



DIRECTOR
Institute of Engineering and Technology
JK Lakshmipat University
JAIPUR (Rajasthan)

JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-16

SEMESTER – I - VIII

Curriculum, Detailed Syllabus

&

Scheme of Examination



INSTITUTE OF ENGINEERING AND TECHNOLOGY

VC, JKLU-Jaipur: The First Semester Courses of 4-year B-Tech Programme have been thoroughly discussed and deliberated upon in the Faculty Council of Institute of Engineering and Technology of JKLU-Jaipur for the B-Tech Batch of 2012-16. Recommended and Forwarded for approval.

[Signature]
20/07/2012

Director - IET
Academic Section

[Signature]
Approved

[Signature]
20/7/12
Vice Chancellor

HANDOUTS

B. Tech. First Semester-2012

JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

Teaching and Examination Scheme for 4- Year B. Tech Programme (Batch: 2012-2016)

I & II Semesters (Common to all Branches of Engineering)

| Year | Code | Semester I | L T P | C | Code | Semester II | L T P | C |
|------|--------|------------------------------|-------|---|-------|--------------------------------------|-------|---|
| I | LA101 | English Communication Skills | 2 0 0 | 2 | LA201 | Professional Communication Skills | 2 0 2 | 3 |
| | MA101 | Engineering Mathematics - I | 3 1 0 | 3 | MA201 | Engineering Mathematics - II | 3 1 0 | 3 |
| | PH101 | Engineering Physics - I | 3 1 2 | 4 | PH201 | Engineering Physics - II | 3 1 2 | 4 |
| | CH101 | Engineering Chemistry - I | 3 1 2 | 4 | CH201 | Engineering Chemistry - II | 3 1 2 | 4 |
| | CSE101 | Computer Programming & IT | 3 0 2 | 4 | EE201 | Electrical & Electronics Engineering | 3 1 2 | 4 |
| | ID101 | Environmental Studies | 3 0 0 | 2 | ME201 | Engineering Mechanics | 3 1 0 | 3 |
| | ME102 | Workshop Practice | 0 0 3 | 2 | ME241 | Machine Drawing | 0 0 3 | 3 |
| | CE101 | Engineering Graphics | 0 0 3 | 2 | | | | |

L = Lectures; T = Tutorials; P = Practicals; C = Credits; W = Weeks; A = Audit

Teaching and Examination Scheme for 4-Year B. Tech Programme (Batch: 2012-2016)

In Civil Engineering

| Year | Code | Semester I | L T P | C | Code | Semester II | L T P | C |
|--------------------|--------|-----------------------------------------------------|-------|-----|-------|------------------------------------------------------|-------|-----|
| II | CE301 | Strength of Materials & Mechanics of Structures – I | 3 1 0 | 5.5 | CE401 | Strength of Materials & Mechanics of Structures – II | 3 1 0 | 5.5 |
| | CE302 | Fluid Mechanics & Applications | 3 1 2 | 7 | CE402 | Concrete & Construction Technology | 3 0 3 | 6 |
| | CE303 | Building Material & Construction | 3 0 2 | 5.5 | CE403 | Surveying - I | 3 0 3 | 6 |
| | CE304 | Engineering Geology | 3 0 2 | 5.5 | CE404 | Building Construction Technology | 3 0 0 | 4 |
| | MA301 | Engineering Mathematics – III | 3 1 0 | 5.5 | MA402 | Numerical & Statistical Analysis | 3 0 2 | 5.5 |
| | HS301 | Principles of Management | 3 0 0 | 4 | HS401 | Principles of Economics | 3 0 0 | 4 |
| Summer Term | | | | | | | | |
| III | CE501 | Theory of Structure | 3 1 0 | 5.5 | CE601 | Concrete Structures – II | 3 0 2 | 5.5 |
| | CE502 | Concrete Structures – I | 3 0 2 | 5.5 | CE602 | Steel Structures – II | 3 0 2 | 5.5 |
| | CE503 | Steel Structures – I | 3 0 2 | 5.5 | CE603 | Water Resource & Irrigation Engineering | 3 0 0 | 4 |
| | CE504 | Surveying - II | 3 0 3 | 6 | CE604 | Transportation Engineering | 3 0 2 | 5.5 |
| | CE505 | Environmental Engineering | 3 0 2 | 5.5 | CE605 | Estimating and Costing | 2 1 0 | 4 |
| | CE506 | Geotechnical Engineering | 3 0 2 | 5.5 | CE606 | Construction Project Management | 3 0 0 | 4 |
| IV | SEM701 | Seminar | 0 0 4 | 2.5 | MA601 | Optimization Techniques | 3 1 0 | 5.5 |
| | | Elective – I | 3 0 0 | 4 | PS801 | Practice School – II / Thesis | ----- | 16 |
| | | Elective – II | 3 0 0 | 4 | | | | |
| | | Elective – III | 3 0 0 | 4 | | | | |
| | | Elective – IV | 3 0 0 | 4 | | | | |
| | | Elective – V | 3 0 0 | 4 | | | | |

L = Lectures; T = Tutorials; P = Practicals; C = Credits; W = Weeks

List of Electives Courses offered in B. Tech (Civil Engineering)

| Semester | Elective | Code | Course |
|-----------------|---------------------------------|-------------|--------------------------------------------|
| VII | Electives – I/II/III/IV/IV/V | CE 721 | Hydraulics |
| | | CE 722 | Engineering Rock Mechanics |
| | | CE 723 | Geographical Information System |
| | | CE 724 | Solid Waste Management |
| | | CE 725 | Repair & Rehabilitation of Structures |
| | | CE 726 | Finite Element Analysis |
| | | CE 727 | Disaster Management |
| | | CE 728 | Design of Pre-stressed Concrete Structures |
| | | CE 729 | Advanced Transportation Engineering |
| | | CE 730 | Earthquake Engineering |
| | | CE 731 | Design of Bridge Structures |
| | | CE 732 | Water Power Engineering |
| | | CE 733 | Rural Water Supply & Sanitation |
| | | CE 734 | Earthquake Resistant Design & Techniques |

CONTENTS

| S. No. | Course Code | Course Credits | Course Title | Page No. |
|--------|-------------|----------------|------------------------------|----------|
| 1. | LA 101 | 02 | English Communication Skills | 03 |
| 2. | MA101 | 03 | Engineering Mathematics - I | 08 |
| 3. | PH101 | 04 | Engineering Physics – I | 11 |
| 4. | CH101 | 04 | Engineering Chemistry – I | 17 |
| 5. | CSE101 | 04 | Computer Programing & IT | 21 |
| 6. | ID 101 | 02 | Environmental Studies | 25 |
| 7. | ME141 | 02 | Workshop Practice | 28 |
| 8. | CE101 | 02 | Engineering Graphics | 33 |

ENGLISH COMMUNICATION SKILLS

| | | |
|----------------------|---|------------------------------|
| Course Code. | : | LA 101 |
| Course Title | : | English Communication Skills |
| Course Credits | : | 02 |
| Total Hours Per Week | : | 2+0+0 |
| Instructor (s) | : | Dr Sanjay Kumar |

Course Description:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence in students. The prescribed books and the exercises are meant to provide students an extensive exposure into the variegated subtleties and nuances of English discovering and practicing which will help students improve their proficiency in the language.

Scope & Objective:

By focusing on all the four language skills such as listening, speaking, reading and writing (LSRW), the course intends to achieve the following specific objectives:

- To improve the language proficiency of students in English with emphasis on LSRW skills.
- To strengthen the skills required to speak with confidence, to read with comprehension, and to write with clarity and precision.
- To help students employ the study skills and communication skills in formal and informal situations.

Text Books:

Sanjay Kumar and Pushp Lata, *Communication Skills*, New Delhi: OUP, 2011

Reference Books:

- Meenakshi Raman and Sangeeta Sharma, *Technical Communication: Principles and Practice*, Second Edition, New Delhi: OUP, 2011.
- Krishna Mohan and Meenakshi Raman, *Effective English Communication*, New Delhi: Tata-McGraw Hill, 2000.

- R3 Krishna Mohan and N.P.Singh, *Speaking English Effectively*, New Delhi: Macmillan, 1994.
- R4 V. Sasikumar and P.V. Dhamija, *Spoken English: A Self-Learning Guide to Conversation Practice*, Tata-McGraw Hill, 2007.
- R5 Norman Lewis, *Word Power Made Easy*, Delhi: GoyalSaab Publishers and Distributors, 1994.
- R6 A.J.Thomson and A.V.Martinet, *A Practical English Grammar*, 4th Edition, New Delhi: OUP, 1999.
- R7 Asha Kaul, *Business Communication*, Second Edition, New Delhi: PHI, 2010.
- R8 Edgar Thorpe and Showick Thorpe, *Objective English*, 2nd Edition, New Delhi: Pearson Education, 2008.

Course Plan:

| Lecture No. | Learning Objectives | Topics to be covered | Reference Chap./ Sec. (Book) |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|
| 1 | Defining Communication with emphasis on various stages and skills in language acquisition | Introduction to the course. | - |
| 2 | Introducing students to characteristic features of effective communication; acquainting them with the barriers to communication and suggesting ways to overcome such barriers, | Characteristic Features of Effective Communication and Ways to Overcome Barriers to Communication | Chapter 1 |
| 3-4 | Introducing students to the Basic Etymological Structure of words in English; Discussing various Roots, Prefixes and Suffixes in the class | Vocabulary Extension: Roots, Prefixes and Suffixes | Chapter 8 |
| 5 | Introducing students to innovative strategies in developing vocabulary. Discussing ways to adding new words through Synonyms, Antonyms, Homophones, One Word Substitution, Situations, etc | Vocabulary Extension: Synonyms, Antonyms, Homophones, One Word Substitution | Chapter 8 |

| | | | |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------|
| 6-7 | Helping students create situations and use new words added to the vocabulary | Vocabulary Extension: Learning words through Situations | Chapter 8 |
| 8 | Introduction to Grammar: Revising Basics of English Grammar such as Nouns, Pronouns, Verbs, Adverbs, Adjectives, Conjunctions, Prepositions, Articles, etc. | Basics of English Grammar | Chapter 2 & 3 |
| 9-10 | Helping students attain more familiarity with Applied English Grammar through concepts such as Tense, Voice, Narration, Non-Finite Verbs, Moods of Verbs, Clauses, Tag Questions, etc | Applied English Grammar | Chapter 2 & 3 |
| 11-12 | Introduction to Standard English Usage: Avoiding Common Errors, Maintaining Subject-Verb Concord, Placing Dangling Modifiers Appropriately, Avoiding Indianisms, etc. | Standard English Usage | Chapter 3, 4 & 6 |
| 13 | Giving students an exposure in Listening Skills; Introducing Effective Listening Techniques | Listening Skills | Chapter 9 and the DVD accompanying the book |
| 14 | Helping students develop effective listening skills for Listening for General Content; Listening to fill up Information; Intensive Listening; Listening for Specific Information etc | Listening Skills | Chapter 9 and the DVD accompanying the book |
| 15-16 | Introducing students to the 20 Vowel Sounds of English. Distinguishing 12 Pure Vowel and 08 Diphthongal glides. Discussing words containing these sounds of English. Giving practice through examples in the class | Phonetics and Spoken English: Sounds of English | Chapter 7 |
| 17-18 | Introducing students to the 24 Consonant Sounds of English. Discussing words containing these sounds of English. | Phonetics and Spoken English: Sounds of | Chapter 7 |

| | | | |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------|
| | Giving practice through examples in the class | English | |
| 19-20 | Introducing students to the rules of Word Accent and Weak Forms in English | Introducing students to the rules of Word Accent and Weak Forms in English | Chapter 7 |
| 21 | Telling students different ways of reading with a purpose. Helping students employ different reading skills such as Skimming, Scanning, Intensive Reading and Extensive Reading; Discussing Tones and Styles; Discourse Features; Developing in students Inferential, Analytical Skills | Reading Comprehension | Chapter 16 & 17 |
| 22 | Giving students adequate practice in attempting RC Passages by discussing passages of variegated types such as Informative Passages, Analytical Passages, Point of View Passages, Narrative Passages, Abstract Passages, Literary Passages, etc | Reading Comprehension | Chapter 16 & 17 |
| 23-24 | Introducing students to the basics of Paragraph Writing such as Structure, Unity, Coherence, Emphasis, Expansion in a paragraph | Paragraph Writing | Chapter 5 & 20 |
| 25 | Helping students inculcate effective paragraph writing techniques by working on a variety of paragraphs such as Descriptive Paragraphs, Argumentative Paragraphs, Abstract Paragraphs, etc | Paragraph Writing | Chapter 20 |
| 26 | Introducing students to the principles and steps in developing the Art of Condensation; Helping them distinguish between Summary, Abstract, Précis and Synopsis | Art of Condensation | Chapter 18 |

| | | | |
|----|----------------------------------------------------------------------------------------------------|---------------------|------------|
| 27 | Helping students use principles of Effective Condensation by giving them practice through examples | Art of Condensation | Chapter 18 |
| 28 | Discussing with students the techniques used for writing effective essays of various types | Essay Writing | Chapter 21 |

Evaluation Scheme:

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|---------------------------------------------------------------------------------------------|----------|--------------------|------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Open Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignments such a Role Play, JAM, Extempore, Paragraph Writing, Vocabulary Exercises, etc. | | 15 | Open/Closed Book |
| 5. | Quiz | 20 min. | 05 | Closed Book |

Chamber Consultation Hour: Thursday 3-4 PM

Notices: All notices concerning this course will be displayed on the Notice Board

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

(Instructor)

ENGINEERING MATHEMATICS-I

| | | |
|------------------------------|---|-----------------------------------|
| Course Code | : | MA101 |
| Course Title | : | Engineering Mathematics – I |
| Course Credits | : | 03 |
| Total Hours per week (L+T+P) | : | 3+1+0 |
| Instructor(s) | : | Dr. Umesh Gupta, Dr. Ritu Agrawal |

Course Description

Partial derivative and its applications, Maxima minima of functions of two variables, Vector calculus

Scope & Objective

The objective of this course is to give the students, an understanding of basic calculus and its applications in real world. This serves as a basic course in calculus of several variables and ordinary differential equations. Differential Equation is a natural goal of Calculus and is the most important part of mathematics for understanding Physical sciences and Engineering applications.

Text books

- T1 G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008
T2 Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones & Barlett, Viba, New Delhi, 2011

Reference Books

- R1 Rober Wrede, Spiegel M. R., *Schaum's outline of advanced calculus*, 3rd edition, Tata Mc-GrawHill, NewYork, 2011
R2 Peter V. O'Neil, *Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
R3 Kreyszig, E., *Advanced Engineering Mathematics*, John Willey, Delhi (2011).
R4 Potter M.C., Goldberg J.L., Edward F.A., *Advanced Engineering Mathematics*, 3rd Edition, Oxford University Press, 2005.

Course Plan

| Lecture No. | Learning Objectives | Topics to be covered | Reference (Ch. of Text Book) |
|-------------|-------------------------------|---------------------------------------------------------|------------------------------|
| 0 | Recall the concepts | | |
| 1 | Calculus of several variables | Functions of two or more variables, Partial Derivatives | Chapter 14, T1 |

| | | | |
|-------|-------------------------------------------------|-------------------------------------------------------------------------------------|----------------|
| 2-3 | | Total derivative, Chain Rule | Chapter 6, R1 |
| 4 | | Euler's Theorem | |
| 5 | | Jacobian and transformation | |
| 6 | | Applications to errors | |
| 7 | Optimization using derivatives, Curve sketching | Maxima-Minima of functions of two variables | Chapter 14, T1 |
| 8-9 | | Lagrange's method | |
| 10-13 | | Curve tracing: Cartesian, parametric and polar coordinates | Chapter 4, T1 |
| 14 | Vector function and its derivatives | Vector functions, their derivatives and integration | Chapter 9, T2 |
| 15 | | Arc length and unit tangent vector, | Chapter 13, T1 |
| 16 | | Curvature and unit normal vector | |
| 17 | | Torsion and unit binormal vector | |
| 18-19 | Operations on vector functions | Directional derivative and gradient vectors, Tangent plane | §14.5, T1 |
| 20 | | Divergence and curl of a vector field | Chapter 9, T2 |
| 21 | Definite Integrals | Integral calculus, Line integral, Arc length | Chapter 6, T1 |
| 22-24 | Multiple Integrals | Double integral: Area, change of order of integration, changing to polar coordinate | Chapter 15, T1 |
| 25 | | Triple integral: Volume integral | |
| 26-27 | Vector Integrals | Vector integration: Line integral, flux, work done, circulation | Chapter 9, T2 |
| 28 | | Path independence, potential function and conservative fields | |
| 29 | | Surface area and integral | |
| 30 | Theorems on Vector Integrals | Green's theorem in the plane | |
| 31 | | Stoke's theorem | |
| 32 | | Divergence theorem | |
| 33 | Special Integrals | Gamma and beta function | Chapter 15, R1 |
| 34-36 | Sequence and Series | Sequence and series | Chapter 11, T1 |
| 37 | Special Trigonometric Series | Orthogonal function | Chapter 12, T2 |
| 38-40 | | Fourier Series | |

Evaluation Scheme:

| EC No. | Evaluation Component (EC) | Duration | Weightage | Nature | Scope (No. of Lectures) |
|--------|--------------------------------|------------------------------|-----------|------------------|------------------------------|
| 1 | First Test | 60 Min. | 20 | Closed Book | 1 - 10 |
| 2 | Second Test | 60 Min. | 20 | Open Book | 11 - 25 |
| 3 | Quiz / Assignment / Attendance | To be decided by Instructors | 10* | Open/Closed Book | To be decided by Instructors |
| 4 | Comprehensive | 3 Hrs. | 40 | Closed Book | 1 - 40 |

* EC No.3 will be based on the weightage of Quiz, Assignment and Attendance.

Chamber Consultation Hour: To be announced in the class.

Make-up Policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructor-in-charge.

(Instructor)

ENGINEERING PHYSICS-I

| | | |
|------------------------------|---|-------------------------------------|
| Course Code | : | PH101 |
| Course Title | : | Engineering Physics-I |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+1+2 |
| Instructor (s) | : | Dr. Kanad Ray, Dr. Vipin Kumar Jain |

Course Description:

Theory: The subject matter of the present course can be divided into two parts namely 'Optics' and 'Modern Physics'. The first part covers Interference, Diffraction and Polarization. The second part deals with Wave Mechanics, Nanotechnology and Solar Cell.

Practical: The contents of the present course can be divided into Optics, Electrical & Electronics based experiments.

Scope & Objective:

In the context of this course, the subject Engineering Physics has been treated as an applied science from which a majority of engineering technologies have evolved. The thorough knowledge of the basic principles will help students to understand and apply many aspects of technology more effectively. Engineering Physics Lab exposes the students to experimental methods of Physics and integrates theoretical knowledge and concepts to practical experience.

Text Books:

- T1. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-I" New Age International Publication, New Delhi, I edn. 2010.
- T2. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-II" New Age International Publication, New Delhi, I edn. 2010.

T3: Lab Manuals for Physics

Reference Books:

R1 Arther Beiser, "Concept of Modern Physics" Tata McGrawHill, New Delhi, 5th edn. 1997.

R2 Ajoy Ghatak, "Optics", Tata McGraw Hill, 4th edn

R3 Eyvind H Wichman, "Quantum Physics" Tata McGraw Hill, Volume 4

R4 Neeraj Mehta, "Applied Physics for Engineers", PHI, I edn. 2011

R5: Dattu R Joshi, "Engineering Physics", Tata McGraw Hill Education Pvt. Ltd. New Delhi, I edn. 2010

Course Plan (Theory):

| Lecture No. | Learning Objectives | Topics to be covered | Reference Chap./ Sec. (Book) |
|-------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------|
| 1 | What is light? | Introduction to optics | Ch-1 of T1 Ch-2 of R2 |
| 2-3 | Coherence | Spatial Coherence, Temporal coherence, Coherence length, Coherence time and 'Q' factor for light | Ch-3 of T2 Ch-2 of R2 |
| 4-5 | Newton's rings | Formation of Newton's rings, Measurement of wavelength of light, Diameter of Newton's rings | Ch-1 of T1 Ch-15 of R2 |
| 6-7 | Michelson's Interferometer | Michelson's Interferometer: Production of circular & straight line fringes | Ch-1 of T1 Ch-15 of R2 |
| 8 | Application of Michelson's Interferometer | Determination of wavelength of light, Determination of wavelength separation of two nearby wavelengths | Ch-1 of T1 Ch-15 of R2 |

| | | | |
|-------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 9-10 | Antireflecting films and interference filters | Elementary idea of anti-reflection coating and interference filters | Ch-1 of T1 Ch-15 of R2 Ch-16 of R2 |
| 11-12 | Fraunhofer diffraction | Single slit diffraction, position of maxima / minima and width of central maximum, intensity variation. | Ch-3 of T1 Ch-18 of R2 |
| 13-14 | Grating spectra | Construction and theory. Formation of spectra by plane transmission grating, Determination of wavelength of light using plane transmission grating | Ch-3 of T1 Ch-18 of R2 |
| 15-16 | Resolving Power | Introduction, Raleigh criterion, Resolving power of diffraction grating. | Ch-3 of T1 Ch-18 of R2 |
| 17-18 | Polarization | Plane, circular and elliptically polarized light on the basis of electric (light) vector, Malus law. | Ch-2 of T1 Ch-22 of R2 |
| 19 | Double refraction | Qualitative description of double refraction | Ch-2 of T1 Ch-22 of R2 |
| 20-22 | Analysis of polarized light | Quarter and half wave plates, construction, working and use of these in production and detection of plane, circular and elliptically polarized light. | Ch-2 of T1 Ch-22 of R2 |
| 23-25 | Optical activity | Introduction and law of optical rotation, specific rotation and its measurement using the half-shade and bi-quartz device. | Ch-2 of T1 Ch-19 of R2 |
| 26-27 | Concept of Quantum Mechanics | Heisenberg's Uncertainty Principle, Wave and Particle Duality of Radiation, De-Broglie's Concept of Matter waves, Quantum Nature of Light | Ch-4 of T1 Ch 2 of R4 |
| 28-29 | Experimental proof of Quantum Mechanics | Photoelectric Effect and Compton Effect | Ch-4 of T1 |
| 30 | Concept of Wave | Concept of Wave Function, Physical | Ch-4 of T1 |

| | | | |
|-------|------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------|
| | Function | interpretation of wave function and its properties | |
| 31-32 | Schrödinger's wave equation | Schrödinger's Wave Equation: Time dependent and time independent cases | Ch-4 of T1 |
| 33 | Application of Schrödinger Equation | Particle in one-dimensional box | Ch-4 of T1 |
| 34-35 | Nanotechnology and physical properties at Nano scale | Introduction of Nanotechnology, Effect on physical properties due to Nano scale | Ch-22 of R5 Ch-18 of R4 |
| 36-37 | Methods and Applications | Methods of Nano material construction, Applications | Ch-22 of R5 Ch-18 of R4 |
| 38 | What is Solar Cell and properties | Introduction to Photovoltaic Cell/Solar Cell and It's Principles | Ch-22 of R5 |
| 39-40 | Theory, Types and Applications | Theory of Solar Cells, Types of Solar Cells, and Applications | Ch-22 of R5 |

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open/Closed Book |

Course Plan (Practical):

| Lecture No. | Learning Objectives | Reference Book |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1-10 | To determine the wave length of monochromatic light with the help of Fresnel's Biprism | T1 & T3 |
| | To determine the wave length of sodium light by Newton's Ring | T1 & T3 |
| | To determine the specific rotation of Glucose (Sugar) solution using a Polarimeter | T1 & T3 |
| | To measure the Numerical Aperture of an Optical Fibre. | T1 & T3 |
| | To convert a Galvanometer in to an ammeter of range 1.5/3 amp and calibrate it. | T1 & T3 |
| | To convert a Galvanometer in to a Volt of range 1.5/3 volt and calibrate it. | T1 & T3 |
| | To study the variation of semiconductor resistance with temperature and hence determine the Band Gap of semiconductor in the form of reverse biased P-N junction diode | T1 & T3 |
| | To study the variation of thermo e. m. f. of iron copper thermo couple with temperature | T1 & T3 |
| | To determine the wavelength of sodium light by Michelson Interferometer | T1 & T3 |
| | To determine coherent length and coherent time of laser using He-Ne Laser | T1 & T3 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|----------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 10 | Closed Book |

| | | | | |
|----|------------------------------------------------------------------------|------------|----|-------------|
| 2. | Mid Term Test-II | 2 hour | 20 | Closed Book |
| 3. | End Term Test/Comprehensive | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

Chamber Consultation Hour: To be announced in the class.

Notices: All notices concerning this course will be displayed on the Notice Board.

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

Instructors

ENGINEERING CHEMISTRY-I

| | | |
|------------------------------|---|------------------------------------------|
| Course Code | : | CH101 |
| Course Title | : | Engg. Chemistry-I |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | (2+1+2) |
| Instructor (s) | : | Dr.Mohd. Shahnawaz Khan, Dr. S. K. Tomar |

Course Description:

This first level course is offered in the first semester for the students of all branches of engineering. It provides a comprehensive survey of underlying physical principles, this course divided into five major independent areas of chemistry such as **Water, Polymers, Lubricants, Organic Chemistry (Names Reactions Mechanism & Stereochemistry), Engineering Materials (Cement & Glass).**

Scope & Objective:

The contents of the present course can be divided into five units based on experiments. This course will help to students to learn direct commercial industrial application of chemistry as well as experimental methods & instrumental techniques. This course also imparts the integrated theoretical knowledge and practical experience into students.

Text Books:

1. Engineering Chemistry by Jain & Jain, **Dhanpatrai publication**

Reference Books:

- 1- Engineering Chemistry by B Sivasankar, (Mc-Graw Hill publication).
- 2- Engineering Chemistry by O.G. Palanna, (Mc-Graw Hill publication).
- 3- Organic Chemistry by Smith, (Mc-Graw Hill publication).
- 4- Organic Chemistry by IL Finar, (Pearson)
- 5- Engineering Chemistry (Wiley India publication).

Course Plan (Theory):

| Lecture No. | Learning Objective | Topic to be covered | Reference / Text Books |
|-------------|-----------------------------|----------------------------------|------------------------|
| 1 | Common impurities of water. | Introduction of water impurities | Ch-1; Text |

| | | | |
|-------|-----------------------------------------------------|---------------------------------------|----------------------------|
| 2-4 | Hardness of water | Methods for hardness determination | Ch-1; Text |
| 5-8 | Municipal water supply | Purification of water | Ch-1; Text |
| 9-12 | Softening of water | Method for softening | Ch-1; Text |
| 13-16 | Boiler trouble | Boiler problems | Ch-1; Text |
| 17-19 | Classification and constituents of polymers | Types of polymers | Ch-3; Text |
| 20-21 | Plastics | Plastics | Ch-3; Text |
| 22-24 | Rubber | Synthetic & natural rubber | Ch-3; Text |
| 25-26 | Introduction of lubricants | General idea of lubricants | Ch-3; Text |
| 27-28 | Types of lubricants | Types of lubricants | Ch-10; Text |
| 29-31 | Properties of lubricants | Properties | Ch-10; Text |
| 32 | Types of silicates & their uses | Types of glass | Ch-10; Text |
| 33 | Annealing | Process involve in formation of glass | Ch-14; Ref-5 |
| 34-35 | Manufacturing of cements | Formation & properties of cement | Ch-14; Ref-5 |
| 36 | Setting and hardening of cement and role of gypsum. | Chemistry of cement | Ch-14; Ref-5 |
| 37-39 | Organic Reactions | mechanism | Ch-9; Ref-5 Ch-26; Text |
| 40-42 | Stereochemistry | 3D configuration of compounds | Ch-27; Text |

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|---------------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Presentations/ Quizzes | 30 min. | 20 | Open/Closed Book |

COURSE PLAN (PRACTICAL)

Text Books:

- T1. Jain and Jain, "Engineering Chemistry Book- Dhanpat Rai Publication, New Delhi.
- T2. Lab Manuals for chemistry.

Reference Books:

R1 Experimental Chemistry by Vogel

| Exp. No. | Learning Objectives | Books |
|----------|--------------------------------------------------------------------------------------------------------------|---------|
| 1-10 | To determine the hardness of water by complex metric method using EDTA. | T1 & T2 |
| | To determine the hardness of water by HCl method. | T1 & T2 |
| | To determine the amount of free chlorine in given sample. | T1 & T2 |
| | Determination of total residual chlorine in a water sample. | T1 & T2 |
| | Determination of free carbon dioxide in a given sample. | T1 & T2 |
| | To determine the viscosity of a given sample of lubricant oil at various temperature. | T1 & T2 |
| | To determine flash and fire point of a given lubricant using Pensky-Martin's apparatus. | T1 & T2 |
| | To determine cloud and pour point of a given sample of lubricating oil using Cloud and Pour point apparatus. | T1 & T2 |
| | Measurement of Nitrate in water sample. | T2 & T2 |
| | Measurement of Oxygen in water sample. | T1 & T2 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 15 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 15 | Closed Book |
| 3. | End Term Test | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

Chamber Consultation Hour: To be announced in the class.

Notices: All notices concerning this course will be displayed on the Notice Board.

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

(Instructor)

COMPUTER PROGRAMMING & IT

| | | |
|------------------------------|---|--------------------------------------------|
| Course Code | : | CSE101 |
| Course Title | : | Computer Programing & IT |
| Course Credits | : | 4 |
| Total Hours Per Week (L+T+P) | : | 3 + 0 + 2 |
| Instructor (s) | : | Prof. Devendra Bhavsar, Prof. Alok Agrawal |

Course Description (Theory):

Unit I : Introduction: Stored Program Architecture of Computers, Evolution of Processors (In terms of word length & Speed only), Storage Device- Primary Memory and Secondary Storage, Working Principle of Primary Storage devices- RAM, ROM, PROM, EPROM, EEPROM, Random, Direct, Sequential access methods. Language Translators – Concept of High-Level, Assembly and Low Level programming languages. Working of Assembler, Interpreter and compiler. Representing Algorithms through flow chart, pseudo code, step by step etc.

Unit II : Number System: Data Representation, Concept of radix and representation of numbers in radix r with special cases of $r=2, 8, 10$ and 16 with conversion from radix r_1 to radix r_2 . R 's and $(r-1)$'s complement. Representation of Integer in sign-magnitude, signed 1's and 2's complement, Floating point representation. Concept of bias and normalization. Representation of alphabets, Binary Codes: Binary arithmetic, Addition and subtraction of Integers and floating point Numbers. Multiplication of Integers. Gray code, BCD 8421 and 2421, Excess-3 and Excess-3 gray codes.

Unit III : Programming in C: Structure of C Program, Concept of Preprocessor, Macro Substitution, Intermediate code, Object Code, Executable Code. Compilation Process, Basic Data types, Importance of braces $\{ \}$ in C Program, enumerated data type, Identifiers, Scope of Variable, Storage Class, Constants, Expressions in C, Type Casting, Control Statements, `printf()`, `scanf()`, reading single character, Command Line arguments.

Unit IV : Arrays in C, Pointers, Using pointers to represent arrays, Dynamic Memory allocation, structures, using typedef, Arrays of Structures & pointers, File Handling (Opening in different modes & closing of file, `fscanf` & `fprintf` only).

Unit V : Functions in C, Passing Parameters (By value & Reference), using returned data, Passing arrays, structures, array of structures, pointer to structures etc., passing characters and strings, The void pointer.

Scope & Objective

This course is offered as a technical art subject to engineering students. It focuses on training the students rigorously in the skills of a structured programming language, particularly in C and application of such language in problem solving.

Text Books:

- T1. Reema Thareja “*Computer Fundamentals and Programming in C*” Oxford Education, first, 2012
- T2. Balagurusamy, “*Programming in ANSI C*” Tata Mcgraw Hill, sixth, 2012.

Reference Books:

- R1 Yashwant Kanetkar, “*Let us C*” BPB publication, fifth, 2012.

Course Plan (Theory):

| Lecture No. | Learning Objectives | Topics to be covered | Reference Chap./ Sec. (Book) |
|-------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1-2 | Introduction | Introduction: Stored Program Architecture of Computers, Evolution of Processors (In terms of word length & Speed only) | CH-1 of T1 |
| 3 | Storage Devices | Storage Device- Primary Memory and Secondary Storage, Working Principle of Primary Storage devices | CH-4 of T1 |
| 4 | Memory | RAM, ROM, PROM, EPROM, EEPROM, Random, Direct, Sequential access methods | CH-4 of T1 |
| 5-7 | Number System | Number System: Data Representation, Concept of radix and representation of numbers in radix r with special cases of r=2, 8, 10 and 16 with conversion from radix r1 to radix r2. r's and (r-1)'s complement | CH-3 of T1 |
| 8-9 | Number Systems | Representation of Integer in sign-magnitude, signed 1's and 2's complement. Floating point representation | CH-3 of T1 |
| 10-11 | Binary Codes | Binary Codes: Binary arithmetic, Addition and subtraction of Integers and floating point Numbers | CH-3 of T1 |
| 12 | Different Number Systems | Multiplication of Integers. Gray code, BCD 8421 and 2421, Excess-3 and Excess-3 gray codes | CH-3 of T1 |
| 13 | Programing Languages | Language Translators – Concept of High-Level, Assembly and Low Level | CH-7 of T1 |

| | | | |
|-------|-----------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| | | programming languages | |
| 14 | Programing Languages | Working of Assembler, Interpreter and compiler | CH-7 of T1 |
| 15 | Algorithms | Representing Algorithms through flow chart, pseudo code, step by step etc. | CH-7 of T1 |
| 16 | Programming in C | Programming in C: Structure of C Program, Concept of Preprocessor | CH-8 of T1 CH-1 of T2 |
| 17 | Programming in C | Macro Substitution, Intermediate code, Object Code, Executable Code. Compilation Process | CH-8 of T1 |
| 18-20 | Basic Data types | Basic Data types, Importance of braces ({}) in C Program, enumerated data type | CH-8 of T1 CH-2 of T2 |
| 21-22 | Identifiers | Identifiers, Scope of Variable, Storage Class, Constants, Expressions in C, Type Casting, | CH-8 of T1 |
| 23-24 | printf (), scanf () | Control Statements, printf (), scanf (), reading single character. Command Line arguments | CH-8 of T1 |
| 25-27 | Decision Making and Looping | For Loop, While Loop, Do While Loop | Ch-9 of T1 Ch-6 of T2 |
| 28 | Arrays in C | Arrays in C, Pointers, Using pointers to represent arrays | CH-11 of T1 |
| 29-32 | Dynamic Memory allocation | Dynamic Memory allocation | CH-13 of T1 |
| 33-35 | Functions in C | Functions in C, Passing Parameters (By value & Reference) using Return Data | CH-10 of T1 |
| 36 | Passing arrays | Passing arrays, structures, array of structures, | CH-13 of T1 |
| 37-38 | pointers | Pointer Basics, The void pointer, pointer to structures etc., passing characters and strings | CH-11 of T2 CH-13 of T1 |
| 39-40 | File Handling | File Handling (Opening in different modes & closing of file, fscanf & fprintf only) | CH-15 of T1 Ch-10 of R1 |
| 41-43 | Structures | structures, using typedef, Arrays of Structures & pointers | CH-14 of T1 Ch-12 of R1 |

Evaluation Scheme (Theory):

| Sr. No. | Evaluation Component | Duration (Hours) | Marks (100) | Nature of Component |
|---------|----------------------|------------------|-------------|---------------------|
| 1. | Midterm test-I | 1 | 20 | Closed Book |
| 2. | Midterm test-II | 1 | 20 | Closed Book |
| 3. | Assignment | Continuous | 10 | Open Book |
| 4. | Quiz | Continuous | 10 | Closed Book |
| 5. | End Term | 3 | 40 | Closed Book |

Course Description (Practical):

List of Experiments:

1. Simple OS Commands, compiling program, compiler options, linking libraries.
2. Simple input output program integer, real character and string. (Formatted & Unformatted)
3. Conditional statement programs (if, if-else-if, switch-case)
4. Looping Program. (for, while, do-while)
5. Program based on array (one, two and three dimensions)
6. Program using Function (with and without recursion)
7. Simple programs using pointers.
8. File handling.
9. Program using Structure and Union.

Course Plan (Practical)

The lab is to be conducted on Linux platform or Windows using Turbo Compiler. The said experiments have to be performed week wise

Evaluation Scheme (Practical):

| Sr. No. | Evaluation Component | Duration (Hours) | Marks (100) | Nature of Component |
|---------|----------------------|------------------|-------------|---------------------|
| 1. | Mid Term Test-I | 2 | 20 | Closed Book |
| 2. | Mid Term Test-II | 2 | 20 | Closed Book |
| 3. | Viva voce evaluation | Day to Day | 10 | Closed Book |
| 4. | Attendance | Day to Day | 10 | |
| 5. | End Term Examination | 2 | 40 | Closed Book |

Chamber Consultation Hour: To be announced in the class.

Notices: All notices concerning this course will be displayed on the Notice Board.

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

(Instructor)

ENVIRONMENTAL STUDIES

| | | |
|------------------------------|---|-----------------------|
| Course Code | : | ID 101 |
| Course Title | : | Environmental Studies |
| Course Credits | : | 2 |
| Total Hours per Week (L+T+P) | : | 2 + 0 + 0 |
| Instructor (s) | : | Dr. S. K. Tomar |

Course Description:

This course is designed as a compulsory course on Environmental Studies for undergraduate students of all disciplines. Assuming limited background in mathematics and science, it gives a balanced presentation of the major issues and concerns related to the environment.

Scope & Objective:

Environmental studies is considered as one of the basic subjects for all graduate students irrespective of branch as it develops thinking and imaginative capacity of the students. Especially, engineers who can successfully cope with new problems in the field must have a sound understanding of fundamental principles. The present course is designed to prepare the students in this direction. The contents of the syllabus have been developed keeping this in mind, so that students are exposed to a variety of situations that will test their understanding of the subject both at the conceptual and analytical skills. This course covers the major environmental problems we face today: runaway growth, imperiled ecosystems, disappearing forests, endangered species, dwindling natural resources, dangerous toxic wastes, green laws, and other such issues.

Text Books:

- T-1. Rajagopalan, R., "Environmental Studies: From Crisis to Cure", Oxford University Press, New Delhi, 2e, 2011

Reference Books:

- R1 Ranjit Daniels & J. Krishnaswamy "Environmental Studies", Wiley India
R2 Davis & Cornwell "Environmental Engineering", Mc Graw Hill

Course Plan:

| Lecture No. | Learning Objectives | Topics to be covered | Reference Chap./ Sec. |
|-------------|-----------------------------------------------|------------------------------------------------|-----------------------|
| 1 – 2 | The Global Environmental Crisis | Understanding environment | Chap. 1 T-1 |
| 3 – 4 | | The global crisis | |
| 5 – 6 | Ecosystems | Basic Concepts | Chap. 2 T-1 |
| 7 – 8 | | Forest and Grassland ecosystems | Chap. 3 T-1 |
| 9 | | Desert Ecosystems | Chap. 3 T-1 |
| 10 | | Aquatic Ecosystems | Chap. 4 T-1 |
| 11 – 12 | Biodiversity | Introduction to Biodiversity | Chap. 5 T-1 |
| 13 – 14 | | Biodiversity Conservation | Chap. 6 T-1 |
| 15 | Renewable and Non-Renewable Natural Resources | Introduction | Chap. 7 T-1 |
| 16 | | Water Resources | |
| 17 | | Energy Resources | Chap. 8 T-1 |
| 18 | | Forest Resources | Chap. 9 T-1 |
| 19 – 20 | | Land, Food, and Mineral Resources | Chap. 10 T-1 |
| 21 | Environmental Pollution | Introduction | Chap. 11 T-1 |
| 22 – 25 | | Air and Noise Pollution | |
| 26 – 28 | | Water, Soil, and Marine Pollution | Chap. 12 T-1 |
| 29 – 32 | | Solid Waste Management and Disaster Management | Chap. 13, 14 T-1 |
| 33 – 34 | Human Population and The Environment | Population Growth | Chap. 15 T-1 |
| 35 | | Environment and Human Health | Chap. 16 T-1 |
| 36 | Social Issues and The Environment | Sustainable Development | Chap. 18 T-1 |
| 37 – 39 | | Global Warming, Acid Rain, and | Chap. 19 T-1 |

| | | | |
|----|------------------------------------|-----------------------------------------|--------------|
| | | Ozone Depletion | |
| 40 | Environmental Laws and Regulations | Different types of laws and regulations | Chap. 20 T-1 |

Evaluation Scheme:

| S. No. | Evaluation Component | Duration | Weightage | Date | Nature | Scope (No. of Lectures) |
|--------|-----------------------------------------|---------------------------------|-----------|------|------------------|---------------------------------|
| 1 | First Test | 55 Min. | 20 | | Closed Book | 1 – 10 |
| 2 | Second Test | 55 Min. | 20 | | Closed Book | 11 – 25 |
| 3 | Quizzes /Assignments (Class room) | To be decided by Instructors | 20 | | Open/Closed Book | To be decided by Instructors |
| 4 | Comprehensive | 3 Hrs. | 40 | | Closed Book | 1 – 40 |

Chamber Consultation Hour: To be announced in the class.

Make-up Policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructor-in-charge.

(Instructor)

WORKSHOP PRACTICE

| | | |
|------------------------------|---|---------------------------|
| Course Code | : | ME141 |
| Course Title | : | Workshop Practice |
| Course Credits | : | 2 |
| Total Hours per Week (L+T+P) | : | 0+0+3 |
| Instructor (s) | : | Er. Kapender Singh Phogat |
| Course Description: | | |

The subject Work-Shop Practice is the most important among all the courses in engineering; it is the heart of all engineering activities. The course is intended to be offered in the first year of engineering to all the discipline students. The course is a basic course and can be studied without any prerequisites though knowledge of materials helps.

After designing a product, it is important to be aware of the manufacturing methods to be able to realize the conceived design in the form of a real product. Also a number of products are an assembly of a number of components and one needs to understand how individual components can be brought together to get the desired product.

The Broad Aim of the course is to enable the student know how products used in day to day life are manufactured. The course also aims at providing students with hands on experience on manufacturing processes that include Machining operations like drilling and grinding, Sheet metal working like bending, shearing & blanking, joining processes like arc welding, gas welding and soldering.

The course aims shall be met through, Class room lectures using electronic media (Power point presentations, Videos), Practical hands on practice in the laboratory, Demonstrations of various machine tool operations in the laboratory.

Scope & Objective:

The Broad Aim of the course is to enable the student know how products used in day to day life are manufactured. This course provides an overview of the basic production techniques and allied/supporting techniques used to produce finished products from raw materials. The course also aims at providing students with hands on experience on manufacturing processes that include Machining operations like drilling and grinding, Sheet metal working like bending, blanking, piercing and beading, joining processes like arc welding and soldering, forging,

casting, and other joining techniques using common machine tools, hand tools and other equipments. Various joining and fitting skills will also be imparted in the practical classes.

Text Books:

- T1. H S Bawa, "Workshop Practice", TMH, New Delhi, 2nd Edition, 2011
- T2. B S Nagendra Parashar and R K Mittal, "Elements of Manufacturing Process", Prentice Hall of India, New Delhi, 2010 print
- T3. B S Raghuwanshi, "A Course in Workshop Technology", Dhanpat Rai & Co., New Delhi, Volume I & II, 2011 reprint,
- T4. Serope Kalpakjian and Steven R. Schmid, "Manufacturing Engineering and Technology," Pearson Education (Low Cost Indian Edition), New Delhi, 4th Edition, 2005

Reference Books:

- R1 K. Venkata Reddy, "Workshop Practice Manual", BS Publications, Hyderabad, 6th Edition, 2011 print
- R2 P. kannaiyah and K. L. Narayana, "Engineering Practices Laboratory", SciTech Publications, Chennai, 2006

COURSE PLAN (PRACTICAL)

Course plan is meant as a guideline and there may be minor deviations while covering the syllabus.

| Week/ LabNo | Learning Objectives | Topics to be covered | Reference Chap./ Sec. (Book)/Manual |
|----------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 1 | Introduction to course | Basics of manufacturing, types of production systems, ethics, safety in workshop. | T1- Ch. 1-Art. 1.1-1.10 Ch.14, Art. 14.1-14.11 |
| | Role of measurements and quality in manufacturing. | Metrology, quality, Least Count of a measuring Instrument, measurement with Varnier Caliper or Micrometer. | T1- Ch. 3 Art. 3.1 – 3.32 |
| 2 | Understand the salient construction details of machine tools including Lathe, and Grinding machine. | Machining Demonstration of Turning, Step Turning, | T3- Vol. II Ch. 6-Article 6.2-5, 6.30 Ch. 13- Articles |

| | | | |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Demonstrate turning, facing, and grinding operations. Distinguish between single point and multi-point cutting tools. | Facing, etc. | 13.29 |
| 3 | Understand principles of producing components/products by casting process. Demonstrate steps in sand casting process. | Casting – Demonstration of sand casting process | T3- Vol. I Ch. 13- Article 13.1-3 Ch. 14- Articles 14.1-2, 14.4 – 5, 14.7- 11, 14.22-24 Ch. 15-Articles 15.2, 15.8, 15.11-12, 15.14 Ch. 18 - Table 18.1 |
| 4 | Understand principles of producing components/products by forging process. Demonstrate forging process. | Forging – Demonstration of forging operations | T1-Ch.5, Art.5.1– 5.17, T3- Vol. I Ch. 20 Article 20.4, 20.6-9, 20.20, 20.39, |
| 5 | Prepare engineering drawing of the development of funnel. Prepare a process sequence diagram. Use hand tools and cut sheet metal as per the development drawing. Prepare the plane pipe. | Sheet metal working applications. Hands on practice of Sheet metal working operations using hand tools- Preparation of Funnel. | T1- Ch. 6, Article 6.1 – 6.12, T3- Vol. I Ch. 26-Article 26.2-10, 26.15-16, 26.23 Ex. 8 on page 791 |
| 6 | Understand the principle of GAS welding. Sketch and label a typical gas welding setup. Sketch the different types of flames used in gas welding. Identify practical applications of gas welding. Observe and Understand the process of GAS welding. Observe and Understand the operation of the equipment required for performing Gas welding. Distinguish between different flame types. | Gas Welding Demonstration of Gas Welding | T1- Ch. 9, Article 9.1 – 9.33, T3- Vol. I Ch. 24-Article 24.16-24, 24.27-28, Ex. 4 on Page 729 |
| 7 | Understand the principle of Arc welding. Sketch and label a typical Arc welding setup. Sketch the different types of Welding Joints. Identify practical applications of Arc welding. Prepare a process sequence diagram. Marking on metal plates as per given drawing. Use hacksaw to cut raw material to required size. | Hands on practice of Joining of metal parts by Arc Welding- Preparation of a Lap Joint model. | T1- Ch. 9, Article 9.11-9.17, T3- Vol. I Ch. 24-Article 24.33-34, 24.36, 24.41-42, 24.71-72 Table 24.5 Ex. 1 on page 724 |

| | | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| | Perform filing operation to prepare the two pieces to be joined. Select suitable electrode for striking the ARC. Perform ARC welding to produce Lap joint model. | | |
| 8 | Demonstrate the skills acquired. | Internal Examination | |
| 9 | Understand the importance of joining processes and Identify their applications, Classify different joining processes, Understand the principle of arc welding, Identify different types of welded joints, Understand the purpose of edge preparation, Distinguish between different welding techniques. Prepare a process sequence diagram. Marking on metal plates as per given drawing. Use hacksaw to cut raw material to required size. Perform filing operation to prepare the two pieces to be joined. Select suitable electrode for striking the ARC. Perform ARC welding to produce Butt joint model. | Mechanical joining processes, Arc Welding Hands on practice of Joining of metal parts by Arc Welding- Preparation of a Butt Joint model. | T1- Ch. 9, 9.11-9.9.14, T3- Vol. I Ch. 24 Article 24.33-34, 24.36, 24.41-42, 24.71-72 Table 24.5 Ex. 2 on page 725 |
| 10 | Identify tools used in carpentry section. Demonstrate the correct holding and use of carpentry tools including hand saw, C-clamp, Bench vice, Chisels, and Mallets. Classify different types of wood used in carpentry works, Identify common types of joints. Read and interpret given drawing of Lap Tee joint model. Prepare a process sequence diagram. Perform marking on the raw material. Prepare the required parts of Lap Tee joint. Produce the Lap Tee joint. Check for flatness and squareness of the parts prepared. Measure the dimensions of individual parts as well as the completed Lap Tee joint. | Introduction to wood working, Wood working Tools, Types of wood, Types of joints. Hands on practice of Wood working operations using hand tools- preparation of Lap Tee Joint. | T1- Ch. 7, Article 7.1-7.32, T3- Vol. I Table 9.1 Ch. 10 Article 10.2-8, 10.12, 10.23, 10.25 |
| 11 | Define Brazing and Soldering processes, Differentiate between Welding, Brazing and Soldering, Identify practical examples of | Mechanical joining processes, Soldering, Brazing. | T1- Ch. 8, Article 8.1 – 8.25, T3- Vol. I Ch. 24-Article 24.65-66 |

| | | | |
|----|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| | Brazing and soldering. | | |
| 12 | Understand the salient construction details of machine tool like Shaping machine. Demonstrate shaping operations. | Machining – Demonstration of Shaping operations | T3- Vol. II Ch. 10-Article 10.2-4, 10.9, 10.29-34, |
| 13 | Prepare engineering drawing of Male & Female Joint. Prepare a process sequence diagram. Use hand tools and cut MS Flat as per the drawing. | Hands on practice of Fitting operations using hand tools- Prepare a job in fitting shop. | T1- Ch. 4, Article 4.1 – 4.27, T3- Vol. I Ch. 23-Article 23.2-5, 23.8, 23.11-17, 23.21 |
| 14 | Demonstrate the skills acquired | Internal Examination | |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 15 | Open Book |
| 2. | Mid Term Test-II | 2 hour | 15 | Closed Book |
| 3. | End Term Test | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

Chamber Consultation Hour: I operate an open door policy - if I am in, I will be glad to talk to you. However, I also have formal office hours so that you know when you can find me in: Thursday and Friday at 14:00 pm - 18:00 pm, or by appointment.

Notices: All notices concerning this course will be displayed on the Notice Board.

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

(Instructor)

ENGINEERING GRAPHICS

| | | |
|------------------------------|---|------------------------|
| Course Code | : | CE101 |
| Course Title | : | Engineering Graphics |
| Course Credits | : | 2 |
| Total Hours per Week (L+T+P) | : | 0 + 0 + 3 |
| Instructor (s) | : | Prof. Pradeep K. Gupta |

Course Description:

One hour lecture on various features of AutoCAD shall be dealt with in the theory hours on which the practice shall be performed in the last 2 hours of practical during a continuous 3 hours session every week. Hands-on practice shall be performed by each student on the individual PC assigned to him using the licensed AutoCAD 2012 installed on the PCs.

Scope & Objective:

Engineering drawing, drafting and graphics is the language of the engineers and technicians. Therefore, it is the intent of this course to equip students with the fundamentals of this unique language and to give them the skills necessary to prepare complete, concise, and accurate communications through engineering drawings using AutoCAD. The aim of this course is to introduce students the basic concepts and the use of engineering drawing with the help of AutoCAD. The students will develop an understanding of 2D computer aided drafting using AutoCAD.

Text Books:

- T1. Kulkarni D M, Rastogi A P, Sarkar A K, Engineering Graphics with AutoCAD, PHI Learning Pvt. Ltd., New Delhi, India, Fourth Printing (Revised Edition), 2012.
- T2. Bhatt N D, Engineering Drawing, Charotar Book Stall, Anand, India.

Reference Books:

- R1 Jolhe D A, Engineering Drawing with an introduction to AutoCAD, TMH, New Delhi, India.
- R2 Gill P S, Engineering Drawing (Geometrical Drawing), S K Kataria & Sons, Delhi, India.

Course Plan:

| Week/ L. No | Learning Objectives | Topics to be covered | Reference Chap./ Sec. (Book)/Manual |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------|
| 1 | Introduction to Engineering Drawing, AutoCAD and Its advantages | Introduction to Engineering Drawing & AutoCAD | T1 Ch1,2 |
| 2 | Description of the Drawing screen and setting up Drawing, Getting Started with AutoCAD and initial setup commands | Drawing Setup, formatting | T1 Ch2 |
| 3 | Introduction of the Draw toolbar like- ARC, POLYLINE, ELLIPSE, RECTANGLE, POINTS, HATCH, TEXT Introduction to Modify Toolbar: MOVE, COPY, ROTATE, STRETCH, TRIM, BREAK, EDIT POLYLINE, CHAMFER, EXPLODE Drawing different figure using above mentioned command | Basic Commands, Draw Toolbar | T1 Ch2 T2 Ch26 |
| 4 | Practice on the modify and Draw toolbar | Advanced Command, Object & Modify toolbar | T1 Ch2 T2 Ch26 |
| 5 | Introduction to different types of Planes of Projection, Practice of Projection of Simple objects like cube, rectangle etc. Introduction, terminology, dimension style, linear dimension, aligned dimension, angular dimension, radius & diameter dimension, angular dimension, base line dimension, Practice on the dimensioning | Orthographic Projection-I, Dimensioning | T1 Ch5 T2 Ch8 |

| | | | |
|----|---------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|
| 6 | More examples for practice purpose is to be taken and the same must be done in AutoCAD | Orthographic Projection-II | T1 Ch5 T2 Ch8 |
| 7 | Different views of the complex objects to be drawn using AutoCAD | Orthographic Projection-III | T1 Ch2 T2 Ch26 |
| 8 | Drawing a given 3D view into isometric Projection, Practicing 2D view of basic figures in AutoCAD | Isometric Projection-I | T1 Ch6 T2 Ch17 T1 Ch2 T2 Ch26 |
| 9 | Drawing Isometric Projection From Orthographic Projection, Drawing 3D isometric view in AutoCAD | Isometric Projection-II | T1 Ch6 T2 Ch17 |
| 10 | Practicing Isometric view in AutoCAD | Isometric Projection-III | T1 Ch2 T2 Ch26 |

Evaluation Scheme:

| EC No. | Evaluation Component | Duration | Marks | Nature of Component |
|--------|-------------------------------|----------|-------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open Book |

Note: A total of 3 quizzes will be conducted. Out of these, the best performance will be considered for final evaluation.

Chamber Consultation Hour: 1 PM to 3 PM, All Mondays

Notices: All notices concerning this course will be displayed on the Notice Board.

Make-up policy: Make-up is granted only for genuine cases with valid justification and prior permission from the Instructors.

Instructors



INSTITUTE OF ENGINEERING AND TECHNOLOGY

VC, JKLU - Jaipur: The Second Semester courses of 4-year B.Tech Programme (Common to all branches) have been thoroughly discussed and deliberated upon in the Faculty Council of Institute of Engineering and Technology of JKLU-Jaipur for B.Tech Batch of 2012-14. Recommended and Forwarded for Approval.

[Signature]
20/07/2012

2012-16 ✓

Syllabus

B. Tech. Second Semester-2013

(COMMON TO ALL BRANCHES)

Approved
for the Batch 2012-16.

Director - IET
Academic Section

[Signature]
21.7.2012
Vice Chancellor

JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

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| S. No. | Course Code | Course Credits | Lectures per Week (L+T+P) | Course Title | Page No. |
|--------|-------------|----------------|---------------------------|--------------------------------------|----------|
| 1. | LA201 | 03 | 2+0+2 | Professional Communication Skills | 03 |
| 2. | MA201 | 03 | 3+1+0 | Engineering Mathematics - II | 06 |
| 3. | PH201 | 04 | 3+1+2 | Engineering Physics – II | 08 |
| 4. | CH201 | 04 | 3+1+2 | Engineering Chemistry – II | 11 |
| 5. | EE201 | 04 | 3+1+2 | Electrical & Electronics Engineering | 14 |
| 6. | ME201 | 03 | 3+1+0 | Engineering Mechanics | 17 |
| 7. | ME241 | 03 | 0+0+3 | Machine Drawing | 19 |

PROFESSIONAL COMMUNICATION SKILLS

| | | |
|----------------------|---|-----------------------------------|
| Course Code | : | LA 201 |
| Course Title | : | Professional Communication Skills |
| Course Credits | : | 03 |
| Total Hours per Week | : | 2+0+2 |

Course Syllabi (Theory):

- Introduction to the course. Characteristic Features of Effective Communication and Ways to Overcome Barriers to Communication.
- Importance of Non-Verbal Communication. Importance of Paralinguistic Features and Vocal Cues.
- Group Discussion. Job Interviews.
- Public Speaking.
- Business Letters and Resume.
- Business Reports, Technical Proposals.
- E-mail Writing, Other Business Writings.
- Editing and Proofreading.

Text Book: Sanjay Kumar and Pushp Lata, Communication Skills, New Delhi: OUP, 2011.

Reference Books:

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication: Principles and Practice, Second Edition, New Delhi: OUP, 2011.
2. Krishna Mohan and Meenakshi Raman, Effective English Communication, New Delhi: Tata-McGraw Hill, 2000.
3. Krishna Mohan and N.P.Singh, Speaking English Effectively, New Delhi: Macmillan, 1994.
4. V. Sasikumar and P.V. Dhamija, Spoken English: A Self-Learning Guide to Conversation Practice, Tata-McGraw Hill, 2007.

5. Norman Lewis, Word Power Made Easy, Delhi: GoyalSaab Publishers and Distributors, 1994.
6. A.J.Thomson and A.V.Martinet, A Practical English Grammar, 4th Edition, New Delhi: OUP, 1999.
7. Asha Kaul, Business Communication, Second Edition, New Delhi: PHI, 2010.
8. Edgar Thorpe and Showick Thorpe, Objective English, 2nd Edition, New Delhi: Pearson Education, 2008.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Open Book |
| 3. | End Term Test / Comprehensive Exam | 3 hour | 40 | Closed Book |
| 4. | Quiz, Assignments, Mock Interviews, GDs, Presentations, etc | ..... | 20 | Open/Closed Book |

Course Syllabi (Practical):

- Sounds of English
- Accent and Intonation
- Listening Skills
- Reading Comprehension
- Vocabulary Extension
- Professional Presentations
- Group Discussions
- Job Interviews

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 10 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 20 | Closed Book |
| 3. | End Term Test/Comprehensive Exam | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

ENGINEERING MATHEMATICS-II

| | | |
|------------------------------|---|------------------------------|
| Course Code | : | MA201 |
| Course Title | : | Engineering Mathematics - II |
| Course Credits | : | 03 |
| Total Hours per Week (L+T+P) | : | 3+1+0 |

Course Syllabi (Theory):

- **Ordinary Differential equation:** Differential equation of first order, Differential equation of higher order with constant coefficients, Differential equation of second order with variable coefficients, Solution in series
- **Partial differential equation:** Partial Differential Equations of First Order, Heat equation, wave equation, Laplace equation, Variable separable technique for solving PDE, Boundary value problems
- **Matrix Algebra:** Matrices, Rank of a Matrix, System of Linear Algebraic Equations, Linear Independence and Dependence, Eigen Values and Eigen Vectors, Diagonalization, Cayley Hamilton Theorem
- **Linear Algebra:** Unit Vector Space, Subspaces, Bases and Dimensions, Coordinates, Row Equivalence and Computations concerning Subspaces, Linear Transformations, The Algebra of Linear Transformations, Representation by matrices
- **3-Dimensional Geometry:** Equation of a sphere, Intersection of a sphere and a plane, tangent plane, Intersection of two spheres, orthogonality of two spheres, Right circular cone. Right circular cylinder

TEXT AND REFERENCE BOOKS

1. Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones & Barlett, Viba, New Delhi, 2011
2. Peter V. O'Neil, *Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
3. G.B. Thomas, Jr., *Thomas' calculus*, 11th edition (Indian), Pearson education, Delhi, 2008
4. Erwin Kreyszig, *Advanced Engineering Mathematics*, Wiley 9th Edition.
5. B.V.Ramana, *Higher Engineering Mathematics*, Tata Mcgra Hill.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Open Book |
| 3. | End Term Test / Comprehensive Exam | 3 hour | 40 | Closed Book |
| 4. | Quiz, Assignments, Mock Interviews, GDs, Presentations, etc | ..... | 20 | Open/Closed Book |

ENGINEERING PHYSICS-II

| | | |
|------------------------------|---|--------------------------|
| Course Code | : | PH201 |
| Course Title | : | Engineering Physics - II |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+1+2 |

Course Syllabi (Theory):

Application of Schrodinger Equations and Band Theory of Solids

- Particle in three-dimensional boxes, Degeneracy.
- Barrier penetration and tunnel effect, Tunneling probability, Alpha Decay.
- Kronig-Penny Model, Brillouin Zones, Effective Mass of Electrons, Distinction between Insulators, Semiconductors and Conductors, Intrinsic and Extrinsic Semiconductors.

Statistical Mechanics

- Introduction, Macroscopic and Microscopic Systems, Phase Space.
- Maxwell-Boltzmann Statistics, Bose-Einstein Statistics, Fermi-Dirac Statistics.
- Sommerfeld Free Electron Gas Model of Solids.

Laser and Fibre Optics

- Theory of Laser Action, Einstein's Coefficients, Threshold Conditions for Laser Action.
- Theory, Design, and Applications of He-Ne Laser.
- Theory of Semiconductor Lasers.
- Optical Fibre, Numerical Aperture, and Maximum Angle of Acceptance.

Special Theory of Relativity

- Postulates of Special Theory of Relativity, Lorentz Transformations, Relativistic Velocity Addition.
- Relativity of Length, Mass, and Time, Mass-Energy Relation, Relativistic Energy and Momentum.

Nuclear Radiation Detectors

- Characteristics of Gas Filled Detectors, Constructions, Working, and Properties of Ionization Chamber.

- Proportional Counter, G.M. Counter, Paralysis Time, Quenching.
- Scintillation Counter.

Electro Dynamics

- Scalar and Vector fields, Definitions of Gradient, Divergence and Curl.
- Maxwell's Equations, Wave equation and its solution for free space, Poynting vector.

Text Books:

- T1. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-I" New Age International Publication, New Delhi, I edn. 2010.
- T2. G.D. Ladiwala and S. S. Sharma, "Engineering Physics-II" New Age International Publication, New Delhi, I edn. 2010.

Reference Books:

- R1 Arther Beiser, "Concept of Modern Physics" Tata McGrawHill, New Delhi, 5th edn. 1997.
- R2 Ajoy Ghatak, "Optics", Tata McGraw Hill, 4th edn
- R3 Eyvind H Wichman, "Quantum Physics" Tata McGraw Hill, Volume 4
- R4 Neeraj Mehta, "Applied Physics for Engineers", PHI, I edn. 2011
- R5: Dattu R Joshi, "Engineering Physics", Tata McGraw Hill, New Delhi, I edn. 2010

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open/Closed Book |

Course Syllabi (Practical):

- To determine the height of water tank with the help of a Sextant.
- To determine the dispersive power of material of a Prism for Violet Red and Yellow colours of Mercury light with the help of a spectrometer.
- To determine the wave length of prominent lines of mercury by plane diffraction Grating with the help of spectrometer.
- To determine the ferromagnetic constants retentivity, permeability and susceptibility by tracing I-H curve using C.R.O.
- To study the Charge & Discharge of a condenser and hence determine time constant (Both current and voltage graphs are to be plotted).
- To determine the high resistance by method of leakage, using a Ballistic Galvanometer.
- To determine dielectric constant of a liquid using moving coil Ballistic Galvanometer.
- To study characteristics of G.M. Counting System.
- To determine the absorption coefficient of lead using lead sheet by G.M. Counting System.
- To verify the expression for the resolving power of a Telescope.
- To determine the specific resistance of the material of a wire by Carey Fosters Bridge.

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 10 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 20 | Closed Book |
| 3. | End Term Test/Comprehensive Exam | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

ENGINEERING CHEMISTRY-I

| | | |
|------------------------------|---|---------------------------|
| Course Code | : | CH 201 |
| Course Title | : | Engineering Chemistry- II |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | (2 + 1 + 2) |
| Total Hours per Week (L+T+P) | : | 3+1+2 |

Course Syllabi (Theory):

- Methods & introduction of Coal
- Introduction of Solid state and structure of solids, Cubic system & Bragg's law
- Structure and properties of graphite, Liquid Crystal
- Introduction of Kinetics, Arrhenius theory, Gibbs law
- One component system
- Corrosion, Mechanism of corrosion
- Introduction of Nanotechnology
- Introduction of Optical fiber
- Introduction of Fuel

Text Books:

1. Engineering Chemistry by Jain & Jain, Dhanpatrai publication

Reference Books:

- 1- Engineering Chemistry by B Sivasankar, (Mc-Graw Hill publication).
- 2- Engineering Chemistry by O.G. Palanna, (Mc-Graw Hill publication).
- 3- Organic Chemistry by Smith, (Mc-Graw Hill publication).
- 4- Organic Chemistry by IL Finar, (Pearson)
- 5- Engineering Chemistry (Wiely India publication).

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open/Closed Book |

Course Syllabi (Practical):

- Proximate analysis of solid fuel.
- Determination of calorific value of solid fuels.
- Measurement of pH of given sample by pH meter.
- Measurement of conductivity of given sample by conductivity meter.
- Measurement of Fluoride in water sample.
- To determine the strength of copper sulphate with the help of Hypo solution.
- To determine the strength of Ferrous Ammonium sulphate solution
- To determine the strength of NaOH and Na_2CO_3 in given alkali mixture
- Determination of Barium as barium sulphate gravimetrically.
- Determination of Na/K/Ca by Flame photometer in a given sample.

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|----------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 15 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 15 | Closed Book |
| 3. | End Term Test | 2 hour | 40 | Closed Book |

| | | | | |
|----|---------------------------------------------------------------------------------------|------------|----|-------|
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

ELECTRICAL & ELECTRONICS ENGINEERING

| | | |
|------------------------------|---|--------------------------------------|
| Course Code | : | EE201 |
| Course Title | : | Electrical & Electronics Engineering |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+1+2 |

Course Syllabi (Theory):

- Introduction to electrical circuits, Loop analysis, Node-voltage analysis
- Wye (Y) – Delta (Δ) and Delta (Δ) – Wye (Y) transformations
- Superposition theorem, Thevenin theorem
- Fundamental aspects of single phase ac supply, Phasor representation
- Steady state analysis of series circuits, Apparent, active and reactive power, power factor
- Three-phase supply and network, Measurement of three-phase power
- Basics of transformer, Practical single phase transformer, Auto transformer
- Rotating Electrical Machines, Introduction to Semiconductor
- Diode and its working, Applications of diodes
- Bipolar Junction Transistor, Transistor configuration

Text Books:

- T₁: S.N.Singh “Basic Electrical Engineering”, Prentice-Hall of India Pvt. Ltd, 2011.
T₂ J. Millman and C. Halkias, Integrated Electronics, McGraw Hill, 2nd Edition, 6th Indian Reprint, 2011

Reference Books:

- R₁ T.K.Nagsarkar, M.S. Sukhija, “Basic Electrical Engineering”, Oxford University press, 2nd edition, 2011.
R₂ A.S. Sedra and K.C. Smith, Microelectronic Circuits, Saunder's College Publishing, 1991.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open/Closed Book |

Course Syllabi (Theory):**ELECTRICAL LAB**

1. Single line diagram of a power system and a distribution sub-station and basic functional study of main components used in power systems.
2. Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light, three pin socket and a lamp operated from two different positions. Basic functional study of components used in house wiring
3. Study the construction and basic working of ceiling fan, single phase induction motor and three phase squirrel cage induction motor. Connect ceiling fan along with regulator and single phase induction motor through auto-transformer to run and vary speed.
4. (a) Basic functional study and connection of moving coil & moving iron ammeters and voltmeters, dynamometer, wattmeter and energy meter.
(b) Run a 3-phase squirrel cage induction motor at no load and measure its voltage, current, power and power factor. Reverse the direction of rotation.
5. Study the construction, circuit, working and application of the following lamps:
(i) Fluorescent lamp, (ii) Sodium vapour lamp, (iii) Mercury vapour lamp, (iv) Halogen lamp and (v) Neon lamp
6. (a) Study the construction and connection of single phase transformer and auto-transformer. Measure input and output voltage and find turn ratio.
(b) Study the construction of a core type three phase transformer. Perform star and delta connection on a 3-phase transformer and find relation between line and phase voltage.

ELECTRONICS LAB

7. Identification, testing and applications of resistors, inductors, capacitors, PN-diode, Zener diode, LED, LCD, BJT, FET, UJT, SCR, Photo diode and Photo transistor.
8. (a) Functional study of CRO, analog & digital multi-meters and function / signal

generator.

(b) Study the single phase half wave and bridge rectifier and effects of filters on waveform.

9. Study the BJT amplifier in common emitter configuration. Measure voltage gain, plot gain frequency response and calculate its bandwidth.

10. (a) Study the construction and basic working of SCR.

(b) Study the single phase half wave and bridge controlled rectifier and observe the effect of firing angle on waveform.

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 10 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 20 | Closed Book |
| 3. | End Term Test/Comprehensive Exam | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |

ENGINEERING MECHANICS

| | | |
|------------------------------|---|-----------------------|
| Course Code | : | ME 201 |
| Course Title | : | Engineering Mechanics |
| Course Credits | : | 3 |
| Total Hours per Week (L+T+P) | : | 3+1+0 |

Course Syllabi (Theory):

- Fundamentals of engineering mechanics, Laws of Motion, Equilibrium, Conditions for equilibrium, Equations of equilibrium.
- Statics of Particles and Rigid Bodies: System of forces, Resultant force, Resolution of force, Moment and Couples.
- Trusses: Truss analysis, analysis of frames and machines.
- Friction: Types of Friction, Laws of friction, Angle of friction, Angle of repose, Applications of Friction.
- Lifting Machines: Mechanical advantage, Velocity Ratio, Efficiency of machine, Ideal machine, Ideal effort and ideal load, Reversibility of machine, Law of machine, Lifting machines; System of Pulleys, Simple wheel and axle, Wheel and differential axle, Weston's differential pulley block, Worm and worm wheel.
- Properties of Plane Surfaces: Centroids & Centre of Mass, area of moments, principle moments of inertia, Second moment of mass.
- Virtual work: Principle of Virtual Work, Active forces and active force diagram.
- Kinematics of Particles and Rigid Bodies: Velocity, Acceleration, Types of Motion, Equations of Motion, Rectangular components of velocity and acceleration, Angular velocity and Angular acceleration, Radial and transverse velocities and accelerations, Projectiles motion on plane and Inclined Plane, Relative Motion.
- Kinetics of Particles and Rigid Bodies: Equation of motion in rectangular coordinate, radial and transverse components, Equation of motion in plane for a rigid body.
- Work, Energy and Power: Work of a force, weight, spring force and couple, Power, Efficiency, Energy, Kinetic energy of rigid body, Principle of work and energy, Conservative and Non-conservative Force, Conservation of energy.
- Impulse and Momentum: Linear and angular momentum, Linear and angular impulse, Principle of momentum for a particle and rigid body, Principle of linear impulse and momentum for a particle and rigid body, Principle of angular momentum and Impulse, Conservation of angular momentum, Angular momentum of rigid body.

Reference Books:

R1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.

R2. Engineering Mechanics, Hibbeler, Pearson Education.

R3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.

R4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.

R5. Engineering Mechanics, Shames, Pearson Education.

R6. Engineering Mechanics, Boresi and Schmidt, CL-Engineering.

R7. Engineering Mechanics, Andrew Pytel & Kiusalas, Cengage Learning.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|-------------------------------|----------|-----------------|---------------------|
| 1. | Mid Term Test-I | 1 hour | 20 | Closed Book |
| 2. | Mid Term Test-II | 1 hour | 20 | Closed Book |
| 3. | End Term Test / Comprehensive | 3 hour | 40 | Closed Book |
| 4. | Assignment(s)/ Quizzes | 30 min. | 20 | Open/Closed Book |

MACHINE DRAWING

| | | |
|------------------------------|---|-----------------|
| Course Code | : | ME 241 |
| Course Title | : | Machine Drawing |
| Course Credits | : | 2 |
| Total Hours per Week (L+T+P) | : | 0+0+3 |

Course Syllabi (Practical):

- **SECTIONAL VIEWS**: Conversion of pictorial view into sectional orthographic projections, sectional views with different types of sections such as revolved, broken aligned section missing views. Representation of those views with Auto-CAD
- **ADVANCE ISOMETRIC VIEWS**: Isometric view of complex objects and Machine Parts "Sectional Isometric Views" with AutoCAD
- Introduction to Oblique views and perspective projection and exploded views of an assembly using AutoCAD
- **INTERSECTION OF SURFACE**: Interpenetration of solids, prism and prism, cylinder and cylinder, cylinder and prism, cone and cylinder, cone and prism.
- **LATEST ISI CONVENTIONS**: Conventions covering the standard practice in machine drawing. Conventions for various components like bearing, gears, springs, key and key ways, threads, tap holes and materials. Working drawing for welded joints, Use of specifications for limits, fits and tolerances, Conventions used for surface roughness i.e. Machined surface, rough surface, etc. Bearing and bearing mountings, Engine and machine tool components.

Text Books:

- T1. Yarwood, Alf. "Introduction to Auto – CAD 2011 2D and 3D Design", Elsevier, 1st edition, 2010
- T2. Ellen Finkelstein, "Auto-CAD 2011 & Auto-CAD LT 2011 Bible," Wiley India Edition
- T3. Ajeet Singh, "Machine Drawing: Includes AutoCAD," TMH, 2nd edition

Reference Books:

- R1 Bhatt, N.D. "Machine Drawing", Charotar Pulisher, 38th edition, 2003.

- R2 James E Fuller, "Using Auto-CAD," Denmark Publishing Co.
- R3 Dhawan, R.K. "Machine Drawing", S. Chand and Co, 2005
- R4 Radhakrishnan, P., "Computer Graphics and Design", Dhanpatrai and Sons.

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (%) | Nature of Component |
|--------|------------------------------------------------------------------------|------------|-----------------|---------------------|
| 1. | Mid Term Test-I | 2 hour | 10 | Closed Book |
| 2. | Mid Term Test-II | 2 hour | 20 | Closed Book |
| 3. | End Term Test/Comprehensive Exam | 2 hour | 40 | Closed Book |
| 4. | Attendance | Day to day | 10 | ..... |
| 5. | Continuous evaluation, Discipline, Punctuality, Assignment & Viva Voce | Day to day | 20 | ..... |



Having been recommended
by EoE and approved by
Academic Council, the Syllabi
and Scheme of Examination
are approved for implementation.

JK Lakshmipat University

[Signature]
24/4/13
Vice Chancellor

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Program

Branch: Civil Engineering

Batch 2012-16

SEMESTER – III to VIII

Detailed Syllabus

&

Scheme of Examination

Academic Council Meeting (20.04.13)



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-2016

SEMESTER-THIRD

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

STRENGTH OF MATERIALS & MECHANICS OF STRUCTURES

| | | |
|-------------------------------------|----------|--------------------------------------------------------------|
| Course Code | : | CE 301 |
| Course Title | : | Strength of Materials & Mechanics of Structures–I |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+1+0 |

Course Syllabi (Theory):

- **Basics of Strength of Materials** - Types of stresses and strains, Definition of determinate and indeterminate structure, Degree of Freedom, Free Body Diagram, Concept of stress and strain, Mohr's circle of stress and strain, Principle stress and strain examples, Strain – stress relationship, Hook's law, Elastic constants & relation between them, Concept of Principle Axes, Moment of Inertia & Centre of Gravity, Compound and composite bars
- **Bending Moment and Shear Force** – Introduction to bending moment and shear force diagram in beam, Simply supported beams, Overhanging beams, Beam with varying distributed load, Bending Moment and Shear Force for inclined loading
- **Concept of Bending & Shear Stresses** – Flexural formula, Stress – Strain diagram for beam, Shear stress in beam, Shear stress in beam with different cross-section
- **Concept of Torsion** - Torsion in circular shaft, Torsion Equation, Shear stress in shaft due to torsion, Combined Bending & Torsion
- **Concept of Slope and Deflection** – Introduction to slope and deflection in beam by differential equation, Double Integration method, Moment area method (Mohr's Theorems), Conjugate beam method, Strain Energy Method, Macaulay's method, Maxwell's reciprocal deflection theorem, Betti's theorem of reciprocal deflections, Examples
- **Combined Direct & Bending Stresses**

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

T1. Pytel, A., and Jaan Kiusalaas, "*Mechanics of Materials*", CL Engineering, 2nd edition, 2011

T2. Hibbeler, R.C., "*Mechanics of Materials SI*", 6th SI edition, Prentice Hall

T3. Ryder, G.H., "*Strength of Materials*", Palgrave Macmillan, 1969

T4. Junarkar -----

Reference Books:

R1 Beer, F.P., Johnston, E.R., DeWolf, J.T., "*Mechanics of Materials*", McGraw Hill, 4th edition,

R2 Craig, R.R., "*Mechanics of Materials*", John Wiley and Sons, 2nd edition, 1999

R3 Singh, Sadhu, "*Strength of Materials - I*", Khanna Book Publishing, Latest edition

R4 Rattan, S.S., "*Strength of Materials*", McGraw Hill, New Delhi, 2nd edition,

R5 Norris & Wilburr -----

FLUID MECHANICS & APPLICATIONS

| | | |
|------------------------------|---|--------------------------------|
| Course Code | : | CE 302 |
| Course Title | : | Fluid Mechanics & Applications |
| Course Credits | : | 7 |
| Total Hours Per Week (L+T+P) | : | 3+1+2 |

Course Syllabi (Theory):

- **Introduction to Fluids:** Fluids and continuum, Physical properties of fluids, Ideal and real fluids, Newtonian and non-Newtonian fluids, Surface tension of liquids
- **Hydrostatics:** Pressure-density-height relationship, manometers, pressure on plane and curved surfaces, center of pressure, buoyancy, stability of immersed and floating bodies, fluid masses subjected to uniform accelerations, measurement of pressure
- **Kinematics of Fluid Flow:** Steady and unsteady, uniform and non-uniform, laminar and turbulent flow, One, two and three-dimensional flows, streamlines, streak lines and path lines, Continuity equation, rotation and circulation, elementary explanation of stream function and velocity potential, Drawing flow nets
- **Hydrodynamics –Basics:** Euler's Equation of motion along a streamline and its integration, Bernoulli's equation and its applications- Pitot tube, flow through orifices, mouthpieces, nozzles, weirs, sluice gates under free and submerged flow conditions, momentum equation and its application to stationary and moving vanes, Pelton Wheel, Problems related to combined application of energy and momentum equations, Pumps and Cavitation.
- **Hydrodynamics -Flow in Pipes:** Laminar Flow, Hagen-Poiseuille Equation, Turbulent Flow, Boundary Layer Theory, Pipe Friction Factor: Blasius Equation, Nikurade's Experiments, Moody, Pipe Design: Local Head Loss, Sudden Enlargement, Sudden Contraction

- **Hydrodynamics -Flow in Open Channels:** Basics of Channel Flow, Moody Diagram for Channel Flow, Friction Formula for Channels, Manning's n, Varying Flow in Open Channels, Flow Characteristics
- **Dimensional Analysis and Hydraulic similitude:** Dimensional analysis, Buckingham's theorem, important dimensional numbers and their significance, geometric, Kinematic and dynamic similarity, model studies.

Course Syllabi (Practical):

1. Metacentric Height Apparatus
2. Apparatus for Orifice Experiments
3. V-Notch
4. Bernoulli's Theorem
5. Venturimeter
6. Orificemeter
7. Friction Factor of pipe
8. Reynolds experiment
9. Study of centrifugal pump
10. Pelton wheel test rig

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

T1. Cengel Y.A., Cimbala J.M., Fluid Mechanics, TMH, New Delhi, 2012

T2. Kundu P.K., Cohen I.M., Fluid Mechanics, Elsevier, Haryana, 2009

Reference Books:

R1. Subramanya K., Fluid Mechanics and Hydraulics Machines, TMH, New Delhi, 2011

R2. Modi P.N., Seth S.M., Hydraulics and Fluid Mechanics including Hydraulics Machines, Standard Book House, New Delhi, 2011

R3. Wylie & Bedford -----

BUILDING MATERIAL & CONSTRUCTION

| | | |
|------------------------------|---|----------------------------------|
| Course Code | : | CE 303 |
| Course Title | : | Building Material & Construction |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

- Introduction, Types of Building Materials: Stone, Bricks, Cement, Mortar, Concrete, Timber, Steel, Paints & Adhesives, Tiles
- Masonry work – Brick & Stone. Types of bonds in masonry
- DPC; Plastering & Pointing; Flooring

Course Syllabi (Practical):

- Identification of materials and study of relevant I.S. codes
- Visits of manufacturing units,
- Preparation of study reports and presentation of seminars
- Preparation of detailed drawings on above topics

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

- T1. Dr B C Punmia, Ashok & Arun Jain, *Building Construction*, Laxmi Publications (P), LTD, New Delhi, 10 th Edition 2008.
- T2. S C Rangwala, *Building Materials*, Charotar Publishing House Pvt, Ltd, 13 th Edition, 2012

Reference Books:

- R1 The Handbook of Building Construction by MM Goyal.
- R2 National Building Code of India, 2005, Bureau of Indian Standards, Delhi

ENGINEERING GEOLOGY

| | | |
|-------------------------------------|----------|----------------------------|
| Course Code | : | CE 304 |
| Course Title | : | Engineering Geology |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

- **Earth Sciences:** Introduction
- **Basics of Engineering Geology:** Scope of Engineering Geology for a Civil Engineer
- **Types of Geology:** Physical geology and mineralogy
- **Petrology:** Classification of rocks and their uses as building and road materials
- **Failures in Earth crust:** Historical geology; Structural geology: Folds, faults, unconformity etc.
- **Investigation in Geology:** Engineering geology: Geological investigations at dam, tunnel and bridge sites and influence of various structures
- **Precautions in different earth planes:** Precautions against faulting, folding, bedding planes, joints, cracks, fissures, permeability and ground water condition

Course Syllabi (Practical):

- Identification of Rocks
- Identification of Minerals

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|---------------|-----------------------------|-----------------|---------------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

T1. Prof Parbin Singh, 'Engineering & General Geology" S K Kataria & Sons, 8 th edition, 2008

T2. Principles of Engineering Geology, Bangar,

Reference Books:

R1 Structural Geology by Billings

R2 Petrology by Tyrll.

ENGINEERING MATHEMATICS - III

| | | |
|------------------------------|---|-------------------------------|
| Course Code | : | MA301 |
| Course Title | : | Engineering Mathematics – III |
| Course Credits | : | 5.5 |
| Total Hours per week (L+T+P) | : | 3+1+0 |

Course Syllabus:

- **Integral Transforms:** Laplace transform and its properties, Fourier Transform, Integral transform method for solving differential equations, Systems of Linear Differential Equations, Discrete Fourier transform, Fast Fourier Transform
- **Special Functions:** Legendre and Bessel functions, series representations and recurrence relations
- **Calculus of variations:** Extremal function, Euler Equation, Isoperimetric problems
- **Complex Analysis:** Functions of complex variables and its derivatives, Integration in complex planes, Series, Singularities and Residues, Evaluation of Real Integrals, Conformal mappings, Schwarz-Christoffel Transformations.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | --- | 10 |

Text and Reference Books

1. Dennis G. Zill and Warren S. Wright, *Advanced Engineering Mathematics*, Fourth Edition (Student Edition), Jones & Barlett, Viba, New Delhi, 2011
2. Peter V. O'Neil, *Advanced Engineering Mathematics*, Seventh Indian Reprint, Cengage Learning, New Delhi, 2011.
3. Erwin Kreyszig, *Advanced Engineering Mathematics*, Wiley 9th Edition.
4. B. S. Grewal, *Higher Engineering Mathematics*, 41st Ed., Khanna Publishers, Delhi, 2011.
5. B. V. Ramana, *Higher Engineering Mathematics*, Tata McGraw Hill.
6. Potter M.C., Goldberg J.L., Edward F.A., *Advanced Engineering Mathematics*, 3rd Edition, Oxford University Press, 2005

FOUNDATIONS OF MANAGEMENT

| | | |
|------------------------------|---|--------------------------|
| Course Code | : | HS301 |
| Course Title | : | Principles of Management |
| Course Credits | : | 4 |
| Total Hours Per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Concepts of management:** Functions and Responsibilities of managers, Principles of management and visiting various, Schools of management Thoughts in developing, Excellent managers
- **Planning:** Nature and purpose of planning, Planning process and principles, Types of planning, Advantages and disadvantages of planning, Concept of objectives and types of objectives, Case analysis
- **Organizing:** Nature and purpose of organizing, Process of organizing, Span of management and determination of span of management, Principles of organizing, Departmentalization, delegation and, Decentralization. Case analysis
- **Directing and leading:** Requirements of Effective directions, Giving orders, motivation, Nature of leadership, leadership and management, Recapitulation and case discussion
- **Controlling:** concept and process, Need for controlling and types of control methods, Essentials of effective control, Benefits and problems in control systems. Case analysis
- **Social responsibilities of business:** Meaning, Social responsibility of business towards different groups, Social performance of business in India, Social audit, Business ethics and corporate governance

Evaluation Scheme (Theory):

| Sr. No. | Evaluation Component | Duration | Marks (100) (%) |
|---------|----------------------------------------------------------------------------------|----------|--------------------|
| 1. | Mid Term Exam | 2 hours | 20% |
| 2. | End Term Exam | 3 hours | 50% |
| 3. | Continuous Evaluation (Quizzes, Assignments, Presentations, Class Participation) | - | 30% |

Text Books:

T1. Tripathy, P.C. and Reddy, P. N. "Principles of Management"... McGraw Hill, New Delhi.
4th ed. 2008.

Reference Books:

R1 Koontz, Herold and Weihrich, Heinz. "Management". McGraw Hill, New York. 9th ed.
1988.

R2 Stoner, James A. F. and Freeman, R Edward. "Management". Prentice Hall of India, New
Delhi. 6th e, 1989.

R3 Bateman, T. S. and Snell, S. A. "Management: Leading and Collaborating in a Competitive
World", McGraw Hill Irwin. 8th edition, 2009.

R3 Draft, R. L. "Principles of Management". Cengage learning. 2009

R4 Schermerhron, J. R. "Introduction to Management", 10th edition, Wiley India. 2009



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-2016

SEMESTER-FOURTH

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

STRENGTH OF MATERIALS & MECHANICS OF STRUCTURES - II

| | | |
|-------------------------------------|----------|-----------------------------------------------------------------|
| Course Code | : | CE401 |
| Course Title | : | Strength of Materials & Mechanics of Structures - II |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+1+0 |

Course Syllabi (Theory):

- Static determinacy and indeterminacy, Analysis of Fixed Beams, Continuous Beams & Propped Cantilever Force Method, Three Moment Theorem, Column Analogy Method, Muller Breslau's Principle.
- **Thin Cylinder and Sphere** - Classification of pressure vessels, Stresses in thin cylindrical shell due to internal pressure, Circumferential or Hoop stress, Longitudinal stress, Effect of internal pressure on dimensions of thin cylindrical shell, Spherical shell subjected to an internal pressure, Change in dimensions of thin Spherical shell due to internal pressure, Examples
- **Columns and Struts** - Definitions, Classifications, Assumptions made in the Euler's Column Theory, Expressions for crippling load of different cases like both the ends are hinged or pinned, one end is fixed and other is free, both ends are fixed, one end is fixed other is hinged, Effective length of column, Slenderness ratio, Crippling stress in terms of Effective length and radius of gyration, limitations of Euler's Formula, Rankine's Formula, Eccentric loading, Johnson's Formula for Columns, both straight line and parabolic formula for columns, Examples.
- **Curved Beam** – Stresses in Curved Beams (Winkler – Bach Theory), Position of Neutral Axis, Values of h^2 for rectangular, circular, I, T and trapezoidal cross-section, Examples. Stresses in a ring, stresses in a chain link, Examples.

- **Spring** – Definitions, Types, Closely-coiled Helical spring, Open – coiled Helical Springs, Examples. Strain energy in the spring, Springs under impact load, Springs in series, Springs in parallel, Examples. Leaf springs or Carriage springs like semi-elliptical spring, and Quarter-elliptical spring, Examples.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

- T1. S.B. Junarkar & H.V., “Mechanics of Structures”, Vol. II
- T2. Hibbeler, R.C., “*Mechanics of Materials SI*”, 6th SI edition, Prentice Hall
- T3. Ryder, G.H., “*Strength of Materials*”, Palgrave Macmillan, 1969
- T4. Srivastava, A.K., and P.C. Gope, “*Strength of Materials*”, PHI, 2nd edition, 2012

Reference Books:

- R1 Beer, F.P., Johnston, E.R., DeWolf, J.T., “*Mechanics of Materials*”, McGraw Hill, 4th edition,
- R2 Craig, R.R., “*Mechanics of Materials*”, John Wiley and Sons, 2nd edition, 1999
- R3 Singh, Sadhu, “*Strength of Materials - I*”, Khanna Book Publishing, Latest edition
- R4 Rattan, S.S., “*Strength of Materials*”, McGraw Hill, New Delhi, 2nd edition,
- R5 C. K. Wang, “Structural Analysis”

CONCRETE & CONSTRUCTION TECHNOLOGY

| | | |
|------------------------------|---|------------------------------------|
| Course Code | : | CE402 |
| Course Title | : | Concrete & Construction Technology |
| Course Credits | : | 06 |
| Total Hours per Week (L+T+P) | : | 3+0+3 |

Course Syllabi (Theory):

- Review of constituent materials – Cement, Aggregates and mix design, admixtures,
- Properties of concrete in fresh and hardened state, special concretes, durability of concrete subjected to extreme environment,
- Deterioration mechanisms, assessment and control of corrosion in concrete structures,
- In-situ assessment of concrete structures,
- Various NDT techniques and their applications,
- Repair of concrete structures.

Course Syllabi (Practical):

1. Tests on cement – specific gravity, fineness, soundness, normal consistency, setting time, compressive strength on cement mortar cubes
2. Tests on fine aggregate – specific gravity, bulking, sieve analysis, fineness modulus, moisture content, bulk density and deleterious materials.
3. Tests on coarse aggregate - specific gravity, sieve analysis, fineness modulus, bulk density.
4. Tests on Fresh Concrete: Workability : Slump, Compaction factor tests
5. Hardened Concrete: Compressive strength on Cubes, Static modulus of elasticity, Flexure tests , Non destructive testing
6. Mix Design of Concrete.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|--------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

References:

1. Neville, A.M. and Brooks, J.J., "CONCRETE TECHNOLOGY", ELBS .1990.
2. Mehta, P.K., "CONCRETE Structure, Material and Properties" Prantice Hall Inc.1986.
3. Newman, K., "CONCRETE SYSTEMS in COMPOSITE MATERIALS".EDT BY L.Holliday. Elsevier Publishing Company. 1966.
4. Powers, T.C., "THE PROPERTIES OF FRESH CONCRETE".JOHN WILEY & SONS, INC. 1968.

SURVEYING – I

| | | |
|-------------------------------------|----------|----------------------|
| Course Code | : | CE403 |
| Course Title | : | Surveying - I |
| Course Credits | : | 06 |
| Total Hours per Week (L+T+P) | : | 3+0+3 |

Course Syllabi (Theory):

- Basic principles, Maps,
- Topographic Sheets, their scales and uses;
- Level, Theodolite, Tacheometer, Compass and other instruments;
- Introduction to Total Station; Temporary adjustments; Measurement of distances and directions;
- Levelling; Contouring; Traversing;
- Adjustment of survey data; Computation of coordinates; Plane Table survey.
- Setting out works for lines and buildings, horizontal and vertical control

Course Syllabi (Practical):

- Chain Surveying
- Compass Surveying
- Plane Table Surveying
- Levelling & Dumpy levels
- Theodolite Surveying

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

References:

1. Surveying Vol. I & II by K.R. Arora.
2. Surveying Vol. I & II by B.C. Punmia.
3. Surveying Instruments by Cledenning & Oliver

BUILDING CONSTRUCTION TECHNOLOGY

| | | |
|------------------------------|---|----------------------------------|
| Course Code | : | CE404 |
| Course Title | : | Building Construction Technology |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Foundations: Different types of shallow & deep foundations, Causes of failure of foundation
- Safe Bearing Capacity of soil, Expansion, Construction joints, Doors & Windows, Lintels & Arches, Sill & Jamb Details, Stairs, Floors, Roof – Flat & Pitched and Formwork.
- Exterior & Interior Wall Sections

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

References:

- 1 The Handbook of Building Construction by MM Goyal
- 2 Building construction by SP Arora, & S P Bindra
- 3 National Building Code of India, 2005, Bureau of Indian Standards, Delhi.
- 4 Engineering materials S C Rangwala

NUMERICAL & STATISTICAL ANALYSIS

| | | |
|------------------------------|---|----------------------------------|
| Course Code | : | MA 402 |
| Course Title | : | Numerical & Statistical Analysis |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3 + 0 + 2 |

Course Syllabi (Theory):

- **Modeling, Computers, and Error Analysis:** Mathematical Modeling and solution using Programming and Software, Computer Arithmetic and Errors: Approximations and Round-Off Errors, Truncation Errors and the Taylor Series
- **Transcendental and polynomial equation:** Solution of non-linear Equations: Bracketing Methods, Open Methods, Roots of Polynomials
- **Linear Algebraic Equations:** LU Decomposition and Matrix Inversion, Iterative methods for solving system of linear equations.
- **Interpolation and approximation:** Interpolation for equally and unequally spaced points, Lagrangian Polynomial, Curve Fitting: Least-Squares Regression
- **Numerical Differentiation and Integration:** Numerical Differentiation and Integration, Newton-Cotes Integration Formulae.
- **Ordinary Differential Equations:** Single step methods for solving first order ordinary differential equation
- **Random Variables and probability distributions:** Introduction to probability, Discrete and continuous random variables, probability mass, probability density and cumulative distribution functions, Mathematical expectation, Chebyshev's inequality, Discrete and continuous probability distributions
- **Sampling distributions:** Sampling, Types of sampling, sampling errors, sampling distribution of means, variance and proportions for normal population, The Central Limit Theorem, Chi-Square, t and F distributions
- **Estimation:** Estimators, Point and interval estimation, confidence intervals for parameters in one sample and two sample problems of normal populations, confidence intervals for proportions
- **Testing of Hypotheses:** Null and alternative hypotheses, the critical and acceptance regions, two types of error, Parametric and Non-parametric tests, Chi-square goodness of fit test, Contingency tables.

- **Correlation and regression:** Types of Relationships, Scatter Diagrams, Regression Line, Coefficients of Determination and Correlation.
- **Analysis of variance:** One way analysis of variance, experimental design, two way analysis of variance without interaction

Course Syllabus (Practical):

Computer Programming in C and Matlab; Introduction to SPSS for solving statistical techniques.

List of experiments:

1. To find the solution of Non-linear equations.
2. To find solution of system of equations.
3. To find the best fitted curve for a given set of points.
4. To differentiate a function numerically.
5. To integrate a functions numerically.
6. To find solution of a differential equation numerically.
7. Working on SPSS

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | --- | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |

| | | | |
|----|-----------------------------------------------------------------------------------------|------------|----|
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text and Reference books:

1. K. E. Atkinson, *Introduction to Numerical Analysis*, John Wiley and Sons.
2. M.K. Jain, S. R. K. Iyengar, R. K. Jain, *Numerical Methods For Scientific And Engineering Computation*, New age International publishers, New Delhi.
3. Steven C Chapra, Raymond P Canale, *Numerical Methods for Engineers*, 6/e, Mc Graw Hill
4. Srimanta Pal, *Numerical Methods: Principles, Analyses and Algorithms*, Oxford University Press, New Delhi.
5. Cheney and Kincaid, *Numerical Methods and Applications*, Cengage Publications, New Delhi.
6. Cleve B. Moler, *Numerical Computing with MATLAB*, Prentice Hall of India, New Delhi
7. Rishard A. Johnson, *Miller and Freund's probability and Statistics for Engineers*, PHI, 8th Ed.
8. Ravichandran J., *Probaility and statistics for Engineers*, Wiley India, New Delhi.
9. Douglas C. Montgomery and George C. Runger, *Applied Statistics and Probability for Engineers*, John Wiley & Sons, Inc., 3rd Edition (2004).
10. Prem S. Mann, *Introductory Statistics*, Wiley publication, 7th edition.

PRINCIPLES OF ECONOMICS

| | | |
|------------------------------|---|-------------------------|
| Course Code | : | HS401 |
| Course Title | : | Principles of Economics |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3 + 0 + 0 |

Course Syllabi (Theory):

- Definition of Economics and role of economics in Engineering and Technology; Basic economic terms; The economy, working of an economy, kinds of an economy and its basic problems; Laws of Demand and Supply and market Equilibrium; Elasticity of demand its measurements and application, Production function and law of Variable Proportion and Law of Returns to Scale; Concepts of cost and revenue, short run and long run cost function; Profit maximization hypothesis, Price and output determination under Perfect Competition, Monopolistic competition and Monopoly.
- Measurement of macroeconomic aggregates, National Income, Consumption, saving and investment function; Macroeconomic issues: Inflation, Unemployment and Economic growth International aspects of macro economics; Foreign Exchange rate and Balance of payments.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Book:

T.R. Jain and M.L. Grover, "Economics for Engineers", V. K. (India) Enterprises

Reference Books:

- D N Dwivedi "Principles of Economics", Vikas Publishing House Pvt Ltd.
- G. Mankiew. Economics Principles and Applications. Cengage Learning



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4-Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-2016

SEMESTER-FIFTH

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

THEORY OF STRUCTURES

| | | |
|------------------------------|---|---------------------|
| Course Code | : | CE501 |
| Course Title | : | Theory of Structure |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+1+0 |

Course Syllabi (Theory):

- **Statically Indeterminate Structures**-Introduction, Static and Kinematic Indeterminacies, Castigliano's theorems, Strain energy method, Analysis of frames with one or two redundant members using Castigliano's 2nd theorem. Concept of rolling load, design of maximum bending moment, shear force due to rolling load, concept of influence lines in beams, I.L diagram for shear force, B.M., deflection etc.
- **Slope deflection and moment Distribution Methods**- Analysis of continuous beams & portal frames, Portal frames with inclined members.
- **Three hinged arch-horizontal thrust**: shear force and bending moment diagrams. Unit-IV Bending moment and shear force in determinate beams and frames, definition and signs, conventions, axial force, shear force and B.M diagrams.
- **Unsymmetrical Bending**: Introduction, Centroidal principal axes of sections, Bending stresses in beams subjected to unsymmetrical bending, shear centre, shear centre for channel, Angles and Z sections.
- **Cable and suspension Bridges** - Introduction, uniformly loaded cables, Temperature stresses, and three hinged stiffening Girder and two hinged stiffening Girder.
- **Analysis of statically determinate trusses**-Introduction, various types, stability, analysis of plane trusses by method of joints and method of sections, analysis of space trusses using tension coefficient method.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Statically Indeterminate Structures, C.K. Wang, McGraw Hill Book Co., New York.
2. Advanced Structural Analysis, A.K. Jain, Nem Chand & Bros., Roorkee.

Reference Books:

1. Indeterminate Structures, R.L. Jindal, S. Chand & Co., New Delhi.
2. Theory of Structures, Vol. I, S.P. Gupta & G.S.Pandit, Tata McGraw Hill, New Delhi.

CONCRETE STRUCTURES – I

| | | |
|------------------------------|---|-------------------------|
| Course Code | : | CE502 |
| Course Title | : | Concrete Structures – I |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

- *Design Philosophies in Reinforced Concrete:* Working stress and limit state methods, Limit state v/s working stress method, Building code, Normal distribution curve, characteristic strength and characteristics loads, design values, Partial safety factors and factored loads, stress -strain relationship for concrete and steel.
- *Beam Design:* Basic assumptions, Analysis and design of singly and doubly reinforced rectangular flanged beams, minimum and maximum reinforcement requirement, design examples.
- *Analysis and Design of Sections in shear, bond and torsion* -Diagonal tension, shear reinforcement, development length, Anchorage and flexural bond, Torsional, stiffness, equivalent shear, Torsional reinforcement, Design examples.
- *Concrete Reinforcement and Detailing*-Requirements of good detailing, cover to reinforcement, spacing of reinforcement, reinforcement splicing, Anchoring reinforcing bars in flexure and shear, curtailment of reinforcement.
- *Serviceability Limit State* -Control of deflection, cracking, slenderness and vibrations, deflection and moment relationship for limiting values of span to depth, limit state of crack width, Design examples.

- **One way and Two Ways Slabs** -General considerations, Design of one way and two ways slabs for distributed and concentrated loads, Non-rectangular slabs, openings in slabs, Design Examples
- **Columns and Footings**-Effective length, Minimum eccentricity, short columns under axial compression, Uniaxial and biaxial bending, slender columns, Isolated and wall footings, Design examples.
- **Staircase Design**
- **Retaining Walls**-Classification, Forces on retaining walls, design criteria, stability requirements, Proportioning of cantilever retaining walls, counterfort retaining walls, criteria for design of counterforts, design examples.

Course Syllabi (Practical):

- Design of Members i.e. Beams, Columns, Footings, Retaining Wall, Staircase etc.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |

| | | | |
|----|-----------------------------------------------------------------------------------------|------------|----|
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Design of Reinforced Concrete Structures, P. Dayaratnam, Oxford & IBH Pub., N. Delhi.
2. Reinforced Concrete-Limit State Design, A.K. Jain, Nem Chand & Bros., Roorkee.

Reference Books:

1. Reinforced Concrete, I.C. Syal & A.K. Goel, A.H. Wheeler & Co. Delhi.
2. Reinforced Concrete Design, S.N. Sinha, TMH Pub., N. Delhi.
3. SP-16(S&T)-1980, Design Aids for Reinforced Concrete to IS:456, BIS, N. Delhi.
4. SP-34(S&T)-1987 Handbook on Concrete Reinforcement and Detailing, BIS, N. Delhi.
5. Relevant IS codes on Aggregates, Cement & Concrete (269, 383, 2386, 10262, SP23)
6. Laboratory manual of concrete testing by V.V. Sastry and M. L. Gambhir

STEEL STRUCTURES – I

| | | |
|------------------------------|---|----------------------|
| Course Code | : | CE503 |
| Course Title | : | Steel Structures – I |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

Introduction: Properties of structural steel. I.S.Rolled sections and I.S. specifications.

Connections: Importance, various types of connections, simple and moment resistant, riveted, bolted and welded connections.

Design of Tension Members: Introduction, types of tension members, net sectional areas, design of tension members, lug angles and splices.

Design of Compression Members: Introduction, effective length and slenderness ratio, various types of sections used for columns, built up columns, necessity, design of built up columns, laced and battened columns including the design of lacing and battens, design of eccentrically loaded compression members.

Column Bases and Footings: Introduction, types of column bases, design of slab base and gusseted base, design of gusseted base subjected to eccentrically loading, design of grillage foundations.

Design of Beams: Introduction, types of sections, general design criteria for beams, design of laterally supported and unsupported beams, design of built up beams, web buckling, web crippling and diagonal buckling.

Design of Trusses:

Gantry Girders: Introduction, various loads, specifications, design of gantry girder.

Plate Girder: Introduction, elements of plate girder, design steps of a plate girder, necessity of stiffeners in plate girder, various types of stiffeners, web and flange splices (brief introduction), Curtailment of flange plates, design beam to column connections: Introduction, design of framed and seat connection.

Course Syllabi (Practical):

1. To verify the Betti's law.
2. Study of a three hinged arch experimentally for a given set of loading and to compare the results with those obtained analytically.
3. To obtain experimentally the influence line diagram for horizontal thrust in a three hinged arch and to compare the same with the theoretical value.
4. To determine the flexural rigidity of a given beam.
5. To study the behavior of different type of struts.
6. To verify moment area theorem for slopes and deflection of a beams.
7. To find the deflection of a pin-connected truss and to verify the results by calculation and graphically.
8. To determine the carry over factors for beam with rigid connections.
9. To determine the rotational stiffness of a beam when far end is (a) fixed (b) pinned.
10. Determine experimentally the horizontal displacement of the roller end of a two hinged arch for a given set of a loading and to compare the results with those obtained analytically.
11. To obtain experimentally the influence line diagram for horizontal thrust in a two hinged arch and to compare the same with the theoretical value.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Design of steel structures, A.S.Arya & J.L.Ajmani, Nem chand & Bros., Roorkee.
2. Design of steel structures, M.Raghupati, TMH Pub., New Delhi.

Reference Books:

1. Design of steel structures, S.M.A.Kazmi & S.K.Jindal, Prentice Hall, New Delhi.
2. Design of steel structures, S.K.Duggal, TMH Pub, New Delhi.

SURVEYING - II

| | | |
|------------------------------|---|----------------|
| Course Code | : | CE504 |
| Course Title | : | Surveying - II |
| Course Credits | : | 6 |
| Total Hours per Week (L+T+P) | : | 3+0+3 |

Course Syllabi (Theory):

- **Trigonometrically Leveling:** Introduction, height and distances -base of the object accessible, base of object inaccessible, geodetical observation, refraction and curvature, axis signal correction, difference in elevation between two points.
- **Triangulation:** Triangulation systems, classification, strength of figure, selection of triangulation stations, grade of triangulation, field work of triangulation, triangulation computations, introduction to E.D.M. instruments.
- **Survey Adjustment and Treatment of Observations:** Definite weight of an observation, most probable values, type of error, principle of least squares, and adjustment of triangulation figures by method of least squares.
- **Astronomy:** Definitions of astronomical terms, star at elongation, star at prime vertical star at horizon, star at culmination, celestial coordinate systems, Napier's rule of circular parts, various time systems: sidereal, apparent, solar and mean solar time, equation of time-its cause, effect, determination of longitude, inter-conversion of time, determination of time, azimuth and latitude by astronomical observations.
- **Elements of Photogrammetry:** Introduction: types of photographs, Terrestrial and aerial photographs aerial camera and height displacements in vertical photographs, stereoscopic vision and stereoscopies, height determination from parallax measurement, flight planning, plotting by radiline method, principle of photo interpretation and photogram metric monitoring in Civil Engineering.

- Introduction of remote sensing and its systems, Analysis /measurements on remote sensing analysis. And interpretation of data
- Concept of G.I.S and G.P.S-Basic Components, data input, storage & output.

Course Syllabi (Practical):

1. Ranging and chaining of a line AB and taking offsets.
2. Traversing with compass and error adjustment to local attraction.
3. To determine the difference in elevation of two given points.
4. Profile levelling and cross sectioning of a given route.
5. To measure the horizontal angle by the method of reiteration and repetition.
6. Theodolite traversing.
7. To prepare the contour map of an area by the method of radial lines.
8. Plane tabling by the method of radiation and intersection.
9. To point problem in plane tabling.
10. Three point problem by mechanical method.
11. Setting out of simple circular curve by offsets from long chord
12. Setting out of simple circular curve by successive bisection.
13. Setting out of simple circular curve by radial and perpendicular offsets.
14. Setting out of simple circular curve by chord produced.
15. Setting out of simple circular curve by one theodolite method.
16. Setting out of simple circular curve by two theodolite method.
17. Setting out of compound curve.
18. Setting out of transition curve.
19. Techometric constant.
20. Use of total station.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Surveying Vol.2 by B.C.Punmia
2. Surveying Vol.3 by B.C.Punmia
3. Surveying Vol.2 by T.P.Kanitkar

ENVIRONMENTAL ENGINEERING

| | | |
|-------------------------------------|----------|----------------------------------|
| Course Code | : | CE505 |
| Course Title | : | Environmental Engineering |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

Water supply; Demand; Sources; Quality standards; Water treatment: Method of purification of water; Screens, plain and coagulant aided sedimentation; Filtration-slow sand and rapid sand, disinfection; Water softening; Iron, Manganese, Fluoride, and Nitrate removal; Electrodialysis, R.O. and Ion exchange process desalination. Different type of pipes and pipe joints, Water distribution system design and storage, Long distance water transmission, Pumping stations, Rural water supply management. Sewage disposal; Sewerage system; Layout and design; Characteristics of municipal wastewater; Wastewater Treatment: Treatment scheme; Screening; Grit removal; Sedimentation; Floatation; Activated sludge process; Extended aeration; Trickling filters; RBC, UASB; Stabilization ponds and lagoons; Septic tank; Sludge handling and disposal. Introduction to tertiary treatment. Rural wastewater management.

Course Syllabi (Practical):

1. To find the turbidity and colour of a given sample of water.
2. To determine the pH value of a given sample of water.
3. To determine the carbonate, bicarbonate, and hydroxide alkalinity of a sample.
4. To find out the concentration of chlorides in the given sample of water.
5. To estimate the hardness of the given sample of water by standard EDTA method.
6. To determine residual chlorine in a given sample of water.
7. To find out total dissolved solid, settleable solids and suspended solids of the given sample.
8. To find the quantity of dissolved oxygen (DO) present in the given sample.
9. To determine biochemical oxygen demand (BOD) exerted by the given waste water sample.
10. To find the optimum amount of coagulant required to treat the turbid water by Jar Test.
11. To find out total bacterial count present in a given sample (SPCT).
12. To determine MPN of coliforms of the given sample.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|--------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Davis M.L. & Cornwell D.A. Introduction to Environmental Engineering, Mc GrawHill, 1991.
2. Peary H.S., Rowe D.R. and Tchobanoglous G. Environmental Engineering, Mc GrawHill, 1995.

Reference Books:

1. Standard Methods for the Examination of Water and Wastewater: APHA, AWWA, WPCF.
2. Chemistry for Environmental Engg and Science: C.N. Sawyer, P.L. McCarty & G.F. Parkin

GEOTECHNICAL ENGINEERING

| | | |
|-------------------------------------|----------|---------------------------------|
| Course Code | : | CE506 |
| Course Title | : | Geotechnical Engineering |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

Soil and soil mass constituents; and weight volume relationships, index properties, classification of soils, soil structure and clay minerals. Capillarity, permeability and seepage through soils, shearing strength of soils, determination of parameters by direct shear box, triaxial and unconfined compression test, vane shear test, typical stress strain curves for soils; stress path concept, determination of pore pressure coefficients. Liquefaction of soils, Soil compaction, laboratory tests and field control, Engineering properties of rocks and classification system. Testing of rocks; laboratory and field tests. Ground improvement techniques: mechanical stabilization, cement lime and bitumen stabilization.

Course Syllabi (Practical):

List of Experiments:

1. Grain size distribution by sieving.
2. Determination of water content by Pycnometer.
3. Determination of specific Gravity by Pycnometer.
4. Determination of liquid limit by Casagrande's apparatus.
5. Determination of liquid limit by cone penetrometer.
6. Determination of plastic limit
7. Determination of shrinkage limit
8. Determination of field density by core-cutter
9. Determination of field density by sand replacement method
10. Determination of compaction properties by standard Proctor Test Apparatus
11. Determination of C- ϕ values by Direct Shear Test Apparatus
12. Determination of unconfined compressive strength by unconfined compression Test Apparatus

Design as per syllabus of theory.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|--------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Acar, Y.B. and Daniel, D.E., "Geoenvironmental 2000: Characterization, "Containment, Remediation & Performance in Environmental Geotechnics," ASCE, NY.
2. Hari, D.S. and Krishna R.R., "Geoenvironmental Engineering: Site Remediation, "Waste Containment, and Emerging Waste Management Technologies," Wiley. USA
3. Oweis, I.S. and Khera, R.P., "Geotechnology of Waste Management," 2nd Ed, PSW Publishing Company, USA.
4. Rees, J.F., "Contaminated Land Treatment Technologies," SCI, Elsevier Applied Science, NY, USA.

Reference Books:

1. Analysis and Design of Sub Structures by Swami Saran, IBH Oxford
2. Basic and Applied Soil Mechanics by Gopal Ranjan and ASR Rao, Newage Int.Pub.
3. Soil Dynamic by Shamsher Prakash, McGraw Hill
4. Foundation Design by Teng, Prentice Hall
5. Soil Mechanics & Foundation Engineering by Bharat Singh, Shamsher Prakash, Nem Chand & Bros, Roorkee.
6. Analysis and Design of Foundation and Retaining Structure by S.Prakash, Gopal Ranjan S.Saran, Sarita Prakashan.

PRACTICE SCHOOL – I

| | | |
|-----------------------|----------|----------------------------|
| Course Code | : | PS501 |
| Course Title | : | Practice School – I |
| Course Credits | : | 4 |
| Duration | : | 6 Weeks |

Course Syllabi:

This course is for 6 weeks at the end of 4th semester during summer term of 4 year full time B. Tech. and 5 year Integrated Dual degree (B.Tech + M.Tech, B.Tech + MBA) programs in all the engineering disciplines. The objective of this programme is to provide the students an understanding of working of corporate world in various functions associated with an Industry/Organization. During this programme, they will observe and learn various real world applications of their curricula and develop an understanding of vast engineering operations and its various facets such as inventory, productivity, management, information systems, human resource development, data analysis etc. The general nature of PS-1 assignments is of study and orientation.

Evaluation Scheme:

| S. No. | Evaluation Component | Marks (100) (Weightage %) |
|---------------|------------------------------------------------------------|--------------------------------------|
| 1 | Quiz-I | 4 |
| 2 | Quiz-II | 4 |
| 3 | Group Discussion-I | 4 |
| 4 | Group Discussion-II | 4 |
| 5 | Seminar-I | 4 |
| 6 | Seminar-II | 4 |
| 7 | Diary-I | 4 |
| 8 | Diary-II | 4 |
| 9 | Observation-I | 4 |
| 10 | Observation- II | 4 |
| 11 | Mid Term Evaluation (Project Report and Presentation/Viva) | 20 |
| 12 | Final Evaluation (Project Report and Presentation/Viva) | 40 |



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4-Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-16

SEMESTER-SIXTH

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

CONCRETE STRUCTURES – II

| | | |
|------------------------------|---|--------------------------|
| Course Code | : | CE601 |
| Course Title | : | Concrete Structures – II |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

- Continuous Beams-Basic assumptions, Moment of inertia, settlements, Modification of moments, maximum moments and shear, beams curved in plan-analysis for torsion, redistribution of moments for single and multi-span beams, design examples.
- Flat slabs and staircases-Advantages of flat slabs, general design considerations, approximate direct design method, design of flat slabs, openings in flat slab, design of various types of staircases, design examples.
- Adv. Foundations-Combined footings, raft foundation, design of pile cap and piles, underreamed piles, design examples.
- Water Tanks, Silos and Bunkers-Estimation of Wind and earthquake forces, design requirements, rectangular and cylindrical underground and overhead tanks, Intze tanks, design considerations, design examples.
- Silos and Bunkers-Various theories, Bunkers with sloping bottoms and with high sidewalls, battery of bunkers, design examples. '
- Pre-stressed Concrete - Basic principles, classification of pre-stressed members, various prestressing systems, losses in pre-stress, initial and final stress conditions, analysis and design of sections for flexure and shear, load balancing concept, IS Specifications.
- End blocks- Analysis of stresses, Magnel's method, Guyon's method, Bursting and spalling stresses, design examples.
- Building Frames-Introduction, Member stiffnesses, Loads, Analysis for vertical and lateral loads, Torsion in buildings, Ductility of beams, design and detailing for ductility, design examples.
- Yield Line Theory-Basic assumptions, Methods of analysis, yield line patterns and failure mechanisms, analysis of one way and two way rectangular and non-rectangular slabs, effect of top corner steel in square slabs, design examples.

Course Syllabi (Practical):

- Design of Members.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|-----------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Plain and Reinforced Concrete, Vol.2, Jai Krishna & O.P.Jain, Nem Chand & Bros.,Roorkee.
2. Pre-Stressed Concrete, N.Krishna Raju, TMH Pub.,N.,Delhi.
3. Design of Prestressed Concrete Structure^, T.Y.Lin, John Wiley & Sons., N.Delhi.
4. Reinforced Concrete-Limit Stage Design, A.K.Jain, Nem Chand & Bros.,Roorkee.

Reference Books:

1. IS 1343-1980.IS Code of Practice for Pre-stressed Concrete.
2. IS 3370-1976(Part 1 to IV), Indian Standard Code of Practice for Liquid Retaining Structures.
3. IS 456-2000, Indian Standard of Practice for Plain and Reinforced Concrete.
4. IS 1893, 4326 & 13920 Indian Standard Code of Practice for Earthquake Resistant Design of Structures.
5. Mechanics of Materials, Ferdinand P. Beer and E. Russel Johnston Jr., Mc GrawHill, 1992.
6. Mechanics of Materials, vol. 1 and 2, 2nd edition, E.J. Hearn, Pergamon Press, 1988.
7. W. Weaver & J.M. Gere, Matrix analysis of Framed Structures, VNR, 1980.
8. Tung Au & Paul Christiano, Fundamentals of Structural Analysis, Prentice Hall, 1993.
9. T.J. MacGinley & B.S. Choo, "Reinforced Concrete - Design Theory and Examples", 2nd. Edition, E & F.N. Spon, Chapman & Hall, London.
10. W.H. Mosley & Bungey, "Reinforced Concrete Design", 4th Edition, Newnes Butterworth.
11. C.J. Mettem, Structural Timber Design and Technology, Longman Scientific & Technical, 1985.

STEEL STRUCTURES – II

| | | |
|------------------------------|---|-----------------------|
| Course Code | : | CE602 |
| Course Title | : | Steel Structures – II |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

- **Elementary Plastic Analysis and Design:** Introduction, Scope of plastic analysis, ultimate load carrying capacity of tension members and compression members, flexural members, shape factor, mechanisms, plastic collapse, analysis, plastic analysis applied to steel beams and simple portal frames and design.
- **Industrial Buildings:** Loads, general arrangement and stability, design considerations, design of purlins, design of roof trusses, industrial building frames, bracings and stepped columns.
- **Design of Water Tanks:** Introduction, permissible stresses, design of circular, rectangular and pressed steel tanks including staging.
- **Design of Steel Stacks:** Introduction, various loads to be considered for the design of steel stacks, design of steel stacks including foundation.
- **Towers:** Transmission line towers, microwave towers, Design loads, classification, design procedure and specification.

- **Cold Formed Sections:** Introduction and brief description of various type of cold-formed sections, local buckling, concepts of effective width and effective sections, elements with stiffeners, design of compression and bending elements.

Course Syllabi (Practical):

1. Introduction: Building Byelaws, Orientation and Principles of planning, introduction of structural drawing.
2. Different types of bonds in walls and junctions in brick masonry, details of masonry columns, Drawings of partition walls, cavity walls.
3. Structural Drawing of RCC Structures, foundations, stair cases, retaining walls, water tanks.
4. Structural Drawing of steel structures, connections, beams, columns, trusses.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|---------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation | Day to day | 25 |

| | | | |
|--|-----------------------------------------------------|--|--|
| | (Assignments, Discipline, Punctuality, & Viva Voce) | | |
|--|-----------------------------------------------------|--|--|

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Design of Steel Structures, A.S.Arya & J.L.Ajmani, Nem Chand & Bros., Roorkee.
2. Design of Steel Structures, P.Dayartnam, Wheeler Pub. Allahabad

Reference Books:

1. Design of Steel Structures, Gaylord & Gaylord, McGraw Hill, New York/International Students
2. IS: 800-1984, Indian Standard Code of Practice for General Construction in Steel.
3. IS-801-1975, Indian Standard Code of Practice for Use of cold-formed light gauge steel structural members in general building construction.

WATER RESOURCES & IRRIGATION ENGINEERING

| | | |
|------------------------------|---|------------------------------------------|
| Course Code | : | CE603 |
| Course Title | : | Water Resources & Irrigation Engineering |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

Introduction, need for harnessing water resources; Water resources projects and their planning; Irrigation practices; Irrigation-its importance and impact on environmental, assessment of water requirements for crops; Methods of irrigation; canal and well irrigation; canal irrigation; canal alignment; Design principles of irrigation canal management of canal irrigation; Design principle of hydraulic structures; Surface and surface considerations including energy dissipation; salient features of diversion head works; Falls; Regulators and cross drainage structures; Reservoir and flood routing through reservoir; basic principles for design of dams and spillway; Hydropower; General features and components of a hydropower station.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Hydro Power Structures – R. S. Varshney (ISBN 8185240787)
2. Water Power Engineering – M. M. Dandekar, Vikas Pub. House Pvt. Ltd.
3. Water Power Engineering – P. K. Bhattacharya, Khanna Pub., Delhi
4. Water Power Engineering – M. M. Deshmukh, Dhanpat Rai and Sons
5. Textbook Of Water Power Engineering- Sharma R. K. , Sharma T. K, S Chand & Company Ltd.

Reference Books:

1. Water Power Development – E. Mosonvi, Vol. I & II
2. Hydro-electric Engineering Practice – G. Brown, Vol. I, II & III
3. Hydro – Electric Hand Book – Creager and Justin

TRANSPORTATION ENGINEERING

| | | |
|------------------------------|---|----------------------------|
| Course Code | : | CE604 |
| Course Title | : | Transportation Engineering |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3+0+2 |

Course Syllabi (Theory):

Introduction to Transportation Systems

Transportation Systems Engineering-Definition and Objectives of Transportation Systems - Various fields of transportation engineering; Role of transportation in society - economical, social, political and environmental significance; Different modes of travel and their coordination with respect to Indian conditions; Introduction to transportation planning process - planning models and mass transit systems;

Highway Engineering

Highway planning - basic principles, road development and planning in India; Highway alignment; Geometric design of highways - design of cross-section, horizontal and vertical elements, IRC specifications;

Highway Pavements

Pavement materials; Requirements and tests on pavement materials; Classification of pavements and design factors; Design of flexible pavements - traffic factors, failure criteria, empirical mechanistic method of design, IRC-CBR design method, Asphalt institute method and AASHTO method; Design of rigid pavements - stresses in plain CC pavements, IRC method of plain CC pavement design, Joints in CC pavement, joint spacing and reinforcement across joints, tie bars and dowel bars; Pavement construction and maintenance; Stabilised roads; Drainage.

Traffic Engineering

Traffic characteristics; Traffic studies and their use; Traffic control devices; Intersections.

Course Syllabi (Practical):

1. Aggregate impact test
2. Angularity number test
3. To determine fineness modulus of a given sample of coarse aggregate.
4. Los angles abrasion test

5. Aggregate crushing value test
6. Standard tar viscometer test
7. Specific gravity and water absorption test
8. To determine the elongation index for given sample of aggregate.
9. To determine the flakiness index of given sample of aggregate.
10. Ductility test
11. To determine the softening point for give sample of bitumen.
12. Marshall stability test
13. Float test

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Evaluation Scheme (Practical):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|--------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test | 2 hour | 20 |
| 2. | End Term Test | 2 hour | 40 |
| 3. | Class Participation and/or Attendance | Day to day | 15 |
| 4. | Additional Continuous Evaluation (Assignments, Discipline, Punctuality, & Viva Voce) | Day to day | 25 |

*Note: The ratio of weightage between Theory and Practical content will be (60%: 40% respectively)

Text Books:

1. Morlok, E. R. (1970). An Introduction to Transportation Engineering and Planning, McGraw Hill Kagakusha, International Student Edition.
2. Hay, W. W. (1988). 2nd Ed. Introduction to Transportation, Engineering. John Wiley and Sons, New York.
3. Papacostas, C. S. (1987). Fundamentals of Transportation, Engineering, Prentice Hall of India, New Delhi.
4. Hutchinson, B. G. (1974). Principles of Urban transportation Planning, McGraw Hill Book Company.

Reference Books:

1. Khanna, S. K. and Justo, C. e. G. (1991). Highway Engineering, Nemchand Bros., Roorkee.
2. Wright, P. H. (1996). Highway Engineering, John Wiley and Sons, New York.
3. Kadiyali, L. R. (1987). Traffic Engineering and Transportation Planning. Khanna Publishers, New Delhi.
4. Huang, Y. H. (1993). Pavement analysis and Design. Prentice Hall, Englewood Cliffs, New Jersey.

ESTIMATING & COSTING

| | | |
|-------------------------------------|----------|---------------------------------|
| Course Code | : | CE605 |
| Course Title | : | Estimating & Costing |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 2+1+0 |

Course Syllabi (Theory):

Estimation for quantities for various types of construction, like building construction, road construction, railways etc. Preparation of bill of quantities, Rate Analysis. Detailed specifications of various items. Preparation of Tender & contract documents Layout of Civil engineering structures. Techniques of construction (including field visits). Various types of brick masonry bonds

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|---------------|------------------------------------------------------------------------------------|-----------------|---------------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Estimating & Costing by B.N. Dutta

CONSTRUCTION PROJECT MANAGEMENT

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE606 |
| Course Title | : | Construction Project Management |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **FINANCIAL EVALUATION OF PROJECTS AND PROJECT PLANNING:** Capital investment proposals, criteria to judge the worthwhileness of capital projects viz. net present value, benefit cost ratio, internal rate of return, Risk cost management, main causes of project failure.
- Categories of construction projects, objectives, project development process, Functions of project management, Project management organization and staffing, Stages and steps involved in project planning, Plan development process, objectives of construction project management.
- **PROJECT SCHEDULING:** Importance of project scheduling, project work breakdown process – determining activities involved, work breakdown structure, assessing activity duration, duration estimate procedure, Project work scheduling, Project management techniques – CPM and PERT networks analysis, concept of precedence network analysis.
- **PROJECT COST AND TIME CONTROL:** Monitoring the time progress and cost controlling measures in a construction project, Time cost trade-off process: direct and indirect project costs, cost slope, Process of crashing of activities, determination of the optimum duration of a project, updating of project networks, resources allocation.
- **CONTRACT MANAGEMENT:** Elements of tender operation, Types of tenders and contracts, Contract document, Legal aspects of contracts, Contract negotiation & award of work, breach of contract, determination of a contract, arbitration.
- **SAFETY AND OTHER ASPECTS OF CONSTRUCTION MANAGEMENT:** Causes and prevention of accidents at construction sites, Safety measures to be followed in various construction works like excavation, demolition of structures, explosive handling, hot bitumen work. Project Management Information System – Concept, frame work, benefits of computerized information system. Environmental and social aspects of various types of construction projects.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text /Reference Books:

1. PERT & CPM by B.C. Punmia.

OPTIMIZATION TECHNIQUES

| | | |
|------------------------------|---|-------------------------|
| Course Code | : | MA 601 |
| Course Title | : | Optimization Techniques |
| Course Credits | : | 5.5 |
| Total Hours per Week (L+T+P) | : | 3 + 1 + 0 |

Course Syllabus:

- **Introduction:** Introduction to Optimization and its scope, Formulating a Mathematical Model, Deriving Solutions from the Model
- **Linear Programming Problems:** Introduction to Linear Programming, Linear Programming Model, Solving L.P.P - Simplex Method, Revised Simplex Method, Duality Theory and Sensitivity Analysis, Dual Simplex Method, Transportation Problem and transportation problem paradox, Assignment Problem
- **Non-linear Programming:** Introduction, Single variable and multi variable optimization, Constrained and unconstrained problems, Kuhn-Tucker conditions
- **Network Optimization Models:** The Terminology of Networks, Shortest-Path Problem, Minimum Spanning Tree Problem, Project Management with CPM/ PERT
- **Other Optimization Models:** Dynamic Programming, Integer Programming, Game Theory,
- **Simulations:** Simulation V/s mathematical modeling, Monte Carlo simulation, simulation language, ARENA, Example & cases.
- **Multi-objective optimization:** Introduction to various multi-objective optimization techniques and its scope, Linear Goal Programming and Its Solution

Evaluation Scheme:

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | --- | 10 |

Text & Reference Books

1. Hillier F.S. and Lieberman G.J., *Introduction to Operations Research: Concepts and Cases*, Tata Mc Graw Hill, 8th Ed., (Indian Adapted Edition), 2005.
2. Taha. H. A, *Operations Research: An Introduction*, Pearson Education, 7th ed., 2003.
3. Ronald L. Rardin, *Optimization in Operations Research*. Pearson Education, First Indian Reprint 2002.
4. Pant.J.C., *Introduction to Optimization: Operations Research*, Jain Brothers, 5th Ed., 2000.
5. Sharma. S. D., *Operations Research*, Kedarnath Ramnath & Co., 15th Edition, 2006.
6. Kalyanmoy Deb, *Optimization for Engineering Design: Algorithms and Examples*, PHI.
7. Kasana H.S. and Kumar K.D., *Introductory Operations Research: Theory and Applications*, Springer.



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4-Year B. Tech Programme

(Branch: Chemical Engineering)

Batch 2012-2016

SEMESTER-SEVENTH

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

HYDRAULICS & HYDRAULIC MACHINES

| | | |
|-------------------------------------|----------|---------------------------------------|
| Course Code | : | CE721 (Elective-I/II/III/IV/V) |
| Course Title | : | Hydraulics |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Difference between pipe and channel flows; types of open channels and their characteristics i.e rigid bed and erodible bed channels, types of flow
- Sediment properties, initiation of sediment motion, bed forms, resistance to flow and sediment transport relationships i.e. bed load, suspended load and total load.
- Uniform flow; resistance relationships, normal depth, section factor for uniform computation and efficient channel cross section. Concepts of specific energy and specific force. Gradually varied flow, governing equations, water surface profiles their characteristics and methods of computations
- Hydraulic jump and its characteristics, free and forced jump, use of hydraulic jump as energy dissipator
- Weirs and notches, types of weirs- sharp crested, broad crested and side weirs, flow through sluice gates.
- Flow characteristics in turbines and pumps, types of turbines and pumps and their selection, hydraulic power transmission – hydraulic press

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|---------------|-----------------------------|-----------------|---------------------------------------|
| | | | |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

- T1. R.J. Garde and A.G. Mirajgaokar, "Engineering Fluid Mechanics (including Hydraulic Machines)", Nem Chand & Bros, Roorkee, Second Edn. 1983.
- T2. K. G. Ranga Raju , " Flow through open Channels" , Second Ed. Tata McGraw- Hill Publishing Company Limited , New Delhi, 2003.

Reference Books:

- R1 K. Subramanya, "Flow in Open Channels", Second Ed. Tata McGraw- Hill Publishing Company Limited , New Delhi, 1997.
- R2 P.N. Modi and S.M. Seth , " Hydraulics and Fluid Mechanics , Standard Book House, New Delhi , 2011.

ENGINEERING ROCK MECHANICS

| | | |
|-------------------------------------|----------|---------------------------------------|
| Course Code | : | CE722 (Elective-I/II/III/IV/V) |
| Course Title | : | Engineering Rock Mechanics |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Classification of Rocks and Rock masses, Laboratory and in-situ testing of rock, insitu stresses and their measurement
- Analysis and design of underground openings, Failure criteria for rock and rock masses.
- Strength and deformability of jointed rock mass, Stability of rock slopes, Foundation on rocks.
- Methods to improve rock mass responses, numerical modeling of rock and rock masses.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|---------------|------------------------------------------------------------------------------------|-----------------|---------------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

References:

1. Introduction to Rock Mechanics by R.E.Goodman, John Wiley & Sons.
2. Engineering in Rocks for Slopes, Foundation and Tunnels, Editor T.Ramamurthy, Prentice Hall India Pvt. Ltd.
3. Fundamentals of Rock Mechanics, Fourth Edition, by Jaeger, Cook and Zimmerman, Blackwell Publishing.
4. R 2 Rock mechanics and the design of structures in rock, L. Obert and Wilbur I. Duvall, John Wiley & Sons, Inc

GEOGRAPHICAL INFORMATION SYSTEM

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 723 (Elective-I/II/III/IV/V) |
| Course Title | : | Geographical Information System |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Introduction to geospatial information systems (GIS) and geographic information science; Representations of geospatial data (vector and raster), data structures and topology; Data modeling and managing data in databases.
- Introduction to query languages; Vector and raster data exploration, analysis and processing; Map as a presentation tool and types of maps; Cartographic design principles, presentations, thematic mapping and map generalization; Introductory visualization and graphic communications; Introduction to spatial modeling and analysis; Network representation and analysis; Spatial interpolation, surface modelling and analysis; Introduction to 3D GIS.
- Data quality analysis, errors and natural variations; Geospatial data integration, metadata and standardization issues; Web GIS, mapping services and geospatial information dissemination; Access to information, privacy, security, and organizational structures (human resources, budget, institutional aspects); GIS project design and implementation.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Lo, C.P. and A.K.W., Yeung. [2007]. Concepts and Techniques in Geographic Information Systems. 2nd, Upper Saddle River, Prentice Hall (ISBN 0-13-149502-X)
2. Longley, P.A., M.F. Goodchild, D.J. Maguire and D.W. Rhind. [2007]. Geographic Information Systems and Science. 2nd, John Wiley & Sons (ISBN 978-0-470-87001-3)

Reference Books:

1. Roche, S. and C. Caron (editors). [2009]. Organizational Aspects of GIS. Wiley & Sons
2. Chang, K.T. [2008]. Introduction to Geographic Information Systems. 5th, McGraw Hill (ISBN 978-0-07-749436-6)

SOLID WASTE MANAGEMENT

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 724 (Elective-I/II/III/IV/V) |
| Course Title | : | Solid Waste Management |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Introduction to Environment:** Ecosystem –meaning- Types -Components- Structure – Functions, Levels of organization in nature- Food chain and Trophic structure, Biogeochemical Cycles, Energy flow.
- **Municipal solid waste:** Definition - Sources and types of solid waste- composition and its determinants of Solid waste-factors influencing generation-quantity assessment of solid wastes-methods of sampling and characterization.
- **Collection:** Collection of Solid waste – collection services – collection system, equipments – time and frequency of collection – labour requirement – factors affecting collection – analysis of collection system – collection routes – preparation of master schedules.
- **Transfer and Transport:** Need for transfer operation – transfer stations – types – transport means and methods – location of transport stations - Manpower requirement – collection routes: Transfer stations – selection of location, types & design requirements, operation & maintenance.
- **Processing techniques** – purposes mechanical volume reduction – necessary equipments – chemical volume reduction – incinerators – mechanical size reduction selection of equipments – components separation – methods – drying and dewatering. Recovery of Resources, conversion products and energy recovery – recoverable materials – processing and recovery systems – incineration with heat recovery.
- **Refuse disposal** – various methods – incinerations – principle features of an incinerator – site selection and plant layout of an incinerator - sanitary landfill- methods of operation – advantages and disadvantages of sanitary land fill - site selection – reactions accruing in completed landfills – gas and leachate movement and control – equipments necessary.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. PERT & CPM by B.C. Punmia. George Techobanoglous et al,"Integrated Solid Waste Management" McGraw - Hill, 1993.
2. Techobanoglous Thiesen Ellasen; Solid Waste Engineering Principles and Management, McGraw - Hill 1997.
3. R.E.Landrefh and P.A.Rebers," Municipal Solid Wastes-Problems & Solutions" ,Lewis, 1997.

Reference Books:

1. Manual on Municipal 1 Solid waste Management, CPHEEO, Ministry of Urban Development, Govt. Of. India, New Delhi, 2000.
2. Blide A.D.& Sundaresan, B.B,"Solid Waste Management in Developing Countries", INSDOC, 1993.
3. Ecology Science and Practice; Claude Fourie, Christian Ferra, Paul Medori, Tean Devaux, Oxford and IBH Publishing Co (Pvt) LTD, special Indian edition.
4. Principles of Ecology- P.S.Verma, V.K.Agarwal.S.Chand & Company (Pvt) LTD 1989.

REPAIR & REHABILITATION OF STRUCTURES

| | | |
|------------------------------|---|---------------------------------------|
| Course Code | : | CE 725 (Elective-I/II/III/IV/V) |
| Course Title | : | Repair & Rehabilitation of Structures |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Introduction:** Deterioration of structures with aging; Need for rehabilitation
- **Distress in concrete /steel structures** Types of damages; Sources or causes for damages; effects of damages; Case studies
- **Damage assessment and evaluation models:** Damage testing methods; Non-destructive testing methods
- **Rehabilitation methods:** Grouting; Detailing; Imbalance of structural stability; Case studies
- **Methods of Repair:** Shotcreting; Grouting; Epoxy-cement mortar injection; Crack ceiling
- **Seismic Retrofitting of reinforced concrete buildings**

Introduction; Considerations in retrofitting of structures; Source of weakness in RC frame building – Structural damage due to discontinuous load path; Structural damage due to lack of deformation; Quality of workmanship and materials; Classification of retrofitting techniques; Retrofitting strategies for RC buildings – Structural level (global) retrofit methods; Member level (local) retrofit methods; Comparative analysis of methods of retrofitting

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Diagnosis and treatment of structures in distress by R.N.Raikar, Published by R&D Centre of Structural Designers & Consultants Pvt.Ltd., Mumbai, 1994.
2. Handbook on Repair and Rehabilitation of RCC buildings, Published by CPWD, Delhi, 2002.

Reference Books:

1. Earthquake resistant design of structures by Pankaj Agarwal and Manish Shrikhande, Prentice-Hall of India, 2006.

FINITE ELEMENT ANALYSIS

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 726 (Elective-I/II/III/IV/V) |
| Course Title | : | Finite Element Analysis |
| Course Credits | : | 04 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Introduction to FEM and its applicability, Review of mathematics: Matrix algebra, Gauss elimination method, Uniqueness of solution, Banded symmetric matrix and bandwidth. Structure analysis: Two-force member element, Local stiffness matrix, coordinate transformation, Assembly, Global stiffness matrix, imposition of Boundary conditions, Properties of stiffness matrix.
- One-dimensional Finite Element Analysis: Basics of structural mechanics, stress and strain tensor, constitutive relation, Principle of minimum Potential, General steps of FEM, Finite element model concept /Discretization, Derivation of finite elements, equations using potential energy approach for linear and quadratic 1-D bar element, shape functions and their properties, Assembly, Boundary conditions, Computation of stress and strain.
- Two Dimensional Finite Element Analysis: Finite element formulation using three noded triangular (CST)
- element and four noded rectangular element, Plane stress and Plain strain problems, Shape functions, node numbering and connectivity, Assembly, Boundary conditions, Isoparametric formulation of 1-D bar elements, Numerical integration using gauss quadrature formula, computation of stress and strain.
- Finite Element Formulation from Governing Differential Equation: Method of Weighted Residuals, Collocation, Sub domain method, Least Square method and Galerkin's method, Application to one dimensional problems, one-dimensional heat transfer, etc. introduction to variational formulation (Ritz Method.)

- Higher Order Elements: Lagrange's interpolation formula for one and two independent variable, Convergence of solution, compatibility, element continuity, static condensation, p and h methods of mesh refinement, Aspect ratio and element shape, Application of FEM, Advantages of FEM, Introduction to concept of element mass matrix in dynamic analysis.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text books:

1. Text Book of Finite Element Analysis, Seshu P., Prentice Hall India.
2. Finite Element Procedure in Engineering Analysis, Bathe K.J., Prentice Hall India.

References:

1. An Introduction to the Finite Element Method, Reddy J.N., Tata McGraw-Hill, New Delhi.
2. Concepts & Applications of Finite Element Analysis, Cook and Plesha, Willey India New Delhi.
3. Introduction to Finite Elements in Engineering, Chandupatla and Belegundu, Prentice Hall India.

DISASTER MANAGEMENT

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 727 (Elective-I/II/III/IV/V) |
| Course Title | : | Disaster Management |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Response Essential Components** Disaster Response Plan, Communication, Participation and Activation of Emergency Preparedness Plans, Search, Rescue, Evacuation and other logistic management, Needs and Damage Assessment; Types and Technique
- **Stakeholders Co-ordination in Disaster Response** Disaster Response: Central, State, District and Local Administration, Armed Forces in Disaster Response: Role and Responsibility, Disaster Response: Police and Other organisations, Role of Multiple stakeholders in Disaster Response
- **Human Behaviour and Response Management**: Psychological Response and Psychological Rehabilitation, Trauma and Stress Management, Rumour and Panic Management, Medical and Health Response to Different Disasters, Role of Information and Communication Technology in Response Management.
- **Relief Measures**: Minimum Standard of Relief, Relief Management- essential components, Funding Relief- short term and long term, Disaster Site Management, Recovery.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. White, G.F, 1974, Natural Hazards: Local, National, Global, Oxford University Press, New York.
2. Taori, K (2005) Disaster Management through Panchayati Raj, Concept Publishing Company, New Delhi.

DESIGN OF PRE-STRESSED CONCRETE STRUCTURES

| | | |
|------------------------------|---|--------------------------------------------|
| Course Code | : | CE 728 (Elective-I/II/III/IV/V) |
| Course Title | : | Design of Pre-stressed Concrete Structures |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Introduction:** Systems of pre - stressing in detail, pre - stressing techniques, transfer of pre - stress, types of commercially available jacks, computation of losses of pre - stress.
- **Anchorage Zone:** end block stresses, design
- **Cable profiles:** Concordant and non - concordant cable profile and associated factors in continuous members. Modern cable laying: materials & practices, precautions etc. Computation of deflection in pre - stressed concrete members.
- **Design of Pre-stressed Concrete Sections:** Flexural, shear and torsion resistance of members, preliminary and final design of sections, design of pre and post tensioned flexural members; simply supported and continuous members.
- **Pre-stressed Slab:** Design of slabs, tendon layout, precast slab, production and their applications.
- **Partial Prestressing:** Principles and advantages, methods, practices and design. Design of circular pipes and circular water retaining structures etc. Case study of one bridge girder with design and constructional features.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. T.Y. Lin, Design of Prestressed Concrete, Structures, Asia Publishing House, 1955.
2. N.Krishnaraju, Prestressed Concrete, Tata McGraw Hill, New Delhi, 1981.

Reference Books:

1. Y. Guyan, Limit State Design of Pre-stressed Concrete, Applied Science Publishers, 1972.

ADVANCED TRANSPORTATION ENGINEERING

| | | |
|------------------------------|---|-------------------------------------|
| Course Code | : | CE 729 (Elective-I/II/III/IV/V) |
| Course Title | : | Advanced Transportation Engineering |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

Airport Planning and Design

Aircraft characteristics related to airport design; Airport configuration - runway configurations, relation of terminal area to runways, runway orientation; Geometric design of the airfield - ICAO and FAA design standards, runways, taxiways, holding aprons and aprons; Planning and design of the terminal area - apron-gate system, size and number of gates, aircraft parking configurations, the passenger terminal system; airport lighting and marking; air traffic control; airport planning and air travel demand forecasting; Structural design of airfield pavements.

Railway Engineering

Indian Railway Track - different gauges, cross sections, coning of wheels; Tractive resistances; Track components - rails, rail failures, sleepers, rail fixtures and fastenings and ballast; Geometric design of the track; Points and crossings Track junctions; Stations and yards; Signalling and interlocking; Track stresses; Track construction and maintenance;

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Horonjeff, R. Mckelvey, F. X. (1994). Planning & Design of airports, Mc Graw Hill, New York.
2. Khanna, S. K. Arora, M. G. and Jain, S. S. (1994). Airport Planning and Design, Nemchand Bros., Roorkee.
3. Ashford, N. and Wright, P. H. (1979). Airport engineering, John Wiley, New York.

Reference Books:

1. Sexena, S.C. Arora, S. P. (1990). A text Book of Railway Engineering, Dhanpat Rai & Sons, New Delhi.
2. Munday, J.S. Railway Track Engineering, Tata McGraw Hill, New Delhi.
3. Agarwal, M. M. (1991). Indian Railway Track, Sachdeva Press, Mayapuri, New Delhi.
4. Hay, W. W. (1988). Railroad Engineering, John Wiley and Sons, New York.
5. Khanna, S. K. and Justo, C. E. G. (1991). Highway Material Testing - a Laboratory Relevant IRC and BIS standards.
6. S.L. Dhingra, and G.V. Rao, Transportation Engg. Laboratory manual, C.D. Cell, Civil Engineering Department, IIT Delhi.

EARTHQUAKE ENGINEERING

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 730 (Elective-I/II/III/IV/V) |
| Course Title | : | Earthquake Engineering |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- **Elements of Seismology** – General effects of an earthquake, terminology, structure of earth, causes of an earthquake, plate tectonic theory, seismic waves, magnitude and intensity, methods of measurement, energy released, seismograph, strong motion earthquakes, accelerogram, soil liquefaction, prominent earthquakes of India.
- **Free vibrations of single degree-of-freedom systems** – Dynamic loads and dynamic analysis, degrees of freedom, Undamped free vibrations, multiple elastic forces, viscously damped vibrations, equations of motion and solution, logarithmic decrement.
- **Forced vibrations of single degree-of-freedom systems** – Forced vibrations (harmonic loading) of single degree of freedom systems. Undamped and viscously damped vibrations, equations of motion and solution, Force transmitted to foundation, transmissibility, response to harmonic support excitations.
- **Response spectrum theory**: Response to general dynamic loading, Duhamel's integral, rectangular and triangular loading, Earthquake response spectrum, tripartite spectrum, construction of design response spectrum, effect of foundation and structural damping on design spectrum.
- **Principles of earthquake resistant design** – Planning aspects, symmetry, simplicity, regularity. Resistance of structural elements and structures for dynamic load, design criteria, strength and deflection.
- **Evaluations of Seismic Forces** – Philosophy of earthquake resistant design, Provisions of IS 1893, Soft storey, Design spectrum of IS 1893, evaluation of lateral loads due to earthquake on multistory buildings.
- **Ductile detailing of RCC members**- Concept of ductility, different ways of measuring ductility, factors affecting ductility, energy absorption, provisions of IS 13920.
- **Earthquake resistant construction** - Failure mechanism of different types of masonry construction, Construction aspects of Masonry and Timber structures, Retrofitting and strengthening techniques of low cost and low rise buildings. Provisions of I.S. 4326 and IS 13935.

- **SDOF Systems Subjected to General Dynamic Loading:** Duhamel's integral, Application to simple loading cases, numerical evaluation of response integral, Piece wise exact method, Newmark's-Beta method.
- **Free Vibration Analysis of MDOF systems – I:** MDOF systems, selection of DOFs, formulation of equations of motion , Stiffness matrices, Static condensation, Free Vibration as Eigen Value problem, Frequencies and Mode Shapes, Determination of natural frequencies and mode shapes by Stodola- Vianello method, Orthogonality conditions.
- **Free Vibration Analysis of MDOF systems – II:** Modal analysis method for free vibration analysis, modal combination rules, systems with and without damping, proportional damping.
- **Forced Vibration Analysis of MDOF systems:** Governing equations, modal analysis, numerical evaluation of modal equations by Newmark's-Beta method, mode combinations.
- **Distributed- Parameter Systems:** Partial differential equations of motion, Free and forced Vibration, Application to beams in flexure.
- **Energy Methods:** Rayleigh method for Discrete and continuous systems, Fundamental mode analysis.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Dynamics of Structures –A.K. Chopra
2. Structural Dynamics - Mario Paz CBS Publication
3. Earthquake Resistant Structures –D.J. Dowrick John Wiely Publication

4. Dynamics of Structures – R. M. Clough and Penzian ,McGraw Hill co.New Delhi
5. Mechanical Vibrations – G. R. Grover Roorkee University, Roorkee
6. Analysis and Design of Foundations for Vibrations – P. J. Moove. Oxford and I. B. H. Publication, Delhi

Reference Books:

1. Foundation Design Manual – N. V. Nayak, Dhanpatrai and sons, Delhi
2. Manual of Earthquake Resistant Non engineering Construction, University of Roorkee
3. Elements of Earthquake Engineering – Jai Krishna, South Asian Pub.New Delhi
4. Earthquake Resistant, Design of Masonry and Timber Structures – A.S. Arya
5. Elements Seismology – Rochter
6. Earthquake Resistant Design of R. C. C. Structures – S. K. Ghosh
7. IS 1893-2002 –Part I, IS 13920, IS: 4326 and IS 13935.
8. Earthquake Tips published by NICEE, IIT Roorkee.
9. Government of Maharashtra Earthquake resistant Design of house guiding lines and assessment of damages.

DESIGN OF BRIDGE STRUCTURES

| | | |
|------------------------------|---|---------------------------------|
| Course Code | : | CE 731 (Elective-I/II/III/IV/V) |
| Course Title | : | Design of Bridge Structures |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Components of bridges- Classification, importance of bridges, Investigation for Bridges.
- Standard specification for Road Bridges. I.R.C. bridge code, width of carriage way, clearances, loads to be considered i.e. D.L., L.L., Impact load, wind load, Earthquake load, Longitudinal force, Centrifugal force, buoyance, Earth pressure, water current force, thermal force etc.
- General design considerations for R.C.C. & P.S.C. Bridges Traffic aspects for highway bridges. Aesthetics of bridge design, Relative costs of bridge components. Design of reinforced concrete deck slab, Pigeaud's theory, beam and slab and T-beam, Courbon's theory.
- Construction Techniques – Construction of sub structure footing, piles, caissons, construction of reinforced earth retaining wall and reinforced earth abutments, super structure – erection method for bridge deck construction by cantilever method, Inspection maintenance and repair of bridges.
- Design of sub structure – abutments, Piers, approach slab.
- Bearing and expansion joints – forces on bearings – Types of bearings, design of reinforced elastomeric bearings, expansion joints.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|----------------------|----------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Concrete Bridge Practice by Dr.V.K.Raina, Tata McGraw Hill
2. Essentials of Bridge Engg. by D. Johnsons Victor, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Design of RCC Bridges- Jagdish Jayaram

Reference Books:

1. Reinforced Concrete Structures – Vol. II by Dr.B.C.Punmia, Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications.
2. Bridge Engg. by S. Ponnuswamy, Tata McGraw Hill

WATER POWER ENGINEERING

| | | |
|-------------------------------------|----------|----------------------------------------|
| Course Code | : | CE 732 (Elective-I/II/III/IV/V) |
| Course Title | : | Water Power Engineering |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Introduction: Principal Components of hydro-electric scheme, water requirement, concept of firm power and secondary power, plant capacity.
- Types hydro electric plants: Classification of hydro-power plants. Storage, Run off of the river and pumped storage plants, classification based on operating head, base load and peak load plants.
- Pondage and storage: Need for pondage and storage, requirements of storage, economic analysis of storage capacity, aspects of cost allocation for different purposes, reservoir operation using flow duration and mass curves considerations for flood routing.
- Intake: Types of intake, design of trench weir.
- Desilting: Introduction, types of desilting basins, Principal of desilting, Design of Desilting basins.
- Water conductor system: Intake structures, desilting tanks, conveyance channels and tunnels, surge tanks, surge shafts or fore bays, pressure shafts, penstocks, power house and tail race channels, different types of three structures and their brief design aspects.
- Hydraulics prime movers: Conveyance channels and tunnels, surge tanks, surge shafts or fore bays, Pressure shafts, penstocks, designs of water conveyance systems and penstocks.
- Power house: Types of power houses, various components and power planning.

- Economics of hydro power installation: Engineering feasibility, political consideration, economic feasibility, analysis of cost, cost of power, operation of a power plant system, cost of hydro power.
- Project report: General report, design report, cost and estimate report.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Hydro-electrical Engineering : Creager and Justin
2. Water Power Engineering : Barrows
3. Water Power Development (Vol. I and II) : Mosony L. Emil

RURAL WATER SUPPLY & SANITATION

| | | |
|-------------------------------------|----------|--------------------------------------------|
| Course Code | : | CE 733 (Elective-I/II/III/IV/V) |
| Course Title | : | Rural Water Supply & Sanitation |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

- Concept of environment and scope of sanitation in rural areas. Magnitude of problems of rural water supply and sanitation. Population to be covered, difficulties. National policy.
- Water supply: Design population and demand loads. Various approaches of planning of water supply schemes in rural areas. Development of proffered sources of water springs. Wells, infiltration wells, radial wells and infiltration galleries, collection of raw water from surface source. Specific practices and problems encountered in rural water supply.
- Improved methods and compact systems of treatment of surface and ground waters for rural water supply. Brief Details of multi-bottom settlers (MBS), diatomaceous earth filter, cloth filter, slow sand filter, chlorine diffusion cartridges. Pumps, pipe materials, appurtenances and improved devices for use in rural water supply. Planning of distribution system in rural areas.
- Community and sanitary latrines. Various methods of collection and disposal of night soil. Planning of waste water collection system in rural areas. Treatment and Disposal of waste water. Compact and simple waste water treatment units and systems in rural areas such as stabilization ponds, septic tanks, Imhoff tank, soak pit etc. Disposal of waste water soakage pits and trenches.
- Disposal of Solid Wastes. Composting, land filling, incineration, Biogas plants, Rural health. Other specific issues and problems encountered in rural sanitation

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|---------------|-----------------------------|-----------------|---------------------------------------|
| | | | |

| | | | |
|----|------------------------------------------------------------------------------------|------------|----|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. 'Water Treatment and Sanitation – Simple Method for Rural Area' by Mann H.T. and Williamson D.
2. 'Water Supply for Rural Areas & Small Communities' by Wanger E.G. and Lanoix J.N., WHO

Reference Books:

1. 'Water Supply and Sewerage', by E.W.Steel & T.J.Mcgee, McGraw Hill.
2. Manual on Water Supply and Treatment', CPHEEO, Mini. Of Urban Development, Govt. of India.
3. Manual on Sewerage and Sewage Treatment', CPHEEO, Mini. Of Urban Development, Govt. of India
4. 'Environmental Engineering' by D. Srinivasan, PHI Learning Pvt. Ltd. 2009

EARTHQUAKE RESISTANT DESIGN & TECHNIQUES

| | | |
|------------------------------|---|------------------------------------------|
| Course Code | : | CE 734 (Elective-I/II/III/IV/V) |
| Course Title | : | Earthquake Resistant Design & Techniques |
| Course Credits | : | 4 |
| Total Hours per Week (L+T+P) | : | 3+0+0 |

Course Syllabi (Theory):

1. Introduction: Causes of Earthquakes, plate tectonics, Earthquake mechanism, seismic zoning map of India, Epicenter, focus, magnitude, intensity, characteristics of ground motion and attenuation, Earthquake recording instruments□seismograph, Accelerograph, Seismoscopy/multi SAR.
2. Theory of vibration: SDOF system, MDOF, Earthquake Excitation, forced vibration, continuous systems□uniform bending beam, uniform shear beams.
3. Earthquake response spectra: Strong motion earthquakes Elastic spectra, inelastic spectra□equivalent linear system.
4. Site response to earthquakes: Local geology and soil conditions, soil investigations and tests dynamic design criteria for a given site.
5. A seismic design of structures:
 - i. Design data and philosophy, seismic coefficients, permissible stresses and load factors multi□storeyed buildings, base shear, fundamental period of building, distribution of forces along the height, dynamic analysis
 - ii. Earthquake resistant instruction of building and ductility provisions in RCC as per IS□13920□1893, IS□1893□2002, IS□456□2000, IS□800□2000, IS□4326□2002
 - iii. Elevated water tanks□behaviour, Design features and analysis.
 - iv. Stack like structures□fundamental period, Dynamic bending moment and shear diagram.
 - v. Bridges□Seismic force, live load, superstructure and substructure.
 - vi. Dams□Hydrodynamic pressure, Zanger method, vertical component of reservoir load.

6. Base isolation: Isolation systems, base Isolation of single and multi-storey buildings, Application of base Isolation.
7. Seismic strengthening, repair of restoration concepts: Existing buildings, Aging, weathering, development of cracks, repair of masonry and concrete structure.

Evaluation Scheme (Theory):

| EC No. | Evaluation Component | Duration | Marks (100) (Weightage %)* |
|--------|------------------------------------------------------------------------------------|------------|-------------------------------|
| 1. | Mid Term Test-I | 1 hour | 20 |
| 2. | Mid Term Test-II | 1 hour | 20 |
| 3. | End Term Test | 3 hour | 40 |
| 4. | Class Participation | Day to day | 10 |
| 5. | Additional continuous Evaluation (Quizzes, Assignments, Presentations, and others) | 30 min. | 10 |

Text Books:

1. Dynamics of structures; : AK Chopra
2. Structural Dynamics : Mario Paz

Reference Books:

1. Soil dynamics : Swami saran
2. Elements of Earthquake Engg. : Jai Krishna
3. Relevant IS Code by AR Chander Sekoran

SEMINAR

| | | |
|------------------------------|---|-----------|
| Course Code | : | SEM701 |
| Course Title | : | Seminar |
| Course Credits | : | 2.5 |
| Total Hours per Week (L+T+P) | : | 0 + 0 + 4 |

Course Syllabi (Theory):

Operation Procedure

1. Student has to devote full semester for SEM701 course.
2. Student has to report to the Supervisor regularly.
3. Seminars s evaluation has to be carried out in the presence of a two member Committee comprising.
4. Experts in the relevant area constituted by the Supervisor.

Final Seminar Report to be submitted has to be in formal hard bound cover bearing of the Institute emblem.

Reference Books:

Based on literature survey to be done with peer reviewed journals and magazines.

Evaluation Scheme (Theory):

| S. No. | Evaluation Component | Duration (Hours) | Marks (100) | Nature of Component |
|--------|-------------------------|------------------|-------------|---------------------|
| 1. | Presentation | Weekly | 25 | Open Book |
| 2. | Report(Soft Copy) | Weekly | 25 | Open Book |
| 3. | Assignment | Continuous | 10 | Open Book |
| 4. | Final Presentation | | 20 | Open Book |
| 5. | Final Report(Hard Copy) | | 20 | Open Book |



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-2168272/330/387/393

INSTITUTE OF ENGINEERING AND TECHNOLOGY

4 Year B. Tech Programme

(Branch: Civil Engineering)

Batch 2012-2016

SEMESTER-EIGHTH

Detailed Syllabus

&

Scheme of Examination

Academic Council (20.04.2013)

CONTENTS

| S. No. | Course Code | Course Credits | Lectures per Week (L+T+P) | Course Title | Page No. |
|--------|-------------|----------------|---------------------------|----------------------|----------|
| 1. | PS801 | 16 | ----- | Practice School – II | 3 |

PRACTICE SCHOOL – II

| | | |
|-----------------------|----------|-----------------------------|
| Course Code | : | PS801 |
| Course Title | : | Practice School – II |
| Course Credits | : | 16 |
| Duration | : | Five and Half Months |

Course Syllabi:

This course is for five and half months (summer and one semester) in VII or VIII Semester. The objective of this programme is to provide the students, an opportunity to work on live projects of corporate world in various fields. During this programme, they will work on real world applications of their curricula through organizational function of their choice. The students are expected to be involved directly in problem solving efforts of specific interest to the host organization. The learning of PS-I will help them in completing PS-II successfully.

Evaluation Scheme:

| S. No. | Evaluation Component | Marks (100) (Weightage %) |
|---------------|------------------------------------------------------------|--------------------------------------|
| 1 | Quiz-I | 4 |
| 2 | Quiz-II | 4 |
| 3 | Group Discussion-I | 4 |
| 4 | Group Discussion-II | 4 |
| 5 | Seminar-I | 4 |
| 6 | Seminar-II | 4 |
| 7 | Diary-I | 4 |
| 8 | Diary-II | 4 |
| 9 | Observation-I | 4 |
| 10 | Observation- II | 4 |
| 11 | Mid Term Evaluation (Project Report and Presentation/Viva) | 20 |
| 12 | Final Evaluation (Project Report and Presentation/Viva) | 40 |

Department of Civil Engineering, IET, JKLU, Jaipur

Corrigendum of Course Booklet

Programme Name: B.Tech. Civil Engineering

Batch: 2012-16

- 1.** Code of Workshop Practice should be read as ME141 in place of ME102.
- 2.** Course name of CE606 should be read as Construction and Project Management in place of Construction Project Management.
- 3.** Credit of ME241 Machine Drawing should be read as 2.
- 4.** Course name of CE 721 should be read as Hydraulics and Hydraulic Machines.



JK Lakshmipat University

Laliya Ka Vas, P.O. Mahapura, Ajmer Road, Jaipur - 302026
Ph: 91-141-2259500/501/503/504

INSTITUTE OF MANAGEMENT

B. Tech + MBA
(MBA Courses)

Batch 2012-17
1st to 6th Semesters

Detailed Syllabus
&
Scheme of Examination

Proposed Curriculum for B.Tech +MBA (MBA Courses) Batch 2012-17

| | CODE | COURSE | CREDITS |
|----------------------------|--------|-------------------------------------|---------|
| Year 1 Semester 1 : | | | |
| 1 | MBA011 | Principles & Practice of Management | 4 |
| 2 | MBA015 | Statistics for Managers | 4 |
| Year 1 Semester 2 : | | | |
| 1 | MBA021 | Organizational Behavior | 4 |
| Year 2 Semester 3 : | | | |
| 1 | MBA012 | Managerial Economics | 4 |
| 2 | MBA018 | Operations Research | 4 |
| Year 2 Semester 4 : | | | |
| 1 | MBA023 | Research Methods | 4 |
| 2 | MBA025 | Production & Operations Management | 4 |
| 3 | MBA028 | Managing Human Resources | 4 |
| 4 | MBA109 | Comprehensive Viva- I | 1 |
| Year 3 Semester 5 : | | | |
| 1 | MBA103 | Financial Accounting & Analysis | 4 |
| 2 | MBA106 | Marketing Management-I | 4 |
| 3 | MBA107 | Information Technology for Managers | 4 |
| Year 3 Semester 6 : | | | |
| 1 | MBA202 | Management Information Systems | 4 |
| 2 | MBA206 | Cost & Management Accounting | 4 |
| 3 | MBA207 | Marketing Management-II | 4 |
| Year 4 Semester 7 : | | | |
| 1 | MBA201 | Financial Management | 4 |
| Year 4 Semester 8 : | | | |
| Practice School (B. Tech) | | | |
| Year 5 Semester 9 : | | | |
| 1 | MBA301 | Logistics & Supply Chain Management | 4 |
| 2 | MBA302 | Entrepreneurship Development | 4 |
| 3 | MBA303 | Business Law | 4 |
| 4 | | Specialization 1 Elective 1 | 4 |
| 5 | | Specialization 1 Elective2 | 4 |
| 6 | | Specialization 2 Elective 1 | 4 |
| 7 | | Specialization 2 Elective2 | 4 |

| | | | |
|----|---------------------------------------|-------------------------------------------------|---|
| 8 | MBA305 | Major Research Project I | 2 |
| 9 | MBA306 | Simulation Exercise | 1 |
| 10 | MBA307 | Soft Skills-III | 1 |
| | Year 5 Semester10 : | | |
| 1 | MBA401 | Strategic Management | 4 |
| 2 | MBA402 | Business Ethics, Corporate Governance & CSR | 4 |
| 3 | | Specialization 1 Elective 3 | 4 |
| 4 | | Specialization 1 Elective 4 | 4 |
| 5 | | Specialization 2 Elective 3 | 4 |
| 6 | | Specialization 2 Elective 4 | 4 |
| 7 | MBA403 | Major Research Project II | 2 |
| 8 | MBA404 | Comprehensive Viva (CV) | 1 |
| 9 | MBA405 | Soft Skills-IV | 1 |
| | ELECTIVES | | |
| | Specialization Group : Finance | | |
| | MBAFM 301 | Security Analysis and Portfolio Management | 4 |
| | MBAFM 302 | Management of Financial Institutions & Services | 4 |
| | MBAFM 401 | International Financial Management | 4 |
| | MBAFM 402 | Banking and Insurance Management | 4 |
| | | Specialization Group : Marketing | |
| | MBAMK301 | Services Marketing | 4 |
| | MBAMK302 | Consumer Behavior | 4 |
| | MBAMK401 | Sales & Distribution Management | 4 |
| | MBAMK402 | Integrated Marketing Communications | 4 |

STRUCTURE OF QUESTION PAPER:

The question paper will comprise of two sections, A and B. Section A will be of 30 marks and section B will be of 20 marks. Section A will have 5 conceptual questions out of which a student will be required to attempt any 3 questions. Section B will have case study/practical problems and will be compulsory.

EXAMINATION SCHEME:

| S. No. | Evaluation Component | Duration | Marks (100) |
|--------|----------------------------------------------------------------------------------|----------|-------------|
| 1 | Mid Term Exam | 2 hours | 20% |
| 2. | End Term Exam | 3 hours | 40% |
| | Continuous Evaluation (Quizzes, Assignments, Presentations, Class Participation) | | 40% |

PRINCIPLES AND PRACTICE OF MANAGEMENT

| | |
|----------------------|--------|
| Course Code | MBA011 |
| Course Credits | 4 |
| Total hours Per Week | 3 |

COURSE SYLLABI:

Managers and Management: An overview, what is Management? Managers in organizations, functions, skills and roles in organization, process of management;

Evolution of Management Thought: Early thinking in management, the theory of management, Schools of management thought, Recent development in management thinking;

The Process of Management: Planning and strategic management, Managerial decision making, Organizing and organization structure, Motivating and leading, Effective control and role of information system;

Management in 21st Century: Organization and their changing environment, Impact of globalization on management, reinventing the organization, meeting the challenges of diversity;

Social Responsibility and Ethics: Stakeholders and responsibilities of business, Business ethics and challenges in turbulent times, socially responsible decision making.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand fundamental concepts and principles of management, including the basic roles, skills, and functions of management.
2. Be knowledgeable of historical development, theoretical aspects and practice application of managerial process.
3. Be familiar with interactions between the environment, technology, human resources, and organizations in order to achieve high performance.
4. Be aware of the ethical dilemmas faced by managers and the social responsibilities of businesses.

TEXT BOOK:

- Stoner, J. A., Freeman R.E. and Gilbert, D. R. (2009). *Management*, 6th edition Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. Koontz, H. and Weihrich, H. (2010). *Essentials of Management: An International Perspective*, 8th edition, Tata McGraw Hill, New Delhi.
2. Bateman, T. S. and Snell, S. A. (2009). *Management: Leading and Collaborating in a Competitive World*, 8 edition, McGraw Hill Irwin.
3. Daft, R. L. (2009). *Principles of Management*. Cengage learning.
4. Schermerhron, J. R. (2009). *Introduction to Management*, 10th edition, Wiley India.

STATISTICS FOR MANAGERS

| | |
|----------------------|--------|
| Course Code | MBA015 |
| Course Credits | 4 |
| Total Hours Per Week | 3 |

COURSE CONTENTS:

Introduction to Statistics: Importance for Managers, Data Classification and Presentation for Discrete and Frequency data, Measures of Central Tendency and Dispersion.

Simple Regression & Correlation: Types of Relationships, Estimation Using the Regression Line, Method of Least Squares, Standard Error of Estimate, Prediction Intervals, Correlation Analysis, Making Inference about Population Parameters, Coefficients of Determination and Correlation.

Time Series and Forecasting: Variations in Time Series, Trend Analysis, Cyclical Variation, Seasonal Variation, Irregular Variation, Time Series Analysis in Forecasting; Index Numbers.

Probability Distributions: Expected Value, Binomial, Poisson and Normal Distributions.

Sampling and Sampling Distributions: Types of Sampling, Sampling Distributions, Standard Error, Sampling from Normal and Non-normal Populations, Central Limit Theorem, Finite Population Multiplier, Estimation, Point and Interval Estimates, Estimator and Estimates, Confidence Levels and Intervals, Interval Estimates of Mean and Proportion from Large Samples, Interval Estimation Using t Distribution, Sample Size for Estimating Means and Proportions.

Testing of Hypotheses: Type I and Type II Errors, 'One Tailed and Two Tailed Tests, One Sample Tests, Hypothesis Testing of Means and Proportions, Two Sample Tests, Equality of Means for Dependent Samples, Difference between Proportions for Large Samples, Chi Square Test of Independence and Goodness of Fit, Analysis of Variance Test for Difference among more than two samples, Inference about population variance.

Non-Parametric Methods: The Sign Test, Rank Sum Tests, The Mann-Whitney U Test and the Kruskal-Wallis Test, One Sample Runs Test, Rank Correlation.

Decision Theory: Decision Environment, Expected Profit under Uncertainty, Marginal Analysis, Utility as a Decision Criterion, Decision Tree Analysis.

Statistics using MS Excel / IBM SPSS: Using Data Analysis ToolPak add-in with MS-Excel, Using SPSS.

LEARNING OUTCOMES:

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

1. Understand the meaning, role and applications of statistics.
2. Apply statistical tools and techniques in solving business problems.
3. Use computer software for statistical analysis.

TEXT BOOK:

- Levin, R.I., & Rubin, D.S. (2010). *Statistics for Management*. New Delhi: Pearson.

REFERENCE BOOKS:

- Bajpai, N. (2010). *Business Statistics*. New Delhi: Pearson
- Field, A. (2009). *Discovering Statistics using SPSS*. New Delhi: Sage Publications Ltd.
- Sharma, J. K. (2009). *Business Statistics*. New Delhi: Pearson.
- Anderson, D.R., Sweeney, D.J., & Williams, T.A. (2011). *Statistics for Business and Economics*, New Delhi: Cengage Learning.
- Davis, G., & Pecar, B. (2010). *Business Statistics using Excel*. New Delhi: Oxford.
- Gupta, S.P., & Gupta, M.P. (2008). *Business Statistics*. New Delhi: Sultan Chand & Sons.
- Chandan, J.S. (2009). *Statistics for Business and Economics*. Noida: Vikas Publishing.
- Agarwal, B.M. (2010). *Business Statistics*. New Delhi: Ane Books.

ORGANISATIONAL BEHAVIOUR

| | |
|----------------------|--------|
| Course Code | MBA021 |
| Course Credits | 4 |
| Total Hours Per Week | 3 |

COURSE SYLLABI:

Introducing Organizational Behaviour: the importance of interpersonal skills, Challenges and opportunities for OB. Developing an OB Model.

The Individual: Biographical Characteristics, ability, global implications.

Personality: What is personality, MBT indicator, The Big Five Personality Model, Other Personality traits Relevant to OB.

Attitudes, Beliefs and Values: components of attitudes, job attitudes, Beliefs, importance of values, Terminal vs Instrumental values.

Perception & Attribution: Factors that influence perception, Making judgment about others, Attribution Theory.

Individual Decision Making: Decision making in organizations, influences on decision making, Ethical decision criteria.

Motivation: Hierarchy of Needs Theory, Two Factor Theory, McClelland's Theory of Needs, Goal Setting Theory, Reinforcement Theory, Equity Theory, Expectancy Theory.

Group Behavior: Defining and classifying groups, stages of group development, group properties, Group Processes, group decision making.

Leadership: Trait Theories, Behavioral Theories, Contingency theories, LMX Theory, Charismatic Leadership and Transformational Leadership.

Team Building: creating effective teams, turning individuals into team players.

Emotional Intelligence: Concept & its Applications.

Inter- group Processes: Conflict and Negotiation, Transitions in conflict thought, conflict process, Bargaining strategies, Negotiation Process, Negotiation Effectiveness.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. List the importance of individual, group and organizational factors that determine the organisational effectiveness.
2. Draw that a manager's job is to identify the indicators that can lead to the organisational effectiveness.
3. Determine what behavioural modifications are suitable at different levels to achieve organizational effectiveness.
4. Define the effectiveness at individual, group and organizational levels.

TEXTBOOK:

- Stephen P. Robbins, Timothy Judge and Seema Sanghi (2010). Organizational Behavior. New Delhi: Pearson Education.

REFERENCE BOOKS:

1. Don Hellriegel and John W. Slocum, Jr. (2004). Organisational Behavior. India: Thompson.
2. Jerald Greenberg and Robert A. Baron (2008). Behaviour in Organizations. New Delhi: Pearson Prentice Hall.
3. James L. Gibson. John M. Ivancevich (2006). Organizations. Singapore: McGraw-Hill

MANAGERIAL ECONOMICS

| | |
|----------------------|--------|
| Course Code | MBA012 |
| Course Credits | 4 |
| Total Hours Per Week | 3 |

COURSE CONTENTS:

Economic Analysis and Business Decisions: Some Fundamental Concept and Measurement Techniques in Managerial Economics. Optimization Techniques

The Objectives of Business Firm: Baumol's Theory, Marris's Theory, Behavioural Theory, Managerial Theory, Alternatives Theories of Firm

Demand and Supply: Demand Determinants, Demand Functions, Demand Elasticity

Demand Analysis: Empirical Demand Functions. Control and Management of Demand, Forecasting Demand

Profit & Output Analysis: Concepts and Measurement of Profit, Sales and Profit, Input-output Decision, Empirical Forms of Production Function, Supply Function and Cost Function with emphasis on multi product firms, Managerial use of Cost Functions, Revenue Functions, Break- even Chart. Optimum Output

Price-output Decisions: Competition, Different forms of Competitions in Sellers' Market and Buyers' Market -Structure of Product and Factor Markets, Interdependence and Reaction functions, Contestable Markets and Entry Barriers, Game theory formulations and Market Strategies

Pricing Principles and Practices: Pricing Rules, Mark-up Pricing, Price Discrimination, Two Part Pricing, Multiple Product Pricing, Joint Product Pricing, Transfer Pricing

Macro Economic issues in Indian Economy : Concepts of National Income, Business Cycles, Inflation and Unemployment, Exchange Rate, Purchasing Power Parity

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand fundamental economics concepts and its applications in business world.
2. Apply demand/supply, cost, profit measurements to solve complex managerial problems
3. Understand market structure and formulate pricing and market strategies
4. Understand capital budgeting and risk analysis to take informed decisions.

TEXT BOOKS:

- D.N. Dwivedi (2012). **Managerial Economics**. New Delhi: Vikas Publishing.

REFERENCE BOOKS:

1. Dominick Salvatore, Ravikesh Srivastava (2012). **Managerial Economics**. New Delhi: Oxford University Press.
2. Mark Hirschey (2012). **Managerial Economics**. New Delhi: Cengage Learning.
3. Mote, V.L. Samuel Paul and G.S. Gupta (2011). **Managerial Economics**. McGraw Hill
4. H.L. Ahuja (2010). **Advanced Economics Theory**. New Delhi: S. Chand.

OPERATIONS RESEARCH

| | |
|----------------------|--------|
| Course Code | MBA018 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction: Quantitative approach to management decision making, Analyzing and defining the problem, Developing a model, Selecting the inputs and putting the model to work, Typical applications of OR.

Linear Programming: Formulating maximization/ minimization problems, Graphical solution, simplex methods, Special cases of LP: Infeasibility, degeneracy, in boundedness and multiple optimal solutions, Duality of P and its interpretation, Dual simplex methods, Post optimality/ sensitivity analysis, Applications of LP.

Transportation and Assignment problems: VAM method, Checking for optimality using MODI method, Unbalanced problem and degeneracy, Hungarian method for assignment problem, Traveling salesman problem.

Game theory: Pure and Mixed Strategy games, 2 Person zero sum games, Saddle point, Mixes strategies use of dominance rules, Solution by graphical methods.

Network Analysis: Difference between PERT and CPM, network construction, calculating EST, EFT, LST, LFT and floats, probability considerations in PERT, time cost trade off.

Queuing Theory: Characteristics of a queuing system, Arrival and service patterns, Single and multiple channel, Queue models with Poisson arrival and exponential service times.

Simulation Modeling: Monte Carlo simulation, Using random numbers, Applications in inventory analysis, Waiting lines, Maintenance and finance areas.

Replacement Models: Types of replacement problems, Replacement of assets that deteriorate with time, Determination of economic life using present value factors, Simple probabilistic models for assets which fails suddenly and completely.

LEARNING OUTCOMES:

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

1. Understand the concepts of Operations Research
2. Understand the applications of Operations Research Techniques in optimal Decision Making

TEXT BOOK:

- J.K Sharma (2013). *Operations .Research: Theory anal Applications*, 5e. New Delhi: Macmillan India Ltd.

REFERENCE BOOKS:

- A Ravindran, Don T Philips and James I Solberg (2001). *Operations Research* Singapore: John Wiley & Sons.
- Pannerselvam (2010). *Operation Research*. New Delhi: Prentice Hall of India.
- Barry Render, Ralph M. Stair (2003). *Quantitative Analysis for Management*. New Delhi: Prentice Hall of liidia.
- Hamdy A Taha (2003). *Operation Research*. New Delhi: Prentice Hall of India.

- Srivastava U.K., Shenoy G.V. and Sharma S.C. *Quantitative Techniques for Managerial **Decisions***. New Age International.
- Anderson, Sweeney, Williams, Quantitative Methods for **Business**, 10e. New Delhi: Cengage Learning.

RESEARCH METHODS

| | |
|----------------------|---------------|
| Course Code Course | MBA023 |
| Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction to Research: Importance of research in Management, Types of research, Market research, Scientific Research.

The Research process: Research Problem, Literature Review, Theoretical Framework, Hypothesis Development, Research design.

Measurement of Variables: Operational definition, Scaling, Reliability, Validity.

Data Collection Methods: Sources of Data, Methods for Data Collection, Advantages and Disadvantages, Issues in Data Collection.

Sampling: Basic Concepts, The Sampling Process, Types of Sampling, Appropriateness of Sampling Method, Sampling Design and size.

quantitative Data analysis: Coding, Editing and Transformation of Data, Descriptive Statistics and Inferential Statistics using MS Excel and IBM SPSS, Introduction to other Data Analysis Packages.

Qualitative Data Analysis: Introduction, Reliability and Validity in Qualitative Research, Methods for Qualitative Data Analysis.

The Research Renort: Contents of the Research Report, Presentation of Report, Applications of research findings for managers and management.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand the importance of research in business.
2. Know different terminology.
3. Design a research.
4. Do research.
5. Analyze data.
6. Write a report.

TEXT BOOK:

- Sekaran, U., & Bougie, R. (2012). *Research Methods for Business: A Skill-Building Approach*. New Delhi: John Wiley & Sons, Ltd.

REFERENCE BOOKS:

1. Cooper, D.R., Schindler, P.S., & Sharma, J.K. (2012). *Business Research Methods*, New Delhi: Tata McGraw-Hill.
2. Zikmund, W.G., Babin, B.J., Carr, J.C., & Griffin, M. (2013). New Delhi: Cengage Learning.
3. Gupta, M., & Gupta, D. (2011). *Research Methodology*, New Delhi: PHI Learning Pvt. Ltd.
4. Panneerselvam, R. (2012). *Research Methodology*, New Delhi: PHI Learning Pvt. Ltd.

PRODUCTION & OPERATIONS MANAGEMENT

| | |
|----------------------|--------|
| Course Code | MBA025 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE OVERVIEW:

Introduction: The Field of Operations Management, Production Systems: Types of Production processes (Project/Job, Batch, Mass/Line, Continuous), OM in the Organizational Chart, Operations as Service, Historical Development of OM, Current Issues in Operations Management.

Operations Strategy and Competitiveness: Operations Strategy, Operations Competitive Dimensions, the Corporate Strategy Design Process, Strategic Fit-Fitting Operational Activities to Strategy, Productivity Measurement.

Forecasting Technique: Moving Average Method , Weighted Moving Average Method, Exponential Smoothing (random , trend , seasonal). Subjective Techniques : Delphi ,Jury of Executive Opinion.

Process Analysis: Process Analysis, Process Flowcharting, Types of Processes, Measuring Process Performance, Process Analysis- Examples, Process Throughput Time Reduction.

Product Design and Process Selection: The Product Design Process, Designing for the Customer, Designing Products for Manufacture and Assembly, Process Selection, Manufacturing Process Flow Design, Global Product Design and Manufacturing, Measuring Product Development Performance.

Facility Location: Plant location methods- Factor rating, Transportation method, Centroid method, Locating service facilities.

Facility Layout: Basic Production Layout Formats, Process Layout, Product Layout, Group Technology (Cellular) Layout, Fixed-Position Layout, Retail Service Layout, Office Layout.

Strategic Capacity Management: Capacity Management in Operations, Capacity Planning Concepts, Capacity Planning, Planning Service Capacity.

Aggregate Sales and Operations Planning: Overview of Sales and Operations Planning Activities, the Aggregate Operations Plan, Aggregate Planning Techniques, Yield Management.

Inventory Control: Definition of Inventory, Purposes of Inventory, Inventory Costs, Independent versus Dependent Demand, Inventory Systems, Fixed-Order Quantity Models, Fixed-Time Period Models, Miscellaneous Systems and Issues.

Material Requirements Planning: Where MRP Can Be Used, Master Production Schedule, Material Requirements Planning System Structure, MRP Examples.

Total Quality Management: Total Quality Management, Quality Specification and Quality Costs, Six-Sigma Quality, the Shingo System: Fail-Safe, ISO 9000.

Just-In-Time and Lean Systems: JIT Logic, the Toyota Production System, JIT Implementation Requirements, JIT in Services.

LEARNING OUTCOMES:

1. The student should be able to understand the concepts of Production and Operations Management.
2. The student should be able to understand the applications of Operations Management

Techniques in organizations.

3. Apply production and operations strategies and principles for domestic and international business situations.
4. To understand world class manufacturing practices.
5. To understand contemporary operations management practices.

TEXT BOOK:

- S. N. Chary (2011). *Production and Operations Management*. Tata McGraw Hill.

REFERENCE BOOKS:

1. Richard B Chase, Nicholas J Aquilano, and F Roberts Jacobs (2004). *Production and Operations Mnagement, 10e*. New Delhi: Tata McGraw Hill.
2. Everette E. Adam and Ronald J Ebert (2004). *Production and Operations Management, 5e*. New Delhi: Prentice Hall of India.
3. Lee J Krajweski and Larry P Ritzman (2002). *Operations Management Strategy and Analysis 6e*. Delhi: Person Education.
4. Norman Gaither and Greg Fraizer (2002). *Operations Management*. Thomson Southwestern.
- S.A. Muhlemann, /. Oakland & K. Lockyer. *ProJuction and Operations Management*. McMillan.
- 6.E. S. Buffa& R. K. Sarin. *Modern ProJuction7operations Management*. John Wiley.
- 7.Panneersalvam. *Production and Operiitions Management*. PHI

MANAGING HUMAN RESOURCES

| | |
|-----------------------------|---------------|
| Course Code | MBA028 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Introduction to ITRM: Meaning, Nature, Scope Function and Importance, Evolution of Concept & Changing Environment & Role of HRM, Strategic HRM.

Plan: Concept, importance, Objective, HRP Process, HRIS.

Job Analysis and Design: Job Analysis Job Description and Job Specification, Job Design.

Recruitment and Selection: Recruitment Policy, Procedure, Methods, Alternatives and Challenges, Diagnostic Approach to selection Process, Purpose & criteria.

Training & Development: Training Concept and Need, Identification, T&D Process, Methods and Evaluation.

Managing Organizational Change and Development.

Performance Management and Appraisal: Concept, Methods of Appraisal, Techniques of Appraisal and Limitations.

Compensation: Objectives and Factors Influencing it, Steps in establishing Pay Rates, Components of Pay, Managerial compensation & other trends in Compensation.

Employee Relations & Trade Unions: Ethic and Fair, Treatment at Work, Factors Building Ethical Behaviour, Trade Unions, Collective Bargain, Union Movement Today and Tomorrow.

Managing Global Human Resources: Internationalizations of Business Difference and Similarity in HR Practices Staffing of Global Organization Contemporary issues in HRM.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand fundamental concepts of human resource management, including its nature, scope, functions and importance.
2. Learn the human resource planning process and job analysis and design.
3. Diagnose the necessity and importance of training and development, performance appraisal of workforce.
4. Be familiar with fair compensation system and factors influencing it in order to achieve high performance.
5. Evaluate the importance of employee relationship and active role of trade unions.
6. Be aware of contemporary issues in HRM and change in human resource practices with internationalization of business.

TEXT BOOK:

- Dessler, G. and Varkkey, B. (2009). *Human Resource Management*. New Delhi: Pearson

REFERENCE BOOKS:

1. Aswathappa, K. (2008). *Human Resource Management Text and Cases*. New Delhi: Tata McGraw.
2. Rao, V. S. P. (2002). *Human Resource Management: Text and Cases*. New Delhi: Excel Books.
3. Ivansevich, J. M. (2010). *Human Resource Management*. New Delhi: Tata McGraw Hill.

COMPREHENSIVE VIVA-I

Course Code : **MBA019**
Course Credits : **1**

Course Description:

The first comprehensive viva is scheduled at the end of I Semester in order to judge the understanding as well as application of the knowledge gained by the students by the end of first Semester of the course. This is also to see the articulation of what is being learnt by them. The idea is to see that students are able to understand what is being taught and see their relevance not only in the practical field but also their inter relationship. The viva is of 100 marks to be conducted by the external examiner appointed by the University.

FINANCIAL ACCOUNTING AND ANALYSIS

| | |
|----------------------|--------|
| Course Code | MBA103 |
| Course Credits | 4 |
| Total hours Per Week | 3 |

COURSE SYLLABI:

Introduction: Importance and Scope of Accounting, Double Entry Book Keeping System, Basic Accounting Concepts and conventions

Preparation of Financial Statements: Accounting Cycle, P/L Account, Balance Sheet, Subsidiary Books, Bank Reconciliation, Adjustment Entries, Prior Period Expenses, Problems with regard to Measurement of Business Income, Long Term Assets and Depreciation

Statutory provisions: Major Provisions in Indian Companies Act relating to Preparation of Statutory Accounts, Indian Accounting Standards, IFRS, VAT, Excise, Challenges relating to IFRS in India, Adoption of IFRS in India

Analysis of Financial Statements: Ratio Analysis, Cash Flow and Funds Flow Analysis, Common Size Statement Analysis, Trend Analysis, Peer Group Analysis, Trend Percentage Analysis;

Contemporary Concepts : EVA, Inflation Accounting, Human Resource Accounting, Window Dressing, Scams, Non Compliance and Penalty, Financial Reporting and Corporate Governance, Computerized Accounting System.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. understand the importance of the accounting language;
2. understand basic principles of accounting;
3. learn the process of preparing accounting statements;
4. learn how accounting information fit into the legal framework of reporting (GAAP & IFRS);
5. learn analysis of accounting information for decision making.

TEXT BOOK:

- Asish K. Bhattacharyya (2010). *Financial Accounting for Business Managers*. PHI.

REFERENCE BOOKS:

1. Ambrish Gupta (2009). *Financial Accounting for Management - An Analytical Perspective*. Pearson.
2. Anthony N. Robert, David F. Hawkins, Kenneth A. Merchant (2010). *Accounting TO and Cases, 12c*. Tata McGraw Hill.
3. S.K. Bhattacharyya and John Dearden (2009). *Accounting for Management — Text & Cases*. New Delhi: Vikas Publishing.
4. Tulsian P.C. (2006). *Financial Accounting*. Pearson.

MARKETING MANAGEMENT-I

| | |
|----------------------|--------|
| Course Code | MBA106 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Nature and Scope of Marketing: Understanding Marketing Management and Marketing Environment, Company Orientation towards the Market Place, Corporate Strategic Planning, Evaluating Business Portfolios, Growth Strategies, Marketing Plan, Value Chain and Value Delivery Process, Components of Marketing Environment.

Customer Value, Satisfaction and Consumer Behavior: Creating Customer Value and Satisfaction, Understanding Consumer Behavior and Buying Process, Organizational Buying Process.

Marketing Segmentation, Selecting Target Markets and Positioning: Differentiated and Undifferentiated Marketing, Segmentation, Targeting and Positioning. Creating Brand Equity, Branding Decisions, Crafting the Brand Positioning, Dealing with Competition.

Product and Pricing Decisions: Product Classification and Product Mix, New Product Development Process, Product Life Cycle Strategies, Developing Pricing Strategies and Programs.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand fundamental and advanced concepts of marketing, including the basic roles, skills, and functions of marketing manager;
2. Develop analytical and conceptual abilities pertaining to marketing decisions;
3. Understand strategic and tactical issues related to marketing and solve complex managerial problems.

TEXT BOOK

- Kotler, Keller, Koshy and Jha (2013). *Marketing Management*. New Delhi: Pearson Education.

REFERENCE BOOKS

1. Rajiv Lal (2005). *Marketing Management: Text and Cases*. Singapore: McGraw-Hill Book Company
2. S. Ramesh Kumar (2012). *Case Studies in Marketing Management*. New Delhi: Pearson Education.
3. Rajan Saxena (2006). *Marketing Management*. New Delhi: Tata McGraw-Hill.
4. Tapan Panda (2009). *Marketing Management*. New Delhi: Excel Books.
5. Arun Kumar, N. Meenakshi 2nd ed. (2011). *Marketing Management*. New Delhi: Vikas Publishing

INFORMATION TECHNOLOGY FOR MANAGERS

| | |
|----------------------|--------|
| Course Code Course | MBA107 |
| Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction to Computers: Components of a Computer System, Hardware and Software, Language Processors, Computer Languages, Evolution of Computers and various generations of computers.

Number Systems: Binary, Decimal, Octal, Hexadecimal, Base-n and Inter-conversions, Binary Arithmetic.

Operating System Fundamentals: Classification of Operating Systems, Introduction to popular operating systems, such as DOS, Windows and Unix.

Working with MS-Office: Working with basic packages in MS-Office Suite (MS Word, MS Excel and MS PowerPoint), Managerial Applications of these packages, Introduction to Open Office, Google Docs.

Computer Networks and Internet: Data Communication and Networking, Types of Computer Networks, Internet and its managerial applications, Basic Taxonomy of Internet, Intranets and Extranets.

Information Technology and Information Systems: Introduction to Information Technology, IT Applications and Implementation Issues, Issues and Impact of IT on business organizations, Overview of 4 GL, Image Processing, Virtual Reality, Video Conferencing, Artificial Intelligence and Information Super Highways.

LEARNING OUTCOMES:

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

1. Understand the basic taxonomy of computers.
2. Work with basic computer software like MS-Windows and MS-Office.
3. Browse, search for and download information from Internet.
4. Be aware of state-of-the-art IT and networking applications.

TEXT BOOK:

- Leon, Alexis and Mathews Leon (2009). *Fundamentals of Information Technology, 2e.* Chennai: Leon Vikas.

REFERENCE BOOKS:

1. Rajaraman, V. (2010). *Fundamentals of Computers, Se.* New Delhi: PHI Learning.

MANAGEMENT INFORMATION SYSTEMS

| | |
|----------------------|--------|
| Course Code | MBA202 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction: MIS Concept, Role, Strategic Objectives, IS Dimensions, Socio-technical approach to Information Systems, Types of Information Systems.

Information Systems and Business Organizations: Features of Organizations, IS Impact on Organizations, IS for Competitive Advantage, Porter's Competitive Forces Model, Business Value Chain, Management Issues.

Ethical and Social Issues: Moral Dimensions, Ethics in an Information Society, Ethical Principles, Accountability, Liability and Control.

IT Infrastructure and Security: Components of IT Infrastructure, Emerging hardware and software trends, Database Management, Telecommunications, Internet, Vulnerability, Threats to IS Society, Business Value of Security, Tools for protecting Information Resources.

Key System Applications: Enterprise Applications, E-Commerce and E-Business, Knowledge Management and Collaboration, Systems for Decision Making.

Building Information Systems: System Development and Organization Change, Role of Users in System Development, System Development Approaches, Global Information Systems.

LEARNING OUTCOMES:

Upon successful completion of the course, students are expected to:

1. Understand the types of information system;
2. Appreciate the facilitating role of information systems in transforming business organizations;
3. Understand the management, ethical and social issues in IS;
4. Gain knowledge about contemporary IS applications.

TEXT BOOK:

- Laudon, Kenneth C. and Jane P. Laudon (2013). *Management Information System: Managing the Digital Firm, 12e*. Delhi: Pearson.

REFERENCE BOOKS:

1. O'Brien, James A.; George M. Marakas and Ramesh Behl (2010). *Management Information Systems, 9e*. New Delhi: Tata McGraw Hill.
2. Jawadekar, Waman S. (2011). *Management Information Systems: Text and Cases, 4e*. New Delhi: Tata McGraw Hill.
3. Mahadeo Jaiswal and Monika Mittal (2010). *Management Information Systems*. New Delhi: Oxford.

COST AND MANAGEMENT ACCOUNTING

| | |
|-----------------------------|---------------|
| Course Code | MBA206 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Introduction: Objective of Cost Accounting, Financial Accounting and Cost Accounting, Management Accounting, Purpose of Cost Audit. Types of costs; Costs and expenses, Functions of an organization- Business functions as Value Chain-Cost Management- Methods and techniques of costing- Evolution of cost accounting-Costing system,

Elements of Cost and Methods of Costing : Classification of costs, ,Need for Classification, Cost Sheet, Identification of Cost, Job Costing, Batch Costing, Unit Costing, Contract Costing, Process Costing.

Materials Cost Management: Managing purchase functions; Storing of materials; Issue of Material, Inventory Valuation, ABC Analysis, VED Analysis, EOQ, Perpetual Inventory System, JIT Inventory, Coding of Material

Labour Cost Management Time Rate and Fixed Rate, Bonus and Incentive Plans, Job Analysis, Job Evaluation, Job Specification, Labour Turnover

Marginal Costing: Marginal Costing and Absorption Costing, Break Even Analysis of Single Product and multiple products, Managerial Decisions on Break Even Analysis

Standard Costing and Variance Analysis: Meaning, Fixation of Standards, Material Variance, Labour Variance, Overhead Variance, Use and Interpretation of Variances.

Cost Control: Budget Making Process, Functional Budgets and Master Budget; Flexible budgeting. Zero Base Budgeting, Activity Based Budgeting and costing, its advantages over traditional costing, Managing without Budget, ERP Solutions, Responsibility Accounting, target costing.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand the classification and analysis of cost .
2. Learn preparation of budget and variance analysis.
3. Understand cost accounting concepts for decision making.
4. Learn modern concepts of material , labour and overhead control.

TEXT BOOK:

- Charles T. Horngren, Gary L. Sundem, William O. Stratton, David Burgstahler, Jeff Schatzberg (2009). *Cost Accounting*, 14e. Pearson, New Delhi

REFERENCE BOOK:

- Bhattacharya Ashish K (2009). *Principles and Practice of Cost Accounting*, 3e. PHI Learning Pvt. Ltd., New Delhi.
- Banerjee, Bhabtosh(2009). *Cost Accounting -Theory and Practice*, 12e. PHI Learning Pvt. Ltd., New Delhi
- M.Y.Khan & P.K.Jain(2010). *Management Accounting- Text Problem and Cases*, 5e. TMH Education Private Limited, New Delhi

MARKETING MANAGEMENT-II

| | |
|----------------------|--------|
| Course Code | MBA207 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Integrated Marketing Communications Decisions:

Managing Integrated Marketing Communications: Advertising, Sales Promotions, Event and Experience Marketing, and Public Relations, Managing Personal Communications, Direct and Interactive Marketing, Word Of Mouth, and Personal Selling.

Marketing Channels and Distribution: Designing and Managing Distribution Channels; Multi Channel Marketing, Direct Marketing and E-Commerce. Managing Retailing, Wholesaling and Logistics.

Marketing Intelligence and Marketing Research: Marketing Intelligence- Gathering Information from internal and external sources. Demand Measurement and Forecasting. Identifying and Solving Marketing Problems, Qualitative and Quantitative Research, Marketing Research System & Process.

Global Marketing, Services Marketing and Rural Marketing,
Social, Ethical and Legal Issues in Marketing. Managing a Holistic Marketing Organization for the Long Run.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand fundamental and advanced concepts of marketing, including the basic roles, skills, and functions of marketing manager;
2. Develop analytical and conceptual abilities pertaining to marketing decisions;
3. Understand strategic and tactical issues related to marketing and solve complex managerial problems.

TEXT BOOK:

- Kotler, Keller, Koshy and Jha (2013). *Marketing Management*. New Delhi: Pearson Education.

REFERENCE BOOKS:

1. Rajiv Lal (2005). *Marketing Management: Text and Cases*. Singapore: McGraw-Hill Book Company
2. S. Ramesh Kumar (2012). *Case Studies in Marketing Management*. New Delhi: Pearson Education.

FINANCIAL MANAGEMENT

| | |
|----------------------|--------|
| Course Code | MBA201 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Scope and Objective of Financial Management Introduction — Nature & Scope of Financial management, Source of Finance, Finance Functions — Goals of Financial Management, Financial Manager's Role, Time value of Money, Risk and Return, Valuation of shares and bonds, Profit Maximization and Wealth Maximization.

Capital Budgeting: Nature and Principles, Compounding and Discounting, Cash Flows, Non- Discounting cash flow techniques, Discounting cash flow techniques, Accept Reject Rules.

Cost of Capital: Concept of cost of capital, Component of Cost of Capital, Factors affecting Cost of Capital, Uses of Cost of Capital, Weighted Cost of Capital.

Capital Structure and Leverage : Theories of Capital Structure, Net Income Approach, Traditional Approach, MM Hypothesis, Designing Capital structure, Financial and Operating leverages.

Working Capital Management: Principles and Concepts of Working Capital, Operating Cycle, Determinants of Working Capital, Assessment of Working Capital Requirement, Receivables Management, Inventory Management, Cash Management, financing of Working Capital.

Dividend Policy: Objectives of Dividend Policy, Determinants of Dividend policy, Dividend Policy, Types of dividend, Dividend theories.

Contemporary Concepts: Behavioral Finance, Balance Scorecard, Financial Reengineering.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand the importance of financial management.
2. Learn project viability analysis.
3. Understand the cost involved in financing alternatives.
4. Understand the importance and dynamics of working capital.
5. Understand the dividend policies of organisations.

TEXT BOOK:

- Prasanna Chandra (2011). *Financial Management- Theory & Practice*. New Delhi: Tata McGraw- Hill Education Private Limited.

LOGISTICS & SUPPLY CHAIN MANAGEMENT

| | |
|----------------------|--------|
| Course Code | MBA301 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Introduction to Supply Chain Management: Key Issues in Supply Chain Management- Supply Chain Performance- Green Supply Chain Management.

The Value of Information: The Bullwhip Effect — Quantifying the Bull whip Effect — Methods for Coping with the Bullwhip Effect - Designing the Supply Chain for Conflicting Goals.

Logistics Network Configuration: Data Collection — Potential Warehouse Locations — Key Features of a Network Configuration DSS.

Outsourcing: Make versus Buy Continuum, Sourcing Strategy, Impact of Internet on Sourcing Strategy.

Transportation: Drivers of Transportation Decisions, Modes of Transportation, Devising a strategy for Transportation.

Inventory Management and Risk Pooling: The Economic Lot Size Model — The Effect of Demand Uncertainty — Supply Contracts — Continuous Review Policy Periodic Review Policy — Risk Pooling — Managing Inventory in the Supply Chain — Forecasting— Selecting the Appropriate Forecasting Technique.

Supply Chain Integration: Push, Pull and Push-Pull Systems — Identifying the Appropriate Supply Chain Strategy — The Impact of the Internet on Supply Chain Strategies —Distribution Strategies — Direct Shipment — Cross-Docking — Transshipment.

Supply Chain Restructuring: Supply Chain Mapping, Supply Chain Restructuring process, Restructuring the Supply Chain Architecture.

Global Supply Chain Management: Global Market Forces — Technological Forces — Global Cost Forces — Political and Economic Forces — Risks and Advantages of International Supply Chains.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand the concepts of Supply Chain Management.
2. Understand how the performance of the supply chain can be improved with the integration of various tiers in the chain.

TEXT BOOK:

- Janat Shah (2007). Supply Chain Management-Text and Cases. Delhi: Pearson Education.

REFERENCE BOOKS:

1. Sunil Chopra and Peter Meindl (2007). *Supply Chain Management, 3e*. Delhi: Pearson Education.
2. Robert B Handfield and Ernest L Nicholas, Jr (2004). *Supply Chain Redesign*. Delhi: Pearson Education.
3. Donald Walters. Palgrave (2003). *Logistics: An Introduction to Supply Chain Management*. New York: Macmillan.
4. David A Taylor (2004). *Supply Chains: A Manager's Guide*. Delhi: Pearson Education.
5. G Raghuram and N Rangaraj (2000). *Logistics and Supply Chain Management*. Delhi: Macmillan India.
6. Ronald H Ballou (2004). *Business Logistics7 SupplyChain Management, 5e*. Delhi: Pearson Education.
7. David Simchi-Levi, Philip Kaminsky and Edith Simchi-Levi (2004). *Designing and Managing the Supply Chain*. Tata McGraw Hill.
8. K. Shridhara Bhat.(2009) **Logistics and Supply Chain Management**: Himalaya Publishing House

ENTREPRENEURSHIP DEVELOPMENT

| | |
|-----------------------------|--------|
| Course Code | MBA302 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction of Entrepreneurship: Concept, knowledge and skills requirement, Characteristics of successful entrepreneurs, Role of entrepreneurship in economic development, Entrepreneurship process, Factors impacting emergence of entrepreneurship, Managerial vs. Entrepreneurial approach, emergence of entrepreneurship, Social entrepreneurship and Corporate entrepreneurship

Starting the Venture: Introduction of MSME, Creative and Innovation, Generating business idea, Sources of new ideas, methods of generating ideas, Creative problem solving, Opportunity recognition, Environmental scanning, Competitor and industry analysis, Feasibility study — market feasibility, technical/operational feasibility, financial feasibility

Promotion of the venture: The business model and business plan as entrepreneurial tools, presenting business plan to investors

Functional plans: Marketing plan — marketing research for the new venture, steps in preparing marketing plan, contingency planning, Organizational plan — form of ownership, designing organization structure, job design, manpower planning, Financial plan — cash budget, working capital, break even analysis

Financing Entrepreneurial Ventures: Debt or equity financing, Commercial banks, Venture capital, Financial institutions supporting to entrepreneurs, Government Grants, Bootstrap financing, Developing entrepreneurial networking

legal issues: Intellectual property rights, Patents, Trade Marks, Copy Rights, Trade Secrets, Licensing, Franchising

Business Growth Issues and Entrepreneurial Opportunities in India LEARNING

OUTCOMES:

Upon completion of the course, the student is expected to:

1. Enhance their entrepreneurial skills.
2. Able to generate new ideas and evaluate opportunities
3. Determine the prerequisites for starting the new venture
4. Design Business Model
5. Prepare Business Plan
6. Able to present the Business plan to investors
7. Raise the funds for the venture

8. Understand the legal issues associated with starting a venture

TEXT BOOKS:

- Robert D Hisrich, Michael P Peters, Dean A Shepherd (2012). Entrepreneurship. New Delhi; Tata McGraw-Hill.

REFERENCE BOOKS:

1. Poomima M Charantimath (2012). Entrepreneurship Development Small Business Enterprises. New Delhi: Pearson.
2. Donald E Kuratko (2011). Entrepreneurship: Theory, Process, and Practice. New Delhi: Cengage Learning
3. Simon down (2010). Enterprise, Entrepreneurship and Small Business. New Delhi: Sage publications.
4. Rajeev Roy (2011). Entrepreneurship. New Delhi: Oxford.

BUSINESS LAW

| | |
|----------------------|--------|
| Course Code | MBA303 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Indian Contract Act 1872- General Contacts

Contract: meaning, essentials of a valid contract, types of contract. Offer and acceptance: rules regarding offer, communication, and revocation of offer and acceptance.

Consideration: -legal requirements regarding considerations, validity of agreement without consideration. Capacity of parties to contract, free consent, legality of object and consideration, Agreements declared void.

Special Contracts: Contingent and quasi contracts; Indemnity and guarantee; Bailment and pledge; Agency.

Indian Partnership Act 1932: Nature of partnership, Registration of firms, type of partners, Rights, Duties and Liabilities of Partners, Laws Related to Dissolution of Partnership.

The Companies Act-1956: Meaning Nature of Company, Classification of companies, Formation of company, Memorandum & Articles of Association, Prospectus, General Meetings and Proceedings, Management of a company, Winding up & Dissolution of companies.

The Sale of Goods Act 1930: Introduction, formation of the contract of sale, Goods and their classification, Express & Implied condition & warranties, Un-paid seller and his rights.

Government Regulation of Business: Securities law, Consumer Protection Act, 1986, Labour laws, Environment laws,

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Upon completion of the course, students are expected to be able to:
2. Understand legal business terminology
3. Understand the laws related to business contract.
4. Know the laws related to formation & functioning of partnership and companies in India.
5. Information about different laws relating to business.

TEXT BOOK:

- S.S. Gulshan & G.K. Kapoor.(2012),“*Business Law Including Company law*” by New Age International Publishers.

REFERENCE BOOKS:

1. Pawan S.Budhwar and Arup Verma,(2009) *Doing Business In India*, Publication: Routledge
2. Rohini Agarwal,(2011) *Mercantile & Commercial Law*, New Delhi: Tax Man
3. N.D. Kalpoor,(2011) *Elements of Mercantile Law*, New Delhi: Sultan Chand & Sons
4. P.R. Chandha,(2010) *Business Law*, New Delhi: Galgotia Publication
5. Roger LeRoy Miller (2010), *Business Law Today*. Boton: Stanford Edition.

STRATEGIC MANAGEMENT

| | |
|----------------------|--------|
| Course Code | MBA401 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction to Strategy: what is strategy, why strategic management, strategic decision making processes.

Strategic Analysis: The General Environment why environmental analysis and diagnosis, analyzing the environment.

The Competitive Environment: Porter's Five Forces Framework, Hyper-competition

Internal Analysis and Diagnosis: the internal factors, analysis of strengths and weaknesses, diagnosis. Value Chain Analysis, Resource based view of strategy, Sustainable competitive advantage

Assessing Organizational Performance: Maximizing shareholder's value, Balanced Scorecard, Benchmarking

Strategy Formulation: Business level strategy, Generic Competitive Strategies: stability strategies, expansion strategies, retrenchment strategies, combination strategies

Corporate level strategy: Growth Strategies, Related Diversification, Portfolio Analysis, Business level strategies, mission and objectives

International strategy and globalization: Globalization or Localization, international Strategy, types of international strategy, Entry mode strategies

Strategy Implementation: organizational systems and strategic change, organizational structures, organizational processes, strategic control systems.

Strategic Leadership: Leadership and Management, Emotional Intelligence, Narcissistic Leaders, Leading Strategic Change.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Evaluate alternative paradigms of strategy and their influence on strategic decision making.
 2. Understand the difference in the concepts of strategy, strategic thinking, strategic planning and strategic Management.
 3. Understand the functions of strategic management.
 4. Use the generic tools.
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TEXT BOOK:

- Henry, Anthony E. (2011). Understanding Strategic Management. New York: Oxford

REFERENCE BOOKS:

1. Jaunch R. Lawrence, Gupta Rajiv, and Glueck William F.(2004). ***Business Policy and Strategic Management***. New Delhi: Frank Bros.& Co.
2. Kachru, Upendra (2005). ***Strategic Management: Concepts and Cases***. New Delhi: Excel
3. Cherunilam, Francis (2002). *Business Policy and Strategic Management*. Mumbai: Himalaya Publishing.

BUSINESS ETHICS, CORPORATE GOVERNANCE & CSR

| | |
|----------------------|--------|
| Course Code | MBA402 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Business Ethics: Introduction , the Changing Environment.

Framing Business Ethics: Corporate Responsibility, Stake holders and Citizenship.

Evaluating Business Ethics: Normative Ethical theories.

Making Decisions in Business Ethics: Descriptive ethical theories.

Managing Business Ethics: Tools and Techniques, Code of ethics, Global code of ethics, social accounting, business ethics and leadership

Stakeholders and Business Ethics: understanding corporate governance, ethical issues in corporate governance, shareholders and globalization, shareholder democracy, shareholding for sustainability.

Employees and Business Ethics: Firm —employee relations, ethical challenges of globalization, corporate citizen and employee relations, sustainable employment

Consumers and Business Ethics: Limits of caveat emptor, ethical issues, marketing and the consumer, the ethical challenges of the global marketplace, consumer sovereignty, ethical consumption

Suppliers, Competitors. Civil Society and Business Ethics: Misuse of power, loyalty, conflicts of interest, aggressive competition, impacts on indigenous businesses, CSO tactics, Boycotts

Government. regulations and Business Ethics: Basic roles of government as a stakeholder, legitimacy, lobbying, party financing, government as regulators.

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Understand the importance of Business Ethics and corporate governance in determining the organizational effectiveness.
2. Draw business ethics indicators.
3. Classify the ethical and unethical practices in business at the individual, group and organizational level.
4. Comprehend how ethics can help in solving moral dilemmas.

TEXT BOOK:

- Crane, Andrew and Matten Dirk (2012). *Business Ethics*. New Delhi: Oxford.

REFERENCE BOOKS:

1. Kline, J.M.(2005). *Ethics for International Business*. London: Routledge.
2. Weiss, Joseph W.(2009). *Business Ethics: Concepts and Cases*. New Delhi: CENGAGE

SECURITIES ANALYSIS AND PORTFOLIO MANAGEMENT

| | |
|----------------------|----------|
| Course Code | MBAFM301 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction to Investment Management: Investment versus Speculation, Financial Markets, Approaches to Investment Decision Making, Common errors in Investment Management, Qualities for successful investing, Investment Alternatives and their evaluation.

Securities Market: Participants in Securities Market, Legal framework, Securities Market Regulation, Primary market and Secondary Market, Government Securities Market, Corporate Debt Market, Money Market.

Risk and return: Concept of Return, Risk, Measuring Historical Risk and Return, Time Value of Money.

Securities Valuation : Bond Concepts, Price, Yield, Yield Curve, Determinants of Interest Rates, Bond Strategies, Equity Valuation, Various Approaches to Equity Valuation.

Security Analysis — Fundamentals: Macroeconomic and Industry analysis, Company Analysis, Strategy Analysis, Accounting Analysis, Financial Analysis, Intrinsic Value, Undervaluation versus Overvaluation, Equity Research in India.

Security Analysis — Technical: Concept of Technical Analysis, Charting Techniques, Technical Indicators, Testing Technical Trading Rules, Evaluation of Technical Analysis.

Modern Portfolio Theory: Diversification and Portfolio Risk, Portfolio Return and Risk, Efficient Frontier, Optimal portfolio, The Single Index Model, Capital Asset pricing Model, Efficient Market Hypothesis, Behavioural finance.

Portfolio Management: Concept of Portfolio Management, Portfolio Management Process, Selection of Asset Mix, Formulation of Portfolio Strategy, Selection of Securities, Portfolio Execution, Portfolio Revision, Performance Evaluation.

Strategies of the Master Investors: Learnings from acclaimed investors — Benjamin Graham, Philip Fisher, Warren Buffett, John Templeton, Peter Lynch, George Soros, David Dreman, Charles Ellis, John Bogle, The Zurich Axioms, India's Money Monarchs.

International Investing: Benefits and Risks of Global Investing, Measuring the Return and Risk of Foreign Investments, International Capital Markets, Factors affecting Global Markets, Tracking Global Markets.

Practical exposure to the Analysis Software and Portfolio Management

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Get insight into the process of Investment and know about various Investment Alternatives.
2. Acquire insight about the relationship of the risk and return.
3. Understand the process of Securities Analysis.
4. Understand Portfolio Management concepts and practices in India.
5. Learn from the great investors in the market.

TEXT BOOK:

- Chandra, Prasanna (2009). *Investment Analysis and Portfolio management*. 3/e. New Delhi: Tata McGraw Hill.

REFERENCE BOOKS:

1. Fischer, D.E. and Jordan, R.J. (2011). *Security Analysis & Portfolio Management*. 6/e. New Delhi: Pearson.
 2. Pandian, Punithavathy (2010). *Security Analysis and Portfolio Management*. New Delhi: Vikas Publication Pvt. Ltd.
 3. Ranganatham, M. and Madhumathi, R. (2012). *Security Analysis and Portfolio Management*, 2/e. New Delhi: pearson.
 4. Elton, E.J., Gruber, M.J., Brown, S.J., and Goetzmann, W.N. (2012). *Modern portfolio theory and Investment Analysis*, 8/e. New Delhi: Wiley India (P.) Ltd.
 5. Bhat, S. (2009). *Security Analysis & Portfolio Management*. New Delhi: Excel Books.
 6. Kevin, S. (2008). *Portfolio Management*. New Delhi: Prentice Hall India.
 7. Avadhani, V.A. (2008). *Securities Analysis & Portfolio Management*. Mumbai: Himalaya Publications.
 8. Alexander, G.J., Sharpe, W.F., and Bailey, J.V. (2001). *Fundamentals of Investment*. New Delhi: Pearson.
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MANAGEMENT OF FINANCIAL INSTITUTIONS AND SERVICES

| | |
|----------------------|----------|
| Course Code | MBAFM302 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Overview Of Financial Institutions : Structure of Financial Systems, Financial development, Pre and Post Liberalization Scenario, Role of financial assets and institutions in economic development.

Indian Banking, Insurance, Bond Market, Public Deposits, Government Securities, Stock Market, Treasury Bills, Venture Capital Fund., microfinance, Mutual Funds, IPO and procedure of issue., Regulation for Secondary Market operation.

Commercial Banks: Organization and Functions - Nationalized and Private Banks, Liquidity management — Theories, Central Bank —Regulatory Framework of RBI, Management of loans Investment and Asset Liabilities Management: .Evaluation of Performance and deposits, interest rates, Non-Performing Assets(NPA), Bank capital -Adequacy norms, Profitability of Commercial Banks.

Role of Development Banks in India: Overview, Operational policies and practices — IDBI, IFCI, ICICI, SFCs, SIDCs, SIDBI, NABARD etc.

Management Of Other Financial Institutions : Investment institutions, Venture Capital, Merchant Banking.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. understand the basic economic principles and the role of savings and investments in the economy;
2. learn the function of banks and other financial intermediaries in lending and borrowing;
3. know the types of banks and banking activities.
4. know about the financial markets, the types of traded securities and the faction of the various parties involved.
5. be aware of the function and role of central banks and the governments and the regal and regulatory framework

TEXT BOOK:

- Bhole, L.M. & Mahakud, I. (2009). *Financial Institutions and Markets*, 5e. TMH ,

REFERENCE BOOKS:

1. H.R Machiraju (2011) *Indian Financial Systems*, 4 Edition Vikas Publishing House Pvt. Ltd.
2. Bharati & V. Pathak(2011), *Indian Financial System: Markets, Institutions and Services*, 3rd Edition Pearson Education
3. Thummuluri Siddaiah(2011), *Financial Services*, 2nd Edition Pearson Education

INTERNATIONAL FINANCIAL MANAGEMENT

| | |
|----------------------|----------|
| Course Code | MBAFM401 |
| Course Credits | 4 |
| Total Hours Per Week | 3 |

COURSE SYLLABI:

Global Accounting — Convergence and Diversity: Global Accounting -What and Why. Sources of difference between accounting systems, possible advantages and disadvantages of a single set of global accounting standards,

Confidence and Assurance: Improving the credibility of financial reporting, Auditing and assurance, Corporate Governance and Financial Reporting, Corporate Social Responsibility Reporting Patterns

Contrasting Harmonization and Diversity across Corporate Reporting Systems: Institutional and external influences on accounting rules and practices, Cultural influences on accounting rules and practices

Introduction to IFRS: Framework of Accounting, IFRS-process and standard setting, Striking feature of IFRS, Journey of IAS to IFRS, Advantages of adopting IFRS, Challenges of Adopting IFRS, Current perspective in India, Categorization of IFRS by ICAI.

Indian Accounting Standards: Indian AS, Difference between IFRS/GAAP and Accounting Standards, Comparative study of India/USA/UK GAAP, Comparison of CHINA GAAP & IFRS.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand the Global financial reporting system
2. Understand Cultural and Institutional influences on Financial reporting
3. Understand a number of regulatory issues relating to International financial reporting
4. Understand Indian accounting standards and financial reporting
5. Understand IFRS in India and its implementation.
6. Understand Convergence of Indian accounting standards to IFRs
7. Understand Comparison of Indian GAAP with /IFRS/USA GAAP/UK GAAP/China GAAP

TEXT BOOK:

- Jasmin Kaur, International Financial Reporting Standards- A Practical Approach. New Delhi: McGraw Hill.

REFERENCE BOOKS:

1. Clare Roberts, Pauline Weetman & Paul Gordon.(2011) *International Corporate Reporting 4th* Edition, Pearson Education
2. A.L. Saini, (2012) *Indian Accounting Standard*, 1st Edition, Snow White Publications Pvt. Ltd.

BANKING AND INSURANCE MANAGEMENT

| | |
|----------------------|----------|
| Course Code | MBAFM402 |
| Course Credits | 4 |
| Total Hours Per Week | 3 |

COURSE SYLLABI:

Overview of Banking Industry: Banking Structure in India: public sector banks, private sector banks, scheduled commercial banks and their Role, Banking Regulator - RBI and its functions, Banking Sector Reforms, SLR, CRR, PLR, CAR.

Banking Products and Channels: Traditional Banking, Branch Banking, Technology Based Channels, Different types of Accounts, Types of Loans - Consumer Credits, Auto Loans, Home loans, Education and Personal Loans, Plastic Money, Debit and Credit Card, Demat services, Banc assurance, Retail Banking - Customer Relationship Management (CRM), Customer Interaction Management (CIC), Know Your Customer (KYC) Norms, Retail Lending and Deposit Schemes, Interest Rates.

Credit and Risk Management: Types of Risks in Banking and Measurement, Credit Policies, Evaluations of Loan Proposal, Credit Analysis, CIBIL, Bank Capital and Liquidity, Cost of Fund, Managing Liabilities and NPAs, Basel Norms, Evaluation of Banking Performance — Ratio Analysis, CAMELS.

Settlement Systems, Service Quality and IT: ECS, RTGS and Clearing House, Concept of Customer Satisfaction, Six Sigma and ISO 9000 certification in Banking, IT based Services, Customer Relationship through Portals, Core Banking Solutions, Universal Banking.

Insurance: Introduction, Definition, Classification of Insurance — Life and Non-life, Seven Basic Principles of Insurance, Types of Policies — Personal Policies, Health Policies, Motor Insurance, Fire Insurance, Marine Insurance, Life Policies.

Life Insurance: Purpose and Objective of Life Insurance, Modern concepts of Life Insurance, Type of Life Insurance, Types of Financial Planning of an individuals, Different components of Life Cycle Calculation of Premium, Concept of Mortality, Actuarial Science and Actuary.

Non-Life Policies: Family Risk Management, Accident and Health Insurance, Mediclaim Policy, Types of Motor Vehicles Policies and their Characteristics, Classifications of Marine Insurance, Application and Basic Principles of Fire Insurance.

LEARNING OUTCOMES:

The following would be the learning outcomes for the students studying this subject:

1. Students would be able to empathize upon the role and significance of banking sector for the economy.
2. They would be able to understand the wide gamut of services provided by banks and learn how a bank is managed.
3. The students would have a hands-on exposure to the Banking Software's and Technology and functioning of the Banks.

4. Students would also learn about the other important part of BFSI sector, i.e., Insurance and understand its finer nuances.

TEXT BOOK:

- Padmalatha, S. and Paul, J. (2010). *Management of Banking and Financial Services*, New Delhi: Pearson Education.

REFERENCE BOOK:

1. Iyengar, V. (2009). *“Introduction to Banking”*, 1/e, New Delhi: Excel Book.
2. Indian Institute of Banking and Finance (2010). *“Banking Project and Services*, New Delhi: Taxman Publication.
3. Indian Institute of Banking and Finance (2010). *“Basics of Banking”*, New Delhi: Taxman Publication.
4. Choudhary, M. (2007). *“Bank Asset and Liability Management: Strategy, Trading, Analysis”*, New Delhi: Wiley Finance.
5. Reserve Bank of India, Latest Annual Report.
6. Mishra, M.N. and Mishra, S.B. (2010). *“Insurance Principles and Practice”*, 5/e, New Delhi: S. Chand & Co.
7. Tripathy, N.P. and Pal, P. (2008). *“Insurance — Theory and Practice”*, 1/e, New Delhi: Prentice Hall of India.

SERVICES MARKETING

| | |
|----------------------|----------|
| Course Code | MBAMK301 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Understanding Service Products, Consumers and Markets: The nature of services, how to understand services, how consumer behavior relates to services, and how to position services. Building blocks for studying services and learning how one can become an effective service marketer.

Applying the 4 Ps of Marketing to Services: The development of the service concept and its value proposition, the product, distribution, pricing, and communications strategies that are needed for developing a successful business model. Revisiting the 4 Ps of the traditional marketing mix (Product, Place, Price, and Promotion) and expanding them to account for the specific characteristics of services that make them different from goods marketing.

Managing the Customer Interface: Managing the interface between customers and the service organization. The additional 3 Ps (Process, Physical environment, and people) that are specific to services marketing.

Implementing Profitable Service Strategies: Four key issues in implementing and managing effective services marketing. Building customer loyalty, complaint handling and service recovery, improving service quality and productivity, and striving for service

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. understand fundamental concepts and principles of Services Marketing;
2. develop analytical and conceptual abilities pertaining to marketing decisions in services and understand role of relationship management;
3. understand strategic and tactical issues related to marketing of services and solve complex managerial problems.

TEXT BOOK:

- Love Lock Christopher, Wirtz Jochen and Chatterjee Jayanta (2010) *Services Marketing: People, Technology and Strategy* New Delhi: Pearson Education

REFERENCE BOOKS:

1. Zeithmal V.A., Bitner M.J., Gremler D.D., and Pandit A. (2008) *Services Marketing: Integrating Customer Focus across the firm*. New Delhi: Tata McGraw Hill
2. Rajendra Nargundkar (2010) *Services Marketing: Text and Cases*. New Delhi: Tata McGraw Hill

CONSUMER BEHAVIOUR

| | |
|----------------------|----------|
| Course Code | MBAMK302 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction: Defining Consumer Behavior, Reasons For Studying Consumer Behavior, Consumer Research Process, Understanding Consumer and Market Segments.

Consumer as an Individual: Consumer Motivation and its Dynamics, Personality and Consumer Behaviour, Brand Personality, Self and Self-Image, Perception.

Consumer Learning and Attitude Formation: Learning Process and Theories, Consumer Attitude Formation and Change, Communication and Consumer Behavior.

Consumer in Social and Cultural Settings: Family and Social Class, Cultural influences on Consumer Behavior, Cross-Cultural Consumer Behaviour.

Consumer Decision Making Process and Ethical Dimensions: Levels and Views of Consumer Decision Making, Decision Making Model, Marketing Ethics and Social Responsibility

LEARNING OUTCOMES:

Upon completion of the course, students are expected to be able to:

1. Encourage appreciation for the value of consumer behaviour in determining successful marketing strategies.
2. Review recent conceptual, empirical, and methodological developments in research on consumer behaviour.
3. Provide a coherent framework for interpreting consumer reactions to marketing stimuli.
4. Provide experience in applying behavioural principles to the analysis of marketing problems and the design of marketing strategy.
5. Learn the importance of ethics and impact of social responsibility on marketing practices.

TEXT BOOK:

- Schiffman, Kanuk & Kumar (2013). *Consumer Behavior*. New Delhi: Pearson Education.

REFERENCE BOOKS:

1. Majumdar, Ramanuj (2010). *Consumer Behavior: Insights from Indian Markets*. New Delhi: PHI
2. Loudon & Della Bitta (2002). *Consumer Behaviour*. New Delhi: Tata McGraw-Hill.
3. Hawkins, Best and Coney (2004). *Consumer Behavior*. New Delhi: Tata McGraw-Hill.
4. Evans, Foxall & Jamal (2009). *Consumer Behavior*. New Delhi: Wiley Indian Edition

SALES AND DISTRIBUTION MANAGEMENT

| | |
|----------------------|----------|
| Course Code | MBAMK401 |
| Course Credits | 4 |
| Total Hours per Week | 3 |

COURSE SYLLABI:

Introduction: Selling as Part of Marketing, Sales Management Process, Role of Sales Manager, Concept of Personal Selling, Sales Management and Salesmanship, Theories of Personal Selling, Process of Personal Selling, Qualities of a Successful Salesman.

Sales Objectives and strategies: Sales Territories and Quota Goal Setting Process in Sales Management, Analyzing Market Demand and Sales Potential, Techniques of Sales Forecasting, Preparation of Sales Budget, formulating Selling Strategies.

Sales Force Management: Designing Sales Territories and Sales Quota; Organizing the Sales Force, Designing the Structure and Size of Sales Force, Recruitment and Selection of Sales Force, Leading and Motivating the Sales Force, Sales Force Training and Compensation, Sales Incentives and Review of Performance.

Introduction to Distribution Management: Introduction, Need and Scope of Distribution Management, Importance of Channel, Types of Channels and Levels of Channels.

Channel Management Decisions: Components of Distribution System, Distributors Selection and Appointment, Channel Conflict and Their Resolutions, Training and Motivating the Channel Partners.

LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

1. Understand fundamental concepts and principles of Sales and Distribution Management.
2. Develop analytical and conceptual abilities pertaining to Sales and Distribution Decisions.
3. Understand strategic and tactical issues related to Sales and Distribution and solve complex managerial problems.

TEXT BOOK:

- Panda Tapan K., Sahadev Sunil (2012) *Sales & Distribution Management* .New Delhi: Oxford

REFERENCE BOOKS:

1. Still Richard R, Cundiff Edward W. and Govoni Norman A. P (2007) *Sales Management: Decisions, Strategies and Cases*. New Delhi: Pearson Education.
2. Krishna K. Havaldar, Vasant M. Cavale. (2011) *Sales & Distribution Management*. New Delhi: Tata McGraw Hill

INTEGRATED MARKETING COMMUNICATION

| | |
|----------------------|----------|
| Course Code | MBAMK402 |
| Course Credits | 4 |
| Total hours per Week | 3 |

COURSE SYLLABI:

Integrated Marketing Communications: Overview, Nature of Communication, Integrated Marketing Communication (IMC) Plan, Role of IMC in Brand Building and Corporate Image.

The IMC Planning Process: Establishing Communication Objectives and Budget, Role of Advertising Agencies.

Managing Mass Communication: Advertising Management- Advertising Goals, Media Planning and Selection, Creative Brief, Advertising Appeals, Execution Frameworks, Advertising Effectiveness. Sales Promotion- Consumer Promotions, Trade Promotions. Public Relations and Sponsorship Programs.

Managing Personal Communication: Direct Mail, Interactive Marketing, Catalogs, Direct Response Mass Media, Telemarketing, Personal Selling.

IMC Perspectives: Measuring the Effectiveness of the Promotional Program. Regulation of Advertising and Promotion.

LEARNING OUTCOMES:

Upon successful completion of the course, students are expected to:

- Develop an understanding of the individual elements of the marketing communication mix.
- Choose a marketing communications mix to achieve the communications and behavioral objectives of the IMC campaign plan.
- Develop an integrated cross-media strategy and creative message and concept to reach the target audience and deliver the brand promise through an IMC campaign.
- Measure and critically evaluate the communications effects and results of an IMC campaign to determine its success.

TEXT BOOK:

- Belch, G. E., Belch, M. A., & Purani, K. (2014). *Advertising and Promotion: An Integrated Marketing Communication Perspective*. New Delhi: McGraw Hill Education.

REFERENCE BOOKS:

- Chunawalla, S. A. & Sethia, K. C. (2010). *Foundations of Advertising- Theory & Practice*. New Delhi: Himalaya Publishing House.
 - Clow, K. E., & Baack, D. E. (2015). *Integrated Advertising, Promotion and Marketing Communications*. Noida, U.P.: Pearson Education
 - Ryan, D. & Jones, C. (2012). *Understanding Digital Marketing*. USA: Kogan page.
 - Shah, K., & D'Souza, A. (2014). *Advertising & Promotions: An IMC perspective*. New Delhi: McGraw Hill Education.
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Institute of Management, JKL U, Jaipur

Corrigendum of Course Booklet

Programme Name: B.Tech + MBA

Batch: 2012-17

(MBA Courses)

1. Syllabi of following courses are missing:

| S. No | Semester | Code | Course Name | Credit |
|-------|----------|--------|---------------------------|--------|
| 1 | 9 | MBA305 | Major Research Project-I | 2 |
| 2 | 9 | MBA306 | Simulation Exercise | 1 |
| 3 | 9 | MBA307 | Soft Skills-III | 1 |
| 4 | 10 | MBA403 | Major Research Project-II | 2 |
| 5 | 10 | MBA404 | Comprehensive Viva (CV) | 1 |
| 6 | 10 | MBA405 | Soft Skills-IV | 1 |

which should be considered as follows:

MAJOR RESEARCH PROJECT – I

Course Code : MBA305

Course Credits : 2

Course Description:

As part of the MBA Programme, the first year students may take up a Research Project under the faculty mentor / guide. They would need to submit the MRP Report and make presentation on the same in the next semester.

SIMULATION EXERCISE

Course Code : MBA306

Course Credits : 1

Course Description:

This single credit course has been introduced with the objective to make students undergo a Business Simulation training exercise and get evaluated on their performance during the process.

SOFT SKILL - III

Course Code : MBA307

Course Credits : 1

Course Syllabi:

Written Communication: Writing effective emails, preparing powerful presentations and writing Business Reports.

English Grammar Capsule: Noun, Preposition, Conjunction, Pronoun, Verb, Tenses, Modifiers and Prepositional Phrases and their implementation.

Enhancing Conversational Skills: Improving Verbal English through practice exercises comprising of day to day conversational situations. Practice exercises to strengthen lexical / structural knowledge of English.

Course Learning Outcomes:

Upon completion of the course, the student is expected to:

- Identify and react accordingly on one-way and two-way communication scenarios.
- Define the communication style followed by him / her.
- Demonstrate active-listening skills
- Deal with challenging emotions
- Overcome cross-cultural barriers
- Recognize filters in himself / herself and others.
- Express the Anger constructively.
- Use grammatically correct language.
- Speak impromptu on any business topic / current affairs.
- Work effectively in diverse teams (As a part of Course activities and role plays).

Reference Books:

- Simon Sweeney. *English for Business Communication*, Cambridge University Press.
- Grant Taylor, *English Conversation Practice* (TMH Edition), TMH.

MAJOR RESEARCH PROJECT – II

Course Code : **MBA403**

Course Credits : **2**

Course Description:

As part of the MBA Programme, the final year students may take up a Research Project under the faculty mentor / guide. They would need to submit the MRP Report and make presentation on the same in the final semester.

COMPREHENSIVE VIVA

Course Code : **MBA404**

Course Credits : **1**

Course Description:

The second comprehensive viva is scheduled at the end of last Semester in order to judge the understanding as well as application of the knowledge gained by the students by the end of last Semester of the course. This is also to see the articulation of what is being learnt by them. The idea is to see that students are able to understand what is being taught and see their relevance not only in the practical field but also their inter relationship. The viva is of 100 marks to be conducted by the external examiner appointed by the University.

SOFT SKILL - IV

Course Code : MBA405
Course Credits : 1

Course Syllabi:

Achieving Genuine Communication: Creating openness, matching body language to message, working constructively with emotions, dealing with anger and managing emotionally charged situations. Managing Cross Cultural Communication and working with filters and assumptions.

Business Etiquette: Art of effective networking and Introductions. Power of handshake, Business Card Protocol, Telephone, cell phone and email etiquette. Pre-meeting strategies. Corporate Dressing, Effective usage of gestures during communication in a formal environment and balancing between Speaking and Listening to arrive at an equilibrium, Negotiations and conflict management.

Course Learning Outcomes:

Upon completion of the course, the student is expected to:

- Identify and react accordingly on one-way and two-way communication scenarios.
- Define the communication style followed by him / her.
- Demonstrate active-listening skills
- Deal with challenging emotions
- Overcome cross-cultural barriers
- Recognize filters in himself / herself and others.
- Express the Anger constructively.
- Use grammatically correct language.
- Speak impromptu on any business topic / current affairs.
- Work effectively in diverse teams (As a part of Course activities and role plays).

Reference Books:

- Simon Sweeney. *English for Business Communication*, Cambridge University Press.
- Grant Taylor, *English Conversation Practice* (TMH Edition), TMH.