5. Windows (7 Hrs.)**

Installing windows with set-up, Starting and Quitting windows, Basic elements of windows, Working with menus dialogue boxes, Window applications, Program manager, File manager, Print manager, Control panel, Write, Paint brush, Accessories including Calculator, Calendar, Clock, Card file, Note pad, Recorder etc.

#### UNIT-3

##### **6. Word processing (4 Hrs.)**

Editing features, Formatting features, Saving, Printing, Table handling, Page settings, Spell-checking, Macros, Mail-merge, and Equation editors.

##### **7. Spreadsheet (4 Hrs.)**

Workbook, Worksheets, Data types, Operators, Cell formats, Freeze panes, Editing Features, Formatting features, creating formulas, Using formulas, Cell references.

##### **8. Presentation Graphics Software (4 Hrs.)**

Templates, Views, Formatting slide, Slides with graphs, Animation, Using special features, presenting slide shows.

#### UNIT-4

##### **9. Computer Network and Communication (4 Hrs.)**

Network types, Network topologies, Network Communication devices, Physical communication media.

##### **10. Internet and its Applications (4 Hrs.)**

E-mail, TELNET, FTP, World Wide Web, Internet chatting, Intranet, Extranet, Gopher, Mosaic, WAIS.

##### **11. Security management tools (4 Hrs.)**

PC tools, Norton Utilities, Virus, Worms, Threats, Virus detection, Prevention and Cure utilities, Firewalls, Proxy servers.

**Text Books:**

1. V. Rajaraman, "Fundamentals of Computers, 3<sup>rd</sup> Edition", PHI.
2. Satish Jain, "Information Technology Concepts, 4<sup>th</sup> Edition", BPB Publications.
3. P.K Sinha, "Computer Fundamental, 5th Edition", BPB PUBLICATION.

**References:**

1. Turban, Mclean and Wetherbe, "Information Technology for Management, 3rd Edition", John Wiley & Sons.
2. Courter G, "Mastering MS Office 2000 Professional, 4<sup>th</sup> Edition", BPB Publication.
3. Steve Sagman, "MS- Office 2000 for Windows, 5th Edition", Addison Wesley.

**Learning Outcomes:**

After completion of this course, the students would be able to:

1. Identify and understand the working of key components of a computer system and representation of numbers, alphabets and other characters.
2. Identify and understand the working of different operating systems and to install windows.
3. Become proficient in using the features of word processing in Word processing.
4. Students will be able to create technical and complex spreadsheets for data analysis using spreadsheet tools.
5. Students will become proficient to develop effective and professional business presentations using Power Point tools.
6. The students will learn about types of Communication networks, use of internet applications and security within the context of Information Technology.

**PROBLEM SOLVING AND PROGRAMMING USING C**

**Subject Code: MCAP1-102**

**L T P C**  
**3 1 0 4**

**Duration: 45 Hrs.**

**Learning Objective:**

This course is designed to provide a comprehensive study of the C programming language. It stresses the strengths of C, which provide students with the means of writing efficient, maintainable, and portable code. The nature of C language is emphasized in the wide variety of examples and applications.

**UNIT-1**

**1. Programming process (3 Hrs.)**

Problem definition, Algorithms, Flow Charts, C Character set, Identifiers and Keywords, Constant and Variables, Data types, Declarations, Statements and Symbolic Constants.

**2. Operators and Expressions (1 Hr.)**

Arithmetic, Relational, Logical, Unary operators.

**3. Bitwise operators (1 Hr.)**

AND, OR, Complement precedence and Associating bitwise shift operators

**4. Input-Output (1 Hr.)**

Standard, Console and String functions.

**5. Coding Standards (1 Hr.)**

Inline documentation, Indentation of code.

**6. Naming conventions (2 Hrs.)**

Variables, Global variables, Functions, Structures.

**7. Debugging (2 Hrs.)**

Tracking defects, Debugging by code inspection, Debugging by logs, Debugging using step-by-step execution, using break points.

**UNIT-2**

**8. Control statements (4 Hrs.)**

Branching, Looping using for, While and Do-while Statements, Nested control structures, Switch, Break, Continue statements.

**9. Arrays (4 Hrs.)**

Definition, Access of Elements, Initialization, Multidimensional arrays, Character arrays.

**10. Pointers (5 Hrs.)**

Address and dereferencing operators, Declaration, Assignment, Initialization, Arithmetic, Precedence of address and Dereferencing operators, Pointer comparison, Conversion, Pointer arrays and Pointers to Pointers. Pointers and Strings, Void pointers, Dynamic memory management.

**UNIT-3**

**11. Functions (5 Hrs.)**

Definition, Call, Prototypes, Formal and Actual parameters, passing arguments to functions, Call by value and Call by address, Passing array elements as arguments and Passing arrays as arguments, Recursion, Recursion v/s Iteration.

**12. Program structure (2 Hrs.)**

Storage classes, Automatic, External and Static variables.

**13. Pre-processor directives (3 Hrs.)**

#include, #define, #undef, #if, #ifdef, #ifndef, #else, #elif, #endif, #error, #pragma, Predefine macros.

**UNIT-4**

**14. Structure (5 Hrs.)**

Variable, Initialization, Accessing members, Assignment, Size of structure, Scope of a structure, Nested structures, Pointer to structures, Scope of a structure, Type definition, Structure as function arguments, Arrays of structures, Structures containing arrays, Self-referential structures, Bit fields, Union, Enumerated data type.

**15. File processing (6 Hrs.)**

Opening and Closing, Data files, Creation, Processing & Unformatted data files, Random file access, Command line arguments.

**Text Books:**

1. Shubhnandan Jamwal, "Programming in C, 3<sup>rd</sup> Edition", Pearson
2. E. Balagurusamy, "Programming in ANSI C, 3<sup>rd</sup> Edition", Tata McGraw Hill.

**References:**

1. Brian Kernighan and Dennis Ritchie, "C Programming Language, 2<sup>nd</sup> edition", PHI
2. Byron Gottfried, "Programming with C, 2<sup>nd</sup> edition", Tata McGraw Hill
3. ISRD Group, "Programming and Problem Solving Using C, 3<sup>rd</sup> Edition", Tata McGraw Hill
4. Yashvant P Kanetkar, "Let us C", BPB Publications, 4<sup>th</sup> Edition, New Delhi.
5. R.S. Salaria, "Application Programming in C, 2<sup>nd</sup> Edition", Khanna Book Publishing.

**Learning Outcomes:**

After completion of this course, the students would be able to:

1. Understand the basic terminology used in computer programming. Students will be able to write, compile and debug programs in C language and use different data types in a computer program.
2. Design programs involving decision structures, loops, breaking control statements.
3. Design programs using arrays and understand the dynamics of memory by the use of pointers.
4. Design programs involving functions and learn to understand and analyse the use of storage classes and pre-processor directives.
5. Provide students with the means of writing efficient code using structures and learn file handling.

**DIGITAL ELECTRONICS**

**Subject Code: MCAP1-103**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

**Learning Objective:**

Digital circuits which are the basic building blocks of a computer are introduced in this module to let the students know what activities it does behind the computing environment. This course portrays excellent ideas of the logic gates available and data processing to make students understand the concept better with the analogue and digital signals while computing.

**UNIT-1**

**1. Number System (4 Hrs.)**

Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Signed and Unsigned number, Conversion from One Number System to another. Arithmetic Operation without Changing the Base, Floating Point Representation.

**2. Binary Codes (3 Hrs.)**

Weighted Binary Codes, Non Weighted Codes, Reflective Codes, Sequential Codes, Alphanumeric Codes, BCD Code, Code Conversions, BCD Arithmetic.

**3. Logic Gates (2 Hrs.)**

Introduction to Logic gates, Universal Gates, Logic Gates Applications.

**UNIT-2**

**4. Boolean algebra (7 Hrs.)**

Introduction, Boolean Laws-Commutative Law, Associative Law, Distributive Law, AND Laws, OR Laws, Inversion Laws, Principle of Duality, Duality Theorem, De-Morgan's Theorem. Simplification of Boolean Expression using Boolean algebra, Sum of Products (SOP) & Product of Sums (POS) Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps.

**5. Combinational Logic Circuits (7 Hrs.)**

Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor, BCD Adder, BCD Subtractor. Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders.

**UNIT-3**

**6. Sequential Logic Circuits (7 Hrs.)**

Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop, Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops, Registers.

**7. Counters (3 Hrs.)**

Design of Asynchronous Counters, Design of Synchronous Counters.

**8. Logic families (3 Hrs.)**

RTL, DCTL, DTL, TTL, ECL and its various Types, Comparison of Logic Families.

**UNIT-4**

**9. Memory Devices (6 Hrs.)**

Classification of memories, RAM organization, Write operation, Read operation, Memory cycle. Static RAM Cell-Bipolar, RAM cell, MOSFET RAM cell, Dynamic RAM cell. ROM Organization, PROM, EPROM, EEPROM, Field Programmable Gate Arrays (FPGA).

**10. Signal Conversions (2 Hrs.)**

Analog & Digital signals, A/D and D/A conversion.

**11. VLSI Design (2 Hrs.)**

Introduction, Process & Applications.

**Text Books:**

1. T. C. Bartee, “Digital and Electronic Circuits, 3<sup>rd</sup> Edition”, McGraw Hill
2. R.P. Jain, “Modern Digital Electronics, 4<sup>th</sup> Edition”, Tata McGraw Hill
3. M. Morris Mano, “Digital Logic and Computer Design, 4<sup>th</sup> Edition”, Pearson.

**Reference Books:**

1. William H.Gothmann, “Digital Electronics: An Introduction to Theory and Practice, 2nd Edition”, Prentice Hall.
2. Albert Malvino, “Digital Computer Electronics, 2nd Edition”, Tata McGraw-Hill.

**Learning Outcomes:**

After completion of this course, the students would be able to:

1. Acquired knowledge about basics of digital electronics and solving problems related to number systems.
2. Acquired knowledge about Boolean algebra.
3. Ability to identify, analyse and design combinational circuits.
4. Ability to design various synchronous and asynchronous sequential circuits.
5. Ability to understand Logic families.
6. Acquired knowledge about memory devices and signal Conversions.

MRSPTU

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

**Subject Code: MCAP1-104**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

**UNIT-1**

**1. Mathematical Logic**

Statements, logical operations, tautologies, contradictions, logical implications and equivalence, normal forms, theory and Inference for statement calculus, predicate calculus, Inference theory for predicate calculus.

**UNIT-2**

**2. Relations and Functions**

Binary relations, computer representation of relations and diagraph, Equivalence relations, applications of congruence, Composition of relations, Transitive Closure, Partially ordered sets, Hasse diagrams, lexicographic ordering, topological sorting, Lattices and special types of lattices, Types of functions, functions for computer sciences, growth of function and binary operations.

**UNIT-3**

**3. Permutations and Combinations**

Basic concepts; Rules of counting; combinatorial distribution of distinct and non-distinct objects; generating functions for permutation and combinatorial enumeration.

#### 4. Recursion and Recurrence Relation

Primitive recursive function, Polynomials and their recursion, Iteration, Sequence and discrete functions, Recurrence relations, Generating function.

### UNIT-4

Lattice and algebraic system, Basic properties of algebraic systems, Special types of lattices, Distributed, Complemented lattices, Boolean algebra, Boolean expressions, Normal form of boolean expressions, Boolean function, Basic circuits and theorems, Logical gates and relations of boolean function, Introduction to graphs, Graph terminology, graph isomorphism, directed and undirected graphs and their representations; Paths, reach ability and connectedness; Basic concepts of trees and spanning tree.

#### Recommended Books:

1. Tremblay J. P. and Manohar R., “Discrete Mathematical Structures with Applications to Computer Science”, 2<sup>nd</sup> Edition”, Tata McGraw Hill.
2. Rosen Kenneth H., “Discrete Mathematics and its applications with combinatorics and graph theory, 6<sup>th</sup> edition”, Tata McGraw – Hill Education Private Limited.
3. Grimaldi, R. P. and Ramana, B. V., “Discrete and Combinatorial Mathematics – An Applied Introduction 2<sup>nd</sup> Edition”, Pearson education.
4. Doerr Alan., “Applied Discrete Structures for Computer Science, 2<sup>nd</sup> Edition”, Galgotia Publications.
5. Liu C.L., “Elements of Discrete Mathematics, 2<sup>nd</sup> Edition” Tata McGraw Hill.

### SOFTWARE LAB – I

#### (INFORMATION TECHNOLOGY & OFFICE AUTOMATION BASED ON MCAP1-101)

Subject Code: MCAP1-105

L T P C  
0 0 2 1

Duration: 30 Hrs.

#### Learning Objectives

1. This course will enable the student to gain and understanding of the core concepts and technologies which constitute Information Technology.
2. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology and Office Tools.

#### 1. WINDOWS OPERATING SYSTEM

Installing WINDOWS with set-up, Starting and Quitting WINDOWS, Basic Elements of WINDOWS, Working with menus dialogue boxes, Window Applications, Windows Explorer, My Computer, Recycle bin, Programs, Favorites, My Documents. Settings- Control Panel, Printers, Taskbar and Start menu, Folder Options, Active Desktop, Find, Help, Run.

Accessories – Entertainment, Games, System tools, Internet Tools, Calculator, Calendar, Clock, Card file, Note pad, Write pad, Recorder etc.

## **2. WORD PROCESSING & PRESENTATION TOOL**

Salient Features of Word, Installation of Word, Starting and Quitting of Word, File, Edit, View, Insert, Format, Tools, Tables, Window, Help options and all of their features, Options and Sub Options etc. Transfer of files between Word Processors and Software Packages.

Salient Features of Power Point, Installation, Starting and Quitting, File, Edit, View, Insert, Format, Tools, Slide Show, Window, Help options and all of their features, Options and Sub Options etc. Transfer of files between Presentation Tool and Software Packages.

## **3. SPREADSHEET TOOL**

Spread Sheet. Getting started with Excel worksheet, Entering data into Work Sheet, Editing cell addressing, Ranges and range names, Commands, Menus, Copying and Moving cell contents, Inserting and Deleting rows and columns, Column width control, Cell protection, Printing reports, Creating and Displaying Graphs, Statistical functions.

## **4. Internet and its Applications**

E-mail, TELNET, FTP, World Wide Web, Internet chatting, Intranet, Extranet, Gopher, Mosaic, WAIS.

### **Learning Outcomes:**

After completion of this course, the students would be able to:

1. Familiarize with PC and WINDOWS commands, File creation, Editing, Directory creation.
2. Become proficient in using the features of word processing in Word.
3. Become proficient in using spreadsheet software and be able to create technical and complex spreadsheets for data analysis using spreadsheet tools.
4. Understand the use of Internet and its applications

## **SOFTWARE LAB – II**

### **(PROBLEM SOLVING AND PROGRAMMING USING C BASED ON MCAP1-102)**

**Subject Code: MCAP1-106**

**L T P C  
0 0 4 2**

**Duration: 60 Hrs.**

**This laboratory course will mainly comprise of exercises on what is learnt under paper: MCAP1-102 (Computer Programming Using C)**

**Note: Program should be fully documented with simple I/O data. Flow charts should be developed wherever necessary.**

**Implement the following Concepts in C Programming:**

- 1. Input-output statements:** Formatted and Non-Formatted statements

**2. Operators:** Arithmetic, Logical, Conditional, Assignment, Bitwise, Increment/Decrement operators

**3. Decision Making:** Switch, if-else, nested if, else-if ladder, Break, Continue, Goto

**4. Loops:** While, Do-while, For

**5. Functions:** Definition, Declaration, Variable Scope, Parameterized Functions, Return statement, Call by value, Call by reference, Recursive functions

**6. Pre-processor Directives:** Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc

**7. Header Files:** STDIO.H, MATH.H, STRING.H, PROCESS.H etc

**8. Arrays:** Array declarations, Single and Multi-dimensional, Memory limits, Strings and String functions

**9. Pointers:** Pointer declarations, Pointer to Function, Pointer to Array/String

**10. Files:** Creation and Editing of various types of files, Closing a file (using functions and without functions).

**Learning Outcomes:**

After completion of this course, the students would be able to:

1. Apply and practice logical ability to solve the problems.
2. Understand C programming development environment, compiling, debugging, linking and executing a program using the development environment.
3. Analysing the complexity of problems, modularize the problems into small modules and then convert them into programs
4. Understand and apply the in-built functions and customized functions for solving the problems.
5. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
6. Document and present the algorithms, flowcharts and programs in form of user-manuals

**COMPUTER ARCHITECTURE & ORGANIZATION**

**Subject Code: MCAP1-206**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

**Learning Objective:**

The objective of the course is to provide students with a solid foundation in computer design. Examine the operation of the major building blocks of a computer system and to introduce students to the design and organization of modern digital computers & basic assembly language.

**UNIT-1**

**1. Basic computer Organization and design (6 Hrs.)**

Common Bus System, Registers, Instruction codes, computer Instructions, Timing and Control, Instruction Cycle, Arithmetic, Logic & Shift micro operations instructions, Memory Reference Instructions, Design of Basic Computer and it's working.

**2. Programming &controlling the basic computer (6 Hrs.)**

Machine & Assembly Language, Programming Arithmetic and Logic Operations, Hardwired & Micro programmed control, Address Sequencing, Design of a control unit.

**UNIT-2**

**3. CPU Architecture (5 Hrs.)**

General register & stack organization, Instruction formats, Addressing Modes, Data Transfer and Manipulation, Program Control. ALU & Control unit architecture.

**4. I/O Organization (5 Hrs.)**

Peripheral Devices, input-output interface, Asynchronous Data Transfer, Modes of data transfer-programmed & interrupt initiated I/O, Priority Interrupt, DMA, I/O Processors.

**UNIT-3**

**5. Memory Organization (7 Hrs.)**

Main Memory-Memory Address Map, Memory connection to CPU, Associative Memory-Hardware organization, Cache Memory-Levels of Cache, Associative Mapping, Direct Mapping, Set-Associative Mapping.

**6. Parallel & Multiprocessing Environment (5 hrs.)**

Introduction to parallel processing, Pipelining, RISC Architecture, Vector & array processing, multiprocessing concepts, memory & resource Sharing, Interprocessor communication & Synchronization.

**UNIT-4**

**7. Overview of Assembly Language Programming (6 Hrs.)**

Architecture of a typical 8 bit processor (8085 microprocessor)—Registers, Instruction Set-Data transfer Instructions, Arithmetic Instructions, Logical Instructions, Program Control Instructions, Machine Control Instructions.

**8. Use of an Assembly Language for specific programs (5 Hrs.)**

Simple numeric manipulations, Sorting of a list and use of I/O instructions.

**Text Books:**

1. M.Morris Mano, "Computer System Architecture", PHI.

2. William Stallings, “Computer Organization and Architecture, 8th Edition”, Pearson.

**References Books:**

1. P.V.S. Rao, “Computer System Architecture, 2<sup>nd</sup> Edition”, PHI.
2. Hayes J.P, “Computer Architecture & Organization, 3<sup>rd</sup> Edition”, McGraw Hill.
3. Stone, “Introduction to Computer Architecture, 2<sup>nd</sup> Edition”, Galgotia.
4. Tanenbaum, “Structured Computer Organization, 3rd Edition”, PHI.

**Learning Outcomes:**

After Completion of the course students will be able to:

1. Understand the fundamentals of different instruction set architectures and their relationship to the CPU design.
2. Understand the principles and the implementation of computer arithmetic.
3. Understand the Basic architecture of CPU and I/O Organization.
4. Understand the operation of modern CPUs including pipelining, memory systems and buses and multiprocessor systems and parallel programming.
5. To Understand the Overview of Assembly Language Programming and to create an assembly language program to program a microprocessor system.



**RELATIONAL DATABASE MANAGEMENT SYSTEM**

Subject Code: MCA1-207

L T P C

Duration: 45 Hrs.

3 1 0 4

**Learning Objective:**

The course aims at providing the students through insight on few DBMS principles and practices. Students will learn and implement the operations for making and using databases with help of SQL and PL/SQL.

**UNIT-1**

**1. Introduction to DBMS (4 Hrs.)**

Overview of DBMS, Basic DBMS terminology, Data independence. Architecture of a DBMS, Introduction to data models: Entity relationship model, Hierarchical model, Network model, Relational model.

**2. Relational Design (5 Hrs.)**

Relation scheme, Codd’s Rule for RDBMS, Anomalies in a database, Functional Dependency: Dependencies and Logical implications, Closure set, Testing if FD is in closure, Covers, Non redundant and Minimum cover, Canonical cover, Functional dependencies and Keys.

**3. Normal forms (5 Hrs.)**

1NF, 2NF, 3NF, BCNF, Multi valued dependencies and Joined dependencies, 4NF, 5NF.

## UNIT-2

### 4. Structured Query Language (7 Hrs.)

Introduction to SQL, Oracle server and Oracle database, Oracle data types, Starting SQL\*Plus, Querying database tables, Conditional retrieval of rows, Working with null values, Matching a pattern from a table, Ordering the result of a query, Aggregate Functions, Grouping the result of a query.

### 5. Querying multiple Tables (4 Hrs.)

Equi Joins, Cartesian Joins, Outer Joins, Self Joins; SET Operators: Union, Intersect, Minus.

### 6. Functions (3 Hrs.)

Arithmetic functions, Character functions, Date functions, and Group functions.

## UNIT-3

### 7. Data Manipulation and Control (5 Hrs.)

Data Definition Language (DDL), Creating Tables, Creating a Table with data from another table, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table, Dropping a Column; VIEW: Manipulating the Base table, Rules of DML Statements on Join Views, Dropping a VIEW, Inline Views.

### 8. Database security and privileges (2 Hrs.)

GRANT command, REVOKE command, COMMIT and ROLLBACK.

## UNIT-4

### 9. PL/SQL (10 Hrs.)

Introduction to PL/SQL, The Advantage of PL/SQL, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data types, variables and constants, Assignments and expressions, Operator precedence, referencing Non-PL/SQL variables, Built in functions , conditional and iterative control, SQL within PL/SQL, writing PL/SQL code. Cursor management in PL/SQL, Cursor manipulation, Triggers, Stored procedures, Exception handling in PL/SQL, Predefined exceptions, User defined exceptions, Triggers, Stored procedures.

### Text Books:

1. Desai, B.C., "An Introduction to Database Systems, 3<sup>rd</sup> Edition", Galgotia Publ. Private Ltd.
2. Ivan Bayross, " PL/SQL The Programming Language of ORACLE, 2<sup>nd</sup> Edition ", BPB Publication
3. Henry F.korth, "Abraham, "Database system concepts, 3<sup>rd</sup> Edition", McGraw hill Inc.
4. RamezElmasri, ShamkantNavathe, "Fundamentals of Database Systems, 3<sup>rd</sup> Edition", Pearson.

### Reference Books:

1. Johannes Gehrke , Raghu Ramakrishnan, "Database Management Systems, 4<sup>th</sup> Edition", McGraw Hill Education.
2. Date, C.J., "Data Base Systems, Vols. I & II, 3<sup>rd</sup> Edition", Narosa Publications.
3. Mark L. Gillenson, "Fundamentals of Database Management Systems, 2<sup>nd</sup> Edition", John Wiley and Sons.

**Learning Outcomes:**

Students who complete this course would be able to perform the following tasks:

1. Master the basic concepts and appreciate the applications of database systems.
2. Be familiar with the relational database design.
3. Master sound design principles for logical design of databases, including the E-R method and normalization approach.
4. Formulate data retrieval queries in SQL and the Relational Algebra and functions.
5. Understand analyse and apply Data Manipulation and Control and Database security and privileges.
6. Understand, analyse, and apply PL/SQL blocks using Cursors and Triggers.

**DATA AND FILE STRUCTURES**

**Subject Code: MCA1-208**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

**Learning Objective:**

A study of advanced programming topics focused on logical structures of data, their physical representation, design and analysis of algorithms operating on the structures, and techniques for program development and debugging. Emphasis is placed on the appropriate use and choice of standard data structures.

**UNIT-1**

**1. Introduction to Data Structure (4 Hrs.)**

Concept of data, Problem analysis, Data structures and Data structure operations, Notations, Mathematical notation and Functions, Algorithmic Complexity, Big-O Notation and time space trade off.

**2. Arrays (4 Hrs.)**

Overview of Arrays, Recursion, Pointers, Pointer Arithmetic, Array of pointers, Arrays in terms of pointers, Static and Dynamic Memory Management, Garbage Collection. Understanding and Implementation of various Data Structures with applications.

**3. Stack (4 Hrs.)**

Operations like push, pop and various applications like conversion from Infix to postfix and prefix expressions, Evaluation of postfix expression using stacks.

**4. Queues (2 Hrs.)**

Operations like Enqueue, Dequeue on simple, circular and priority queues.

**5. Linked Lists (3 Hrs.)**

Operations like Creations, Insertion, Deletion, Retrieval and Traversal on Single, Circular and doubly linked list.

## UNIT-2

### 6. Trees (3 Hrs.)

Definitions and Concepts: Root Node, Leaf Node, Level, Degree, Height and Tree representation using linked List and array.

### 7. Tree operations (5 Hrs.)

Creation, Insertion, Deletion and Traversals (Preorder, In-order, Post ordered) and searching on various types of trees. Types of Trees: Binary trees, Binary search tree, Height balanced (AVL) tree, B trees, B+ Tree.

### 8. Heap (2 Hrs.)

Definition, Structure, Algorithms and applications.

## UNIT-3

### 9. Graphs (8 Hrs.)

Graph definitions and Concepts: Edge, Vertices, and Graph representation using Adjacency matrix, Adjacency lists. Types of graphs: Weighted, Unweighted, Directed, Undirected Graphs. Graph Operations: Creation, Insertion, Deletion, Traversals and Searching (Depth first, Breadth-first) of various types of graphs and Dijkstra's algorithm for shortest distance calculation.

## UNIT-4

### 10. Sorting (6 Hrs.)

Concepts, Order, Stability and Efficiency of various algorithms (Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Heap Sort and Radix Sort).

### 11. Searching (2 Hrs.)

Concept and Efficiency of linear and binary search algorithms.

### 13. Hashing (2 Hrs.)

Definition, Implementation and Applications.

#### Text Books:

1. Lipschutz, Seymour, "Theory & Problems of Data Structures, 2<sup>nd</sup> Edition", Schaum Series.
2. Horwitz, E., and Sahni, S., "Fundamentals of Data Structures, Computer Science, 2<sup>nd</sup> Edition" Press.
3. Tremblay, "An introduction to Data Structures with Applications, 3<sup>rd</sup> Edition", Tata McGraw.

#### Reference Books:

1. Aho, A. V., Hopcroft, and Ullman, J.E., "Data Structures and Algorithms, 3<sup>rd</sup> edition", Addison Wesley.
2. Tanenbaum, A. M. and Augenstein, M.J., "Data Structures using C, 2<sup>nd</sup> Edition", Prentice Hall International.
3. Berman, A. Michael, "Data Structure via C++, 2<sup>nd</sup> Edition", Oxford University Press.

#### Learning Outcomes:

After completion of this course, the students would be able to:

1. Design and apply appropriate data structure using simple algorithms for modelling and solving given computing problems

2. Understand, analyse and Develop algorithms to implement different data structures such as: arrays, linked lists, stacks, queues and Linked Lists
3. Understand, analyse and Develop algorithms to implement linear data structures such as trees.
4. Understand, analyse and Develop algorithms to implement graphs.
5. Identify, understand and determine the usage of sorting, searching and Hashing operations and their associated algorithms.

**SOFTWARE LAB – III**

**(RELATIONAL DATABASE MANAGEMENT SYSTEM BASED ON MCAP1-207)**

**Subject Code: MCAP1-209**

**L T P C  
0 0 4 2**

**Duration: 60 Hrs.**

**Learning Objective:**

Students will learn and implement the operations for making and using databases with help of SQL and PL/SQL

**Implement the following Concepts:**

1. Comparative study of various Database Management Systems
2. Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language (DCL)
3. How to apply Constraints at various levels.
4. View data in the required form using Operators, Functions and Joins.
5. Creating different types of Views for tailored presentation of data
6. How to apply Conditional Controls in PL/SQL
7. Error Handling using Internal Exceptions and External Exceptions
8. Using various types of Cursors
9. How to run Stored Procedures and Functions
10. Creating Packages and applying Triggers
11. Creating Arrays and Nested Tables

**Learning Outcomes:**

Students who complete this course would be able to perform the following tasks:

1. Understand, appreciate and effectively explain the underlying concepts of database Technologies.
2. Design & implement a database schema for given problem domain.
3. Populate & query a database using SQL DML/DDL commands.
4. Normalize a database.
5. Programming PL/SQL including stored procedures, stored functions, cursors, packages.

**SOFTWARE LAB – IV**

**(DATA AND FILE STRUCTURES BASED ON MCAP1-208)**

Subject Code: MCAP1-209

L T P C  
0 0 4 2

Duration: 60 Hrs.

**List of practical exercises, to be implemented using object-oriented approach in C++ Language:**

1. **Array:** Insert an element at end as well as at a given position, Delete an element from a given position, find the location of a given element using linear search and display the elements of the linear array.
2. **Linked List:** Insert an element, Delete an existing element, and Display all the elements.
3. **Stack:** To implement PUSH& POP operation on stack.
4. **Queue:** Insert and Delete operation on circular queue represented using a linear array.
5. **Bubble Sort:** To sort an array of integers in ascending order using Bubble sort.
6. **Selection Sort:** To sort an array of integers in ascending order using Selection sort.
7. **Insertion Sort:** To sort an array of integers in ascending order using bubble sort.
8. **Merge Sort:** To sort an array of integers in ascending order using merge sort.
9. **Quick Sort:** To sort an array of integers in ascending order using Quick sort.
10. **Binary Search Tree:** To demonstrate the use of binary search algorithm to search a given element in a Sorted array in ascending order. To insert, delete and display operations on a binary search tree.
11. **Breadth-First Search:** To illustrate the traversal of graph using breadth-first search.
12. **Depth-first Search:** To illustrate the traversal of graph using depth-first search.

**Learning Outcomes:**

Students who complete this course will be able to:

1. Designing and applying appropriate data structure using simple algorithms for modelling and solving given computing problems.
2. Understand and implement the both array based and linked-list based data structures, including singly, doubly, and circular linked-lists.
3. Understand and implement the Stack data structure and stack operations.
4. Understand and implement the both array based circular queue and linked-list based queue implementations.
5. Understand and implement general tree data structures, including binary tree, both array based and reference based implementations;
6. Understand and implement binary search trees.
7. Understand and implement heaps using an array based tree data structure.
8. Understand and implement graph data structures

**Departmental Elective-I**

**SOFTWARE ENGINEERING AND PROJECT MANAGEMENT**

**Subject Code: MCAP1-256**

**L T P C**

**Duration: 45 Hrs.**

**3 1 0 4**

**Learning Objective:**

To help students to develop skills that will enable them to construct software of high quality software that is reliable, and that is reasonably easy to understand, modify and maintain.

**UNIT-1**

**1. Software Engineering (2 Hrs.)**

Evolution of Software Engineering, Goals of software engineering, Software Development vs. Software Engineering.

**2. Software Process (6 Hrs.)**

Software Process, Waterfall, Spiral, Prototyping, Selection of appropriate process model Fourth Generation Techniques.

**3. Software Requirements Analysis (3 Hrs.)**

Analysis Principles, SRS, Components of SRS, Requirement Elicitation Techniques- FAST and QFD

**UNIT-2**

**4. Software Design (7 Hrs.)**

Design Objectives, Principles, Design Concepts, Design Process, Design Strategies and Methods, Architectural Design-Architectural Styles, Modular Design, Object oriented design, User-interface design. Principles of structured Analysis and Design Tools i.e. DFD, DD, decision tables and decision trees.

**5. Software Project Management (7 Hrs.)**

Software Project Planning and its characteristics, Types of metrics, Effort Estimation- FP, LOC, FP vs. LOC, Schedule & Cost Estimation Models- Activity Networks- PERT/CPM, COCOMO-I, COCOMO-II Model.

**UNIT-3**

**6. Software Testing (7 Hrs.)**

Testing Fundamentals- Error/Fault/Failure, Testing Principles, Test Cases, Testing Techniques-White Box, Black-Box Testing & its Technique: Equivalence Class Partitioning, Boundary Value Analysis, White-Box Testing & its Techniques: Basis Path Testing, Structural Testing, Logic Based Testing, Fault Based Testing.

**7. Software Testing Strategies (4 Hrs.)**

Unit Testing, Integration Testing, System Testing, Verification and Validation Testing, Acceptance Testing, Alpha and Beta Testing, Regression Testing.

**UNIT-4**

**8. Quality Assurance (5 Hrs.)**

Overview of Software Quality, Software Quality Attributes, Factors Affecting Software Quality, Building, Software Quality Assurance Plan. Quality management Principles, Capability Maturity model. Risk Assessment.

**9. Software Maintenance (2 Hrs.)**

Types of software maintenance, Reverse Engineering, and Software maintenance process models.

**10. System Configuration Management (SCM) (2 Hrs.)**

SCM principle, Change Management, Version and Release Management.

**Text Books:**

1. R.S. Pressman, "Software Engineering: A Practitioner's Approach, 6th edition", McGraw- Hill.
2. P. Jalote, "An Integrated Approach to Software Engineering, 3rd edition" Narosa Publishing House.
3. Mall, Rajiv, "Fundamentals of Software Engineering, 4<sup>th</sup> Edition", McGraw- Hill.

**Reference Books:**

1. K.K. Aggarwal and Y. Singh, "Software Engineering (revised 2nd ed.)", New Age International Publishers.
2. Deutsch, Willis, "Software Quality Engineering: A Total Technical and Management Approach, 3<sup>rd</sup> Edition", Prentice Hall.
3. Lewis, T.G., "Software Engineering, 3<sup>rd</sup> Edition", McGraw Hill
4. Hibbard, P.G., "Constructing Quality Software, 4<sup>th</sup> Edition", North Holland Publication.

**Learning Outcomes:**

1. Ability to understand Goals of software Engineering, Software Process models and Software Requirement analysis.
2. Ability to understand Software Design in detail.
3. Ability to understand software project Management
4. Ability to identify, Analyse and understand software testing.
5. Students will be proficient to understand software Quality Assurance.
6. Ability to understand Software maintenance.

**SYSTEM ANALYSIS AND DESIGN**

Subject Code: MCAP1-257

L T P C

Duration: 45 Hrs.

3 1 0 4

**Learning Objective:**

To teach the analysis and practicality of various systems on which software

System can be developed. After completing this course students will be able to design and develop systems.

### UNIT-1

#### 1. System Development Life Cycle (7 Hrs.)

System Definition, Characteristics, Elements & Types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

#### 2. Software Requirements Analysis (5 Hrs.)

Analysis Principles, SRS, Components of SRS, Requirement Elicitation Techniques- FAST and QFD.

### UNIT-2

#### 3. System Design (12 Hrs.)

Process and Stages of systems design, Input/output and File design, Documentation(User Manual, Design Documentation, Training Manual), Design objectives, Principles, Design Concepts, Design Process, Design Strategies and Methods, Architectural Design- Architectural Styles, Modular Design, Object oriented design, User-interface design. Principles of structured Analysis and Design Tools i.e. DFD, DD, decision tables and decision trees, Case Studies techniques in System Design.

### UNIT-3

#### 4. Software Testing (6 Hrs.)

Testing Fundamentals- Error/Fault/Failure, Testing Principles, Test Cases, Testing Techniques-White Box, Black-Box Testing & its Technique: Equivalence Class Partitioning, Boundary Value Analysis, White-Box Testing & its Techniques: Basis Path Testing, Structural Testing, Logic Based Testing, Fault Based Testing.

#### 5. Software Testing Strategies (6 Hrs.)

Unit Testing, Integration Testing, System Testing, Verification and Validation Testing, Acceptance Testing, Alpha and Beta Testing, Regression Testing.

### UNIT-4

#### 6. System Implementation (4 Hrs.)

System implementation Process, Implementation methods.

#### 7. Software Maintenance (4 Hrs.)

Types of software maintenance, Reverse Engineering, and Software maintenance process models.

#### Text Books:

1. Awad Elias N., "System Analysis and Design 2<sup>nd</sup> Edition", Galgotia Publications.
2. Sen James A., "Analysis and Design of Information System, 2<sup>nd</sup> Edition", Tata McGraw Hill.

#### Reference Books:

1. Harry J. Rosenblatt, Shelly, "Systems Analysis and Design, 3<sup>rd</sup> Edition", Cashman Series.
2. Scott Tilley, Harry J. Rosenblatt, "System Analysis and Design, 3<sup>rd</sup> Edition", Wiley.

#### Learning Outcomes:

1. Ability to understand characteristics of system, Software Process models and Software Requirement analysis.
2. Ability to understand Software Design.
3. Ability to identify, Analyse and understand software testing strategies.
4. Students will be proficient to understand implementation of software.
5. Ability to understand Software maintenance.

## SOFTWARE DESIGN METHODOLOGIES

**Subject Code: MCA1-257**

**L T P C  
3 1 0 4**

**Duration: 45 Hrs.**

### **Learning Objective:**

This course provides attendees with in-depth coverage of the concepts needed to effectively design and analyze software architecture. After attending this course, participants will have a better understanding of the essential considerations in any architectural design process, methods for eliciting critical quality attributes, the role of architecture evaluation, using the methods within a software development life cycle.

### UNIT-1

#### **1. Basic concepts of Design (2 Hrs.)**

Introduction, Characteristics of design activities, Essential elements of designs.

#### **2. Design Principles (2 Hrs.)**

Basic rules of software design: Causes of difficulties, Vehicles to overcome difficulties, Basic rules of software design.

#### **3. Design processes (3 Hrs.)**

The context of design in software development process, Generic design process: descriptive models, structure of software design methods.

#### **4. Design Quality (4 Hrs.)**

Software quality models: Hierarchical models, Relational models, The effect of design on software quality: efficiency, Correctness and reliability, Portability, Maintainability, Reusability, Interoperability.

### UNIT-2

#### **5. Software Architecture (7 Hrs.)**

The notion of architecture: Architecture in the discipline of buildings, Architecture in the discipline of computer hardware, The general notion of architecture: The notion of software architecture: Prescriptive models, Descriptive models, multiple view models, The roles of architecture in software design, Software architectural style: Introductory examples, The notion of software architectural style. Typical Architectural Styles: Data flow: The general data flow styles, Pipe- and filter sub-style, Batch sequential processing sub-style.

### UNIT-3

#### **6. Using Styles in Design (8 Hrs.)**

Choices of styles, Combinations of styles, Hierarchical heterogeneous styles, simultaneously heterogeneous styles, Locationally heterogeneous styles, Case Study: Keyword frequency vector: Specification of the problem, Designs in various styles, Analysis and comparison.

**7. Architectural Design space (4 Hrs.)**

Theory of design spaces: Structure of design spaces, Solving design synthesis and Analysis problems, Design space of architectural elements: Behavior features, Static features.

**UNIT-4**

**8. Analysis and Evaluation (8 Hrs.)**

The concept of scenario, scenarios for evaluating modifiability: Scenarios for evaluating reusability, Specification of operational profiles, Evaluation and analysis of performance, Scenarios for evaluating reusability: Analysis and Evaluation of Modifiability: the SAAM Method: The input and output, The process (Activities in SAAM Analysis).

**9. Model-Based Analysis (5 Hrs.)**

The HASARD Method: Representation of quality models, Construction of quality models, Hazard identification, Cause- Consequence analysis, Assembling graphic model, Identification of quality concerns.

**10. Quality Trade- Off Analysis (2 Hrs.)**

The ATAM Method: ATAM analysis process, ATAM analysis activities

**Text Book:**

1. Hong zhu “Software Design Methodology: From Principles to Architectural Styles, 2<sup>nd</sup> Edition”, Elsevier.

**Reference books:**

1. Bosch, J., ACM Press, “Design and Use of Software Architectures- Adopting and Evolving a product – Line Approach, 3<sup>rd</sup> edition”, Addison Wesley.
2. Nick Rozanski, Eoin Woods, “Software Systems Architecture: Working With Stakeholders Using Viewpoints and Perspectives, 2<sup>nd</sup> Edition” Pearson.

**Learning Outcomes:**

1. Ability to understand basic concepts, principles, processes and quality attributes of design.
2. Ability to identify, Analyse and understand architecture of software.
3. Students will be proficient in using Styles in design.
4. Ability to identify, Analyse and understand architectural Design space.
5. Students will be proficient in analysis and evaluation of software.

MRSPTU

# **PUNJAB TECHNICAL UNIVERSITY KAPURTHALA**

## **Scheme and Syllabus of Masters in Business Administration (MBA)**

---

**Batch 2012 onwards**

**By  
Board of Studies Business Administration**

**First Semester****Contact Hours: 36Hrs.**

Course Code	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MBA 101	Principles and Practices of Management	4	1	-	40	60	100	5
MBA 102	Organizational Behaviour	4	1	-	40	60	100	5
MBA 103	Accounting for Management	4	1	-	40	60	100	5
MBA 104	Quantitative Techniques	4	1	-	40	60	100	5
MBA 105	Managerial Economics	4	1	-	40	60	100	5
MBA 106 *	Business Communication	3	2	-	40	60	100	5
MBA 107 *	Information Technology for Management	3	2	-	40	60	100	5
MBA 108	Viva Voce	-	-	-	-	50	50	2
<b>Total</b>		<b>28</b>	<b>7</b>	<b>-</b>	<b>280</b>	<b>470</b>	<b>750</b>	<b>37</b>

**Second Semester****Contact Hours: 34 Hrs**

Course Code	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MBA 201	Business Environment	4	1	-	40	60	100	5
MBA 202	Production and Operation Management	4	1	-	40	60	100	5
MBA 203	Human Resource Management	4	1	-	40	60	100	5
MBA 204	Marketing Management	4	1	-	40	60	100	5
MBA 205	Financial Management	4	1	-	40	60	100	5
MBA 206	Research Methodology	4	1	-	40	60	100	5
BTHU 101*	Human Values and Professional Ethics	3	-	-	40	60	100	3
MBA 207	Viva Voce	-	-	-	-	50	50	2
<b>Total</b>		<b>27</b>	<b>6</b>	<b>-</b>	<b>280</b>	<b>470</b>	<b>750</b>	<b>35</b>

**Third Semester****Contact Hours: 32 Hrs.**

Course Code	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MBA 301	Applied Operations Research	4	1	-	40	60	100	5
MBA 302	Corporate Legal Environment	4	1	-	40	60	100	5
MBA XXX***	Specialization I	4	1	-	40	60	100	5
MBA XXX***	Specialization II	4	1	-	40	60	100	5
MBA XXX***	Specialization -III	4	1	-	40	60	100	5
MBA XXX***	Specialization -IV	4	1	-	40	60	100	5
MBA 307**	Presentation on Training Reports	3	-	-	100	-	100	2
MBA 308	Viva Voce	-	-	-	-	50	50	2
<b>Total</b>		<b>27</b>	<b>6</b>	<b>-</b>	<b>340</b>	<b>410</b>	<b>750</b>	<b>33</b>

## Fourth Semester

Contact Hours: 33 Hrs

Course Code	Course Title	Load Allocation			Marks Distribution		Total Marks	Credit
		L	T	P	Internal	External		
MBA 401	Strategic Management	4	1	-	40	60	100	5
MBA 402	Entrepreneurship and Managing Small Medium Business	4	1	-	40	60	100	5
MBA XXX***	Specialization I	4	1	-	40	60	100	5
MBA XXX***	Specialization II	4	1	-	40	60	100	5
MBA XXX***	Specialization III	4	1	-	40	60	100	5
MBA XXX***	Specialization IV	4	1	-	40	60	100	5
MBA 407	Research Project Report	-	-	-	-	100	100	2
MBA 408	Viva Voce	-	-	-	-	50	50	2
<b>Total</b>		<b>24</b>	<b>6</b>	<b>-</b>	<b>240</b>	<b>510</b>	<b>750</b>	<b>34</b>

XXX represents the subject code as per specialization

\* The internal assessment of this course is based on the report to be prepared individually by the students. Such reports may be checked and signed by external examiner / University official at the time of subject viva voce examination.

\*\* The experts from industry/ academia may be invited for evaluation.

Note: The viva voce examination of MBA 308 will be held on the basis of Sumer Training report and other subjects of 3<sup>rd</sup> semester. Such reports may be checked and signed by external examiner at the time of subject viva voce examination.

The student can opt for either Super specialization or Dual combination.

- In Super specialization the student will study the following subjects

Semester III; 04 subjects and Semester IV 04 subjects

- In Dual specialization the student will study the following subjects

Semester III; 2+2 and Semester IV 2+2

The student may opt for either super specialization or dual specialization.

The students opting for super specialization must study 04 subjects of the chosen specialization in Semester III and Semester IV. Thus student must opt for 08 subjects in all specialization either as super specialization or as a dual must study these subjects in the respective semester.

The student opting for dual specialization must study 02 subjects of each of these specializations in Semester III and Semester IV. Thus the student must study a total of 04 subjects of each specialization.

In Semester III two subjects each from 02 specializations. In semester IV two subjects each from 02 specializations.

**\*\*\* Semester III (Specialization)**

**Marketing (Compulsory)**

MBA 901 (M) Consumer Behaviour

MBA 902 (M) Advertising Management

**Marketing (Optional)**

MBA 903 Product and Brand Management

MBA 904 Retail and Franchising

MBA 905 Rural and Industrial Marketing

---

**Finance (Compulsory)**

MBA 921 Security Analysis and Portfolio Management

MBA 922 Management of Financial Services

**Finance (Optional)**

MBA 923 Direct Tax Planning

MBA 924 Strategic Financial Management

MBA 925 Treasury and Credit risk Management

---

**Operations (Compulsory)**

MBA 941 Project Management

MBA 942 Total Quality Management

**Operations (Optional)**

MBA 943 Materials Management

MBA 944 Production Planning and Control

MBA 945 Managing ERP

---

**Human Resource Management (Compulsory)**

MBA 961 Social Security & Labour Welfare

MBA962 Training & Development

**Human Resource Management (Optional)**

MBA963 Industrial Psychology

MBA 964 Manpower planning

MBA 965 Conflict and Negotiations

---

**Information Technology (Compulsory)**

MBA 981 Programming in C

MBA 982 Relational Database Management System

**Information Technology(Optional)**

MBA 983 Software Engineering

MBA 984 Enterprise Recourse Planning

MBA 985 Data Mining and Pattern Recognition

---

**\*\*\* Semester IV (Specialization)**

**Marketing (Compulsory)**

MBA 906 (M) Service Marketing

MBA 907 (M) International Marketing

**Marketing (Optional)**

MBA 908 Sales and Distribution Management

MBA 909 Logistics Management

MBA 910 Customer Relationship Management

---

**Finance (Compulsory)**

MBA 926 International Finance

MBA 927 Banking and Insurance Operations

**Finance (Optional)**

MBA 928 Global Capital Market

MBA 929 Management Control System

MBA 930 Financial Engineering

---

**Operations (Compulsory)**

MBA 945 Supply Chain Management

MBA 946 Technology Management

**Operations (Optional)**

MBA 947 Knowledge Management

MBA 948 Manufacturing Policy and Implementation

MBA 949 Lean Manufacturing

---

**Human Resource Management (Compulsory)**

MBA 966 Organization Development

MBA967 International Human Resource Management

**Human Resource Management (Optional)**

MBA968 Industrial Relations and Labour Laws

MBA 969 People Management and Leadership

MBA 970 Stress Management

---

**Information Technology (Compulsory)**

MBA 986 Programming in C++

MBA 987 E-commerce and Cyber Securities

**Information Technology (Optional)**

MBA 988 System Analysis and Design

MBA 989 Visual Programming

MBA 990 Introductions to Computer Networks

---

**Instruction to Paper Setter**

The question paper will consists of three parts:

**Part A (20 marks):** This section will have 6 questions covering the whole syllabus carrying 05 marks each. The student has to attempt any 04 questions.

**Part B (32 marks):** This section will consist of 04 sub sections. Each section consists of 02 questions from the each unit of the syllabus. The student has to attempt one question each subsection. Each question carrying 08 marks.

**Part C (08 marks):** This section will consist of one case study of 8 marks

## **MBA101 Principles & Practices of Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** This course presents a thorough and systematic coverage of management theory and practice. The course aims at providing fundamental knowledge and exposure of the concepts, theories and practices in the field of management. It focuses on the basic roles, skills and functions of management, with special attention to managerial responsibility for effective and efficient achievement of goals.

### **Unit I**

**Introduction:** Definition, nature, scope, importance, Functions of management and manager, Managerial roles and skills, Managerial ethics: need, importance, classification and ethical dilemma, Corporate social responsibility: concept, need, tools and strategies. **Evolution of management thought and Management thinkers.** Scientific Management, General administrative theories, Quantitative approach, Behavioral approach, Systems approach, Contingency approach.

### **Unit II**

**Planning:** Importance, types of plans, and process of planning, business forecasting. Concept, importance, benefits, limitations and process of Managing by Objectives. **Strategic management** : Nature, importance, purpose, types, process and major kinds of strategies. **Decision-Making:** Importance, types, steps and approaches, Decision Making in various conditions, decision tree.

### **Unit III**

**Organizing:** Concept, types, structure and process of organization, Bases of departmentation, Line & Staff concept; problems of use of staff & ways to avoid line-staff conflict. Authority & power :-concept, responsibility and accountability. **Delegation:** concept, importance, factors affecting delegation, Reasons for failure and ways to make delegation effective, Span of Management. **Decentralization vs centralization:** concept, reasons types and advantage vs disadvantages of decentralization. **Coordination:** Concept, importance, difficulties and techniques to ensure effective coordination.

**Unit IV**

**Control:** Concept, importance, characteristics, planning-control relationship, process of control –setting objectives, establishing standards, measuring performance, correcting deviations, types, process and techniques of control, **Comparative study:** Comparative study of main features of Japanese Management and Z-culture of American Companies, Chinese Style Management, **Modern management techniques:** an overview of various latest techniques: Business process Re engineering, business outsourcing, benchmarking, knowledge management, total quality management process, McKinsey's 7-S Approach, E-Business Management.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings /Books:**

- Heinz Wehrich, Cannice & Koontz, *Management (A Global Perspective)*, Tata McGraw Hill
- Griffin, *Management: Principle & Applications*, Cengage Learning
- Stephen Robbins & Coulter Mary, *Management*, Pearsons Education
- V S P Rao & V H Krishna, *Management*, Excel Books
- P.Subba Rao, *Principles of Management*, Himalaya Publishing
- Dubrin, *Management: Concepts & Cases*, Cengage Learning
- Daft, *Principles of Management*, Cengage Learning
- Ferrell, *Business: A Changing World*, Tata McGraw Hill
- Mukherjee, *Principles of Management and Organisational behaviour*, Tata McGraw Hill.

---

**MBA102Organisational Behaviour**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The course aims to provide an understanding of basic concepts, theories and techniques in the field of human behaviour at the individual, group and organizational levels in the changing global scenario. The course must be taught using case study method.

**Unit-I**

**Organizational Behavior:** What managers do, Definition of OB, contributing disciplines to OB, challenges and opportunities for OB. **Foundations of Individual Behavior:** biographical characteristics, **Learning**, Theories of Learning, **Attitudes**, Attitude Change, **Values & Believes , Prejudices, Personality:** Determinants of Personality, **Perception**, Attribution Theory, Person's Perception.

**Unit II**

**Motivation:** Definition & Process of Motivation, Early Theories of Motivation, Contemporary Theories of Motivation, Nature and process of Motivation, Application of Motivation Concept. **Job Satisfaction:** Nature & Significance of Job satisfaction, **Leadership:** Theories of Leadership; Leadership Effectiveness Model; Leadership in Indian

Culture; Nature & Significance of Leadership; Leadership traits & Skills; Behavioral Styles in Leadership. Transactional Analysis, Life Position, Johari Window Model.

### **Unit-III**

**Foundations of Group Behavior:** Nature & Concept of Group Formation, Stages of Group Formation, Theories of Group Formation. **Teams** Difference between Group & Team. **Group Decision Making:** Meaning & Nature; Decision making in groups; Decision making process; Steps in Decision making; Decision Making Styles; Advantages & disadvantages of Decision Making; Techniques of Decision Making; Group Size & Decision Making; Consensus Decision Making in Groups. **Conflict Management:** Definition of Conflict, transitions in Conflict thought; Functional Vs Dysfunctional Conflict; Conflict Process; Individual & Group Level Conflict; Organization level Conflict; Conflict Management; Negotiations-Meaning & definition; Negotiations Process; Issues in Negotiations.

### **Unit-IV**

**Stress Management:** Meaning and Concept of Stress, Stress in Organization, Management of Stress. **Power and Politics in Organization:** Nature & Concepts, Sources & Types of Power, Techniques of Politics. **Organizational Change & Development:** Meaning & Definition, Change Agents, Change Models, Resistance to Change. **Learning Organization:** Meaning & Definition, Creating a Learning Organization. **Organizational Culture:** Meaning & Concept, Cultural Differences & Business Ethics.

#### **Suggested Readings/ Books:**

- Robbins, *Organization Behaviour*, Pearson Education
  - Luthans, *Organization Behaviour*, Tata McGraw Hill
  - Newstrom, *Organizational Behaviour: Human Behaviour at work*, Tata McGraw Hill
  - Kalliath, *Organization Behaviour*, The McGraw –Hill
  - Griffin & Moorhead, *Introduction to Organisational Behaviour*, Cengage Learning
  - Hersey, *Management of Organizational Behaviour*, Prentice Hall India
  - Parikh, Gupta, *Organisational Behaviour*, Tata McGraw Hill
  - Aswathappa, *Organization Behaviour*, Himalaya Publications
  - Locum, *Fundamentals of Organisational Behaviour*, Cengage Learning.
  - Saiyadain, M.S. : *Organization Behaviour*, Tata McGraw Hill
-

**MBA-103 Accounting for Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The objective of this course is to acquaint the students regarding various accounting concepts and its application in managerial decision making. The course attempts to build potential to use appropriate accounting tools and techniques of financial accounting and management accounting for preparing and analyzing financial statements.

**Unit –I**

Accounting as an information system, concepts, convention and principles of Accounting, Role of accountant in an organization. Branches of accounting: Financial, Cost and Management Accounting and their inter-relationships, Introduction of Accounting Standards. Exposure to format of schedule VI of Public Limited, Banking and Insurance Companies.

**Unit- II**

Financial Analysis-Concepts and objectives, Tools of Financial Analysis: trend analysis, common size statements, comparative statements, Introduction to ratio analysis, fund flow and cash flow statements (with additional information).

**Unit- III**

Cost Accounting-Meaning, Scope and Classification of costs, Absorption costing, Marginal costing. Introduction to Break Even Analysis, Use of Cost-data in managerial Decision-making with special reference to pricing and make or buy decisions. Introduction to Standard Costing including Variance Analysis – materials and labour variances. Cost Control Techniques-Preparation of budgets and their control, Zero base budgeting.

**Unit- IV**

Introduction to recent developments in cost management: Introduction to concept of Price Level Accounting, Human Resource Accounting, Transfer Pricing. Target Costing, Kaizen costing , Activity based costing, Life Cycle Costing. Introduction to Tally Software Package in Accounting – Creating Companies, journal entries and ledger accounts.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings/ Books**

- Garrison, *Managerial Accounting*, Tata McGraw
- Maheshwari, *Financial Accounting*, Vikas Publishing
- Khan and Jain, *Management Accounting*, Tata McGraw
- Ramchandran, *Financial Accounting for Management*, Tata McGraw
- Jawahar Lal, *Accounting For Management*, Himalaya Publishing
- J.Madegowda, *Accounting For Managers*, Himalaya Publishing

- Sankar, Narayana, Ramanathan, *Financial Accounting for Managers*, Cengage Learning

**MBA-104 Quantitative Techniques**

Max. Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** The objective of this paper is to acquaint the students with various statistical tools and techniques used to business decision making. . The course aims at providing fundamental knowledge and exposure to the students to use various statistical methods in order to understand, analyze and interpret data for decision making.

**Unit-I**

**Introduction to statistics:** meaning, scope, importance and limitations, applications of inferential statistics in managerial decision-making. **Analysis of data:** source of data, collection, classification, tabulation, depiction of data. **Measures of Central tendency:** Arithmetic, weighted, geometric mean, median and mode. **Measures of Dispersion:** Range, Quartile deviation, Mean deviation, Standard deviation Coefficient of variation, Skewness and Kurtosis.

**Unit-II**

**Sampling and Sampling Distribution:** Concept and definitions, census and sampling, probability samples and non-probability samples, relationship between sample size and errors, simple numerical only. **Hypothesis Testing:** Sampling theory; Formulation of Hypotheses; Application of Z-test, t-test, F-test and Chi-Square test, techniques of association of attributes & testing. Test of significance for small sample

**Unit-III**

**Correlation Analysis:** Significance, types, Methods of correlation analysis: Scatter diagrams, Graphic method, Karl Pearson's correlation co-efficient, Rank correlation coefficient, Properties of Correlation. **Regression analysis:** meaning, application of regression analysis, difference between correlation & regression analysis, regression equations, standard error and Regression coefficients. **Index Number:** Definition, and methods of construction, tests of consistency, base shifting, splicing and deflation, problems in construction and importance of index number.

**Unit-IV**

**Time Series Analysis:** Meaning, Components and various methods of time series analysis  
Trend analysis: Least Square method - Linear and Non- Linear equations, Applications in

business decision-making. **Theory of Probability:** Definition, basic concepts, events and experiments, random variables, expected value, types of probability, classical approach, relative frequency and subjective approach to probability, theorems of probability, addition, Multiplication and Bays Theorem and its application. **Theoretical Distributions:** Difference between frequency and probability distributions, Binomial, Poisson and normal distribution

**Note:** Relevant Case Studies should be discussed in class.

**Suggested Readings/ Books:**

- Levins, Krehbiel, *Business Statistics*, Pearson Berenson
- Gupta & Gupta, *An Introduction to Statistical Methods*, Vikas Publications
- Levin & Rubin, *Statistics for Management*, Prentice Hall
- S P Gupta, *Statistical Methods*, Sultan Chand
- Beri, *Business Statistics*, Tata Mc Graw Hill
- Croucher, *Statistics: Making Business Decisions*, Tata McGraw Hill
- C.R. Reddy, *Quantitative Techniques for Management Decisions*, Himalaya Publishing
- Anderson Statistics for Business & Economics, Cengage Learning

---

**MBA 105 Managerial Economics**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** This course is intended to make students understand various social, political, legal and economic and other factors that influence business in India so as to enable them appreciate associated opportunities, risks and challenges and their relevance for managerial decisions.

**Unit-I**

**Managerial Economics:** Meaning, Nature, Scope & Relationship with other disciplines, Role of managerial economics in decision Making, Opportunity Cost Principle, Production Possibility Curve, Incremental Concept. **Marginal Analysis:** Law of diminishing marginal utility, Law of equi-marginal utility, **Indifference Curve Analysis:** Meaning Assumptions Properties, Consumer Equilibrium, Uses.

**Unit-II**

**Demand Analysis and Theory of Production: Law of Demand:** Meaning, Determinants, Exceptions, Bandwagon and Snob effects, Demand function, Application of demand analysis in managerial decision making. **Elasticity of Demand:** Meaning, Types & Degree of elasticity of demand, Methods of measuring price elasticity of demand, Factors determining the elasticity of demand, **Demand Forecasting:** Importance, Scope, Techniques of forecasting. **Theory of Production:** Production function, Short run and Long run production,

Analysis, Isoquants, Optimal combination of inputs, Application in managerial decision making.

### Unit-III

**Theory of Cost and Market Structure: Cost Analysis:** Cost Concepts and Determinants of cost, **Traditional and Modern Theory of Cost:** Long run and Short run, Economy of scale, Revenue Curve, **Market Structure:** Price Output Decision under Perfect Competition, Monopoly, Monopolistic and Oligopoly Competition, Application in Managerial Decision Making. **Behaviour of Firms and Game Theory:** Nash Equilibrium, Prisoner's Dilemma.

### Unit-IV

**Macro Economics: Concept of National Income:** Conceptual Framework, Measure of National Income, Methods of Measurements, Phillips Curve, Okun's Law and Kuznets Curve, Classical Keynesian Theory, Investment Multiplier, Balanced Budget and Foreign Trade Multiplier, **Business Cycle:** Concepts, Causes, Measures to control through Fiscal and Monetary Policy, **Inflation:** Meaning, Types, Theories – Demand and Cost Push Inflation, Causes, Effects and Cures of Inflation Through Price, Demand and Income Policies

**Note:** Relevant Case Studies will be discussed in class.

#### Suggested Readings/ Books:

- K.K .Dewett, *Modern Economic Theory*, S. Chand Publication
- D.M.Mithani, *Managerial Economics Theory and Applications*, Himalaya Publication
- Peterson and Lewis, *Managerial Economic*, Prentice Hall of India
- Gupta, *Managerial Economics*, TataMcGraw Hills
- Geetika, *Managerial Economics*, Tata McGraw Hills
- D.N.Dwivedi, *Managerial Economic*, Vikas Publications
- Froeb, *Managerial Economics*, Cengage Learning

---

### MBA106 Business Communication

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** This course is designed to give students a comprehensive view of communication, its scope and importance in business, the role of communication in establishing a favourable image of the organization. The aim is to develop students' ability to communicate correctly and effectively on matters having relevance to day-to-day business operations. This course will make student conversant with fundamentals of communication, help them honing oral, written and non-verbal communication skills and to transform their communication abilities.

**Theoretical Framework****Unit- I**

**Introduction to Communication:** Meaning, Process, Importance of Communication in Business, Types of Information, Formal and Informal Communication, Internal and External Communication, Communication Channels, Choosing the Means of Communication, Audience Analysis, Ethical Considerations for Business Communication, Media of Communication, Barriers of Communication, Approaches to Effective Communication, Essentials of Effective Business Communication (7Cs model)

**Unit –II****Strategies to Improve Individuals Reading and Listening Skills- Developing Reading**

**Skills:** Identify The Purpose of Reading, Factors Effecting Reading, learning how to think and read, developing effective reading habits, reading tactics and strategies: training eye and training mind (SQ3R), Recognizing a broad range of thought patterns in reading selections, reading and interpreting visuals, making inferences, recognizing facts and opinions.

**Developing Listening Skills:** importance, purpose of listening, art of listening, factors affecting listening, components of effective listening, process of listening, principles and barriers to listening, activities to improve listening.

**Unit- III**

**Types of Communication: Oral Communication:** Advantages and Disadvantages, Conversation as Communication, Art of Public Speaking, Telephonic Conversations and Voice Mails, Group Communication through Committees, Preparing and Holding Meetings, other formal communication with public at large, seminar, symposia and conferences, Overcoming Stage fright, Ambiguity Avoidance. **Written Communication:** Advantages and Disadvantages, Covering letter, Need, Functions and Kinds, Layout of Letter Writing, **Types of Letter Writing:** Persuasive Letters, Request Letters, Sales Letters, Complaints and Adjustments; **Departmental Communication:** Meaning, Need and Types: Interview Letters, Promotion Letters, Resignation Letters, Newsletters, Circulars, Agenda, Notice, Office Memorandums, Office Orders, **Press Release Report Writing:** Structure, Types, Formats, Drafting of Various Types of Report. **Nonverbal** – Features, Understanding of Body Language, Posture, Gestures. **Influences on Communication:** Social influences, Culture and Communication, Few Guidelines for Better Multicultural Communication, Business Etiquettes and Communication.

**Practical Framework****Unit- IV**

**Developing Effective Public Relations:** Drafting Speech, Press Release, Brochures, Handouts, Leaflets, e-newsletters. **Group Discussion-** Nature, Uses and Importance, Guidelines for GD **Presentations:** How to make effective Presentations, Four P's of

Presentation, Structuring, Rehearsing, and Delivery Methods. **Resume Writing:** Planning, Organising Contents, Layout, Guidelines for Good Resume. **Interviews:** Preparation Techniques, Frequently Asked Questions about How to face an interview board, Proper body posture, Projecting a positive image, Steps to succeed in interviews, Practice Mock Interview in classrooms,. **The Case Method of learning:** Dimensions of a case, Case Discussion, Usefulness of the case method, Training of Managers, Use the Case Method. **Report writing:** Structure, Types, Formats, Preparations and Presentation.

**Important Note:** Final Examination paper shall comprise of both theoretical framework and practical framework. All the students have to prepare file / report on various practical tasks undertaken during the semester in the class. At time of viva voce the student has to carry the report

**Suggested Readings / Books:**

- Lesikar, Petit & Flatley, *Lesikar's Basic Business Communication*, Tata McGraw Hill
- Raman Meenakshi Prakash Singh, *Business Communication*, Oxford University Press.
- Rizvi Ashraf, *Effective Technical Communication*, Tata McGraw Hill
- Krizan, Buddy, Merrier, *Effective Business Communication*, Cengage Learning
- Poe & Fruchling, *Basic Communication*, AITBS
- Diwan & Aggarwal, *Business Communication*, Excel
- Baugh, Frayer & Thomas, *How to write first class Business Correspondence*, Viva Books
- Taylor, *English Conversion Practice*, Tata McGrawHill
- Devaraj, *Executive Communication*, Tata McGraw Hill
- Ober, *Effective Bossiness Communication*, Cengage Learning.

---

**MBA 107 Information Technology for Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The primary objective of this course is to familiarize the student with basic concepts of information technology and their applications to business processes. Through this course it is intended to familiarize the students with the computer hardware and software applications for data/file management.

**Unit –I**

**Computer Fundamentals:** Block Structure of a Computer, Characteristics of Computers, Generations of Computers, Classification of Computers, Computer Memory and Mass

Storage Devices, Input-Output Devices. **Number System:** Bit, Byte, Binary, Decimal, Hexadecimal, and Octal Systems, Conversion from One System to the other.

### **Unit –II**

**Computer Software:** application and system software, programming languages and their classification, assemblers, compilers and interpreters, process of software development, operating systems: functions of operating systems. **Computer Network & Communication:** Network types, network topologies, network communication devices, physical communication media, network protocol (TCP/ IP), internet and its applications: E-mail, TELNET, FTP, World Wide Web, internet chatting.

### **Unit –III**

**Personal Productivity Software: Word Processing:** Editing Features, Formatting Features, Saving, Printing, Table Handling, Page Settings, Spell-Checking, Macros, Mail-Merge, and Equation Editors. **Spreadsheet :** Workbook, Worksheets, Data Types, Operators, Cell Formats, Freeze Panes, Editing Features, Formatting Features, Creating Formulas, using Formulas, Cell References, Replication, Sorting, Filtering, Functions, Charts and Graphs. **Presentation Graphics Software:** Templates, Views, Formatting Slide, Slides with Graphs, Animation, Using Special Features, Presenting Slide Shows.

### **Unit –IV**

**Database Management System:** Traditional File Concepts and Environment, Database Management Systems Concepts. **MS Access: Creating Tables,** Adding and Deleting Records, **Querying:** Creating, Saving and Editing; Joining Tables in Queries **Forms:** Creating and using forms, **Reports:** Creating and Printing Reports.

**Note:** Relevant Case Studies should be discussed in class.

**Important Note:** Final Examination paper shall comprise of both theoretical framework and practical framework. All the students have to prepare file / report on various practical tasks undertaken during the semester in the class. At time of viva voce the student has to carry the report.

#### **Suggested Readings / Books:**

- ITL Education Solutions, Introduction to Information Technology, Pearson Education.
- Turban, Rainer and Potter, Introduction to information technology, John Wiley and Sons.
- Roger Jennings, Microsoft Access 2010, Pearson Education

- Forouzan, Basics of Computer Science, Cengage Learning
  - Joseph Brady & Ellen F Monk, Problem Solving Cases in Microsoft, Excel Thomson Learning
  - A. K. Saini & Pradeep Kumar, Computer Applications in Management, Anmol Publications
  - Deepak Bharihoke, Fundamentals of Information Technology, Excel Books.
-

# *Second Semester*

**MBA 201 Business Environment**

Max. Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objectives:** To provide students with an understanding of basic economic principles of production & exchange-essential tools in making business decisions in today's global economy. The objective is to make the student understanding how the economy works, covering microeconomic description of business applications, including pricing for profit maximization, price elasticity, market structures and modeling of business in varying economic climates.

**Unit –I**

**Introduction:** definition, components and overview of Business Environment, Complexity and Diversity of Business Environment in the 21st century, Concept of Business Cycle, Need to scan the business environment and techniques of scanning the business environment.

**Political Environment:** Three political institutions: Legislature, Executive and Judiciary. Brief note on Fundamental rights and Directive Principles of state policy, Rationale and extent of state intervention.

**Unit –II**

**Economic Environment:** Concept and Salient features of various economic system, New Industrial policy and industrial licensing, New economic policies, Aspects of economic reforms and its effects on business, Emerging Economies. Effect of recession on Business and remedies for that, Economic Planning in India: Objectives, Strategies and Evaluation of current five year plan. Monetary and Fiscal Policy. **Legal Environment:** Company Regulatory Legislations in India, FEMA, Latest. EXIM policy. Competition Law, Consumer Protection Act 1986, Right to Information Act 2005

**Unit –III**

**Public Sector in India:** Concepts, Philosophy and Objectives, Performance, Problems and Constraints. Disinvestment and Privatisation, Joint sector and Cooperative sector in India. **Social Environment:** Corporate Social Responsibility, Consumer Movement, Business Ethics, Cross-Cultural Business Environment, Ecological Environment Protection: Green Management, Global Warming, Carbon Foot Printing, The Environment Protection Act 1986.

## Unit –IV

**Technological Environment:** Impact of Technology on Business, Technological Policy, Intellectual Property Rights, Import of Technology, Appropriate Technology, Problems in Technology Transfer. **International Environment:** Emergence of Globalisation. Control of Foreign Direct Investment, Benefits and Problems from MNCs. WTO, its role and functions, Implications for India. Trading Blocks, Foreign Trade: SEZ (Special Economic Zones), EPZ (Export processing zone), EOU (*Export Oriented Units*), Dumping and Anti-Dumping measures.

**Note:** Student must consult Economic Times, Financial Express and Economic Survey of current years.

Relevant Case Studies should be discussed in class.

**Suggested Readings / Books:**

- Dr Francis Cherunilam, Business Environment Text & Cases, Himalaya Publishing
- S.K. Mishra, and V.K Puri, Economic Environment of Business, Himalaya Publishing
- Paul Justice, Business Environment- Text and Cases, TATA McGraw Hill.
- Aswathappa, Essential of Business Environment, Himalaya Publishing
- Aggarwal & Diwan, Business Environment, ExcelBooks
- Sengupta, Government & Business Vikas Publishing House
- Economic Survey, Government of India (Latest)

**MBA 202 Productions & Operations Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** It is a subject where a student learns various steps of product design, development, production, plant location, storage, production planning and control. The students are motivated to apply concepts and principles of management to become more effective professional

**Unit- I**

**Operations management:** concept, functions. transformation process model: inputs, process and outputs; classification of operations; responsibilities of operations manager, contribution of henryford, deming, crossby, taguchi. **Facility Location** – importance, factors in location analysis, location analysis techniques. **Product Design and development** – product design and its characteristics, product development process (technical), product development techniques. **Process selection-** project, job, batch, mass and process types of production systems. operations management in corporate profitability and competitiveness

**Unit- II**

**Facility Layout** – Objectives, Advantages, Basic Types of Layouts, Problems in facility layout. **Production Planning & Control (PPC):** –Concepts, Objectives, and Functions, work study – **Productivity:** Method study; Work measurement. **Capacity Planning** – Concepts, Factors affecting Capacity Planning, Capacity Planning Decisions.

**Unit- III**

**Quality Management:** Introduction, Meaning, Quality Characteristics of Goods and Services, Juran's Quality Trilogy, Deming's 14 principles, Tools and Techniques for Quality Improvement, Statistical Process Control Chart, Quality Assurance, Total Quality Management (TQM) Model Concept of Six Sigma and its Application. **Acceptance Sampling** – Meaning, Objectives, Single Sample, Double Sample and Multiple Sample Plans with sated risk, Control charts for variables – Averages and Ranges, Control Charts for Defectives – Fraction Defective and Numbers Defective.

**Unit- IV**

**JIT and Lean Production System:** JIT Approach, Implementation requirements, Services, Kanban System. **Inventory Management:** Concepts, Classification, Objectives, Factors Affecting Inventory Control Policy, Inventory Costs, Basic EOQ Model, Re-order level, ABC analysis. Logistics and Franchising. **Purchasing Management** – Objectives, Functions, Methods, **Procedure, and Value Analysis:** Concepts, Stock Control Systems, Virtual Factory Concept and Production Worksheets.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings / Books:**

- Mahadevan B, Operations Management: Theory And Practice, 2<sup>nd</sup> Edition, Pearson Education
- Krajewski & Ritzman, Operations Management, 5th Pearson Education
- Buffa & Sarin, Modern Production/Operations Management, 8th John Wiley
- Chary, Production and Operations Management, Tata McGraw-Hill
- Johnston R et al – Cases in Operations Management, Pitman
- McGregor D – Operations Management, McGraw-Hill
- Nair Production & Operations 1st Tata McGraw Management
- Adam and Eben, Production & Operations, 5<sup>th</sup> ed Prentice Hall.

**MBA-203 Human Resource Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The objective of the paper is to make student aware of the various functions and importance of the HR department in any organization. It is basically concerned with managing the human resources, whereby the underlying objective is to attract retain and motivate the human resources in any organization, which is the most challenging and daunting look for any organization today.

**Unit-I**

**Human Resources Management:** Meaning, Scope, Objective, Functions, Roles and Importance. interaction with other functional areas. HRM &HRD a comparative analysis. Human Resource Management practices in India. **Human Resource Planning:** Meaning & Concept, Process and importance , Methods of Human Resources Planning, Importance of HRIS. **Job Analysis, Job Description, Job Specification & Job Evaluation** – Meaning, Concepts and Methods.

**Unit-II**

**Recruitment & Selection:** Meaning & Concept, Process & Methods Recruitment & Selections. Induction & Placement Process. **Training & Development:** Meaning & Concept of Training & Development, Methods of Training & Development, Difference Between Training & Development, Aligning Training to Business Needs, Future of Training & development. Career Planning & Coaching & Mentoring.

**Unit-III**

**Performance Appraisal:** Meaning & Concept of Performance Appraisal, Methods & Process Of Performance Appraisal, Issues in Performance Appraisal and Potential Appraisal. **Compensation Management-** Wage & Salary Administration: Meaning & Concept of Wage & Salary Administration, Elements & Methods of Wage & Salary, Incentive Plans & Fringe Benefits. **Internal Mobility:** Promotion, Transfer, Demotion, Separation. **Quality of work life (QWL):** Meaning, Concept, Development and Various Approaches of QWL, Techniques for improving QWL. Health, Safety & Employee Welfare, Social Security, Job Stress, Counselling and Monitoring, Job Satisfaction and Morale. Competency Mapping

**Unit IV**

**Industrial Relations:** Meaning & Concept of Industrial Relations. **Collective Bargaining -**

Meaning, Scope and Objectives; Collective Bargaining – Issues and Strategies; Negotiations Skills and Strategies; **Participative Management; Employee Grievances** and their Resolution – Model for Grievance Resolution Procedure. **Quality Circles:** Concept, Structure. Role of Management, Quality Circle in India, HR Audit, Contemporary Issues in HRM.

**Note:** Relevant Case Studies should be discussed in class.

**Suggested Readings/ Books:**

- V.S.P.Rao, Human Resource Management, Excel Books
- C.B. Memoria, Personal Management, Himalaya Publications
- Edwin B.Flipppo, Personal Management, Tata Mc Graw Hill
- K. Aswathappa, Human Resource Management, Tata McGrawHill
- Bohlander, Snell & Vohra, Human Resource Management, Cengage Learning
- Dale Yoder, Personal Management & Industrial Relations, Tata McGraw Hill
- C.B. Gupta, Human Resource Management, Sultan Chand and Sons
- R.S. Dwivedi, HRD in India Companies, Himalaya publications
- Gary Dessler, Human Resource Management, McMillan
- Gomez-Mejia, Managing Human Resources, Pearson Education .

## MBA 204 Marketing Management

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The course aims at making students understand concepts, philosophies, processes and techniques of managing the marketing operations of a firm in turbulent business environment. This course will provide better understanding of the complexities associated with marketing functions, strategies and provides students with the opportunity to apply the key concepts to practical business situations.

### Unit –I

**Understanding Marketing and Consumers:** Definition, Importance, Scope, Various Marketing Concepts, Marketing Mix, Marketing vs Selling, Effect Of Liberalization and Globalization, Creating Customer Value. **Analyzing Marketing Environment-** Micro, Macro Corporate Strategic Planning: defining role marketing strategies, Marketing planning process. **Marketing Information System:** Concept and Components. Understanding Consumer Behaviour, Factors Influencing Consumer Buying Behaviour, Business Buying Process, Understanding Business Buyer Behaviour.

### Unit –II

**Creating and Managing Product:** Market Segmentation & Targeting. Differentiation & Positioning, Competitors Analysis. Product Decisions: Product Mix, Packaging And Labelling Decisions, Branding & Brand Equity, Services Marketing, New Product Development, Consumer Adoption Process, Product Life Cycle and Strategies. **Pricing**

**P  
u  
n  
j  
a  
b  
T  
e  
c  
h  
n  
i  
c  
a  
l  
U  
n  
i  
v  
e  
r  
s  
i  
t  
y  
B  
a  
t  
c  
h  
20  
12  
O  
n  
w  
a  
r  
d  
s**

**Decisions:** Objectives, Factors Affecting Pricing Decisions, Pricing Methods, Price Changes, Pricing Strategies.

### **Unit –III**

**Delivering and Promoting Product: Supply Chain Decisions:** Nature, Types, Channel Design and Channel Management Decisions, Retailing, Wholesaling, Managing Logistics and Supply Chain. **Promotion Decisions:** Communication Process, Promotion Mix, Advertising, Sales Promotion, Public Relations, Direct Selling and Online Marketing. **Personal Selling:** Personal Selling Process, Managing the Sales Force, Designing Quota & Territories, Evaluating Performance.

### **Unit –IV**

**Emerging Trends in Marketing:** Green Marketing, Event Marketing, Network Marketing, Direct Marketing, Social Marketing, Buzz Marketing/ Viral Marketing, Consumerism, Customer Relationship Management (CRM), Customer Satisfaction, Loyalty, Retention, Global Marketing, Rural Marketing, E-Commerce: Marketing In The Digital Age.

**Note :** Relevant Case Studies should be discussed in class.

#### **Suggested Readings/ Books**

- Kotler & Koshy, *Marketing Management*, Pearsons Education
- Ramaswamy & Namakumari, *Marketing Management*,McMillan
- Etzel, Walker, Stanton, and Pandit, *Marketing Management*, Tata McGrawHill,
- Kurtz & Boone, *Principles of Marketing*, Cengage Learning
- Kotler & Armstrong, *Principles of Marketing*, Prentice Hall
- Biplab S. Bose, *Marketing Management*, Himalaya Publications
- Subhash c. Jain, *Marketing Management*, Cengage Learning
- Rajan Saxena,, *Marketing Management*, Tata McGraw Hill.

---

## **MBA 205 Financial Management**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** To provide an understanding of the function, the roles, the goals and the processes of corporate financial management, covering the sourcing of finances and their issues in investment and operations. Problem-solving methodology will be used to illustrate the theories and tools in financial decision making.

### **Unit –I**

**Introduction to Financial Management:** Objectives - Functions and Scope - Evolution - Interface of Financial Management with Other Functional Areas - Environment of Corporate Finance. **Sources of Long-Term Finance:** Equity Capital and Preference Capital -

Debt Capital - Term Loans and Deferred Credit, Leasing and Hire-Purchase - New Instruments. **Raising Long-term Finance:** Venture Capital, Initial Public Offering, Public Issue by listed companies, Rights Issue, Preferential allotment, Private placement, Term Loans **Valuation of Securities:** Concept Of Valuation - Bond Valuation - Equity Valuation: Dividend Capitalization Approach and Ratio Approach -Valuation of Warrants and Convertibles.

### **Unit –II**

**Introduction to Risk and Return:** Risk and Return Concepts - Risk in a Portfolio Context - Relationship Between Risk and Return -CAPM and Dividend Capitalization Model. **Time Value of Money:** Introduction - Types of Cash flows - Future Value of a Single Cash Flow, Multiple Flows and Annuity - Present Value of A Single Cash Flow, Multiple Flows and Annuity, Growing Annuity, Perpetuity and Growing Perpetuity. **Basics of Capital Expenditure Decisions:** The Process of Capital Budgeting - Basic Principles in Estimating Cost and Benefits of Investments -Appraisal Criteria: Discounted and Non-Discounted Methods (Pay-Back Period -Average rate of return - Net Present Value -Benefit Cost Ratio - Internal Rate of Return) **Analysis of Project Cash Flows:** Cash Flow Estimation - Identifying the Relevant Cash Flows - Cash Flow Analysis - Replacement, Cash Flow Estimation Bias - Evaluating Projects with Unequal Life - Adjusting Cash Flow for Inflation.,Capital Rationing.

### **Unit –III**

**Leverage:** Measuring and analyzing the implications of Leverage - Operating Leverage, Financial Leverage and Total Leverage. **Capital Structure Policy:** Business & Financial Risk - A Total Risk Perspective - Business & Financial Risk - A Market Risk Perspective - Determinants of Capital Structure Decision -Approach to Estimating the Target Capital Structure - Variations in Capital Structures, EBIT / EPS Analysis and ROI / ROE Analysis. **Capital Structure Theories:** Net Income Approach - Net Operating Income Approach - Traditional Approach - Modigliani-Miller Model (MM), Miller Model - Criticisms of MM and Miller Models - Financial Distress & Agency Cost - Asymmetric Information Theory. **Dividend Policy:** Traditional Position - Walter Model - Gordon Model - Miller-Modigliani Position - and Rational Expectations Model

**Unit –IV**

**Estimation of Working Capital Needs:** Objectives of Working Capital (Conservative vs Aggressive Policies), Static vs Dynamic View of Working Capital - Factors Affecting the Composition of Working Capital Independence among Components of Working Capital - Operating Cycle Approach to Working Capital and Cash Management. **Inventory Management:** Nature of Inventory and its Role in Working Capital - Purpose of Inventories - Types and Costs of Inventory -Inventory Management Techniques - Pricing of Investments **Receivables Management:** Purpose of Receivables - Cost of Maintaining Receivables - Credit Policy Variables (Credit Standard, Credit Period, Cash Discount, Collection Program), Credit Evaluation - and Monitoring Receivables. **Financing Current Assets:** Behavior of Current Assets and Pattern of Financing -Accruals - Trade Credit - Provisions - Short-Term Bank Finance - Public Deposits, Commercial Paper - Factoring

**Note:** Relevant Case Studies should be discussed in class.

**Suggested Readings/ Books :**

- I.M. Pandey, *Financial Management*, Vikas publishers
- Khan & Jain, *Financial Management*, Tata McGraw Hill
- Prasanna Chandra, *Financial Management (Theory & Practice)*, Tata McGraw Hill
- Brigham, *Financial Management : Text & Cases*, Cengage Learning
- Brealy & Myres, *Principles of Corporate Finance*, Tata McGraw Hill
- John J., *Financial Decision Making: Concept, Problem & Cases*, Prentice Hall
- G.S. Reddy, *Financial Management: Principles and Practice*, Himalaya Publishing .

---

**MBA206 Research Methodology**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The course aims at equipping students with an understanding of the research process, tools and techniques in order to facilitate managerial decision making.

**Theoretical Framework****Unit –I**

**An Introduction To Research:** Meaning, Definition, Objectives, And Process; Research Problem: Selection Of Problem, Understanding Problem, Necessity Of Defined Problem; Review Of Literature In Research. **Research Design:** Meaning, Types – Descriptive, Diagnostic, Exploratory, And Experimental.

**Unit –II**

**Sources Of Data:** Primary And Secondary; Data Collection Methods; Questionnaire Designing: Construction, Types And Developing A Good Questionnaire. **Sampling Design**

and Techniques, Scaling Techniques, Meaning, Types, Data Processing Operations, Editing, Coding, Classification, Tabulation. Research Proposal/Synopsis Writing.

**Practical Framework**

**Unit –III**

**Statistical Software - Use of SPSS / Systat and Excel:** Windows Process, Basic Structure of Data File, Using Data Editor, Working With Multiple Data Sources, Graphs and Charts, Sorting And Selecting Data, Descriptive Statistics: Central Tendency and Dispersion, Correlation: Linear, Partial and Multiple, Simple and Multiple Regression, Discriminant Analysis, Conjoint Analysis, Time Series and Business Forecasting. Applications Of Index Numbers; Sampling Distribution; Tests Of Significance: Z- Test, T- Test, Chi-Square Test, F -Test, And ANOVA; Use Of SPSS For T-Test, Chi-Square Test And ANOVA.

**Unit –IV**

Multi Dimensional Scaling, Factor Analysis, Cluster Analysis, Interpretation of Data, Report Preparation and Presentation. Each Student has to prepare Mini Research Project on Topic / Area of their Choice and Make Presentation. The report should consist of application of tests and techniques mentioned in above units.

**Note:** Relevant Case Studies should be discussed in class.

**Suggested Readings/ Books**

- D R. Cooper, & P.S,Schindler, Business Research Methods, Tata McGraw Hill
- N. Malhotra, and S.,Dash, Marketing Research : An Applied Orientation, Pearson Education
- C.R,Kothari, Research Methodology: Methods & Techniques, New Age International Publishers
- Hiolton, Brownlow McMurray,Cozens, SPSS Explained, Tata McGraw Hill
- Willian G.Zikmund, Business Research Methods,Thomson South-Western Learning
- Darren George & Paul Mallery, SPSS for Windows Step by Step, Pearson Education
- Churchill & Israel, Marketing Research, Cengage Learning
- Rajendra Nargundka Marketing Research : Text & Cases, Tata McGraw Hill
- Srivastava and Rego, Business Research Methodology, Tata McGraw Hill
- Zikmund, Essentials of Marketing Research, Cengage Learning.

---

**HVPE 101 Human Values & Professional Ethics**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective/s and Expected outcome:**

To help the students to discriminate between valuable and superficial in the life. To help develop the critical ability to distinguish between essence and form, or between what is of value and what is superficial, in life - this ability is to be developed not for a narrow area or field of study, but for everyday situations in life, covering the widest possible canvas. To help students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability, it is important to act

**Punjab Technical University**

**Scheme of (MBA)  
Batch 2012 Onwards**

on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) - it concentrates on providing to its students the skills to do things. In other words, it concentrates on providing "How to do" things. The aspects of understanding "What to do" or "Why something should be done" is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort to fulfill our responsibility to provide our students this significant input about understanding. This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life. It has been experimented at IITB, IITK and UPTU on a large scale with significant results.

**PART A**

**1. Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

- Understanding the need, basic guidelines, content and process for Value Education.
- Self Exploration—what is it?- its content and process; „Natural Acceptance“ and Experiential Validation- as the mechanism for self exploration.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels

**(6 Hrs.)**

**2. Understanding Harmony in the Human Being - Harmony in Myself!**

- Understanding human being as a co-existence of the sentient „I“ and the material „Body“
- Understanding the needs of Self („I“) and „Body“ - *Sukh* and *Suvidha*
- Understanding the Body as an instrument of „I“ (I being the doer, seer and enjoyer)

- Understanding the characteristics and activities of „I“ and harmony in „I“
- Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure *Sanyam* and *Swasthya*

**(6 Hrs.)**

**3. Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

- Understanding harmony in the Family- the basic unit of human interaction.
- Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship.
- Understanding the meaning of *Vishwas*; Difference between intention and competence
- Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj*), Universal Order (*Sarvabhaum Vyawastha* )- from family to world family!

**(6 Hrs.)**

**PART B**

**4. Understanding Harmony in the Nature and Existence - Whole existence as Co-existence**

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
- Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
- Holistic perception of harmony at all levels of existence

**(4 Hrs.)**

**5. Implications of the above Holistic Understanding of Harmony on Professional Ethics**

- Natural acceptance of human values

- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
  - Ability to utilize the professional competence for augmenting universal human order
  - Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems
  - Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
  - At the level of individual: as socially and ecologically responsible engineers, technologists and managers
  - At the level of society: as mutually enriching institutions and organizations

(6 Hrs.)

**Recommended Books:**1. R R Gaur, R Sangal, G P Bagaria, 2009, *A Foundation Course in Value Education*.**Suggested Readings / Books:**

1. Ivan Illich, 1974, *Energy & Equity*, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain.
3. A Nagraj, 1998, *Jeevan Vidya ek Parichay*, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, *How the Other Half Dies*, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, *Science and Humanism*, Commonwealth Publishers.
6. A.N. Tripathy, 2003, *Human Values*, New Age International Publishers
7. Subhas Palekar, 2000, *How to practice Natural Farming*, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, *Limits to Growth – Club of Rome's report*, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, *Fundamentals of Ethics for Scientists & Engineers*, Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, *Engineering Ethics (including Human Values)*, Eastern Economy Edition, Prentice Hall of India Ltd
11. B P Banerjee, 2005, *Foundations of Ethics and Management*, Excel Books.
12. B L Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.

# **Third Semester**

**Applied Operation Research (MBA 301)**

Max. Marks – 100

External assessment – 60

Internal Assessment - 40

**Objective:** objective of the syllabus is to acquaint the students with the knowledge of various tools and techniques which helps in optimal utilization the scarce resources of an organization.

**Unit I**

Decision-making environments: Decision-making under certainty, uncertainty and risk situations; Uses of Decision tree, Uses, scope and applications of Operation Research in managerial decision-making

Project Management: Rules for drawing the network diagram, Application of CPM and PERT techniques in project planning and control; Crashing and resource leveling of operations Simulation and its uses

**Unit II**

Linear programming: Mathematical formulations of LP Models for product-mix problems; graphical and simplex method of solving LP problems; sensitivity analysis; duality  
Transportation problem: Various method of finding Initial basic feasible solution and optimal cost  
Assignment model: Algorithm and its applications

**Unit III**

Game Theory: Concept of game; Two-person zero-sum game; Pure and Mixed Strategy Games; Saddle Point; Odds Method; Dominance Method and Graphical Method for solving Mixed Strategy Game -Sequencing Problem: Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m Machines Problems.

**Unit IV**

Queuing Theory: Characteristics of M/M/I Queue model; Application of Poisson and Exponential distribution in estimating arrival rate and service rate; Applications of Queue model for better service to the customers  
Replacement Problem: Replacement of assets that deteriorate with time, replacement of assets which fail suddenly.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

- 1) Taha Hamdy- Operations Research- An Introduction, Prentice-Hall
- 2) J K Sharma- 'Operations Research' Pearson Learning
- 3) Vohra- Quantitative Techniques in Management, Tata McGraw-Hill
- 4) Peter C Bell- Management Science/ Operations Research, Vikas Publications.
- 5) Anand Sharma 'Operations Research' Himalaya Publications
- 6) Prasad 'Operations Research' Cengage Learning

**Corporate Legal Environment (MBA 302)**

Max. Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** The objective of this paper is to acquaint the students with the corporate legal framework prevalent in the country.

**Unit I**

**Law of Contract:** Definition, offer and Acceptance, Consideration, Capacity of parties, Free Consent, Legality of Object, Performance and Discharge of Contract and Remedies for Breach of Contract.

Introduction to the concept of agent and different types of mercantile agents  
Bailment and Pledge, Indemnity and Guarantee

**Unit II**

**Sale of Goods Act:** Meaning, Formation of contract, Meaning of condition and warranties. Difference between Transfer of Property and Possession, Right of an Unpaid Seller **Negotiable Instrument:** Bills of Exchange, Promissory Note, Cheque and Rules Regarding the Crossing of Cheques.

Dishonour of cheques and liability of banker and drawer.

**Law of Insurance:** Fundamentals Elements of Insurance.

Basic features of law relating to carriers (Air, Road, Rail and Shipping)

**Unit III**

**Company Law** Incorporation of companies Memorandum of Association and Articles of Association Membership of a company Prospectus, Issue of capital, Loans, investments, deposits and charges, Meetings, Accounts and Auditors, Amalgamation, reconstructions, arrangements and compromises Provision with respect to appointment and removal of Director, Meeting, Winding up by court

**Unit IV**

**Taxation:** Constitutional framework of taxation. Direct and indirect taxes. Basic features of Central excise, Customs, Central, state sales tax and VAT.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested text Books:**

1. Majumdar A. K. and Kapoor G. K. 'Company Law' Taxmann Publishers
2. Bansal C. L. 'Business Laws' Taxmann Publishers
3. Singhanian V. K. and Singhanian K. 'Direct Tax Laws and Practice' Taxmann Publishers.
4. Chawla, Garg and Sarin 'Mercantile Law' Kalyani Publishers.
5. K. R. Bulchandani 'Law and corporate law' Himalya Publishing

**CONSUMER BEHAVIOUR (MBA 901)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The objective of this course is to help students understanding the various factors effecting consumer behavior and to understand the process of consumer buying. Based on the understanding of Consumer behavior, the students are expected to design the strategy.

**Unit I**

Introduction to Consumer Behaviour: Consumer Behavior: Scope, importance and interdisciplinary nature, strategic applications, Research in Consumer behaviour: need, scope, types, research process, application of research in consumer behaviour, Market Segmentation: meaning and bases of segmentation, criteria for effective targeting, implementing segmentation strategies

**Unit II**

Individual Determinants of Consumer Behaviour: Motivation: Nature and Types of Motives, Dynamics of motivation, Types of Needs, Motivational theories, Personality: Theories, Product Personality, Self, Self image, Vanity, Consumer Perception: Concept and Elements of Perception, Dynamics of perception, Consumer Imagery, Perceived Risk, Consumer Learning: Elements of learning, Behavioural and Cognitive Learning Theories, Consumer Attitude: Functions of Attitude, Attitude Theories: Tricomponent, Multi attribute and Cognitive Dissonance, Attitude formation, Attitude Change Strategies, Designing persuasive communications

**Unit III**

External Influences on Consumer Behaviour: Group behaviour: Meaning and types of group, Influence of Reference Groups, group appeals, Family: Functions of family, Family decision making, Family Life Cycle, Culture: Values and Norms, Characteristics and Affect on Consumer Behaviour, Types of sub culture, Cross cultural consumer, Social Class: Categories, Measurement and Applications of Social Class

**Unit IV**

Consumer Decision Making Process: Personal Influence and Opinion Leadership: Process of Opinion Leadership, Profile of Opinion Leader, Opinion leadership and Firm's promotional Strategy, Diffusion of innovations: Diffusion Process, Adoption Process, Profile of Consumer Innovator, Introduction to Consumer Decision Making: levels, decision making process- pre purchase, purchase and post purchase process, Models of consumer decision-making,

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Schiffman, L.G. and Kanuk, L.L., 'Consumer Behavior', Pearson Education
2. Loudon, D. and Bitta, D., 'Consumer Behaviour', Tata McGraw Hill
3. Assael, H., 'Consumer Behaviour in Action', Cengage Learning
4. Blackwell, R.D., Miniard, P.W. and Engel, J.F., 'Consumer Behaviour', Cengage Learning
5. Batra S and Kazmi S, 'Consumer Behaviour', Excel Books
6. Nair, 'Consumer Behaviour in Indian Perspective' Himalaya Publications.

**Advertising Management (MBA 902)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The objective of this course is to develop the understanding about the marketing communication tools and implement them in designing Advertisement strategies

**Unit – I**

Meaning, nature, scope and classification, Key players in advertising, role of advertising and its importance, surrogate advertising, puffery in advertising. Advertising's role in Marketing Mix, Integrated marketing communication, AIDA Model, Laivdge – Stenier Model of communication, Setting goals and advertising objectives, concept of DAGMAR in setting objectives, Role of advertising in India's economic development, Ethics in advertising, Social, Economic and Legal aspects of advertising.

**Unit – II**

How advertising works: perception, cognition, affect, association, persuasion, behaviour, Associating feeling with brands, Use of research in advertising planning, Advertising Media; industry structure, functions, advantages, disadvantages of print, Television, Radio, Internet, Outdoor, Basic concept of media planning, media selection, Media Scheduling strategy, setting media budgets.

**Unit – III**

Planning and managing creative strategies, creative approaches, Building Advertising Program: Message, Theme, advertising appeals, art of copywriting, Guidelines for copywriting, Copywriting for print, Audio, TV and outdoor media, advertising layout: how to design and produce advertisements, Advertising Budget: nature and methods of advertising appropriation.

**Unit – IV**

Measuring Advertising Effectiveness: stages of evaluations and various types of testing-Pre and Post testing, Advertising, Advertising agencies: history, role, importance, organizational structure, functions, selection of agency, client agency relationship, compensation strategies.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Reading:**

1. Belch, G. E. & Belch, Advertising and Promotion, Tata McGraw Hill.
2. Wells W., Burnet J. and Moriarty S, Advertising: Principles & Practice, Pearson Education.
3. O' Guinn, T. and Allen, C. 'Advertising Management with Integrated Brand Promotion' Cengage Learning
4. Aaker, D A, Myers and Batra, Advertising Management, Pearson Education
5. S. A. Chunawalla, Foundation of Advertisement Theory and Practices, Himalaya Publications

**Product and Brand Management (MBA 903)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** To create understanding among students for concepts, process, techniques of product and brand management

**Unit I**

Product management: meaning, importance the product manager's job, planning and control systems for product management, product portfolio planning and analysis, Mapping, understanding company product/brands and competitive brand market position, Impact of global forces on products.

**Unit II**

Product planning and development: Meaning, objectives, Strategic reasons, processes challenges and issues, Forecasting demand, Estimating market opportunity, test marketing, types, design issues, Evaluation of test marketing results, Market entry decisions - Launching new product programs, National launching of new products, Tracking the launch, absorbing the new product in the mix.

**Unit III**

Brand concept: meaning, nature and importance of Brand; Types of brands , Strategic Brand Management Process; Brand Identity perspectives , Brand identity prism, Identity levels, Concepts and Measures of Brand Equity, Brand Assets and liabilities, Aaker's Model of Brand Equity, Designing marketing programs to build brand Equity, customer based brand equity ,Brand Loyalty, Measures of Loyalty, Branding strategies – product, line , range and umbrella branding, Brand Personality: Definition, Measures and Formulation of Brand Personality; Brand Image dimensions, Stages of Concept Management for functional, symbolic and experiential brands.

**Unit IV**

Brand Positioning: Concepts and Definitions, 3 Cs of positioning ,Brand positioning and differentiation strategies, Repositioning, Celebrity Endorsements, Brand Extension: need, various types, implication of extension, Managing brands over time, Brand reinforcement , brand revitalization, measuring brand value, managing global brands ,Branding in different sectors

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Murthi YRL, Brand Management, Vikas Publications
2. Keller K. L., Strategic Brand Management, Pearson Education
3. Aaker, David, Managing Brand Equity, Prentice Hall of India.
4. Verma H 'Brand Management', Excel Books
5. Venugopal 'Product and Brand Management' Himalaya Publications
6. Sasikumar and Chandrasekar 'Brand Management Practices' Himalaya Publications.



**RETAIL AND FRANCHISING MANAGEMENT (MBA904)**

Max. Marks: 100

Internal Assessment: 40

External Assessment: 60

**Objectives:** the course will enable learner to comprehend retail and franchising concepts, its process and application in today's scenario.

**Unit I**

Retailing: Definition, Scope, Economic significance, Opportunities in retailing, various retail formats, Multichannel retailing including online retailing (E-tailing), Changing scenario of retail, Customer Buying Behaviour in Retailing: Types of buying decisions, Buying process, Social factors influencing buying decisions in retailing.

**Unit II**

Retailing Strategy: Retail strategy, Target market and retail planning process, Financial strategy. Retail Locations and Site Selection, location opportunities, factors affecting the site selection, estimating demand for a new location. Human Resource Management in Retailing: Gaining competitive advantage through HRM, Designing retail organization structure, Motivating retail employees.

**Unit III**

Merchandise Management: Planning merchandise, buying merchandise, Pricing decision for merchandise. Retail Communication Mix: Developing brands and building customer loyalty, Promotion strategy, planning a retail promotion strategy. Store Management: Managing the store, store layout, design and visual merchandising.

**Unit IV**

Franchising: Meaning, scope, types, history and overview, advantages and disadvantages to franchisee and franchisor, Recognizing franchising opportunities, Assessing franchise feasibility, The franchising market process, Selling and marketing research, Franchisor's operations process, Location and site selection, Information systems, Franchise legal documents, Trademarks, Copyrights, Patents, & Trade Secrets, Investigating franchise opportunities, Developing franchisee business plans

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Levy, Weitz, & Pandit ,Retail Management, Tata McGraw Hill, New Delhi.
2. Cullen,Retailing : Environment and cases Cengage India
3. Barry Berman & Joel R Evans, Retail Management, PHI, New Delhi.
4. Kati, 'Franchising' Himalaya Publications.
5. Sheikh and Fatima 'Retail Management' Himalaya Publications.
6. Dunne 'Introduction to Retail' Cengage Learning.

**RURAL AND INDUSTRIAL MARKETING (MBA 905)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The course aims at creating an understanding of challenges of rural and industrial marketing. The student should be able to apply the concepts and methods of marketing management to rural and industrial markets

**Unit I**

Rural Marketing: Nature, definition, scope, importance, challenges and opportunities in India. Factors influencing rural marketing, Rural market: size & structure, segmentation of Indian rural market. Rural and urban market: A comparative analysis, Future of rural marketing

**Unit II**

Rural marketing research, Rural consumer behaviour, Rural market mapping, Rural market Index, Product and service marketing in rural India, Rural marketing mix: product planning, new product development for rural markets, Brand management in rural market and communication media & message, distribution channels, Rural retail channel management marketing strategies & tactics with reference to rural markets, e-Rural Marketing, role of IT Cultivation, Processing & retailing organized rural retailing

**Unit III**

The concept of industrial marketing: Nature and scope, evaluation, The industrial customer: Industrial Buying organisation, Industrial buying process, Market segmentation models, Measurement of potential, Market development strategy and process, managing industrial product line, Product portfolio analysis, Managing existing product line and developing new products.

**Unit IV**

Pricing industrial products: Formulation of pricing strategy, Review of pricing objectives, Methods, Pricing across product life cycle, Price administration, Price leadership, Managing channels of distribution: Channel participants, Channel design, Evaluation, Selection of alternatives, channel management, physical distribution, communication mix, Industrial sales force management, Industrial marketing control strategies, marketing audits.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings**

1. Dogra and Ghuman, 'Rural Marketing' Tata McGraw-Hill
2. Kashyap P and Raut S 'The Rural Marketing', Biztantra
3. Krishnamacharyulu & Ramakrishnan, 'Rural Marketing –Text & Cases', Pearson Education
4. Samiudin & Rehman, 'Rural Marketing', National Publishing House
5. Sukhpal Singh, 'Rural Marketing Management', Vikas Publications
6. Cherunilam 'Industrial Marketing' Himalaya Publications.

**Security Analysis and Portfolio Management (MBA 921)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** To acquaint the students with the working of security market and principles of security analysis; and to develop the skills required for portfolio management so as to be able to judge the competitive position of firm in capital market to support investment decisions

**Unit 1**

Introduction: Concepts of investment, Objectives of investment, various alternatives of investments, Investment vs speculation. Financial Markets: Primary Markets and secondary markets. Introduction to Primary Market, Primary Market Design and its Role, Types of Offers in the Primary Market, Major Eligibility Guidelines for the issuers in Primary Market, Contribution of Promoters, Issue of Sweat Equity

Secondary Market : Introduction, Major players, Trading and settlement Mechanism, Types of orders, Stop Loss, Trading on Margin and how margin works, Short Selling Price freeze, Market Wide Circuit breaker, Basis of Market Wide Circuit Breaker, Insider Trading, Odd lot Trading, Bulk Deals, Block Deals, Arbitrage Opportunity in the market.

Risk and Return: Concept, types and measurement of risk and return.

**Unit 2**

Security analysis: Fundamental Analysis: International Environment: Global Economy Overview, Global Markets, Global Market and Indian Market Inter linkages. Economic Analysis: GDP, Fiscal Policy, Monetary Policy and Liquidity, Inflation, Interest Rate , Unemployment, Individual Savings, Domestic corporate Tax Rate, Balance of Trade. Industry Analysis: Tools for Industry Analysis, Cross Sectional Industry Performance over Time, Industry Life Cycle. Company Analysis: Analysis of Financial statements.

Technical Analysis: Introduction, Basic Tenets of Dow Theory , Characteristic Phases of Bull and Bear Trends, Critical Appraisal of Dow theory, Different Types of charts, Concept of trend, Trend lines: support and resistance, Importance of Volume, Reversal Patterns, Continuation Pattern, Moving averages, other market indicators

**Unit 3**

Portfolio Management: Meaning, Importance and Approaches of Portfolio Management, Portfolio analysis, Portfolio evaluation and revision techniques.

Portfolio theory: Markowitz Model, Capital Asset Pricing Model, Single-index model, Arbitrage Pricing theory. Market Efficiency and Behavioral Finance

**Unit 4**

Derivatives: Introduction, Meaning of Future contracts, Forward Contracts, Difference, Trading of Stock futures. Option Contracts: Introduction, types, Payoffs and option strategies.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings**

1. Reily and Brown, Investment Analysis and Portfolio Management, Cengage, New Delhi
2. Bodie, Kane, Marcus and Mohanty, Investments, Tata McGraw Hill, New Delhi
3. Fisher DE and Jordon RJ, Security Analysis and Portfolio Management, PHI, New Delhi
4. Hirt and Block, Fundamentals of Investment Management, Tata McGraw Hill, New Delhi
5. A. Avdhani 'Security Analysis and Portfolio Management' Himalaya Publications

6. Preeti Singh 'Investment Management' Himalaya Publications

**MANAGEMENT OF FINANCIAL SERVICES (MB 922)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The objective of this paper is to acquaint the students with emerging trends in financial services.

**Unit - I**

Financial Services - Meaning, types and their importance. Depository - Introduction, Concept, depository participants, functioning of depository systems, process of switching over to depository systems, benefits, depository systems in India, Dematerialization and Rematerialization. Role, objectives and functions of SEBI and its guidelines relating to depository system.

**Unit - II**

Mutual funds and AMCs - Concept, origin and growth of mutual funds, Constitution & management of MFs - Sponsors, Trustees, AMCs, and custodians. Classification of mutual fund schemes, advantages and disadvantages in mutual fund schemes, NAV and pricing of mutual fund units. Recent trends in mutual funds in India.

Credit rating - the concept and objective of credit rating, various credit rating agencies in India and International credit rating agencies, factors affecting credit rating & procedural aspects.

**Unit - III**

Leasing - concept and development of leasing, business, difference between leasing & hire purchase, types of leasing business, advantages to lessor and lessee. Tax aspect of leasing.

Merchant Banking - Origin and development of merchant banking in India scope, organizational aspects and importance of merchant bankers. Latest guidelines of SEBI w.r.t. Merchant bankers.

Venture capital - concepts and characteristics of venture capital, venture capital in India, guidelines for venture capital.

**Unit - IV**

Debt Securitisation: Meaning, Features, Scope and process of securitisation.

Factoring - Development of factoring types & importance, procedural aspects in factoring, financial aspects, prospects of factoring in India.

Plastic Money - Concept and different forms of plastic money - credit and debit cards, pros and cons. Credit process followed by credit card organisations. Factors affecting utilisation of plastic money in India.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. S Gurusamy 'Financial Services & System' Thomson Publications
2. M Y Khan 'Financial Services' Tata McGraw-Hill
3. L M Bhole 'Financial Institutions & Markets' Tata McGraw- Hill
4. Gordon & Natarajan 'Financial Markets & Services' Himalaya Publications
5. V. A. Avdhani 'Financial Services in India' Himalaya Publications
6. Vasant Desai 'Financial Markets and Financial Services' Himalaya Publications

**DIRECT TAX PLANNING (MB 923)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** To acquaint the students with the understanding and planning of direct tax aspects in the Indian context.

**Unit - I**

Meaning of Tax management, tax planning, tax avoidance and tax evasion. Type of direct taxes. Basic definitions under income tax act & determination of residential status, Exempted Incomes, Tax planning in relation to Income from salary, Income from house property.

**Unit - II**

Tax Planning in relation to income from business & profession, Capital gains, Income from other sources. Clubbing provisions, Set off and carry forward of losses, Deductions out of GTI, Introduction to TDS and payment of Advance Tax, Rates of tax & computation of tax liability of individuals. Double Taxation Avoidance Agreements.

**Unit - III**

Tax planning under Wealth Tax Law. Corporate Taxation: MAT provisions. Introduction to Direct Tax Code (DTC)

**Unit - IV**

Tax planning in relation to Ownership pattern, Location of Business, Nature of Business, Dividend policy, issue of bonus shares, inter corporate dividends, Amalgamation and merger of companies. Managerial decisions like make or buy, own or lease, close or continue, export or local sales, replace or repair, Foreign collaborations or joint ventures.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

- 1 Girish Ahuja & Ravi Gupta, Corporate Tax Planning & Management, Direct Taxes Ready Reckoner, Bharat Law House Pvt. Ltd.
2. Dr Vinod K. Singhanian, Kapil Singhanian, Monica Singhanian, Direct Taxes Planning & Management, Taxmann's Publication Pvt. Ltd.
3. Dr. Vinod K. Singhanian, Kapil Singhanian, Monica Singhanian, Direct Taxes – Law & Practice, Taxmann's Publication, Pvt. Ltd.,
4. R.N. Lakhota, Subhash Lakhota, Corporate Tax Planning, Vision Books.

**Strategic Financial Management (MBA 924)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** To help students to understand the contemporary issues relating to finance having strategic impact on business.

**Unit I**

**An Overview of Strategic Financial Management:** Financial and Non Financial Objectives of a Firm, Agency Theory, Conflicts of Interest in a Firm, Long-term and Short-term Financial Planning in a Company.

**Corporate Valuation:** Strategic Decision Making Framework, Interface of Financial Policy and Strategic Management, Shareholder's Value Creation - Value drivers. Value Based Management System (VBMS): Approaches to Facilitate VBMS- Marakon Approach, Alcar Approach, Mckinsey Approach. DCF Approach Managerial Implication of Shareholder's Value Creation – FCFE and FCFE model. Shareholder's Value Creation - MVA Approach - EVA Approach- EVA Analysis of an Indian Corporate.

**Unit II**

**Long Term Projects:** Valuation of long term infrastructure, capital intensive Projects – Real options valuations. Risk Management techniques – Use of Risk adjusted discounting rates.

**Strategic Cost Management Systems:** Importance of Cost System, Strategic Cost Management: Value Chain Analysis, Competition Cost Analysis, Activity-based Costing, Life Cycle Costing, Target Costing and Strategic Control Systems.

**Dividend and Bonus Policy:** Dividend Policy Decisions - Pay-Out Ratio, Stability, Residual Payment, Linter's Model - Corporate Dividend Behavior, Legal Aspects, Procedural Aspects, Dividend Policies in Practice, Repurchase or buyback of shares - Bonus Issues and Stock Splits.

**Unit III**

**Corporate Risk Management:** Risk Management in Practice, Guidelines for Risk Management, Evaluation of Hedging Strategies- Forward, Futures, Options.

**Financial Planning and Forecasting Ratios System:** Types of Financial Planning Models, Development of Simulations Models, Improving financial modeling, Conditions for the Successful Use of Models, Growth with Internal Equity, Higging's sustainable growth model

**Unit IV**

**Quantitative Techniques for Working Capital Management:** Cash Management Models: Baumol Model and Miller and Orr Model, Simulating a Cash Budget, Factoring services – Evaluation/Cost Benefit Analysis.

**Financial Management in Public Sector Undertakings:** Role of Financial Advisor, Financial Objectives, Capital Budgeting, Long- term Financing, Working Capital Management, Miscellaneous Aspects.

**Financial distress and Corporate restructuring:** Revival of sick units and Turnaround Strategies.

**Financial Modelling & Simulation Techniques using Monte Carlo or Crystal Ball (Application of Excel)**

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Reading:**

1. Damodran Aswath, 'Corporate Finance: Theory and Practice'. John Wiley & Sons.
2. Brealy, Richard A. and Myers, Stewart C., 'Principles of Corporate Finance' Tata McGraw Hill.
3. Frank J. Fabozzi 'Financial Management and Analysis' John Wiley & Sons.
4. Damodran, Aswath 'Strategic Risk Management' John Wiley & Sons.
5. Grinblatt, Mark and Titman, Sheridan, 'Financial Markets and Corporate Strategy' McGraw Hills
6. Mao J. C. T. 'Quantitative Analysis of Financial Decisions' Mcmillan.
7. Chandra, Prasana 'Financial Management Theory and Practice' Tata McGraw Hills.
8. Ramesh Babu 'Strategic Financial Management' Himalaya Publications.

**Treasury & Credit Risk Management (MB 925)**

Max. Marks – 100

External assessment – 60

Internal Assessment - 40

**Objectives:** To provide an understanding and application of credit and risk management in financial sector.

**Unit I**

Scope and Function of Treasury Management: Objectives of Treasury, Structure and Organisation, Responsibilities of Treasury Manager, Function of treasury – Centralised vs Decentralised. Domestic Cash Management: Short Term/Medium Term Funding – Meaning and Importance of Cash Management, Objectives of Cash Management, Cash Flow Cycle, Cash Flow Budgeting and Forecasting, Electronic Cash Management. Medium term and Long term Funding: FDs/NCDs/Term Loans, Securitisation, Evolving role of treasury as profit centre

**Unit II**

Treasury products: Short term funds and investment management, Financial marketing: Money market, Capital market, Call money, Government securities, REPOs, Certificate of deposits, Rediscounting bills, Commercial paper, Foreign Exchange Markets & treasury: Linkage of domestic operations with foreign operations .Liquidity planning and managing cash assets : Measurement of liquidity, Objectives of cash management, Reserve with Central banks , Managing float, Managing correspondent balances ,Liquidity planning , Traditional liquidity measures Treasury’s role in International Banking: Changing Global Scenario and Treasury Functions ,Treasury Structure- Front and Back Office, Forex Cash Management – Positions vs Cash Flows

**Unit III**

Risk Management: Introduction: Meaning of Risk in Banking Operations- Financial and Non-Financial Risks, Risk Process, Key Risks in Relation to Treasury Management – Interest Rate Risk, Currency Risk, Liquidity Risk, Credit Risk and Operational Risk, Relationship with other Financial Risks. Measurement and Control of Risk: Identifying Measures and Controlling Risk – Statistical Methods, Risk Exposure Analysis, Risk Management Policies, Risk Immunisation Strategies, Fixation and Delegation of Limits, Different Limits- Open Position / Asset Position Limits/ Deal Size/Individual Dealers/Stop Loss Limits

**Unit IV**

Assets Liability Management: Components of Assets and Liabilities – History of Asset- Liability Management, Organisational and Functions of ALCO Management and Interest rate Exposure/Liquidity, Risk Adjusted Return on Capital, Capital Adequacy Concerns, ALCO Techniques – GAP Analysis, Simulation, Duration, Analysis and Linear and other mathematical methods. Hedging the Risk: Forward, Futures and Options Market, Mechanics of Futures, Cash and Futures Market, Foreign Currency Futures Market, Options Market- Options Strategies, Hedging Strategies and Arbitrage, Call Options and Put Options.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings**

1. IIBF. “Risk Management” Macmillan, New Delhi.
2. Bagchi, S. K. “Credit Risk Management.” Jaico Publishing House, Mumbai.
3. Chance D. M. “Introduction to Derivatives & Risk Management” Thomson Learning
4. V. A. Avdhani ‘Treasury Management’ Himalaya Publications.

5. Vivek and Asthana 'Financial Risk Management' Himalaya Publications.
6. Stulz 'Risk Management and Derivatives' Cengage Learnings.

**Project Management (MBA 941)**

Max. Marks – 100

External assessment – 60

Internal Assessment - 40

**Objective:** To acquaint the students with the steps involved in the planning, implementation and control of projects.

**UNIT - I**

**Project Management Concepts** Attributes of a Project, Project Life Cycle, The Project management Process, Global Project Management, Benefits of Project Management, Needs Identification,

**UNIT - II**

Project Selection, Preparing a Request for Proposal, Soliciting Proposals, Project organization, the project as part of the functional organization, pure project organization, the matrix organization, mixed organizational systems

**UNIT - III**

**Project Planning and Scheduling:** Design of project management system; project work system; work breakdown structure, project execution plan, work packaging plan, project procedure manual; project scheduling; bar charts, line of balance (LOB) and Network Techniques (PERT / CPM)/ GERT, Resource allocation, Crashing and Resource Sharing

**UNIT - IV**

**Project Monitoring and Control and Project Performance:** Planning, Monitoring and Control; Design of monitoring system; Computerized PMIS (Project Management Information System). Coordination; Procedures, Meetings, Control; Scope/Progress control, Performance control, Schedule control, Cost control, Performance Indicators; Project Audit; Project Audit Life Cycle, Responsibilities of Evaluator/ Auditor, Responsibilities of the Project Manager.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Kanda 'Project Management – A Life Cycle Approach' PHI
2. Gido 'Project Management' Cengage Learnings
3. Vasant Desai 'Project Management' Himalaya Publications.
4. Maylor 'Project Management' Pearson Education
5. Prasanna Chandra 'Projects, Preparation, Appraisal Budgeting & Implementation' Tata McGraw Hills.

**Total Quality Management (MBA 942)**

Max. Marks – 100  
External assessment – 60  
Internal Assessment - 40

**Objective:** The course is designed to develop a sound understanding of how the application of TQM assists the pursuit of business excellence and provide skills and strategies in human dimensions of quality and in the tools and techniques applicable to TQM and business excellence.

**UNIT I**

Introduction to TQM: History, aims, objectives, benefits, gurus and their principles, TQM reasons for use of TQM, proven examples and benefits, methods to assist the progress of TQM, introduction to tools and techniques: brainstorming, affinity diagram, benchmarking, fishbone diagram, check sheet, flow chart, line graph, run chart, histogram, Pareto diagram, FMEA, scatter diagram, control chart, QFD, tree diagram, force field analysis, seven w. and is/is-not questions, why-why diagrams

**UNIT II**

Customer focus: External and internal customers, Measuring customer satisfaction, Continuous improvement process, Role of TQM's control and improvement process, designing for quality, workforce teams: team work for quality, types of teams and tasks involved, characteristics of successful and unsuccessful teams, barriers to team work, Benchmarking, JIT

**UNIT III**

TQM for Marketing Function: Quality in marketing and sales, factors for excellence, BPR and IT: business process management, quality control SQC/SPC: statistical process control, change management, Quality in after sales services.

Organization for quality: quality circles, self managing teams, quality director, reliability of quality characteristics, quality leadership: developing a quality culture.

**UNIT IV**

Total employee involvement: Awareness of quality, recognition and rewards, empowerment and self development,

Education and training, cost of quality: cost of poor quality, categories of quality cost, analysis of quality costs, benefits of costs of quality control, supporting technologies: overview of supplier quality assurance system, TQM implementations & barriers to implementation, Six sigma, Introduction to ISO 9000, ISO 9001: 2000 series of standards

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Hurbert K. Rampersad, Managing Total Quality, Tata McGraw Hill Publishing Company Ltd.,
2. Mukherjee 'Total Quality Management' PHI Learning
3. Singhal & singhal 'Implementing ISO 9001:2008 Quality Management Systems: A Reference Guide' PHI Learning
4. Bhat 'Total Quality Management' Himalaya Publications.

**Material Management (MBA 943)**

Max. Marks – 100

External assessment – 60

Internal Assessment - 40

**Objective:** The aim is to create understanding and importance of managing materials through purchasing, inventory control, pricing and negotiation.

**UNIT I**

Introduction to materials management, importance, scope. Systems approach to Materials Management. Importance of forecasting in Material management, handling materials, vendor development and management. Materials Planning

**UNIT II**

Purchasing – Purchasing in Materials Management – System Concept – Purchasing and Procurement activities under Materials management – Value Analysis and Value Engineering – Purchasing and Quality Assurance. Pricing theory, pricing practices and contracts.

**UNIT III**

Incoming Material Quality Control – Statistical Quality Control – Purchasing capital equipment, plant and machinery – International Buying and Import purchasing – Governmental purchasing practices and procedures. Negotiation skills.

**UNIT IV**

Inventory Management and Control Systems – Stores Management and Operation – Material Accounting, Flow of Costs and Inventory Valuation, Physical Verification, Security and Materials Audit. Stores management and waste management.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested readings:**

1. S. A. Chunawalla ‘Materials and Purchasing Management’ Himalaya Publications.
2. K. Shridhara Bhat ‘Materials Management’ Himalaya Publications.
3. P. Gopala Krishan ‘Materials Management: An Integrated Approach’ PHI Learning

**Production Planning and Control (MBA 944)**

Max. Marks – 100  
External assessment – 60  
Internal Assessment - 40

**Objective:** To understand the various components and functions of production planning and control such as work study, product planning, process planning, production scheduling, Inventory Control. Recent trends like manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP).

**UNIT I**

Objectives and benefits of planning and control-Functions of production control-Types of production-job- batch and continuous-Product development and design-Marketing aspect - Functional aspects-Operational aspect-Durability and dependability aspect aesthetic aspect. Profit consideration-Standardization, Simplification & specialization- Break even analysis-Economics of a new design.

**UNIT II**

Method study, basic procedure-Selection-Recording of process - Critical analysis, Development - Implementation - Micro motion and memo motion study – work measurement - Techniques of work measurement - Time study - Production study - Work sampling - Synthesis from standard data - Predetermined motion time standards.

**UNIT III**

Product planning-Extending the original product information-Value analysis-Problems in lack of product planning-Process planning and routing-Pre requisite information needed for process planning-Steps in process planning-Quantity determination in batch production-Machine capacity, balancing-Analysis of process capabilities in a multi product system.

**UNIT IV**

**PRODUCTION SCHEDULING** Production Control Systems-Loading and scheduling-Master Scheduling- Scheduling rules-Gantt charts-Perpetual loading-Basic scheduling problems - Line of balance – Flow production scheduling-Batch production scheduling-Product sequencing – Production Control systems-Periodic batch control-Material requirement planning kanban – Dispatching-Progress reporting and expediting-Manufacturing lead time-Techniques for aligning completion times and due dates.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings**

1. Narsimhan, McLeavey and Billington ‘Production Planning and Inventory Control’ PHI Learnings.
2. Panneersenvam ‘Production and Operations Management’ PHI Learnings
3. Starr ‘Production and Operations Management’ Cengage Learnings.
4. Aswathapa and Bhat ‘Production and Operations Management’ Himalaya Publications

**Managing ERP (MBA 945)**

Max. Marks – 100

External assessment – 60

Internal Assessment - 40

**Objective:** The course has been designed to provide an in depth knowledge of managing ERP. The course aims to create understanding and using of the managerial aspects of ERP systems.

**UNIT I**

**ERP AND TECHNOLOGY:** Introduction, Related Technologies, Business Intelligence, E-Commerce and E-Business, Business Process Reengineering, Data Warehousing, Data Mining, OLAP, Product life Cycle management, SCM, CRM

**UNIT II**

**ERP IMPLEMENTATION:** Implementation Challenges, Strategies, Life Cycle, Pre-implementation Tasks, Requirements Definition, Methodologies, Package selection, Project Teams, Process Definitions, Vendors and Consultants, Data Migration, Project management, Post Implementation Activities.

**UNIT III**

**ERP IN ACTION & BUSINESS MODULES:** Operation and Maintenance, Performance, Maximizing the ERP System, Business Modules, Finance, Manufacturing, Human Resources, Plant maintenance, Materials Management, Quality management, Marketing, Sales, Distribution and service.

**UNIT IV**

**ERP MARKET:** Marketplace, Dynamics, SAP AG, Oracle, PeopleSoft, JD Edwards, Enterprise Application Integration, ERP and E-Business, Future Directions, Trends in ERP.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Altekar 'Enterprisewide Resource Planning: Theory and Practice' PHI Learning.
2. Murthy 'Enterprise Resource Planning' Himalaya Publications
3. S. Sadagopan, ERP: A Managerial perspective. Tata McGraw Hill
4. Alexis Leon Enterprise Resource Planning, Tata McGraw-Hill

**Social Security & Labour Welfare (MBA 961)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** To acquaint the students with basic Acts pertaining to social security and labour welfare as applicable in India.

**UNIT- I**

The concept of scope of social security. Social assistance and social insurance Evolution of Social Security. Law relating to social security Payment of wages Act,1936

**UNIT-II**

Scope, importance, features and implications of the following Acts as applicable in India:

Minimum Wages Act, 1948

Payment of Bonus Act, 1965

Workman's Compensation Act,1923

Maternity Benefit Act,1961

**UNIT-III**

Scope, importance, features and implications of the following Acts as applicable in India:

Employment State Insurance Act,1948

Provident Fund & Miscellaneous Provision Act,1951

Gratuity Act,1972

I.L.O and social Security. The concept of Labour welfare: definition, Scope and Objectives, welfare work and social work

**UNIT-IV**

Evolution of labour welfare, classification of welfare work, agencies for welfare work. Welfare activities of govt. of India; welfare work by trade unions Labour welfare work by voluntary social organizations. Labour administration; agencies for administrating labour welfare laws in India.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Reading:**

1. A. M. Sharma 'Social, Security Labour Welfare' Himalayas Publishing House
2. I.L.O Social Security, International labour Office

**Training & Development (MB-962)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** To create understanding among students for need, importance and implementation of training so as to achieve employee development.

**UNIT- I**

Training and Development: Meaning & Concepts. Importance & Objectives of Training & Development, Process and Significant of T&D, Identification of Training Needs, Methods of Training needs, Principles and theories of Learning.

**UNIT-II**

Types of Training & Development Methods, Training and Development System, Training & Development Centers, Role of External Agency in Training and Development, Training for change, Resistance in Training.

**UNIT-III**

Developing Effective Trainers, Designing & Implementing Training Programs. Approaches to Management Development, Designing & Implementing Development Programmers, Team Building Exercises, Management Games, Simulations.

**UNIT-IV**

Evaluation of Training and Development Programs, Criteria, Problem and Steps Involved in evaluation. Kirkpatrick Model of Evaluation, CIRO Model, Cost-Benefit Analysis of Training. Emerging issues in Training and Development in India. Evolving Training Policy.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Dayal ,I 'Manpower Training in organizations' Prentice Hall of India, New Delhi
2. Craig ,Robert 'Training and Development' McGraw Hill, New York
3. Lynton,R.P and U.Pareek 'Training and Development' Irwine Doresy, Hopwood
4. Reddy 'Effective Human Resource Training and Development Strategy' Himalaya Publications
5. Goldstein 'Training in Organisations' Cengage Learnings
6. Radha Sharma - 360 Degree Feedback, Competency Mapping and Assessment Centres
7. Biswajeet Pattanayak : Human Resources Management
8. Armstrong M.A. : Handbook of Human Resource Management Practice Cogan Page, London

**INDUSTRIAL PSYCHOLOGY (MB 963)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The objective of the course is to acquaint the students about the psychology of the executives in the organization and then to use it to enhance the productivity.

**Unit I**

Introduction: Nature, Scope, and Problems; Brief history of industrial and organizational psychology.

Individual differences and their evaluation, Role of heredity and environment, Types of individual differences.

**Unit II**

Psychological testing: Utility, Reliability, and Validity. Attitudes: Meaning, Characteristics, Methods of measuring attitudes, Implication for organization.

**Unit III**

Hawthorne Studies: The studies and their implications Industrial Morale: Meaning, Characteristics, Factors that influence morale, Measures of improving morale.

**Unit IV**

Motivation: Meaning, Types, Applications; Job redesign, Work on incentives. Characteristics of the workplace: Physical working conditions: Noise, Illumination, Colour, Music, Miscellaneous Factors; Work Schedules: Working Hours, Permanent Part-Time Employment, Flexible Work Schedules, Rest

Pauses, and Shift Work; Psychological and Social Issues: Job Simplification, Boredom & Monotony, Fatigue, and Telecommuting.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. M.L. Blum & J. C. Naylor Industrial Psychology (Its Theoretical & Social Foundations) CBS
2. Ghosh, P. K. & Ghorpade, M.B. 'Industrial Psychology' Himalaya Publications
3. Miner, J.B. 'Industrial-Organisation Psychology' - Tata McGraw Hill
4. Riggio 'Industrial/Organisational Psychology' 4th Prentice Hall India
5. Dubrin 'Applying Psychology: Industrial & Organisation Effectiveness' 5th Prentice Hall India

**Manpower Planning (MBA 964)**

Max. Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** To appraise the students about the importance of manpower planning specially in today's dynamic environment with emphasis on effective recruitment and selection.

**Unit - I**

Human Resource Planning; Macro level scenario of manpower planning, setting up of objectives, organizing planning concept, process of manpower planning. Demand and Supply Forecasting; analyzing Jobs and Work; Types of Employment.

**Unit - II**

The Recruitment Process; Advertising for Recruitment; Issues in Recruitment; Screening Applications; Measuring and Interpreting Individual Differences; Creating Psychometric Tests, Validation of Measurement; Using Psychometric Tests.

**Unit - III**

Conducting Interviews, Types of Interviews, Group Discussions; Decision Making for Selection; Managerial Selection; New Tools for Recruitment.

**Unit - IV**

Recruitment and Selection: Linking with other HRM Systems; Selecting Expatriates; Use of Technology in Recruitment and Selection; Communicating the Decision; Induction and Socialization; Internal Selection; Designing Systems, Administering and Evaluating the system; Ethical Issues; Present Trends in Recruitment and Selection.

---

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Dessler Gary & V. Biju, *Human Resource Management*, Pearson Education,
2. Roberts. Gareth, "*Recruitment & Selection- A competency approach*", Chartered Institute of Personnel & Development, London
3. Billsberry Jon, *Experiencing Recruitment & selection*, Wiley Publications
4. Cooper Dominic, Robertson T Ivan & Tinline Gordon, *Recruitment & Selection –A framework for success*, Thomson Publications, London

**Conflict and Negotiations (MBA 965)**

Max. Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** To help students develop the skills of conflict avoidance, resolution and negotiation.

**Unit - I**

Conflict: Understanding Conflict; Principles Of Interaction; Dynamics Of Competition; Nature and Types of Conflicts, Why Conflict Arise In Organizations And Industry; Assertiveness and Aggression In Conflict.

**Unit - II**

Learning To Manage Conflicts; Conflict Management Strategies; Cultural Influences In Conflict; Resolving Conflicts – Strategies And Systems; Organizational Systems For Dealing With Conflict; Collaboration In Organizations; Self Awareness For Conflict Management; Managerial Skills And Competences For Effective Conflict Resolution.

**Unit - III**

Introduction to Negotiation as a Decision Making Process; The Process of Negotiation; Planning & Preparing to Negotiate; Internalizing Negotiating Processes.

**Unit - IV**

Managing Negotiations in the following Contexts: Cross Functional Coordination; Marketing Relations; International Business; Labour-Management Relations; Intangibles in Negotiation: Power; Time and Information; Post Negotiation Phase; Ethical Considerations in Negotiation.

---

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Barbara A. Budjac Corvett, *Conflict Management-A Practical Guide to Developing Negotiation Strategies*, Pearson Education,
2. Carell R. Michael & Heavrin Christina, *Negotiating Essentials- Theory, skills and Practices*, Pearson Education,
3. *Harvard Business Review on Negotiation and Conflict Resolution*, Harvard Business Press,
4. Luecke and Patterson, *“How to Become a Better Negotiator”*, American Marketing Association

---

**Programming in C (MBA 981)**

Max Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** The objective of the C programming language is to make user familiar with the programming approach. The C programming offers a new powerful way to cope with the complexity of a program. We can familiarize our self with the development environment.

**Unit I**

**Programming process and Problem Solving:** Problem Identification, Analysis, Flowcharts and algorithms. Program Coding and Execution. C Character set, Identifiers and keywords, Data types, Declarations, Expressions, Statements and Symbolic Constants. Input-Output functions. Pre processor Program structure. Operators and their procedure, Various Expressions and Statements.

**Unit II**

**Control statements:** Branching, looping using for, while and do-while Statements, Nested control structures, switch, break, continue statements. **Functions:** Definition, Call, prototypes, and passing arguments to functions. Storage classes, automatic, external and static variables.

**Unit III**

**Pointers:** The basics of Pointer, Pointer Expressions and arithmetic. **Arrays:** Single and Multidimensional Arrays, Initializing the arrays Memory Representation, Accessing array elements. Introduction to String and String Manipulation Functions.

**Unit IV**

**Structures:** initialization, accessing members, Arrays of structures, structures containing arrays, Unions **File handling:** Introduction, Defining & Opening a File Closing a File, Input/Output Operations on Files.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Herbert Schildt, C: The Complete Reference, McGraw-Hill Osborne Media
2. Y.P. Kanetkar, Let us C Solutions: BPB Publications
3. Brain W. Kernigham and Dennis M. Richie, The C Programming Language: PHI Learning
4. Ashok Kamthane, Programming with ANSI and Turbo C : Pearson Education
5. Gottfried, B, Theory and Problems of Programming in C: Tata Mcgraw-. Hill Ltd



**Relational Database Management System (MBA 982)**

Max Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** The course has been designed to provide an introduction of Database Management Systems. The student will be introduced to various fundamental concepts of Database Management Systems including various models, database design and languages. Overview of DBMS, Relational Database Management System, Object Based Data Bases

**Unit I**

Data Base Concepts: Introduction to files and Data base approach, Architecture of a DBMS, Components of a DBMS, Advantages and Disadvantages of DBMS. Data Independence.

**Unit II**

Different Types of Models, Introduction to ERD, Hierarchical Database, Network Database, Relational Database, Codd's Rules, Concept of Domain, Tuples, Cardinality, Comparison between HDB-NDB-RDB, Relational Algebra.

**Unit III**

Normalization: Functional dependencies, First Normal Form, Second Normal Form, Third Normal Form with examples, Anomalies.

**Unit IV**

Brief introduction to Concurrency, Recovery, Integrity and types of database Security. Introduction to Oracle data types, Basic DDL and DML Commands , working with Null values, Nested queries.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Vipin Desai, An Introduction to Database Systems, WestPublishing Company
2. Silberschatz , Korth, Sudarshan, DATABASE System Concepts, Tata Mcgraw - Hill
3. Date, C.J., Data Base Systems, Vols. I & II, Narosa Publication.
4. Scott Urman, Oracle PL/SQL Programming (Oracle Series) Tata Mcgraw Hill
5. Ivan Bayross, SQL/PL SQL, BPB Publishing

**Software Engineering (MBA 983)**

Max Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** This course introduces the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering.

**Unit I**

**System Concept:** Definitions, Sub-systems, Modules, Software Engineering goals,  
**Software Process Models:** Waterfall, Prototyping, Spiral, Communication skills for Software Engineer/Analyst. Software requirements, Software requirements specifications (SRS), Components of SRS.

**Unit II**

**Systems Development Life Cycle:** Feasibility Study, Requirements Capture, Detailed Systems Analysis, Systems Design, Testing, On-site Implementation and Maintenance.  
**System Analysis:** Principles of Structured Analysis, DFD, E-R-diagram, Data Dictionary, Cost estimation models, COCOMO model, Risk in estimation.

**Unit III**

**Software Design:** Objectives, Principles, Concepts, Design Process, Design Methodologies, Structured design, Modular design, Object oriented design,  
**User-interface design:** Menu, Screen and Report Layout Designing, The Mode/Style of interaction between the system and the user.

**Unit IV**

**Testing Fundamentals:** Objectives, Principles, Testability, Test Cases, White Box & black box Testing, Testing Strategies: Verification & Validation, Unit Test, Integration Testing, Validation Testing, System Testing. Introduction to Computer Aided Software Engineering (CASE), Types of Data Processing - Batch, On-line and Real Time Processing.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Roger Pressman, Software Engineering Practitioner's Approach, McGraw-Hill
2. Fairley, Software Engineering Concepts, Tata McGraw-Hill
3. Pankaj Jalote, An Integrated Approach To Software Engineering, Springer
4. Shere, Kenneth, Software Engineering & Management, Prentice Hall.
5. Software Quality Engineering: A Total Technical and Management Approach, Prentice Hall

**Enterprise Resource Planning (MBA 984)**

Max Marks: 100  
External Assessment: 60  
Internal Assessment: 40

**Objective:** The course has been designed to provide an in depth knowledge enterprise resource planning to students of management. The course aims to create understanding of the technical aspects of ERP systems, understand the steps and activities in the ERP.

**Unit I**

**ERP: Enterprise Perspective:** An Overview, Features of ERP, Need of ERP. Advantage of ERP Growth of ERP Trends in ERP, ERP in India.

**Unit II**

**ERP: System Perspective:** Management Information System, Operations Support System, DSS, Transaction Processing System, Executive Support System (ESS)  
Data Warehousing, Data Mining, OLTP, (On Line Transaction Processing), OLAP (On Line Analytical Processing) Supply Chain Management, Customer Relationship Management

**Unit II**

**Business Modules in ERP Packages,** Finance, Production, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution, Resource Management, Business Process Reengineering, Relationship between ERP & BPR,

**Unit IV**

**ERP Implementation** Life Cycle, Implementation methodology, ERP Project Management & Monitoring. ERP: Key Issues: ERP and E-Commerce, ERP Culture, ERP and CRM, ERP and SCM, ERP Selection Issues, ERP in Public Sector Enterprises, Pre and Post Implementation Issues, ERP Vendors, Key ERP Consultants in India, Future Directions in ERP

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. Alexis Leon Enterprise Resource Planning, Tata McGraw-Hill
2. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India
3. V.K. Garg &N.K. Venkita Krishnan, ERP Concepts & Planning, Prentice Hall
4. Rahul V. Altekar "Enterprisewide Resource Planning", Tata McGraw Hill,
5. S. Sadagopan, ERP: A Managerial perspective. Tata McGraw Hill
6. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill,



**Data Mining and Pattern Recognition (MBA 985)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The objective of this course is to get students familiar with the data mining techniques, softwares and tools being used in Industries. After completing this course, students will learn various tools and techniques which are prominent from Industrial point of view.

**Unit-I**

**Data mining:** Overview, Definition & Functionalities,

**Data Processing:** Form of Data Preprocessing,

**Data Cleaning:** Missing Values, Noisy Data,(Binning Clustering, Regression, Computer and Human inspection), Inconsistent Data, Data Integration and Transformation.

**Data Reduction:** Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation

**Unit-II**

**Concept Description:** Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases,

**Association rule mining:** mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm Mining Multilevel Association rules from Transaction Databases Mining Multi- Dimensional Association rules from Relational Databases

**Unit-III**

**Classification and Predictions:** What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbor classifiers, Genetic Algorithm.

**Cluster Analysis:** Data types in cluster analysis,

**Categories of clustering methods:** Partitioning methods. Hierarchical Clustering- CURE and Chameleon, Density Based Methods-DBSCAN, OPTICS, Grid Based Methods- STING, CLIQUE, Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis

**Unit –IV**

Introduction, Design principles of pattern recognition system, Statistical Pattern recognition,

**Parameter estimation methods:** Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA),

**Classification Techniques:** Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering.

**Note :** Relevant Case Studies should be discussed in class.

**Suggested Readings:**

1. M.H.Dunham, Data Mining: Introductory and Advanced Topics, Pearson Education
2. Jiawei Han, Micheline Kamber, Data Mining Concepts & Techniques, Elsevier
3. C. M. Bishop, Pattern Recognition and Machine Learning, Springer

4. S. Theodoridis and K. Koutroumbas, Pattern Recognition, 4th Edition, Academic Press, 2009.
5. Arun k. Pujari, Data Mining Techniques, Universities Press Private Limited.

# *Fourth Semester*

## Strategic Management (MBA 401)

Max. Marks: 100

Internal Assessment: 40

External Assessment: 60

Objective: This course helps students to combine strategic and managerial approach towards various decisions of management.

### Unit I

Definition, nature, scope, and importance of strategy; and strategic management (Business policy). Strategic decision-making. Process of strategic management and levels at which strategy operates. Role of strategists.

Defining strategic intent: Vision, Mission, Business definition, Goals and Objectives.

Environmental Appraisal: Concept of environment, components of environment (Economic, legal, social, political and technological). Environmental scanning techniques- ETOP, QUEST and SWOT (TOWS).

### Unit II

Internal Appraisal: The internal environment, organisational capabilities in various functional areas and Strategic Advantage Profile. Methods and techniques used for organisational appraisal (Value chain analysis, Financial and non financial analysis, historical analysis, Industry standards and benchmarking, Balanced scorecard and key factor rating). Identification of Critical Success Factors (CSF).

### Unit III

Corporate level strategies-- Stability, Expansion, Retrenchment and Combination strategies. Corporate restructuring. Concept of Synergy. Mergers & Acquisitions. Corporate Restructuring. Business level strategies: Porter's framework of competitive strategies; Conditions, risks and benefits of Cost leadership, Differentiation and Focus strategies. Location and timing tactics. Concept, Importance, Building and use of Core Competence. Strategic Analysis and choice: Corporate level analysis (BCG, GE Ninecell, Hofer's product market evolution and Shell Directional policy Matrix).

### Unit IV

Industry level analysis ; Porter's five forces model. Qualitative factors in strategic choice. Strategy implementation: Resource allocation, Projects and Procedural issues. Organisation structure and systems in strategy implementation. Leadership and corporate culture, Values, Ethics and Social responsibility. Operational and derived functional plans to implement strategy. Integration of functional plans. Strategic control and operational Control. Organisational systems and Techniques of strategic evaluation.

**Relevant case studies related to the topics should be discussed.**

### Suggested Readings

1. Kazmi A. -Business Policy & Strategic Management: Tata McGraw Hill
2. Thomson & Strickland -Strategic Management: Concept & Cases: Tata McGraw Hill
3. S. Reddy, Strategic Management by Himalaya Publication
4. Wheelen & Hungee -Strategic Management & Business Policy: Addison- Wesley
5. Johnson & Scholes -Exploring Corporate Strategy: Prentice Hall India
6. Jauch & Glueck -Business Policy & Strategic Management: Tata McGraw Hill

## **Entrepreneurship and Managing Small Medium Business (MBA 402)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The purpose of this paper is to prepare a ground where the students view Entrepreneurship as a desirable and feasible career option. In particular the paper seeks to build the necessary competencies and motivation for a career in Entrepreneurship.

### **Unit I:-**

**Foundations of Entrepreneurship:** Concept , Need, Definition& role of Entrepreneurship ,Definition, characteristics& scope of Entrepreneur, Innovation, Invention, Creativity, Opportunities . Concepts of Entrepreneur, Manager, Intrapreneur / Corporate Entrepreneuró comparative study , Roles& Responsibilities. Role of entrepreneur in Indian economy, Entrepreneurship as a career, Sustaining Competitiveness - Maintaining competitive advantage, Entrepreneurial culture. Reasons for the failure of entrepreneurial ventures, various case studies- successful, failed and turnaround ventures.

### **Unit II:-**

**Women entrepreneurs& Entrepreneurship Development:-**Meaning, role, problems& reasons for less women entrepreneurs. Various institutes & Govt schemes to help & uplift women entrepreneurs. Case studies for successful women entrepreneurs. Concept, need & role of Entrepreneurship Development. Role of the following agencies in the Entrepreneurship Development DIC , SISI ,EDII & NIESBUD .

### **Unit III:-**

**Small& Medium Enterprises:-** Small & Medium Industry: Meaning and importance - Definition of SME órole & importance in India Economy, Steps for Starting Small Industry: Decisions to become entrepreneur - Steps to be taken - Search for a business idea, source of ideas, idea processing, selection idea, input requirements, Nature and Components of SME Environment, SME Funding, Sources of Finance for SMEø.

### **Unit IV:-**

**Project Management** Technical, Financial, Marketing Personnel and Management feasibility Reports  
Financial schemes offered by various financial institutions like Commercial Banks, IDBI, ICICI, SIDBI,  
SFCs, Venture Capital Funding, Angle Capitalist. Role of Central Government and State Government in  
Promoting Entrepreneurship with various incentives, subsidies, grants.

**Relevant case studies related to the topics should be discussed.**

### **Books Recommended:-**

- 1) Vasant Desai Management of small scale industries, Himalaya Publishing
- 2) Angadi, Cheema, Das, Entrepreneurship, Growth, and Economic Integration, Himalaya Publication

- 3) Roy Entrepreneurship Oxford University Press
- 4) Dr. R.K Gupta & Lipika k.Guliani Fundamentals of entrepreneurship development & project management-Himalaya Publication (in press)
- 5) Rizwana and Janakiran, Entrepreneurship Development, Excel Books
- 6) Murthy, Small Scale Industry and Entrepreneurial Development, Himalaya Publishing

### **SERVICES MARKETING (MBA-906)**

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** This course aims at creating understanding among the students to apply service marketing concepts and strategies to the create customer value in today's highly competitive environment.

#### **Unit I**

Introduction to Services, Growth of service sector economy, Service characteristics, Service classification, Service marketing mix, Consumer behaviour in services: customer expectation of service, customer perceptions of service.

#### **Unit II**

Managing relationship and building loyalty, Complaint handling and Service recovery strategies, Service development and design: Challenges of service design, types of new services, core and supplementary elements, new service development process, Service blueprint, Physical evidence and the Servicescapes: types, role and its effect on behaviour.

#### **Unit III**

Delivering and performing service through employees and customers: service culture, employee's role, strategies to deliver quality, cycle of failure, mediocrity and success, self service technologies and Customer Participation, introduction to customer citizenship behavior Delivering services through intermediaries and electronic channels, Managing demand and capacity, Waiting line strategies integrated.

#### **Unit IV**

Services Marketing communications and services marketing triangle, Pricing of services: Pricing approaches, Pricing Strategies, Improving Service Quality and productivity: Integrated gaps model of service quality, Prescriptions for closing quality gaps,

**Relevant case studies related to the topics should be discussed.**

#### **Recommended Books**

1. Zeithmal A Valarie and Bitner Mary, -Services Marketingø Tata McGraw Hill,
2. Lovelock, Christopher H, -Services Marketingø Pearson Education ,
- 3 Hoffman, -Marketing of servicesø Thomson South westen
4. Govind Apte, -Service MarketingøOxford Press
5. Shajahan ,öService Marketingö Himalya Publishing



## INTERNATIONAL MARKETING (MBA 907)

Max. Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objectives:** The course aims at acquainting students with the concepts and procedures for international marketing and trains them to develop and implement plans and strategies for entering international markets and managing overseas operations.

### Unit I

Definition, scope, importance and challenges of international marketing, International trade theories, Reasons for going international, economic analysis of multinational trade, International Market Segmentation and Positioning; Screening and Selection of Markets; International Market Entry Strategies: Exporting, licensing, Contract Manufacturing, Joint Venture M & A, Setting-up of Wholly Owned Subsidiaries Aboard, Strategic Alliances.

### Unit II

International Marketing Environment: Political, Legal, Environmental, Socio Cultural and Technological environment, Country Risk Analysis, International Economic Environment: IMF, WTO, International Monetary System, International Trade Barriers: Tariff and Non Tariff Regional Blocks: European Union, NAFTA, SAARC, ASEAN, MERCOSUR, International Marketing Research, Selection of export markets.

### Unit III

Direction & composition of Indian exports, Indian export and import policy export promotion organizations, export, incentives, Producing for exports, export quality control; export finance, shipment and procedures thereof, Export documents

### Unit IV

Processing of an export order, organisation and structure of export and import houses. International product policy: Product standardization & adaptation, international, product mix, International product life cycle, new product development, exports packaging, International pricing policy: Factors influencing selection of pricing policies, international pricing strategies, International distribution policy: Factors influencing selection of international distribution channels, types of international distribution channels, role of internet in international distribution International communication policy: communication strategies in international marketing, international promotion mix.

**Relevant case studies related to the topics should be discussed.**

### Suggested Readings:

1. Onkvisit S. & Shaw, J., International Marketing: Analysis & Strategy, Pearson Education
2. CzinkotaM, Ronkaine I, Sutton Brady, C. and Beal, T. International Marketing, CengageLearning.
3. Cherunilam F, International Trade & Export Management, Himalaya Publishing.
4. Cateora & Graham, International Marketing, McGraw Hill.
5. Keegan, Global Marketing Management, Pearson Education Asia.
6. Daniels, J, International Business, Pearson Education.
7. Cherunilam, International Marketing, Himalaya Publishing.

## **SALES AND DISTRIBUTION MANAGEMENT (MBA 908)**

Max. Marks: 100

Internal Assessment: 40

External Assessment: 60

**Objectives:** The course aims to impart the knowledge and skills needed to manage the sales force and distribution functions in a business organization so as to help gain a competitive advantage.

### **Unit I**

Sales Management: Scope, Importance, Objectives, Selling process, Personal Selling objectives, Determining sales related marketing policies, Sales organization structures: Types of sales organization structure, Relationship of sales department with other departments, Distributive network relations.

### **Unit II**

Sales Force Management: Recruiting and selecting sales personnel, Training sales force Motivating Sales Personnel, Compensating Sales Personnel, Managing expenses of sales personnel, Staff meeting and Sales Contests, Controlling the Sales Force: Sales Budget, Sales Quotas, Sales Territories, Sales control and cost analysis.

### **Unit III**

Distribution Planning and Control: Functions of Intermediaries; Types and Role of Channel Intermediaries in India for Consumer and Industrial Products: Wholesale and Retail Structure, Complex Distribution Arrangement (Structural Separation and Postponement) Channel Strategy and Design; Selection of channel partner, Motivation, control and Evaluation of Intermediaries; Managing Channel Dynamics, Relationships and Channel Conflict; Ethical and Legal Issues in Sales and Distribution Management in Indian context.

### **Unit IV**

Distribution System and Logistics: Physical Distribution System óObjectives Present need, Concept, Significance, and Decision Areas; Customer Service Goals; Logistics Planning; An overview of Transportation, Warehousing, Inventory Decisions, Reverse Logistics, Vendor evaluation, Supplier Service Policy (SSP), Purchase order processing; Efficient Supply Chain Management (SCM); Integration of Sales and Distribution Strategy; Role of IT in distribution, Performance measurement and controls in supply chain management

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings**

1. Cundiff, Govoni & Still, -Sales Managementø Prentice Hall India.
2. Mark W. Johnston & Greg W. Marshall, -Sales Force Managementø Tata McGraw-Hill
3. Ingram, -Sales managementø CengageLearning
4. Gupta, S L, -Sales and Distribution Managementø Excel Books
5. Panda, T.K. and Sahadev, S. -Sales and Distribution Managementø Oxford University
6. Rosenbloom, Bert, -Marketing Channels: A Management Viewø Cengage Learning,
- 7 Havaladar, K. K. and Cavale, VM. -Sales and Distribution Managementø Tata McGraw Hill,
8. Chunawalla, S.A. Sales and Distribution Management, Himalaya Publishing House

## LOGISTICS MANAGEMENT (MBA 909)

Max. Marks: 100  
Internal Assessment: 40  
External Assessment: 60

**Objectives:** To make students understand about the growing recognition that the twin goals of cost reduction and service enhancement can be achieved through logistics and supply chain management.

### Unit I

Meaning, nature, scope and evolution of logistics, role of logistics in organisation and economy, key logistics activities and its relationship with cost, marketing and material management, Interdependence of transaction and exchange actions, Importance of channels and concept of logistical support, Geo-market dynamic logistical operation, its elements and network, logistics information system, Elements of Inventory: Inventory costs; concept of EOQ, Safety Stock.

### Unit II

Managing materials flow: purchasing, procurement, production control, inbound logistics, data and information system, inventory planning, material disposal, forecasting, development of warehouse resources: nature, scope, importance types, its productivity measures, Location Strategies ,financial dimensions of warehousing, issues of packaging, Types logistics organisational structure

### Unit III

Transportation: Different transportation modes and their pros and cons. Evaluation of transport decision, Freight rate structure and road transportation, Sea & Air cargo-tariff structure, Practices and procedures of their operation and services provided by them, Intermodal transportation, Containerization's concept and its operation, Inland container depot & terminals in India Liner Shipping conferences -its norms and practices, Chartering principles and practices, Insurance and claim procedures in different modes of transportation, Reviewing transportation infrastructure in India, Interstate tariffs and documentation, Carrier consignee liabilities, Pricing and related services.

### Unit IV

Elements of storage and material handling including warehousing and packing alternatives, Receipt, dispatch, loading and unloading. Handling machines, Dispatch of vehicles, System design and administration, Total costs planning, minimum total costs policy, maximum customer service policy, maximum profit policy, Organization and Control for physical distant Information system for P.D. Information system in Logistics.

**Relevant case studies related to the topics should be discussed.**

### Suggested Readings

1. Bowersox Donald J., *Logistical Management*, Macmillan Publishing Co., Inc., New York.
2. Martin Christopher, *Logistics and Supply Chain Management*, Pearson Education, New Delhi, Sixth Edition, 2005.
3. Aliawadi & Singh, "Logistics Management" PHI

## **Customer Relationship Management (MBA 910)**

Max. Marks: 100

Internal Assessment: 40

External Assessment: 60

**Objective:** The purpose of this paper is to make students understand strategies and models of customer relationship

### **Unit-I**

Introduction to CRM: Meaning and Definition of Customer Relationship Management (CRM), Nature and Scope of CRM, Key Elements of Customer Management, Conceptual Framework of CRM, Components of CRM, Uses and Benefits of CRM, Challenges and Barriers in CRM; Understanding People component of CRM, Organization Environment and CRM, Value Chain Considerations for CRM, Difference between CRM and e-CRM.

### **Unit-II**

CRM Strategy: Sales Strategy ó Sales challenges for FMCGs, Sales Processes and Participation in CRM, CRM and Sales Organization, Sales Customer Relationship Cycle, Sales Force Communications, Sales Force Automation Technology, Data Mining for CRM, Framework for Deploying Customer Relationships in Organizations; Marketing Strategy ó Service Quality and Customer Satisfaction, Customer Loyalty, Customer Retention, Relationship between Customer Satisfaction and Loyalty, Relationship between Customer Loyalty and Profitability, CRM Strategy Cycle.

### **Unit-III**

CRM Models: Brief Introduction to Classic Marketing Models; Models of Customer Management ó One-to-one, Transparent Marketing, Top Vanilla, Spot Sell, Pure Spot Sell, Channel Partnership; Impact of Web-based Marketing on these Models, Paradox of Technological Progress; Customer Requirements of CRM, Company's perspective of CRM, Concept of Share of Wallet.

### **Unit-IV**

Accountability for CRM: Tactical versus Strategic Application of CRM, Target Opportunities, Incremental Revenue, Cost Changes, Contact Strategies, Revenue and Cost Review, Feasibility Analysis, New Opportunities for improving CRM, Creating Long-term Customer Value (LTCV), Measuring Customer Relationships, Payback for Customer Relationships.

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings**

1. Baran, Roger J.; Robert J. Galka and Daniel P. Strunk (2008) Customer Relationship Management, Cengage Learning, 1<sup>st</sup> Edition.
2. Barnes, James G. (2001) Secrets of Customer Relationship Management, McGraw Hill, 1<sup>st</sup> Edition.
3. Kincaid, Judith (2003) Customer Relationship Management: Getting it Right!, Pearson Education, 1<sup>st</sup> Edition.
4. Peelen, Ed (2008) Customer Relationship Management, Pearson Education, 1<sup>st</sup> Edition.
5. Anderson, Kristin and Carol Kerr (2002) Customer Relationship Management, McGraw Hill Education, 1<sup>st</sup> Edition.
6. Sheth, Jagdish N. (2001) Customer Relationship Management: Emerging concepts, tools and applications, McGraw Hill Education, 1<sup>st</sup> Edition.
7. Sheth, Jagdish N.; Atul Parvatiyar and G. Shainesh (2002) Customer Relationship Management: Emerging concepts, tools and applications, McGraw Hill Education, 2<sup>nd</sup> Reprint.

## **International Finance (MBA 926)**

Max. Marks: 100

Internal Assessment: 40

External Assessment: 60

**Objective:** The objective of this paper is to help students to understand finance in global settings.

### **Unit-1**

International Finance: An overview, Importance, nature and scope, recent changes and challenges in IFM. International Flow of Funds: Balance of Payments (BoP), Fundamentals of BoP, Accounting components of BOP, Factors affecting International Trade flows, Agencies that facilitate International flows. International Monetary System : Evolution, Gold Standard, Bretton Woods system, the flexible exchange rate regime, the current exchange rate arrangements, the Economic and Monetary Union (EMU).

### **Unit 2**

Foreign Exchange Market: Function and Structure of the Forex markets, Major participants, Types of transactions and settlements dates, Foreign exchange quotations, Factors influencing foreign exchange rates. Parity Conditions in international finance and currency forecasting: PPP, the Fisher effect, The International Fisher Effect, Interest Rate parity Theory, The relationship between forward and future spot rate.

### **Unit 3**

Foreign Exchange risk Management: Measuring and managing Transaction exposure, Measuring and Managing Economic exposure, and Measuring and Managing translation exposure, Country Risk Analysis, Foreign Exchange and Derivative Markets: Currency Futures and option Markets, Swap and Interest rate derivatives

### **Unit 4**

International Sources of Finance: Long Term- International Capital Markets (ADR $\phi$ , GDR $\phi$ ), Foreign Bond Market, Foreign Banks, Euro Markets, World Bank and IMF. Short Term: Banker $\phi$  Acceptance, Discounting, Factoring, Forfating, EXIM Bank of India

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. P. G. Apte, International Financial Management, Tata McGraw-Hill, New Delhi.
2. Alan C. Shapiro, Multinational Financial Management, Prentice Hall India Private Ltd,
3. Jeff Madura, International Financial Management, Thomson Publications.
4. Maurice D. Levi, International Finance, Tata McGraw-Hill, New Delhi.
5. S. Eun Choel and Risnick Bruce, International Financial Management, Tata McGraw Hill,
6. Avadhani, V.A. International Finance, Himalaya Publishing

## **Banking & Insurance Operations (MB 927)**

Max. Marks ó 100

External assessment ó 60

Internal Assessment ó 40

Objective: The purpose of this paper is to make students understand the applications of banking and insurance operations in the business.

### **Unit I**

Banking system and structure in India, Types of banks, Role of Reserve Bank as regulator of banking system, Provisions of Banking Regulation Act & Reserve Bank of India Act. The terms banker and customer, Types of relationship between banker and customer, Bankers obligations to customers, Right of lien, set off, appropriation, Provisions of Negotiable Instrument Act, 1881 ó Bankers legal duty of disclosure and related matters

### **Unit II**

Customers` accounts with banks, Opening- operation, KYC norms and operation, Types of accounts and customers, Nomination, Settlement of death claims. Banking Technology, Home banking, ATMs, Internet banking, Mobile banking, Core banking solutions, Debit, Credit, and Smart cards, EFD, RTGS International banking, Exchange rates, Documentary letter of credit, financing exporters and importers, ECGC Policies and guarantees

### **Unit III**

Banker as lender, Types of loans, Overdraft facilities, Discounting of bills, Financing book dates and supply bills, Charging of Security bills, pledge, mortgage, assignment. Prudential norms for asset classification and capital adequacy. Management of NPAs. Asset liability management and risk management in banks, Basel norms. Money laundering.

### **Unit IV**

Introduction to Insurance, Elements of Insurance Risk, Players in Life and Non-Life Insurance sector, Insurance documents, Role and responsibilities IRDA, Provisions of Insurance Act 1938. Insurance Ombudsman. Types of Insurance, Life Insurance and General Insurance Products including unit linked plans, Alternative risk transfer mechanism and Re-Insurance, Nature of Re-Insurance risk, Legal framework of life and general insurance Bancassurance- concepts, critical issues, functional aspects, Indian Scenario, Future Prospects, Insurance Accounting, Financial Analysis and valuations, Solvency and performance measures.

**Relevant case studies related to the topics should be discussed.**

### **Recommended books:**

1. L M Bhole -Financial Institutions & MarketsøTata McGraw- Hill
2. Sunderaram and Varshney. öBanking Theory, Law and practiceö Sultan Chand & Sons, New Delhi.
3. Koch W, Timothy, & S. Scott. öBank Managementö Thomson, New Delhiy,
4. Gordon & Natrajan, Banking (Theory, Law and Parctice) Himalaya Publishing
5. Agarwal, O.P. Banking and Insurance, Himalaya Publishing

6. Gupta, P.K. Fundamentals of Insurance, Himalaya Publishing

## Global Capital Market (MBA 928)

Max. Marks ó 100  
External assessment ó 60  
Internal Assessment - 40

**Objectives:** The objectives of the course is to provide the student with a thorough understanding of the structure and functions of different financial markets as well as the instruments that are in use in those markets.

### Unit I

**Introduction:** Type of Global Capital Markets, Theoretical benefits, advantages, Problems of supranational capital markets.

**The Structure of Global Financial Markets:** Money Markets-Advantages of Money Markets-Understanding Bond Markets-Advantages with Bonds-Types of Bond Market Instruments-Players in Bond Markets- Government Bond Issues and Agency Debt- The Need for MBS Market-Process of Securitization-Collateralized Mortgage Obligations (CMOs)-Comparing Different Mortgage Securities.

**The Eurocurrency Market:** Advantages and risk, Origin and history the market, Euro market centers, Euro market mechanism and instruments, Market participants, Eurocurrency Interest rate, Crisis and the market, recent development.

### Unit II

**European Markets:** monetary policy of the ECB, developments in money market, bond markets, equity markets, and derivatives markets since the start of the monetary union.

**The American Markets:** Introduction to US Money Markets-Instruments of Money markets-Variety Types of Municipal Securities-Eurodollar Market-Money Market Mutual Fund- The US Bond Market-Instruments in Bonds Markets-Types of Corporate Bonds-The US Equity Markets-Banking Regulations- Three Major Exchanges in US.

**Japanese Markets:** General Background of Japanese Markets- Japanese Banking Structure-Financial Sector Reforms in Japan-Major Funding Avenues-Export Finance in Japan-Credit Rating in Japan

### Unit III

**German Capital Markets:** The Germany Economy-The German Banking System-The German Bond Markets

**English Markets:** Introduction to UK Markets-The Big Bang of 1986- The UK Financial Market-The Financial Services Authority-Major Funding Routes-Export Finance

**Swiss Capital Markets:** General Scenario- The Swiss Banking Industry-The Swiss Insurance Industry-Performance of the Swiss Economy-Regulation of the Swiss Banking Industry-Swiss Fixed Income Markets-The Swiss Bond Market-Swiss Equity Markets-Exchange rates/Interest rates-Export Finance in Switzerland

### Unit IV

**Multilateral Financial Institutions:** World Bank Group- Detailed Study of World Bank-International Development Association (IDA)- International Finance Corporation (IFC)-Multilateral Investment Guarantee Agency (MIGA)-International Center for Settlements of Investment Dispute (ICID); International Monetary Fund (IMF)- Main Areas of Activities-Funding Avenues-Lending Activities-The Process of IMF Lending-Other IMF Facilities-Regional Development Banks; OPEC-AFDB-IADB-EBRD-ADB.

**Export Credits:** The Origin and Growth of Export Credits-How Exports are Financed-How Interest on Export Credits is Calculated-Role of Export Credit Insurance-Berne Union and its

Importance-The Indian Context.

**Relevant case studies related to the topics should be discussed.**

**Suggested Reading:**

1. Obstfeld Maurice and Taylor Alan M. -Global Capital Markets: Integration, Crisis and GrowthøCambridge University Press.
2. Giddy Ian, -Global Financial MarketsøHoughton Mifflin Co
3. Frank J. Fabozzi -Financial Management and AnalysisøJohn Wiley & Sons.
4. Bhole, L.M., -Financial Institutions and MarketsøTata Mcgraw Hill
5. Joshi, P.R., -Global Capital MarketsøTata Mcgraw Hill

## Management Control System (MBA 929)

Max. Marks ó 100

External assessment ó 60

Internal Assessment - 40

**Objective:** The objective of this course is to make students understand control systems in the organization for better decision making.

### Unit I

**Introduction to Management Control Systems:** nature of management control- purpose of MCS-the organizational context of MCS-the formal systems the informal systems- the subsystems and the components of the control systems- use of information technology on control systems,

**Designing the Control Process and Managerial Control:** introduction- schools of thoughts in control (contingency approach, cybernetics approach) ó designing management controls- the control process hierarchy- communication and reporting structures in the control systems. Ethical dimensions in MCS, corporate culture of MCS, organization structures.

**Behaviour in Organizations:** goal congruence, action control, result control, types of organizations, functions of controller.

### Unit II

**Responsibility Centers:** responsibility accounting, different types of responsibility centers (investment centers, revenue centers, expense centers, administrative and support centers, r&d centers, marketing centers, profit centers), general considerations/business units as Profit centers/measuring loose coupling between inter profit centers.

**Key Success Variables and Measures of Performance:** identifications of key success variables-key success variables and the control paradigm-performance indicators-eva and profitability measures.

### Unit III

**Budget Preparations & Financial Reporting:** nature of a budget, operating and other budgets, flexible and fixed budgets, budget preparation process, behaviour aspects. Analysing financial performance reports: calculating variances like material, labour and profit:Limitations of variance analysis, tools like standard costing, target costing, life cycle costing and activity based costing.(appropriate numerical examples should be given).

**MCS in service & non-profit organizations:** characteristics, professional service organizations, financial service organizations, healthcare organizations, non-profit organizations.

### Unit IV

**MCS in Multinational Corporation:** control issues, cultural differences, exchange rates, transfer pricing-objectives, methods, administration of transfer prices. (appropriate numerical examples should be given)

MCS in projects nature of projects, control environment, project planning and appraisal, project execution, project evaluation

**Management audit:** concepts, types, process, and applications in various functions.

**Relevant case studies related to the topics should be discussed.**

### Suggested Readings:

1. Robert Anthony and Vijay Govindarajan -Management Control Systemø Tata McGraw Hills.

2. Kenneth. A Merchant -Modern Management Control Systems Text & Cases- Prentice Hall
3. Maciariello, Joseph A / Kirby, Calvin J. -Management Control Systems: Using Adaptive Systems to Attain Control- Prentice Hall.
4. Sinha Pradip, Management Control Systems, Himalaya Publishing
5. Ghosh, N. Management Control Systems, PHI

## **FINANCIAL ENGINEERING (MB 930)**

Max. Marks ó 100

External assessment ó 60

Internal Assessment - 40

**Objective:** The objective of this paper is to make student understand application of financial concepts with the help of financial tools.

### **Unit - I**

Overview - Meaning, scope, tools used in financial engineering, difference between financial engineering and financial analysis. Growth and Contributory factors to Growth of Financial Engineering. Skills and Knowledge Required: Statistical, Modeling, Technology, Legal, Accounting and Taxation.

### **Unit - II**

Determinations of value of financial instruments and products. Time value of money, the required rate of return. Absolute valuations versus relative valuation. Measuring return and risk. Portfolio consideration and investment horizons. Speculation, arbitrage and market efficiency.

### **Unit - III**

Derivatives: Types and uses; Basic Principles of options, Option trading strategies, Option pricing ó Black Scholes Model, Option Greeks.

### **Unit - IV**

Forwards and futures: Basics & Types; Swap; Other derivative assets: futures options, warrants, forward rate agreement, swap options, exotic options, and credit derivatives. Risk Management and corporate strategy, the practice of hedging, Interest rate risk management.

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. Hull, John C.: Options, Futures and Other Derivatives, Prentice Hall of India
2. Walmsley, Julian: New Financial Instruments, Prentice Hall of India
3. Marshall, John F. and Bansal, Vipul K.: Financial Engineering, Prentice Hall of India
4. Grinblatt, Mark and Titman, Sheridan: Financial Markets and Corporate Strategy, Tata McGraw Hill
5. Strong, Robert A.: Derivatives ó An Introduction, Thomson South-Western
6. Kumar, S.S.S: Financial Derivatives, Prentice Hall of India

## Supply Chain Management (MBA 945)

Max. Marks ó 100  
External assessment ó 60  
Internal Assessment - 40

### Objective:

#### Unit I

Introduction to supply chain management, Objectives, Importance , Supply chain drivers ,Obstacles, Decision phases in supply chain, Supply chain networks and Models, Supply chain planning: Strategic, operational and tactical, Supply chain strategies, Achieving strategic fit, value chain, Strategic Alliances and Outsourcing

Introduction to Supply Chain Inventory Management, Inventory theory models: Economic Order Quantity Models, Reorder Point Models and Multi echelon Inventory Systems, Relevant deterministic and stochastic inventory models.

#### Unit 2

Distribution Management: Role of transportation in a supply chain - direct shipment, warehousing, cross-docking; push vs. pull systems; transportation decisions (mode selection, fleet size), market channel structure, Facilities decisions in a supply chain. Supply chain facility layout and capacity planning

Designing the supply chain network, designing the distribution network ,role of distribution , factors influencing distribution, design options, network design in the supply chain , factors affecting the network design decisions

#### Unit 3

Coordination in a Supply Chain, Lack of supply chain coordination and the Bullwhip effect, obstacle to coordination, managerial levers, building partnerships and trust , vendor-managed inventories, continuous replenishment collaborative planning, forecasting and replenishment. Measurement of Supply chain performance: The balanced score card approach, Performance Metrics. Demand forecasting in supply chain, aggregate planning in supply chain, Predictable variability

#### Unit 4

Strategic Cost Management in Supply Chain, The financial impacts, Volume leveraging and cross docking, Target pricing, Measuring service levels in supply chains, Customer Satisfaction/Value/Profitability/Differential Advantage. Information Technology in the Supply Chain, IT Framework, customer relationship management, internal supply chain management, supplier relationship management, impact of e-business in supply chain, transaction management, future of IT

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings:**

1. David Simchi-Levi, Philip Kaminsky, and Edith Simchi-Levi, *Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies*, McGraw-Hill/Irwin, New York
2. Sunil Chopra and Peter Meindel. *Supply Chain Management: Strategy, Planning, and Operation*, Prentice Hall of India
3. Coyle, Bardi, Longley, *The management of Business Logistics ó A supply Chain Perspective*, Thomson Press
4. Janat Shah, *Supply Chain Management*, Pearson Publication
5. Donald J Bowersox, Dand J Closs, M Bixby Coluper, *Supply Chain Logistics Management*, TMH
6. Wisner, Keong Leong and Keah-Choon Tan, *Principles of Supply Chain Management A Balanced Approach*, Thomson Press.

## **Technology Management (MBA 946)**

Max. Marks ó 100  
External assessment ó 60  
Internal Assessment - 40

**Objective:** To provide students with the requisite knowledge of concepts and to impart practical skills and techniques required in the area of strategies for managing technology in business.

### **UNIT I**

Management of technology: Various aspects and issues, strategic considerations, technological change and innovation, impact of technological change on employment and productivity, social consequences.

### **UNIT II**

Technology forecasting, technology development, technology acquisition and transfer. Technology absorption and diffusion, evaluation/assessment of competing technologies, foreign diffusion, collaboration and strategic technological alliances.

### **UNIT III**

Law regarding protection of trade intellectual property rights, patents, trademarks, TRIPS and W.T.O. - Its impact on Indian economy.

### **UNIT IV**

Technological environment in India - Technology policy, role of various government organisations such as DST, CSIR in development and dissemination of technology, technology development at organization level, role of information system, quality systems and market feedback.

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. Fredruck Betz, *Managing Technology*, Prentice Hall.
2. MaukDudgson, *Technology Strategy and the Firm*, Longman Publications.
3. Morse and Babcock, *Managing Engineering and Technology*, PHI

## Knowledge Management (947)

Max. Marks ó 100  
External assessment ó 60  
Internal Assessment - 40

Objectives ó Knowledge Management course aims to develop behavioral and conceptual skills among students that are mandatory for the organizational growth. After completing the course, Students are expected to be able to formulate strategies for development, deployment and utilization of knowledge capabilities of organization.

### Unit 1

Data, information and knowledge; Fundamentals of Knowledge Management, Drivers of knowledge management, Knowledge Management and learning organizations - Learning organization: five components of learning organization, Knowledge sources and documentation. Essentials of Knowledge Management, Knowledge management techniques, Knowledge creation process, systems and tools, building the knowledge corporation and implementing Knowledge management in organization

### Unit 2

Analyzing business environment-knowledge audit and analysis ó designing Knowledge Management team ó creating Knowledge Management system blue print- implementation- capture ó store and sharing. Organizational culture and knowledge management Knowledge system ó Issues, challenges and benefits.

### Unit 3

Organizational Context of KM , Dispersed knowledge; Social boundary of knowledge processes; Knowledge workers and knowledge-intensive firms; Knowledge workers and their retention; Structuring of multinationals and knowledge processes. Organizational knowledge measurement techniques, organizational implementation barriers.

### Unit 4

Intellectual capital ó Introduction, social innovation capital, false linearity, false orientation. Performance Measurement of KM Systems - Factors influencing knowledge management; KM Measurement Bell curve; Types of performance measures; Measurement approaches; Application softwares.

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings:**

1. Sudhir Warier, Knowledge Management , Vikas Publications.
2. Stuart Barnes Knowledge Management Systems , Thomson Learning.
3. J.M. Firestone, M.W. Mcelroy Key issues in the New Knowledge Management, MA: KMCI Press/Butterworth Heinemann
4. Pankaj Sharma, Knowledge Management ó, APH Pub.
5. Amrit tiwana,'The essential guide to knowledge management,' Pearson education.
6. Ratnaja gogula,'Knowledge management', A new dawn- ICFAI
7. Awad and Ghaziri, Knowledge Management, PHI

## **Manufacturing Policy and Implementation (MBA 948)**

Max. Marks ó 100  
External assessment ó 60  
Internal Assessment - 40

**Objective:** The aim of this course is to make students understand manufacturing decisions, operation and production scheduling and quality control parameters.

### Unit I

Introduction to manufacturing, Strategic decisions in Manufacturing Management, Choice of Technology, Capacity Layout / Automation in Material handling systems Emerging trends Flexible Manufacturing Systems as enablers of low cost strategy ó Their implications for Costing Systems

### Unit II

Aggregate planning and Master Production Scheduling , Materials Requirement Planning (MRP), Manufacturing Resources Planning (MRP ó II), Implementation Problems / Indian experience, Quick response systems in Manufacturing Replacement Theory

### Unit III

Review of Operations Scheduling Process ,Industrial scheduling systems - Job Shop Scheduling, Batch Production Scheduling, Flow Production Line Balancing ó Introduction to flexible Manufacturing Systems and World Class Manufacturing Quality control and Quality assurance in manufacturing; Acceptance sampling, Six Sigma, Kaizan, QC Circles, Statistical Process Control,

### Unit IV

Objective of TPM ó Total System effectiveness, Break-down maintenance, Preventive Maintenance, Productive Maintenance, Predictive Maintenance, Condition Monitoring System, Maintenance Prevention, Reliability Improvement, Total Employee Involvement and Small Group Activities, FMEA

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. B.S. Sahay World Class Manufacturing , Macmillan publishers India Ltd., Chennai.
2. R. Panneerselvam, Production and Operations Management ó PHI learning.
3. Kanishka bedi, Production and Operations management with solution manual, Oxford University press, Chennai.
4. Kachru Upendra, Production and Operation Management, EXCEL Books

5. Chunawalla and Patel, Production and Operations Management, Himalaya Publishing

## **Lean Manufacturing (949)**

Max. Marks ó 100

External assessment ó 60

Internal Assessment - 40

### **Objectives**

This course will give integrated perspective of lean thinking started by Toyota and adopted by other manufacturing companies across the globe. The scope of lean manufacturing and its techniques are not only limited to manufacturing, in today's scenario it has been adopted by service industries also. Students will learn various quality control techniques that are important for providing quality products and services to customers.

### **Unit I**

INTRODUCTION, Mass production system, Craft Production, Origin of Lean production system, Why Lean production, Lean revolution in Toyota, Systems and systems thinking, Basic image of lean production, Customer focus, Waste Management.

### **UNIT II**

JUST IN TIME, Why JIT, Basic Principles of JIT, JIT system, Kanban, Six Kanban rules, Expanded role of conveyance, Production leveling, Three types of Pull systems, Value stream mapping. JIDOKA, Development of Jidoka concept, Why Jidoka, Poka, Yoke systems, Inspection systems and zone control ó Types and use of Poka-Yoke systems, Implementation of Jidoka

### **UNIT III**

KAIZEN, Six ó Sigma philosophy and Methodologies, QFD, FMEA Robust Design concepts; SPC, QC circles standardized work in lean system, Standards in the lean system, 5S system, Total Productive Maintenance, Why Standardized work, Elements of standardized work, Charts to define standardized work, Kaizen and Standardized work, Common layouts.

### **UNIT IV**

Involvement, Hoshin Planning & Lean Culture, Involvement, Activities supporting involvement, Quality circle activity, Kaizen training, Key factors of PKT success, Hoshin Planning System, Four Phases of Hoshin Planning, Why Lean culture ó How does lean culture feel

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings:**

1. Pascal Dennis, Lean Production Simplified: A Plain-Language Guide to the World's Most Powerful Production System, (Second edition), Productivity Press, New York, 2007
2. Mike Rother and John Shook, Learning to See: Value Stream Mapping to Add
3. Value and Eliminate MUDA, Lean Enterprise Institute, 1999.
4. Jeffrey Liker, The Toyota Way : Fourteen Management Principles from theWorld's Greatest Manufacturer,McGraw Hill, 2004.
5. Michael L. George, Lean Six SIGMA: Combining Six SIGMA Quality with Lean Production Speed,McGraw Hill, 2002.
- 6.Taiichi Ohno, Toyota Production System: Beyond Large-Scale Production,Taylor & Francis, Inc., 1988.

**Organizational Development (MB-966)**

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective:** The objective of this course is to make students understand interventions processes in the organization

**Unit-I**

Introduction to OD; Definitions & its distinguishing characteristics Historical background: various stages, second-generation OD and extent of application, values, assumptions and beliefs in OD., Foundations of OD: Models and theories of planned change, Systems theory, Participation and Empowerment, Teams and Teamwork, Strategies of change, Inter-Disciplinary Nature of OD.

**Unit-II**

Action Research and OD, Action Research: A Process and an Approach. Managing OD Process: Diagnosis, The Six-Box Model, Third Waves Consulting, Nature of OD intervention, Analysis of Discrepancies, Phases of OD Program, Model of Managing Change, Creating Parallel Learning Structures.

**Unit-III**

OD Interventions: AN overview, Team Interventions, Intergroup and Third Party Peace Making Interventions, Comprehensive Interventions, Structural Interventions, Training Experience: T-Groups, Behavioral Modeling and Career Anchors. Power, politics and OD: Power defined and explored, theories about the sources of Power, Organizational Politics in the practice of OD.

**Unit-IV**

Issue in Consultant-Client Relations: Entry and contracting, defining the client system, trust, the nature of the consultant's expertise, diagnosis and appropriate, interventions, depth of intervention, on being absorbed by the cultural, the consultant as a model, the consultant team as a microcosm, the dependency issue and terminating the relationship, ethical standards in OD,

Implications of OD for the Client. Contemporary Issues in OD. OD and Quality Movement, OD- Now and Beyond.

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings:**

1. Wendell L. French, Cecil H. Bell : Organization Development Prentice Hall
2. Richard Beckhard: Organization Development Strategies & Models Tata Mc Graw Hill.
3. Blake, Robert & Mouton : Building a Dynamic Corporate through Grid OD, Homewood
4. Thomas H, Patten Organization Development through Team Building , Thomas Publication
5. Edgar F. Huse : Organization Development & Change, Thomas Publication
6. Burke W.W.: Organization Development Principles & Practice, Sage Publication
7. S. Ramnarayan & Kuldeep Singh and T.V. Rao: OD ó Interventions & Strategies, Response Books, New Delhi.
8. S. Ramnarayan, and T.V. Rao : OD ó Accelerating Learning & Transformation, Sage, New Delhi

## INTERNATIONAL HUMAN RESOURCE MANAGEMENT (MB-967)

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The aim is to make student understand HR Policies in Global settings

### UNIT- I

**Introduction to cross cultural management:** Significance of Culture for International Management. Culture dimensions, impact of cross culture on organizations, role of culture in Strategic Decision- Making. Influence of National Culture on Organizational Culture.

**Comparing Culture:** Cultural and behavioral differences in different countries, various models for comparing cultural- Hofstede. GLOBE, Kluchohm & Stood beck

### UNIT-II

**Shift in Culture:** Culture as a factor in a people's Response to Change, significance of shift in Culture, Economic Factors and Shifts in National Culture, Foreign Intervention and influence on shifts in Local Cultures.

**Cross- Cultural Communication:** Role of effective communication for international and cross-cultural management and in the field of international marketing, Cross, Cultural Verbal Non-Verbal communication across cultures, managing Culture, Specific Perception , Responding the Demographic Change.

### UNIT- III

**Cross Cultural Human Resources Management –** Staffing and Training for Global Operations Global Staffing Choices, Expatriates or Local Managers, Dynamics of Cross-Cultural leadership, managing and motivating multi culture Teams.

**Cross –cultural Negotiation & Decision making:** Culture and Dispute, Resolution of Conflicts and Disputes in cross culture context, Negotiations across culture, Cross , culture Negotiation Process with two illustrations from multi cultural context {India-Europe / India óUS setting, for instance}

### UNIT- IV

**Cross-culture ethics:** Ethics values across cultures and Ethics dilemma, Overview of culture and management in Asia (India, China and Japan), US and Europe.

**Relevant case studies related to the topics should be discussed.**

### Suggested Readings:

1. Deresky Helen -International management: Managing Across Borders and Culturalø 4th Ed., Prentice Hall India
2. Esen Drlarry, Rchildress John -The Secret of a Winning Culture: Building High- Performance Teamsø Prentice Hall India.
3. Cashby Franklin -Revitalize Your Corporate Culture: Powerful Ways to Transform Your Company into a Hiongh- Performance Organisation, Prentice Hall India.
4. Rao, P.L. Interantional Human Resource Management, Excel books

## **Industrial Relations and Labour Laws (MBA 968)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The aim of this course is to help students to understand basics of labour laws and industrial relations applicable in various business houses.

### **UNIT-I**

Industrial Relations-Concept , Theories and Evolution, System approach to IR-Actors, Context, Web of Rules & Ideology, Trade UNIONSIM, impact of trade unions on wages, The Trade unions Act ,1926 {with amendments}

### **UNIT-II**

Grievance Handling, Tripartite and bipartite bodies, Anatomy of Industrial disputes, Conciliation , arbitration and adjudication, Sexual Harassment.

### **UNIT-III**

Collective Bargaining : Concept, meaning and objectives, Approaches, technique & Strategies to collective Bargaining, Process of Collective Bargaining, Impact of CB and workers participation in management on IR

### **UNIT-IV**

Industrial relations in U, K & USA, Japan & Russia, The industrial Disputes Act,1947{with amendments}, Factories Act{with amendments}

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. Arun Monappa & J.T., Dunlop Industrial System , TATA McGraw Hill
- 2 C.N.Patil, Collective Bargaining , University press
3. Pramod verma, Industrial Relations, Tata McGraw Hill
4. S.C.Srivastava, Industrial Relation& Labor Laws, Vikas Publications
- 5.Singh and Sinha, Labour Laws in Brief, Excel Books

## **People Management and Leadership (MBA 969)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The aim of this course is to make students understand how to manage people, leadership strategies at work

### **Unit - I**

People Management: Meaning and Concepts. Importance of People Management, Interactive Approach to Managing People; The Role of Human Resources, Individual and Interpersonal Behaviour.

### **Unit - II**

Deciding How to Decide; Performance at Work; Work Planning and Organization. Interactive Communication Skills; Responsible Management of People at Work.

### **Unit - II**

Leadership; Types and Importance of Leadership, Role of Leadership in Creating a High-Performance Work Culture. Empowerment and Delegation; Interactive Problem-Solving and Leadership.

### **Unit - IV**

Creativity and Innovation; Knowledge Management, Meaning and Concept, Leadership and Knowledge Management, The Human factor of Knowledge Management.

---

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings**

1. Andrew J. DuBrin, Leadership Principles, Cengage Learning: India Edition 2009
2. Haldar U. Kumar, Leadership and Team Building, Oxford University Press, 2011
3. Lussier Achua, Effective Leadership ,Cengage Learning , 5<sup>th</sup> Edition
4. Daft Richard . L , Leadership , Cengage Learning , 5<sup>th</sup> Edition

## **Stress Management (MBA 970)**

Max Marks: 100

External Assessment: 60

Internal Assessment: 40

**Objective:** The course aims to help the students understand how to cope with stress at work place.

### **UNIT -I**

Meaning and concept of Stress, Hans Selye Model of Stress, Physiological Stress, Pestonjee's Bounce Back Model of Stress, Modules of Stress

### **UNIT-II**

Life events and Stress, Organisational role stress, Meaning, concept and Types of Role Stressors

### **UNIT-III**

Coping styles or strategies, Moderators of stress, counteracting stress, spirituality and stress.

### **UNIT-IV**

Managing Stress, Stress Tolerance Level, Managing Stress in Individual, Managing stress in organization, Stress Audit.

**Relevant case studies related to the topics should be discussed.**

#### **Suggested Readings:**

1. Dutta, P.K., Stress Management, Himalaya Publication
2. D.M. Pestonjee Stress And Coping : An Indian Experience, Sage Publication
3. Udai Pareek Making Organizational Role Effective:
4. Udai Pareek Handbook of HRD Tools

## **Programming in C++ (MBA 986)**

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective:** The objective of this course to learn programming from real world examples and understanding object oriented approach for finding solutions to various problems with the help of C++ language. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

### **Unit I**

Introduction to Object Oriented Programming: Objects, Classes, Data abstraction, Data Encapsulation, Inheritance, Polymorphism, Introduction to C++, Identifier and keywords, constants, C++ operators, Variable declaration, statements, expressions, Conditional expression loop statements, breaking control statements.

### **Unit II**

Defining function, types of functions, Parameter Passing: by value, by address and by reference, Arrays, Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Pointer to functions. Functions: Prototyping.

### **Unit III**

Classes, member functions, objects, nested classes, inline member functions, static class member, Friend functions and Friend classes, Constructors: properties, types of constructors :Default, parameterized and copy, Destructors, Inheritance, single inheritance, types of base classes, types of derivations, multiple inheritance.

### **Unit IV**

Polymorphism: Function, operator and constructor overloading. Operator overloading: Rules for operator overloading, unary, binary operator overloading, virtual functions, pure virtual functions and abstract base classes.

Files and streams: Classes for file stream operations, opening and closing of files, binary file operations. Opening and closing of files, file operations.

**Relevant case studies related to the topics should be discussed.**

**Suggested Readings:**

1. D. Ravichandran, Programming with C++, Tata McGraw-Hill
2. Herbert Schildt, The Complete Reference C++, McGraw-Hill Osborne Media
3. Robert Lafore, Object Oriented Programming in C++, Pearson Education
4. Deitel and Deitel, C++ How to Program, Prentice Hall
5. Bjarne Stroustrup, The C++ programming language, Addison-Wesley Professional



## **E-Commerce and Cyber Securities (MBA 987)**

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective** The overall objective of this subject is to familiarize the students with internet, online system and html tags. A brief description of how web pages are made and knowledge of ASP.Net

### **Unit I**

Basics of E-Commerce Need of e-commerce, elements of electronic business process :- Basics of Internet and networking; Network Economics; Commerce Paradigm; Interactions ; Transactions; Introduction to electronic Payment System; digital cash, electronic check, on line credit card, on ó line banking, Internet Basics: What is internet? What Special about Internet, Internet Protocols: TCP, IPv4, IPv6, FTP, HTTP, SOAP, SMTP, UDP.

### **Unit II**

Security Issues in e-business, Security Overview, Electronic Commerce Threats, Encryption, Cryptography, Public Key and Private Key Cryptography, Digital Signatures, Digital Certificates, Securing E-commerce Networks: Security, Protocols such as HTTP, SSL, Firewalls, Personal Firewalls, IDS, VPNs, Public Key Infrastructure(PKI) for Security, E-Business models, Futures of E-Commerce : Cyber-laws; Nation State in New Millennium; Entrepreneurial Opportunities; Embedded E- Commerce, Strategies for E-Commerce. Legal, Ethical and Societal Impacts of E-Commerce

### **Unit III**

An Introduction to Java Script: Statements, Comments, Variables, Operators, Functions, Loops, Objects, HTML: Basic HTML and tags, Language description, usability, static creation of HTML web pages. Creating tables, forms and their advantages. An overview of XML, Use of XML, integrity of XML with databases.

### **Unit IV**

ASP.Net (Active Server Pages), An Introduction to ASP.Net, variables and data types, Site Design: Creating Master Pages, Content Pages, Use of web.config file, global.asax file, Styling with themes, Events and code, Database connectivity through ADO.net, caching, Introduction of Web Services, Deployment, Builds and Finishing Up. An Introduction to AJAX.

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. Chris Hart, John Kauffman et al., Beginning ASP.NET 2.0, Wrox, Wiley India Pvt Ltd
2. Stephen Walther, ASP.NET Unleashed, Sams Publications
3. Bharat Bhaskar, Electronics Commerce, Tata McGraw-Hill
4. Ivan Bayross, Web Enabled Commercial Application Development, BPB Publications
5. James Conard, Patrick Rengler, Birn Eranics, Introduction to .net , Jay Elynn Wron Publications
6. Dave Chaffey. E-Business and E-Commerce Management- Strategy, Implementation and Practice, Pearson Education

## **System Analysis and Design (MBA 988)**

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective:** The overall objective of this subject is to familiarize the students with System Development concepts. System development life cycle, system project planning, system design & testing fundamentals.

### **Unit I**

System Definition and concepts: General Theory systems, Manual and automated systems, Real time business sub systems, System environment and Boundaries, Real time system and distributed systems, Basic principles of successful systems, Approach to system development: Structured System Analysis and Design, Prototype, Joint Application Development, Role and Need of Systems Analyst. Qualifications and responsibilities.

### **Unit II**

Introduction to Systems, Development Life Cycle (SDLC). Various phases of SDLC: Study Analysis, Design, Development, Implementation, Maintenance; Documentation: Principles of Systems Documentation, Types of documentation and their importance, Data and fact gathering techniques: Interviews, Group Communication -Questionnaires; Assessing Project Feasibility: Technical, Operational, Economic, Cost Benefits Analysis, Module specifications, Top-down and bottom-up design. Module coupling and cohesion, Structure Charts.

### **Unit III**

System Design and Modeling: Process Modeling, Logical and physical design, Conceptual Data Modeling: Entity/Relationship Analysis, Entity-Relationship Modeling, ERDs and DFDs, Structured English, Decision Tree, Table

### **Unit IV**

Planning considerations, Conversion methods, procedures and controls, System acceptance criteria, System Evaluation and Performance, Testing and Validation.

**Relevant case studies related to the topics should be discussed.**

#### **Suggested Readings:**

1. Hoffer J. A, George J.F, Valacich J.S, and Panigrahi P.K *Modern Systems Analysis and Design*, Pearson Education,
2. A. Dennis and B. H. Wixom, *Systems Analysis and Design*, John Wiley & Sons, Inc.
3. Whitten J. L, Bentley L. D, *Systems Analysis and Design Methods*, Tata McGraw-Hill,
4. Kendall & Kendall, *Systems Analysis and Design*, Pearson Education
5. *An Integrated Approach to Software Engineering* . Published by Springer

## Visual Programming (MBA 989)

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective:** The objective of this syllabus is to help the students in finding solutions to various real life problems and converting the solutions into computer program using Visual Basic (Event Driven programming). Students will be able to create software with 2 tier or 3 tier architecture. Students will learn about event driven programming and database access.

### Unit I

Introduction to Visual Basic 2005: History of Visual Basic, Features of Visual Basic 2005, B6.0 v/s VB 2005, Advantages of Visual Basic 2005.

Introduction to .Net, Origin and Structure of .NET Introduction to Visual Basic 2005 IDE: Solutions and Projects, Using the code editor.

### Unit II

Variables, Arrays and Collections, Constraints, Operators and Conditional Statements, procedures and Functions. Constructing a User Interface using windows forms, interacting with forms, form controls, Dialog Boxes.

### Unit III

MDI Applications and Menus, Types of Menus. Working with Databases using ADO.NET: Evolution of ADO.NET, Overview of ADO.NET, Working with ADO.NET objects.

### Unit IV

Introduction to Object Oriented Programming, Creating a class library using Visual Basic 2005. Exception and error handling, debugging in Visual Basic 2005.

**Relevant case studies related to the topics should be discussed.**

#### **Suggested Readings:**

1. Ivan Bayross, Sharanam Shah : Visual Basic 2005 for Beginners, Shroff *Publishers* & Distributors Pvt. Ltd.
2. Deitel & Deitel Visual Basic .NET How to Program, Prentice Hall
3. Anne Prince: Murach's Beginning Visual Basic .NET, BPB Publishers
4. Richard Blair, Jonathan Crossland, Matthew Reynolds, Thearon Willis, Beginning VB.NET Wrox Press

## **Introduction to Computer Networks (MBA 990)**

**Max. Marks: 100**

**External Assessment: 60**

**Internal Assessment: 40**

**Objective:** This course provides an in-depth discussion of computer networks. It includes a detailed discussion of the different Network Models. Concepts that have a direct effect on the efficiency of a network (e.g. different protocols and broadcast domains, topology) are also discussed.

### **Unit I**

**Overview:** Introduction : Data communications, networks, topology, the internet, protocols and standards ; Network Models: The OSI model, TCP/IP protocol suite, addressing.

### **Unit II**

**Physical Layer, Media & Data link Layer:** Data & signals: analog and digital, data rate limits, performance; Multiplexing: FDM, WDM, STDM, spread spectrum; Transmission media: guided media, unguided media; Switching: circuit switching , packet switching, structure of a switch Error detection and correction: Introduction, nature of errors, parity check, CRC, hamming code; CSMA/CD, CSMA/CA, FDMA, TDMA, SDMA; connecting devices : passive hubs, active hubs, repeaters, bridges, switches, gateways; frame relay, backbone networks, V LAN, ATM, protocols at physical layer & data link layer

### **Unit III**

**Network Layer & Application Layer:** IPv4 Addresses, IPv6 Addresses, IPv4 Addresses vs IPv6 Addresses internetworking, transition from IPv4 to IPv6, ICMP, IGMP, Protocols at network & application layer, routing & introduction to routing algorithms Domain Name System : Name space, domain name space, DNS in the Internet, resolution, remote logging, E-mail, file transfer, www, http

### **Unit IV**

**Network Security:** Introduction, cryptography, cryptography types, security Services, digital signatures, key management, ip security, SSI/TLS, firewalls

**Relevant case studies related to the topics should be discussed.**

### **Suggested Readings:**

1. Behrouz A Forouzan, Data communications, Tata McGraw-Hill
2. A.S.Tannenbaum, Computer Network, Prentice Hall
- 3 D.E.Cormer, Computer Networks, Addison Wesley and Internet
- 4 Cormer & Stevens, Inter networking with TCP-IP Design, Implementation Prentice Hall
- 5 D.Bertsekas & R.Gallagar, Data networks, Prenntice Hall

**MASTER OF BUSINESS ADMINISTRATION (1<sup>st</sup> YEAR)**

**Total Contact Hours = 26**

**Total Marks = 750**

**Total Credits = 27**

SEMESTER 1 <sup>st</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MBAD1-101	Principles & Practices of Management	4	-	-	40	60	100	4
MBAD1-102	Organization Behaviour	4	-	-	40	60	100	4
MBAD1-103	Accounting for Management	4	-	-	40	60	100	4
MBAD1-104	Quantitative Techniques	4	-	-	40	60	100	4
MBAD1-105	Managerial Economics	4	-	-	40	60	100	4
MHUM0-104	Business Communication	2	-	1	40	60	100	2.5
MCAP0-191	Computer Applications in Business	2	-	1	40	60	100	2.5
MBAD1-106	Minor Project-I	2	-	-	50	-	50	2
<b>Total</b>	<b>Theory = 7 Labs = 2</b>	<b>26</b>		<b>2</b>	<b>330</b>	<b>420</b>	<b>750</b>	<b>27</b>

**MASTER OF BUSINESS ADMINISTRATION (1<sup>st</sup> YEAR)**

**Total Contact Hours = 30**

**Total Marks = 750**

**Total Credits = 30**

SEMESTER 2 <sup>nd</sup>		Contact Hrs			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
MBAD1-207	Business Environment and Ethics	4	-	-	40	60	100	4
MBAD1-208	Macro Economics	4	-	-	40	60	100	4
MBAD1-209	Research Methodology	4	-	-	40	60	100	4
MBAD1-210	Production & Operations Management	4	-	-	40	60	100	4
MBAD1-211	Human Resource Management	4	-	-	40	60	100	4
MBAD1-212	Marketing Management	4	-	-	40	60	100	4
MBAD1-213	Financial Management	4	-	-	40	60	100	4
MBAD1-214	Minor Project- II	2	-	-	50	-	50	2
<b>Total</b>	<b>Theory = 7 Labs = NIL</b>	<b>30</b>			<b>330</b>	<b>420</b>	<b>750</b>	<b>30</b>

*\*Summer/Industrial Training for 6-8 weeks at the end of 2<sup>nd</sup> semester*

**Overall**

Semester	Marks	Credits
1 <sup>st</sup>	750	27
2 <sup>nd</sup>	750	30
<b>Total</b>	<b>1500</b>	<b>57</b>

**INSTRUCTIONS TO THE PAPER SETTERS**

There will be “*Three Sections*” of Question Paper - Section A, Section B and Section C

**1. Section A (20 Marks)**

It consists of 10 compulsory short notes of two marks each, that covers all the units equally.

**2. Section B (32 Marks)**

It consists of 08 questions (Ques. 2 to Ques. 9) of 8 marks each. (Two questions from each unit as mentioned below)

- a) Question 2 and Question 3 from Unit I (Choice between 2 and 3 only)
- b) Question 4 and Question 5 from Unit II (Choice between 4 and 5 only)
- c) Question 6 and Question 7 from Unit III (Choice between 6 and 7 only)
- d) Question 8 and Question 9 from Unit IV (Choice between 8 and 9 only)

**3. Section C (8 Marks)**

A short Case Study related to the syllabus

Note: In numerical based papers the paper setter should set one numerical question from each unit wherever it is possible.

# MBA

## FIRST SEMESTER

## SYLLABUS

**PRINCIPLES & PRACTICES OF MANAGEMENT**

**Subject Code: MBAD1-101**

**L T P C**  
**4 0 0 4**

**Duration: 45 Hrs**

**Learning Objectives:** This course aims to provide a thorough and systematic coverage of management theory and practice. The course aims at providing fundamental knowledge and exposure of the concepts, theories and practices in the field of management. It focuses on the basic roles, skills and functions of management, with special attention to managerial responsibility for effective and efficient achievement of goals.

**Unit I (13 Hrs)**

**Introduction to Management:** Definition, Nature, Significance and Scope. Functions of Manager, An Overview of Management Functions. Is managing a science or art? Evolution of Management Thought: Classical Approach, Scientific Management, General Administrative Theory, Quantitative Approach, Behavioral Approach, System approach and Contingency approach.

**Unit II (15 Hrs)**

**Planning and Decision Making:** Types of Plans and Process of Planning, Nature of Objectives, Setting Objectives. Importance and Steps in Decision Making, Types of Decision and Decision Making Under Different Conditions. Group Decision Making. Decision Making Styles

**Organizing:** Nature and Significance, Process of Organizing, Bases of Departmentation, Delegation and Decentralization, Line & Staff relationship

**Delegation:** Concept and Elements. Authority, Responsibility, Accountability

**Span of Management:** Factors Determining Effective Span-Situational Approach.

**Unit III (10 Hrs)**

**Coordination:** Concept and Importance, Factors which Make Coordination Difficult, Techniques or Methods to Ensure Effective Coordination.

**Control:** Concept, Planning-Control Relationship, Process of Control, Human Response to Control, Dimensions or Types of Control, Traditional & Modern Techniques of Control

**Unit IV (8 Hrs)**

**Management by Objectives:** Concept, Process, Benefits and Weaknesses, Comparative Study of Indian, Japanese and American Management Culture

**Current Trends in Management Practices:** Workforce Diversity, e-Business, Knowledge Management, Workplace Spirituality

**Course Outcomes:** After completing the course student will be able to understand and explain the concept of management and its managerial perspective. It will equip students to map complex managerial aspect arise due to ground realities of an organization. They will Gain knowledge of contemporary issues in Management principles and various approaches to resolve those issues.

### Recommended Books

1. Heinz Wehrich, Cannice & Koontz, 'Management (A Global Perspective)', Tata McGraw Hill.
2. Harold Koontz, and Heinz wehrich, 'Essentials of Management: An international Perspective', Tata McGraw Hill.
3. Stephen Robbins & Mary coulter, 'Management', Pearson Education
4. VSP Rao & VH Krishna, 'Management', Excel Books
5. P. Subba Rao, 'Principles of Management', Himalaya Publishing

## ORGANIZATION BEHAVIOR

**Subject Code: MBAD1-102**

**L T P C  
4 0 0 4**

**Duration: 45 Hrs**

**Learning Objectives:** The course aims to provide an understanding of basic concepts, theories and techniques in the field of human behavior at the individual, group and organizational levels in the changing global scenario. The course must be taught using case study method.

### Unit-I (10 Hrs)

**Organizational Behavior:** Concepts, Theories and organization aspects of OB, Contributing Disciplines to OB, challenges and opportunities for OB. Foundations of Individual Behavior: Biographical Characteristics, Learning, Theories of Learning, Attitudes, Attitude Change, Values & Believes, Prejudices

**Personality:** Determinants of Personality, Perception, Attribution Theory, Person's Perception.

### Unit II (12 Hrs)

**Motivation:** Definition & Process, Early Theories of Motivation, Contemporary Theories of Motivation, Nature and process of Motivation, Application of Motivation Concept.

**Job Satisfaction:** Nature & Significance of Job satisfaction, Leadership: Nature Significance & Theories; Leadership Effectiveness Model; Leadership in Indian Culture; Leadership traits & Skills; Behavioral Styles in Leadership. Transactional Analysis, Life Position, Johari Window Model.

### Unit-III (13 Hrs)

**Foundations of Group Behavior:** Nature & Concept of Group Formation, Stages of Group Formation, Theories of Group Formation. Teams, Difference between Group & Team.

**Group Decision Making:** Meaning & Nature; Decision making process; Decision Making Styles; Advantages & disadvantages of Decision Making; Techniques of Decision Making; Group Size & Decision Making; Consensus Decision Making in Groups.

**Conflict Management:** Definition of Conflict, transitions in Conflict thought; Functional Vs Dysfunctional Conflict; Conflict Process; Individual & Group Level Conflict; Organization

level Conflict; Conflict Management; Negotiations-Meaning & definition; Negotiations Process; Issues in Negotiations.

#### Unit-IV (10 Hrs)

**Organizational Change & Development:** Meaning & Definition, Change Agents, Change Models, Resistance to Change. Power and Politics in Organization: Nature & Concepts, Sources & Types of Power, Techniques of Politics. Stress Management: Meaning and Concept of Stress, Stress in Organizations, Strategies to Overcome Stress.

**Course outcomes:** After studying this course the students will equip with ability to Identify, explore and examine factors impinge on individual and group behavior in organizations in the new millennium; explain the terminology associated with organizational behavior. Incorporate and apply the predominant organizational behavior theories to gain knowledge of contemporary issues in organizational behavior and frameworks to work with real life organizational issues concerned with Human Behaviour at work place.

#### Recommended Books

1. Robbins, 'Organization Behaviour', Pearson Education
2. Luthans, 'Organization Behaviour', Tata McGraw Hill
3. Hersey, 'Management of Organizational Behaviour', Prentice Hall India
4. Aswathappa, 'Organization Behaviour', Himalaya Publications
5. L.M. Prasad, 'Organisation Behaviour', Sultan Chand
6. Parikh, Gupta, 'Organisational Behaviour', Tata McGraw Hill

### ACCOUNTING FOR MANAGEMENT

Subject code – MBAD1-103

L T P C

Duration – 45 Hrs

4 0 0 4

**Learning Objective:** This course aims to acquaint the students regarding various accounting concepts and its application in managerial decision making. The course attempts to build potential to use appropriate accounting tools and techniques of financial accounting and management accounting for preparing and analyzing financial statements.

#### Unit –I (12 Hrs)

Accounting as an Information System, Concepts, Convention and Principles of Accounting, Role of Accountant in an Organization, Branches of Accounting: Financial, Cost and Management Accounting and Their Inter-Relationships, Introduction of Accounting Standards. Exposure to Format of Schedule VI of Banking, Insurance and Public Limited Companies

#### Unit –II (11 Hrs)

Financial Analysis: Concepts and Objectives, Tools of Financial Analysis: Trend Analysis, Common Size Statements and Comparative Statements. Introduction to Ratio Analysis, Fund Flow and Cash Flow Statements (With Additional Information)

**Unit –III (14 Hrs)**

Cost Accounting: Meaning, Scope and Classification of Costs, Absorption Costing, Marginal Costing. Introduction to Break Even Analysis, Use of Cost-Data in Managerial Decision-Making with Special Reference to Pricing and Make or Buy Decisions, Introduction to Standard Costing including Variance Analysis: Materials and Labour Variances. Cost Control Techniques-Preparation of Budgets and Their Control, Zero Base Budgeting

**Unit –IV (8 Hrs)**

Introduction to Recent Developments in Cost Management: Price Level Accounting, Human Resource Accounting, Transfer Pricing, Target Costing, Kaizen Costing, Activity Based Costing and Life Cycle Costing

**Course outcomes:** After completing the subject students will be able to analyze a company's financial statements and come to a reasoned conclusion about the financial situation of the company. Students will also learn how to use the accounting and business terminology.

**Recommended Books**

1. Garrison, 'Managerial Accounting', Tata McGraw
2. Ramchandran, 'Financial Accounting for Management', Tata McGraw
3. Maheshwari, 'Financial Accounting', Vikas Publishing
4. Khan and Jain, 'Management Accounting', Tata McGraw
5. Jawahar Lal, 'Accounting for Management', Himalaya Publishing
6. J.Madegowda, 'Accounting For Managers', Himalaya Publishing

---

**QUANTITATIVE TECHNIQUES**

---

**Subject Code – MBAD1-104**

**L T P C**

**Duration – 45 Hrs**

**4 0 0 4**

**Learning Objectives:** Statistical methods are applied in all functional areas of business: accounting, finance, management and marketing. The main objective of the course is to enable students to understand the role and importance of Statistics in improving managerial decisions.

**Unit-I (12 Hrs)**

**Statistics:** An Overview- Concept, Significance and Limitations, Importance and Scope of Statistics in Decision Making, Especially in Business Management, Identification of Problem, Review of Literature, Distribution of Data - Normal Distribution

**Measure of Central Tendency:** Objectives of Averaging. Requisites of Measure of Central Tendency, Mathematical Averages – Arithmetic Mean (Simple And Weighted), Geometric Mean, Harmonic Mean, Averages of Position-Median And Mode, Partition Values- Quartiles, Deciles and Percentiles, Relationship Between Mean, Median and Mode, Comparison Between Measures of Central Tendency

**Measure of Dispersion:** Significance of Measuring Dispersion (Variation), Classification of Measure of Dispersion, Dispersion Measures- Range and Inter Quartile Range or Deviation. Average Deviation Measures- Mean Absolute Deviation, Variance and Standard Deviation, Chebyshev's Theorem, Coefficient of Variation, Skewness, Moments and Kurtosis: Measures of Skewness, Moments: about Mean, Arbitrary Point, Zero or Origin. Measures of Kurtosis.

### Unit-II (11 Hrs)

**Correlation:** Significance, Types, Methods of Correlation Analysis: Scatter Diagrams, Graphic Method, Karl Pearson's Correlation Co-Efficient, Rank Correlation Coefficient, Properties of Correlation, Karl Pearson's Co-Efficient of Correlation and Rank Correlation

**Regression:** Concept of Regression and The Difference between Correlation and Regression, Lines and Equations of Regression. Regression as a Predicting Tool

**Time Series Analysis:** Components of a Time Series, Determination of Secular Trend and Seasonal Variations in Business Data, Least Squares Method as a Tool for Forecasting.

### Unit-III (12 Hrs)

**Index Numbers:** Different Methods of Constructing Price and Quantity Index Numbers. Fixed Base and Chain Base Index Numbers, Problems of Reversibility in Index Numbers

**Probability:** Definition, Types of Probability, Classical Approach, Relative Frequency and Subjective Approach to Probability, Theorems of Probability, Addition, Multiplication and Bays Theorem and Its Application Probability Distribution Function, Cumulative Probability Distribution Function, Expected Value and Variance of a Random Variable

**Discrete Probability Distribution:** Binomial Distribution and Poisson Distribution

**Continuous Probability Distribution:** Approximation of Binomial and Poisson Distribution of Normal Distribution

### Unit-IV (10 Hrs)

**Sampling:** Concepts of Census and Sampling, Types of Sampling – Probability and Non Probability Sampling Central Limit Theorem, Determination of Sample Size and Sample Error

**Hypotheses Design:** Formulation of Null and Alternative Hypothesis, Level of Significance. Concept of Standard Error of Mean, Confidence Limits

**Hypotheses Testing:** Type I and Type II Errors, Student's 'T' Test in Small Samples, Z-Test, Chi-Square Test, Analysis of Variance (Numerical Using Statistical Tables).

**Course Outcomes:** Student will be able to understand the measurement systems variability, control processes (as in statistical process control or SPC), for summarizing data, and to make data-driven decisions.

### Recommended Books

1. Levin & Rubin, 'Statistics for Management', Prentice Hall
2. Beri, 'Business Statistics', Tata Mc Graw Hill
3. Croucher, 'Statistics: Making Business Decisions', Tata McGraw Hill
4. Gupta & Gupta, 'An Introduction to Statistical Methods', Vikas Publications
5. S P Gupta, 'Statistical Methods', Sultan Chand
6. C.R. Reddy, 'Quantitative Techniques for Management Decisions', Himalaya Publishing

**MANAGERIAL ECONOMICS**

**Subject Code: MBAD1-105**

**L T P C**  
**4 0 0 4**

**Duration: 45 Hrs**

**Learning Objective:** This course is intended to make students understand various social, political, legal and economic and other factors that influence business in India so as to enable them appreciate associated opportunities, risks and challenges and their relevance for managerial decisions.

**Unit-I (11 Hrs)**

**Managerial Economics:** Meaning, Nature, Scope & Relationship with Other Disciplines, Role of Managerial Economics in Decision Making, Opportunity Cost Principle, Production Possibility Curve, Incremental Concept

**Marginal Analysis:** Law of Diminishing Marginal Utility, Law of Equi-Marginal Utility, **Indifference Curve Analysis:** Meaning Assumptions Properties, Consumer Equilibrium and Its Application.

**Unit-II (12Hrs)**

**Demand Analysis:** Law of Demand: Meaning, Determinants, Exceptions, Bandwagon and Snob Effects, Demand Function, Application of Demand Analysis in Managerial Decision Making. Elasticity of Demand: Meaning, Types & Degree of Elasticity of Demand, Methods of Measuring Price Elasticity of Demand, Factors Determining the Elasticity of Demand, Demand Forecasting: Importance, Scope, Techniques of Forecasting.

**Unit-III (12 Hrs)**

**Theory of Production:** Production Function, Short Run and Long Run Production, Analysis, Isoquants, Optimal Combination of Inputs, Application in Managerial Decision Making. Theory of Cost - Cost Analysis: Cost Concepts and Determinants of Cost, Traditional and Modern Theory of Cost: Long Run and Short Run, Economy of Scale, Revenue Curve.

**Unit-IV (10 Hrs)**

**Market Structure:** Price Output Decision Under Perfect Competition, Monopoly, Monopolistic and Oligopoly Competition, Application in Managerial Decision Making. Behavior of Firms and Game Theory: Nash Equilibrium, Prisoner's Dilemma.

**Course Outcomes:** After studying the subject the students will be able to understand and explain the concept of economics and its managerial perspective including the real insight of the consumer's economic behavior leading them to estimate the demand for the new product as well as changes in the existing products.

**Recommended Books**

1. Peterson and Lewis, 'Managerial Economic', Prentice Hall of India
2. Froeb, 'Managerial Economics', Cengage Learning
3. Geetika, 'Managerial Economics', Tata McGraw Hills
4. K.K .Dewett, ' Modern Economic Theory', S. Chand Publication
5. D.M.Mithani, 'Managerial Economics Theory and Applications', Himalaya Publication

6. D.N.Dwivedi, 'Managerial Economic', Vikas Publications.

## BUSINESS COMMUNICATIONS

**Subject Code: MHUM0-104**

**L T P C**  
**2 0 1 2.5**

**Duration: 28 Hrs**

**Learning Objective:** This course is designed to give students a comprehensive view of communication, its scope and importance in business, the role of communication in establishing a favorable image of the organization. The aim is to develop students' ability to communicate correctly and effectively on matters having relevance to day-to-day business operations. This course will make student conversant with fundamentals of communication, help them honing oral, written and non-verbal communication skills and to transform their communication abilities.

### Unit- I (7 Hrs)

**Introduction to Communication:** Meaning, Process, Importance of Communication in Business, Types of Information, Formal and Informal Communication, Internal and External Communication. Approaches to Effective Communication, Essentials of Effective Business Communication (7Cs model)

**Written Communication:** Advantages and Disadvantages, Covering letter, Need, Functions and Kinds, Layout of Letter Writing, Types of Letter Writing: Persuasive Letters, Request Letters, Sales Letters, Complaints and Adjustments

### Unit –II (7 Hrs)

**Developing Reading Skills:** Identify the Purpose of Reading, Factors Effecting Reading, Learning How to Think and Read, Developing Effective Reading Habits, Reading Tactics and Strategies: Training Eye and Training Mind (SQ3R)

**Developing Listening Skills:** Importance, Purpose of Listening, Art of Listening, Factors Affecting Listening, Components of Effective Listening, Process of Listening, Principles and Barriers to Listening, Activities to Improve Listening

### Unit- III (7 Hrs)

**Oral Communication:** Advantages and Disadvantages, Conversation as Communication, Art of Public Speaking, Group Communication Through Committees, Preparing and Holding Meetings, Overcoming Stage Fright, Ambiguity Avoidance.

**Departmental Communication:** Meaning, Need and Types: Interview Letters, Promotion Letters, Resignation Letters, Newsletters, Circulars, Agenda, Notice, Office Memorandums, Office Orders, Press Release

**Report Writing:** Structure, Types, Formats, Drafting of Various Types of Report. Nonverbal – Features, Understanding of Body Language, Posture, Gestures. Influences on Communication: Social Influences, Culture and Communication, Few Guidelines for Better Multicultural Communication, Business Etiquettes and Communication.

### Unit- IV (7 Hrs)

**Group Discussion:** Nature, Uses And Importance, Guidelines for GD Presentations: How To Make Effective Presentations, Four P<sup>s</sup> of Presentation, Structuring, Rehearsing and Delivery Methods.

**Resume Writing:** Planning, Organizing Contents, Layout, Guidelines for Good Resume. Interviews: Preparation Techniques, Frequently Asked Questions about How to Face an Interview Board, Proper Body Posture, Projecting a Positive Image, Steps To Succeed In Interviews, Practice Mock Interview in Classrooms.

**The Case Method of Learning:** Dimensions of a Case, Case Discussion, Usefulness of The Case Method, Training of Managers, Use The Case Method. Report Writing: Structure, Types, Formats, Preparations And Presentation.

**Course Outcome:** After studying this course the students will enable to:

- Know the dynamics of communication in the business world
- Practice the different tools of communication
- Enable them to speak effectively suited to the situation
- Improve their competence in English

#### Recommended Books

1. Lesikar, Petit & Flately, 'Lesikar's Basic Business Communication', Tata McGraw Hill
2. Raman Meenakshi 'Prakash Singh, Business Communication', Oxford University Press.
3. Rizvi Ashraf, 'Effective Technical Communication', Tata McGraw Hill
4. Krizan, Buddy, 'Merrier, Effective Business Communication', Cengage Learning
5. Diwan & Aggarwal, 'Business Communication', Excel
6. Baugh, Frayer & Thomas, 'How to write first class Business Correspondence, Viva Books Taylor, English Conversion Practice', Tata McGrawHill
7. Devaraj, 'Executive Communication', Tata McGraw Hill
8. Ober, 'Effective Bossiness Communication', Cengage Learning

## COMPUTER APPLICATIONS IN BUSINESS

**Subject Code: MCAPO-191**

**L T P C**

**Duration: 28 Hrs**

**2 0 1 2.5**

**Learning Objective:** The objective of this course is to provide an insight into basic features of computer systems and their applications in Managerial Decision Making. It also provides technical framework to students for understanding the emerging world of e-Business.

#### Unit-I (7 Hrs)

**Introduction to Computers:** Types of Computers, Storage Devices and Memories, Input/Output Devices. Introduction to Software, Types of software – Software, its nature and qualities.

**Operating System:** Types of Operating System, WINDOWS XP: Basic Operations, utilities and features.

**Unit-II (7 Hrs)**

**MS Applications:** MS Word – Basics, Formatting text and Documents, Mail Merge, Macros

**MS Excel** – Introduction, Creating a List, Graphs and Charts, Sorting, Filtering Data, Pivot tables, Freezing Panes and Basic Formulae in Excel

**MS PowerPoint** – Basics, Creating effective presentation, Animations and Templates

**Unit-III (7 Hrs)**

**Internet and E-Business:** Introduction to internet and its applications, Intranet and Extranet, World Wide Web, Internet Applications. E – business - E-Business framework, Infrastructure for E-Business, E - Shopping, Electronic Data Interchange.

**Unit-IV (7 Hrs)**

**Computer Networks and Security:** Overview of a Network, Types of Network, Network Topologies, Firewall, Cryptography, Public Key and Private Key Cryptography, Digital Signatures.

**Course Outcomes:** Students will be able to understand the concepts of computer and various software related to it. The use of MS Office (Excel, Access & Power point) helps in different type of analysis and projection of reports related to the business management. The software helps in planning & coordinating the supply chain of the company.

**Recommended Books**

1. Rainer and Potter, 'Introduction to Information Technology', John Wiley and Sons.
2. Roger Jennings, 'Microsoft Access 2010', Pearson Education
3. Forouzan, 'Basics of Computer Science', Cengage Learning
4. Joseph Brady & Ellen F Monk, 'Problem Solving Cases in Microsoft', Excel Thomson Learning.
5. K. Saini & Pradeep Kumar, "Computer Applications in Management", Anmol Publications.
6. Deepak Bharihoke, "Fundamentals of Information Technology", Excel Books.

**MINOR PROJECT - I**

**Subject Code – MBAD1- 106**

**L T P C**

**2 0 0 2**

- The students will have to formulate a problem related to any business area and write a review the literature of at least 20 studies related to the problem in a proper format.
- The students will have to submit the report and a presentation on the report of 15-20 minute is mandatory.

# MBA

## SECOND SEMESTER

### SYLLABUS

**BUSINESS ENVIRONMENT AND ETHICS**

**Subject Code: MBAD1-207**

**L T P C**  
**4 0 0 4**

**Duration: 45 Hrs**

**Learning Objectives:** Well thought-out decision making in a business organization requires the proper knowledge of the environment in which it has to function. This course aims at exposing the students to the corporate business environment forces that may affect their future decision making.

**Unit –I (13 Hrs)**

**Overview of Business Environment:** Definition, Components, Nature and Significance of Business Environment

**Types of Business Environment:** Internal and External, Process of Environmental Scanning. Need to Scan The Business Environment and Techniques of Scanning The Business Environment.

**Political Environment:** Relation between Business and Government of India. Constitutional Provisions Related to Business, Concept of State Intervention in Business, Ideology of Different Political Parties, Bureaucracy and Indian Business.

**Three Political Institutions:** Legislature, Executive and Judiciary.

**Unit –II (12Hrs)**

**Economic Environment:** Planning, Industrial Policy. Legal Environment: Company Regulatory Legislations in India, FEMA, Latest EXIM Policy. Competition Law, Consumer Protection Act 1986, Right to Information Act 2005.

**Technological Environment:** Impact of Technology on Business, Problem of Transfer of Technology, Social Issues Related with Technology and Their Relevance for Business

**Unit –III (10 Hrs)**

**Current Scenario of Business Environment in India:** Impact of Liberalization and Privatization on Indian Economy. Globalization Trend

**Global Trade:** Nature & Operations of Multilateral Economic Institutions - World Bank, WTO & IMF and Their Impact on Indian Business Environment

**Unit –IV (10 Hrs)**

**Corporate Governance & Ethical Issues:** Corporate Governance, Corporate Social Responsibility, Meaning, Nature and Scope of Business Ethics, Ethical Principles, Ethics and Market Practices, Ethics and Government, Ethics and Social Environment, Indian Management Thoughts, Freedom of Conscience, Work Life Balance.

**Course Outcomes:** After completion of the subject the students will be familiarized with the nature of business environment and its components. The subject contents facilitate the students to develop conceptual framework of business environment and generate interest in international business.

### Recommended Books

1. Manuel G. Velasquez, 'Business Ethics', Pearson Education
2. Sheikh Saleem, 'Business Environment', Pearson Education
3. Frances Cherunilam, 'Business Environment', Himalaya Publishing House
4. K. Aswathapa, 'Business Environment', Tata Mcgraw Hill
5. Biswanath Ghosh, 'Ethics in Management and Indian Ethos', Vikas Publication

## MACRO ECONOMICS

**Subject Code: MBAD1-208**

**L T P C**

**Duration: 45 Hrs**

**4 0 0 4**

**Learning Objective:** This course will teach students the basic tools of macroeconomics and apply them to real world economic policy. The goals of the course are for students to understand how to evaluate macroeconomic conditions, understand how monetary policy and fiscal policy can be used to influence short-run macroeconomic conditions.

### Unit-I (11 Hrs)

**Nature of Macro-Economic System;** Role of Macro Economics for Managerial Decision Making Circular Flow of Income; **National Income:** Concepts and Measurement, Keynesian Theory of Income Determination, Consumption Function, Keynes' Psychological Law of Consumption, Income-Consumption Relationship: Relative Income, Life Cycle and Permanent Income Hypothesis.

### Unit-II (10 Hrs)

Saving and Investment Functions; Marginal Efficiency of Capital; Multiplier, Accelerator and Investment Behavior, Balance of Payment and Exchange Rate Determination Applications: India's Experience With Exchange Rate, Impact of Fluctuations in Exchange Rate on Export, Import and Growth of Domestic Industry

### Unit-III (10 Hrs)

**Introduction to Demand and Supply of Money:** Motive for Holding Money; Liquidity Preference

**Inflation and Unemployment:** Concepts of Inflation-Demand Pull And Cost Push; Introduction to Philips Curve as Relation Between Inflation And Unemployment.

**Business Cycle:-**Features and Phases, Effects And Control.

### Unit-IV (14 Hrs)

**Macro Economic Policy:** Understanding of Macroeconomic Stabilization and Structural Reforms. Central Banking Operations and Aspects of Monetary Management; Growth and Stabilization Effects of Monetary Policy Operations; Nature and Components of Fiscal Policy; Fiscal Policy Operations for Macro-Economic Growth and Stabilization; Fiscal Deficit and Its Management; Public Debt Operations and Their Impact, Co-Ordination of

Fiscal And Monetary Policies For Effective Macro-Management; Corporate Adjustments To Monetary And Fiscal Variations.

**Course Outcomes:** Upon successful completion of the course, the student should be able to demonstrate a basic understanding of news relating to the economy as a whole, the economic implications of changes in government fiscal or monetary policy; how interest rates are determined and the role of interest rates in personal and corporate decision-making; and critically apply economic concepts when participating as a citizen in a democratic society. In particular, the students should be able to calculate equilibrium national income levels, calculate and use various multipliers, convert nominal values to real values.

### Recommended Books

1. Olivier Blanchard, 'Macroeconomics Updated Englewood Cliffs:' Prentice Hall 5<sup>th</sup> edition, **2011**
2. Dimand, Robert W. Durlauf, Steven N.; Blume, Lawrence E., eds. "Macroeconomics, Origins and History" **2008**
3. D.N. Dwivedi, 'Macroeconomics: Theory and Policy', Tata McGraw-Hill, New Delhi, **2001**
4. John Bouman, 'Principles of Macroeconomics – free fully comprehensive Principles of Microeconomics and Macroeconomics texts'

## RESEARCH METHODOLOGY

**Subject Code: MBAD1-209**

**L T P C**  
**4 0 0 4**

**Duration: 45 Hrs**

**Learning Objectives:** The course aims at equipping students with an understanding of the research process, tools and techniques in order to facilitate managerial decision making. Theoretical Framework

### Unit –I (10 Hrs)

**An Introduction to Research:** Meaning, Definition, Objectives, and Process; Research Problem: Selection of Problem, Understanding Problem, Necessity of Defined Problem, Review of Literature in Research.

**Research Design:** Meaning, Types - Descriptive, Diagnostic, Exploratory and Experimental

### Unit –II (12 Hrs)

**Sources Of Data:** Primary and Secondary; Data Collection Methods; Questionnaire Designing: Construction, Types and Developing A Good Questionnaire. Sampling Design and Techniques, Scaling Techniques, Meaning, Types, Data Processing Operations, Editing, Coding, Classification, Tabulation. Research Proposal/Synopsis Writing, Practical Framework

### Unit –III (13 Hrs)

**Statistical Software:** Use of SPSS and Excel: Windows Process, Basic Structure of Data File, Using Data Editor, Working With Multiple Data Sources, Graphs and Charts, Sorting and Selecting Data

**Descriptive Statistics:** Central Tendency and Dispersion, Correlation: Linear, Partial and Multiple, Simple and Multiple Regression, Discriminant Analysis, Conjoint Analysis, Time Series and Business Forecasting, Applications of Index Numbers; Sampling Distribution; **Tests of Significance:** Z- Test, T- Test, Chi-Square Test, F -Test, and ANOVA, Use Of SPSS for T-Test, Chi-Square Test and ANOVA.

#### Unit –IV (10 Hrs)

Multi Dimensional Scaling, Factor Analysis, Cluster Analysis, Interpretation of Data, Report Preparation and Presentation.

*\*Each Student has to prepare Mini Research Project on Topic / Area of their Choice and Make Presentation. The report should consist of application of tests and techniques mentioned in above units.*

**Course Outcomes:** After completing this course the students should be able to understand the principles of research and enable students to link the research process with theories of their specialist areas.

#### Recommended Books

1. D R. Cooper, & P.S,Schindler, 'Business Research Methods', Tata McGraw Hill
2. Hiolton, Brownlow McMurray,Cozens, SPSS Explained, Tata McGraw Hill
3. N. Malhotra, and S.,Dash, 'Marketing Research : An Applied Orientation', Pearson Education
4. C.R,Kothari, ' Research Methodology: Methods & Techniques', New Age International Publishers.
5. Darren George & Paul Mallery, 'SPSS for Windows Step by Step', Pearson Education

### PRODUCTIONS & OPERATIONS MANAGEMENT

**Subject Code: MBAD1 - 210**

**L T P C  
4 0 0 4**

**Duration: 45 Hrs**

**Learning Objective:** It is a subject where a student learns various steps of product design, development, production, plant location, storage, production planning and control. The students are motivated to apply concepts and principles of management to become more effective professional

#### Unit- I (12Hrs)

**Operations Management:** Concept, Functions. Transformation Process Model: Inputs, Process and Outputs; Classification of Operations; Responsibilities of Operations Manager, Contribution of Henryford, Deming, Crosby, Taguchi. Facility Location – Importance, Factors in Location Analysis, Location Analysis Techniques. Product Design and Development – Product Design and Its Characteristics, Product Development Process (Technical), Product Development Techniques. Process Selection- Project, Job, Batch, Mass and Process Types of Production Systems, Operations Management in Corporate Profitability and Competitiveness

**Unit- II (10 Hrs)**

**Facility Layout:** Objectives, Advantages, Basic Types of Layouts, Problems in facility layout.

**Production Planning & Control (PPC):** Concepts, Objectives and Functions, work study – Productivity: Method study; Work measurement.

**Capacity Planning:** Concepts, Factors affecting Capacity Planning, Capacity Planning Decisions.

**Unit- III (13 Hrs)**

**Quality Management:** Introduction, Meaning, Quality Characteristics of Goods and Services, Jurans' Quality Trilogy, Deming's 14 Principles, Tools and Techniques for Quality Improvement, Statistical Process Control Chart, Quality Assurance, Total Quality Management (TQM) Model Concept of Six Sigma and its Application.

**Acceptance Sampling:** Meaning, Objectives, Single Sample, Double Sample and Multiple Sample Plans with sated risk,

**Control Charts for Variables:** Averages and Ranges, Control Charts for Defectives – Fraction Defective and Numbers Defective.

**Unit- IV (10 Hrs)**

**JIT and Lean Production System:** JIT Approach, Implementation requirements, Services, Kanban System. Inventory Management: Concepts, Classification, Objectives, Factors Affecting Inventory Control Policy, Inventory Costs, Basic EOQ Model, Re-order level, ABC analysis, Logistics and Franchising

**Purchasing Management:** Objectives, Functions, Methods, Procedure, and Value Analysis: Concepts, Stock Control Systems, Virtual Factory Concept and Production Worksheets.

**Course Outcomes:** After studying this course, the students learn the role of operations on achieving various competitive capabilities. The students also learn how to help an organization in improving productivity and meeting customer's competitive capabilities.

**Recommended Books**

1. Buffa & Sarin, 'Modern Production/Operations Management', John Wiley, 8<sup>th</sup> edition
2. Chary, Production and Operations Management, Tata McGraw-Hill
3. Krajewski & Ritzman, 'Operations Management', Pearson Education, 5<sup>th</sup> edition
4. Adam and Eben, 'Production & Operations', 5th ed Prentice Hall, 5<sup>th</sup> edition

---

**HUMAN RESOURCE MANAGEMENT**

**Subject Code: MBAD1- 211**

**L T P C**

**Duration: 45 Hrs**

**4 0 0 4**

**Learning Objectives:** The objective of the paper is to make student aware of the various functions and importance of the HR Department in any organization. It is basically concerned with managing the human resources, whereby the underlying objective is to

attract retain and motivate the human resources in any organization, which is the most challenging and daunting look for any organization today.

#### **Unit-I (10 Hrs)**

**Human Resources Management:** Meaning, Scope, Objective, Functions, Roles and Importance. Interaction with other Functional Areas, HRM & HRD – A Comparative Analysis, Human Resource Management practices in India.

**Human Resource Planning:** Concept, Process, importance and Methods. Human Resource Information System

**Job Analysis:** Job Description, Job Specification. Job Evaluation – Concepts and Methods

#### **Unit-II (10 Hrs)**

**Recruitment & Selection:** Concept, Process & Methods of Recruitment & Selections. Induction & Placement

**Training & Development:** Concept and Methods, Difference between Training & Development, Aligning Training to Business Needs, Future of Training & development. Career Planning, Coaching & Mentoring

**Internal Mobility:** Promotion, Transfer, Demotion, Separation

#### **Unit-III (13 Hrs)**

**Performance Appraisal:** Concept, Methods and Issues in Performance Appraisal, Potential Appraisal. Compensation Management- Wage & Salary Administration: Concept of Wage & Salary Administration, Elements & Methods of Wage & Salary, Incentive Plans & Fringe Benefits.

**Quality of Work Life (QWL):** Concept, Development, Various Approaches and Techniques for improving QWL. Job Stress, Counseling and Monitoring, Job Satisfaction, Morale and productivity

#### **Unit IV (12 Hrs)**

**Industrial Relations:** Concept, Importance and Difference between HR and IR. **Collective Bargaining:** Meaning, Scope, Objectives, Issues and Strategies, Negotiations Skills and Strategies, Participative Management

**Employee Grievances and Their Resolution:** Model for Grievance Resolution Procedure.

**Quality Circles:** Concept, Structure and Role of Management, Quality Circle in India, HR Audit, Contemporary Issues in HRM.

**Course Outcome:** After completing this course the students should be able to understand the concepts, principles and processes of HRM, understand the crucial role that HRM plays in helping organizations all over the world adapt to the endless change today.

#### **Recommended Books**

1. Edwin B. Flippo, 'Personal Management, Tata', Mc Graw Hill
2. Bohlander, 'Snell & Vohra, Human Resource Management', Cengage Learning

3. Gary Dessler, 'Human Resource Management', McMillan
4. V.S.P.Rao, 'Human Resource Management', Excel Books
5. C.B. Memoria, 'Personnel Management', Himalaya Publications
6. T.N. Chhabra, 'Human Resource Management', Dhanpat rai & sons.
7. C.B. Gupta, 'Human Resource Management', Sultan Chand and Sons
8. R.S. Dwivedi, 'HRD in India Companies', Himalaya Publications

## MARKETING MANAGEMENT

**Subject Code: MBAD1-212**

**L T P C**

**Duration: 45 Hrs**

**4 0 0 4**

**Learning Objectives:** The course aims at making students understand concepts, philosophies, processes and techniques of managing the marketing operations of a firm in turbulent business environment. This course will provide better understanding of the complexities associated with marketing functions, strategies and provides students with the opportunity to apply the key concepts to practical business situations.

### Unit –I (12 Hrs)

**Understanding Marketing and Consumers:** Definition, Importance, Scope, Various Marketing Concepts, Marketing Mix, Marketing vs Selling, Effect of Liberalization and Globalization, Creating Customer Value. **Analyzing Marketing Environment:** Micro, Macro **Corporate Strategic Planning:** Defining Role Marketing Strategies, Marketing Planning Process.

**Marketing Information System:** Concept and Components

**Consumer Behaviour:** Understanding Consumer Behaviour, Factors Influencing Consumer Buying Behaviour, Business Buying Process, Understanding Business Buyer Behaviour

### Unit –II (12 Hrs)

**Creating and Managing Product:** Market Segmentation & Targeting, Differentiation & Positioning, Competitors Analysis

**Product Decisions:** Product Mix, Packaging and Labeling Decisions, Branding & Brand Equity, Services Marketing, New Product Development, Consumer Adoption Process, Product Life Cycle and Strategies

**Pricing Decisions:** Objectives, Factors Affecting Pricing Decisions, Pricing Methods, Price Changes, Pricing Strategies

### Unit –III (11 Hrs)

**Delivering and Promoting Product - Supply Chain Decisions:** Nature, Types, Channel Design and Channel Management Decisions, Retailing, Wholesaling, Managing Logistics and Supply Chain.

**Promotion Decisions:** Communication Process, Promotion Mix, Advertising, Sales Promotion, Public Relations, Direct Selling and Online Marketing.

**Personal Selling:** Personal Selling Process, Managing the Sales Force, Designing Quota & Territories, Evaluating Performance.

**Unit –IV (10 Hrs)**

**Emerging Trends in Marketing:** Green Marketing, Event Marketing, Network Marketing, Direct Marketing, Social Marketing, Buzz Marketing/ Viral Marketing, Consumerism, Customer Relationship Management (CRM), Customer Satisfaction, Loyalty, Retention, Global Marketing, Rural Marketing,

**E-Commerce:** Marketing in The Digital Age

**Note: Relevant Case Studies should be discussed in class.**

**Course Outcomes:** This course will equip students to review marketing issues with respect to understand basic concepts of Marketing, understand target segmentation and consumer decision making design of products that meet consumer needs understand pricing, channels of distribution understand marketing communication.

**Recommended Books**

1. Ramaswamy & Namakumari, 'Marketing Management', McMillan
2. Etzel, Walker, Stanton, and Pandit, 'Marketing Management', Tata McGrawHill,
3. Kurtz & Boone, 'Principles of Marketing', Cengage Learning
4. Kotler & Koshy, 'Marketing Management', Pearsons Education
5. Kotler & Armstrong, 'Principles of Marketing', Prentice Hall
6. Biplab S. Bose, 'Marketing Management', Himalaya Publications

---

**FINANCIAL MANAGEMENT**

**Subject Code: MBAD1-213**

**L T P C**

**Duration: 45 Hrs**

**4 0 0 4**

**Learning Objectives:** To provide an understanding of the function, the roles, the goals and the processes of corporate financial management, covering the sourcing of finances and their issues in investment and operations. Problem-solving methodology will be used to illustrate the theories and tools in financial decision making.

**Unit I (12 Hrs)**

Nature, Scope and Objectives of Financial Management, Profit Maximization Vs Wealth Maximization, Financial Planning, Forms of Business Organization, Role of Financial Manager

**Financing Decision:** Cost of Capital, Computation of Cost of Equity, Debt and Quasi Capital, Weighted Average Cost Capital – Capital Structure – Factors Affecting Capital Structure, Liquidity Ratios

**Capital Structure Theories:** Net Income Approach, Net Operating Income Approach, Traditional Approach, Modigliani-Miller Model (MM), Criticisms of MM Models, Financial Distress & Agency Cost, Asymmetric Information Theory.

**Capital Structure Policy:** Determinants of Capital Structure Decision, Approach to Estimating the Target Capital Structure, Variations in Capital Structures, EBIT / EPS Analysis and ROI / ROE Analysis, Profitability Ratios

**Unit II (12 Hrs)**

**Leverage:** Measuring and analyzing the implications of Leverage - Operating Leverage, Financial Leverage and Combined Leverage CVP analysis, PV Chart and Break Even Analysis for business decisions, Leverage Ratios

**Investment Decision:** Nature and Significance of Investment Decision, Time Value of Money - Future value of a single cash flow, Annuity, Present Value of a Single Cash Flow, Annuity, Present Value of an Uneven Cash Flow, Multi -Period Compounding

**Capital Budgeting:** Process and Techniques, Discounted and Non-Discounted Methods (Pay Back, ARR, NPV, IRR, Benefit Cost Ratio)

**Introduction Risk and Return:** Risk and Return Concepts, Risk in a Portfolio Context, Relationship between Risk and Return Model - CAPM, APT, (with numerical problems), Certainty Equivalent Factor, Capital Rationing

**Unit III (11 Hrs)**

**Dividend Decisions:** Meaning and Significance of Dividend, Dividend Models: Traditional Model, Walter Model, Gordon Model, Miller-Modigliani Position, Rational Expectations Mode, Determinants of Dividend, Bonus Shares, Stock Splits. Dividend Ratios, Dividend Capitalization Approach

**Working Capital Decision:** Meaning, Nature and Scope of Working Capital - Component of Working Capital – Factors affecting Working Capital, Working Capital Strategies, Working Capital Ratios, Operating cycle, Cash Management Models – Cash Budgeting– Inventory Management

**Unit IV (10 Hrs)**

**Long term Sources of Funds:** Equity share, Preference shares, Debentures, Bonds, Warrants, Venture capital and Ploughing back of profits

**Short Term Sources of Funds:** Commercial Paper, Certificate of Deposit, Treasury Bills

**Financial Markets:** Nature and Significance of Primary and Secondary Markets, objectives and functions, Stock Market Index calculation, Venture capital financing, EVA

**Course Outcome:** After completing this course the students should be able to make optimum decisions pertaining to raising funds, making investments & managing the assets of a corporation, big or small, with an ultimate goal of creating value.

**Recommended Books**

1. Brigham, 'Financial Management : Text & Cases', Cengage Learning
2. Brealy & Myres, 'Principles of Corporate Finance', Tata McGraw Hill
3. John J., 'Financial Decision Making: Concept, Problem & Cases', Prentice Hall
4. I.M. Pandey, 'Financial Management', Vikas Publishers
5. Khan & Jain, 'Financial Management', Tata McGraw Hill

**MINOR PROJECT - II**

**Subject Code – MBAD1- 214**

**L T P C**

**2 0 0 2**

- The students will have to submit a research report on the relevant management topic. The students may continue with minor Project-I or may select any other fresh topic.
- The report must contain an empirical based analysis with the help of statistical softwares like SPSS/MS Excel.
- The students will have to give presentation of 15-20 minute on the research report.

MRSPTU