

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**COURSE STURUCTURE - R10**

**COMMON TO BRANCHES**

**(ECE, IT, ME, CHEM, BME, ECom E, PCE, MM)**

**I Year**

I Semester		P	C	II Semester		P	C
1	English – I	3	2	1	English – II	3	2
2	Mathematics - I	3+1	2	2	Mathematics – II	3+1	2
3	Engineering Physics – I	3+1	2	3	Engineering Physics – II	3+1	2
4	Engineering Chemistry I	3	2	4	Engineering Chemistry-- II	3	2
5	C Programming	3	2	5	Engineering Drawing	1+3	2
6	Environmental Studies	3	2	6	Mathematical Methods	3+1	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	3	2	7	Engineering Physics & Engineering Chemistry Laboratory -II	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring, )	3	2	8	English - Communication Skills Lab	3	2
9	C Programming Lab	3	2	9	IT Workshop	3	2
10	English Proficiency Lab	3	2				
		<b>32</b>	<b>20</b>			<b>31</b>	<b>18</b>

**COURSE STURUCTURE - R10**

**COMMON TO BRANCHES**

**(CSE, EEE, CE, EIE, AE, BT, AME,)**

**I Year**

I Semester		P	C	II Semester		P	C
1	English – I	3	2	1	English – II	3	2
2	Mathematics - I	3+1	2	2	Mathematics – II	3+1	2
3	Engineering Physics – I	3+1	2	3	Engineering Physics – II	3+1	2
4	Engineering Chemistry I	3	2	4	Engineering Chemistry-- II	3	2
5	C Programming	3	2	5	Engineering Drawing	1+3	2
6	Mathematical Methods	3+1	2	6	Environmental Studies	3	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	3	2	7	Engineering Physics & Engineering Chemistry Laboratory -II	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring, )	3	2	8	English - Communication Skills Lab	3	2
9	C Programming Lab	3	2	9	IT Workshop	3	2
10	English Proficiency Lab	3	2				
		<b>33</b>	<b>20</b>			<b>30</b>	<b>18</b>

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**Syllabus effective from 2010-2011**

**ENGLISH SYLLABUS FOR SEM. 1 & 2 of JNTU-K**

**Introduction**

The major challenge of a language teaching in a technical institution is to prepare the student for employability through imparting language skills to develop communicative competence. The proficiency in English language is closely linked to 'good communication skills' more so in the recent times when employability is at stake for want of communication skills on the part of the students. Since skills and personal attributes are revealed through communication, the responsibility of grooming students in life skills is also emphasized as part of language teaching and learning.

The core key skills needed are:

- Communication
- Team Work
- Problem Solving
- Learning Skills

The personal attributes to be groomed are:

- Adaptability
- Commitment
- Enthusiasm
- Stress Management
- Integrity
- Sense of Humour
- Self-Motivation
- Reliability
- Self-esteem
- Personal Presentation

Since the inception of the Board of Studies for English, effort to design a Course Structure that would cater to the needs of a wide range of learner groups has been made. It was felt by the Board that the Course Structure has to take into consideration the above criteria and therefore the objectives of the Language course ought to be much focused.

**Objectives**

**1:** To improve the language proficiency of technical under graduates in English with emphasis on LSRW skills.

1.1: To provide learning environment to practice *listening, speaking, reading, and writing* skills within and beyond the classroom environment.

1.2: To assist the students to carry on the tasks and activities through guided instructions and materials.

**2:** To effectively integrate English language learning with employability skills and training.

2.1: To design the main course material and exercises with authentic materials drawn from everyday use to cater to everyday needs.

The material may be culled from newspaper articles, advertisements, promotional material etc.

2.2: To provide hands-on experience through case-studies, mini-projects, group & individual presentations.

Each chapter will be structured with a short passage or collage of passages for reading. All further exercises and activities will draw upon the broad subject of the passage(s), and use **functional and situational approach**

Chapter / Grammar & vocabulary	Reading & comprehension	Listening & speaking	Core skills and personal attributes developed through the exercises	Objectives achieved through the exercises	Plan of evaluation	
	Reading comprehension based on the passage(s): multiple-choice questions asking students to derive sense of a word from the context provided by a sentence, short questions asking students to sum up the key points of a passage, encouraging students to address not only explicit statement but also implied meaning.	Dialogues from situations related to what <b>Writing and analysis</b> has been encountered in the reading passages.; the dialogues may now be Instructions on how to lay out a piece of used in a role-play, and in groups, writing, and exercises where students may analyze them for meaning are asked to generate their own write-and implications, and ultimately engage in ups dialogues of their own making.			A three-tier system, allowing the student to work through self-assessment, assessment by peers, and finally, assessment by the teacher.	
<p><b>Chapter – 1 .Read &amp; Proceed</b> The importance of the language used for communication:</p> <ul style="list-style-type: none"> <li>• Understanding the need for English in the wider world, and the opportunities afforded by a strong command of the language</li> <li>• Assessing one’s level within the language, and understanding the ways in which grasp of the language can be bettered</li> <li>• Understanding the basic structure of the sentence. <b>English: subject – verb – object -</b></li> </ul> <p><b>Functional grammar exercise:</b> Students may discuss in groups or pairs when, why and where English is used. What, for example, if they have to face a job interview? Or make an official presentation in a State that does not use Telugu? Or even find their way in an unfamiliar city?</p> <p><b>Possible areas of focus and evaluation:</b></p> <ul style="list-style-type: none"> <li>• Making sentences from given keywords</li> <li>• Correcting the order of words to make sentences, noting how change in word order can affect meaning.</li> </ul>	<p>Short extracts from:</p> <ol style="list-style-type: none"> <li>1.An interview with Arundhati</li> <li>2.Jawaharlal Nehru's 'Tryst with Destiny' speech</li> <li>3.Albert Einstein's essay 'The World As I See It'</li> </ol>	<p>Sentences Understanding and using the basic structure of the verb – object); creating sentences; understanding the different kinds of sentences (whether a statement, or a question, or an exclamation, and so on)</p>	<p><b>Small conversations between :</b></p> <ol style="list-style-type: none"> <li>1.A student and a hostel warden</li> <li>2.An interviewer and an interviewee</li> <li>3.Two friends together preparing for an oral examination at college</li> </ol>	<p>Communication teamwork, problem skills</p>	<p>Enhanced learner- development of linguistic proficiency</p>	<p>[Both Teacher's Sample Test Questions will be provided]</p>

<p><b>Chapter 2. Travel</b> Nouns, pronouns, and adjectives:</p> <ul style="list-style-type: none"> <li>• Understanding the kinds and uses of nouns</li> <li>• Understanding the use of pronouns to replace nouns</li> <li>• Understanding the ways in which nouns are qualified through adjectives</li> <li>• Understanding the kinds of adjectives, their degrees and their uses</li> </ul> <p><b>Functional grammar exercise:</b> Students may be asked, in pairs, to plan a trip to a place of mutual interest. Each pair would then be encouraged to explain how and why they arrived at this choice. What words are used to identify – and distinguish – the proposed destination? What naming words are used? How those words are then qualified? How do the nouns (the naming words) and adjectives (the qualifiers) help to create a character and atmosphere for the place or site to be visited? Is it possible to build anticipation through such evocation?</p> <p><b>Potential areas of focus and evaluation:</b></p> <ul style="list-style-type: none"> <li>• Changing nouns to the related adjectives</li> <li>• Changing adjectives to the related nouns</li> <li>• Replacing nouns with pronouns while retaining the meaning of the sentence</li> </ul>	<p>Reading and analysis of short extracts from two or more of the following:</p> <ol style="list-style-type: none"> <li>1. Vikram Seth, <i>From Heaven Lake</i></li> <li>2. Ruskin Bond, <i>Landor Days</i></li> <li>3. Rabindranath Tagore, <i>The Europe Traveller's Diary</i></li> <li>4. Pankaj Mishra, <i>Butter Chicken in Ludhiana</i></li> </ol>	<p><b>Paragraphs</b></p> <p>Understanding the structure of a paragraph; retaining the thread of an argument; introducing the subject of the paragraph in the initial sentence; developing the argument in the next few sentences; drawing to a conclusion by reinforcing what has already been stated, but without introducing any new ideas towards the end; being brief and concise, but carrying all the information that needs to be conveyed</p>	<p><b>Snippets of exchanges between:</b></p> <ol style="list-style-type: none"> <li>1. A tour guide and a tourist</li> <li>2. A local inhabitant of a city and a visitor</li> <li>3. A photographer and her friend, with the photographer telling about the places of interest she has been to in her recent travels</li> </ol>	<p>Communication, adaptability, sense of humour, reliability,</p>	<p>Functional approach to finding solutions, enhanced learner-participation, development of linguistic proficiency</p>	<p>[Both Teacher's Manual and Sample Test Questions will be provided]</p>
---	--	---	---	---	--	---

<p><b>Chapter 3. Gender</b></p> <p>Verbs and adverbs:</p> <ul style="list-style-type: none"> <li>• Understanding the placement of a verb within a sentence</li> <li>• Understanding tenses</li> <li>• Understanding the use of adverbs to describe verbs</li> </ul> <p><i>Functional grammar exercise:</i></p> <p>Students may be asked to consider recent news headlines for remarkable stories involving women. How are either the events or the women remarkable? What have these women done, or what do they do? What words of action are used to talk about the accomplishments of the women? How are actions of the past differentiated from actions of the present and actions yet to be performed? How (using what adverbs) are those actions qualified?</p> <p><b>Potential areas of focus and evaluation:</b></p> <ul style="list-style-type: none"> <li>• Changing verbs to the related adverbs</li> <li>• Changing adverbs to the related verbs</li> <li>• Using verbs in their correct tenses, deriving the sense from the rest of the sentence</li> </ul>	<p>Reading and analysis of short extracts from four newspaper/journal pieces:</p> <ol style="list-style-type: none"> <li>1. <i>The Telegraph</i> report on the 20-year old Burdwan girl who walked out of her marriage in revolt of her in-laws' demands for dowry</li> <li>2. A perspective on astronaut Kalpana Chawla's achievement</li> <li>3. The inspirational story of a young woman who survived child-marriage</li> <li>4. Sudha Murthy's write on what it is possible for women to achieve</li> </ol>	<p>Essays and arguments</p> <p>Understanding that an essay or argument is a descriptive or persuasive piece of writing that needs to be organized as a succession of paragraphs; introducing the chief concerns in the first paragraph, and providing a layout of how the argument is going to be structured; developing the main thrust of the argument in the succeeding paragraphs; making smooth transitions between ideas and paragraphs (using appropriate connecting words or phrases); winding to a conclusion by drawing the various strings of the argument together</p>	<p><b>Short exchanges between:</b></p> <ol style="list-style-type: none"> <li>1. Two friends, on an issue of contemporary interest</li> <li>2. A reporter and a talk-show guest</li> <li>3. A teacher and a student in school</li> </ol>	<p>Communication, teamwork, commitment, integrity, self-motivation, self-esteem</p>	<p>Enhanced learner-participation, development of linguistic proficiency, development of critical thinking</p>	<p>[Both Teacher's Manual and Sample Test Questions will be provided]</p>
---	---	--	--	---	--	---

<p><b>Chapter 4. Disaster Management</b> Articles and punctuation:</p> <ul style="list-style-type: none"> <li>• Understanding the uses of ‘a’, ‘an’, and ‘the’</li> <li>• Understanding the uses of words/phrases expressing quantity, like ‘some’, ‘a bit of’, ‘more’, etc.</li> <li>• Understanding and using correct punctuation to convey meaning</li> </ul> <p><b>Functional grammar exercise:</b> Students may be asked to imagine that in the aftermath of a natural disaster, they are part of a relief team effort. When asked to effectively identify the needs of the situation, how do they plan to go about providing necessary aid? Is <i>an</i> ambulance to be arranged for? Or <i>a</i> medical tent set up? Are <i>adequate</i> first-aid supplies available? Do <i>more</i> rations need to be fetched? Could there be a tie-up with <i>an</i> overseas relief organization?</p>	<p>Reading and analysis of a short piece on the tsunami</p>	<p>Official letters and emails Effectively using the format of official communication: providing one’s own address and contact details, documenting the date and place from which the communication is sent, the salutation used for the addressee, the main body of the letter or email (keeping it comprehensive but to the point), and signing off</p>	<p>Dialogues between: 1.a social worker and an earthquake victim 2.two doctors working in an area afflicted by natural disaster 3.two school students campaigning to raise relief money</p>	<p>Communication, teamwork, problem solving, adaptability, stress management, reliability, integrity</p>	<p>Enhanced learner-participation, development of linguistic proficiency, functional approach to problem solving, enabling group work</p>	<p>[Both Teacher’s Manual and Sample Test Questions will be provided]</p>
<p><b>Chapter 5 –Health Prepositions, conjunctions and exclamations:</b></p> <ul style="list-style-type: none"> <li>• Understanding the use of prepositions – words that connect verbs with their objects</li> <li>• Understanding that certain verbs use certain prepositions</li> <li>• Understanding the uses of common prepositions: to, for, at, by, of, and so on</li> <li>• Understanding the uses of conjunction and exclamations</li> </ul> <p><b>Functional grammar exercise:</b> Students may be asked to propose ways which healthier living might be attained eating better <i>and</i> exercising, drinking plenty <i>of</i> water, partaking <i>fre</i> vegetables <i>from</i> the Market, and so on. Possible exercises may be framed around:</p> <ul style="list-style-type: none"> <li>• Filling in blanks within sentences</li> <li>• Distinguishing between different meanings possible through the use of different prepositions with the same verbs</li> </ul>	<p>Reading and analysis of three different kinds of writing, and comparisons between them:</p> <ol style="list-style-type: none"> <li>1.A Government of India report on the success of nationwide campaigns for polio vaccination</li> <li>2.A vegetarian’s perspective on what makes for healthy living</li> <li>3.An athlete’s say on the benefits of lifelong exercise</li> </ol>	<p><b>Reports</b> Learning the difference between an essay, for example, and a report; learning to identify the key points of an event or incident, and documenting them briefly but in a manner that conveys both the temper and the unfolding of the event; understanding what is meant by a ‘target readership’, and learning to tailor the piece to the needs of that readership</p>	<p><b>Brief exchanges between:</b></p> <ol style="list-style-type: none"> <li>1. A father and his son/daughter, as he explains the importance of staying fit</li> <li>2. A friends discussing the ideal diet</li> <li>3. A campus counsellor and a student</li> </ol>	<p>Personal presentation, stress-management, commitment, enthusiasm,, self-motivation</p>	<p>Development of linguistic proficiency, functional approach to problem solving</p>	<p>[Both Teacher’s Manual and Sample Test Questions will be provided]</p>

<p><b>Chapter 6 Sports :</b> Revision of all elements of grammar handled thus far, through evocative descriptions of State or national or international level sports stories, and discussion of them.</p> <p><b>Functional grammar exercise:</b> Students may, in pairs, be asked to present an account of a memorable sports meet or game. The use of nouns pronouns, and adjectives should help to clarify exactly what event is being talked about. Judicious use of adjective will help provide the context: how important the game or match was, where it was held, and so on. In a brief account of the game, verbs and adverbs will be necessary to report exactly what happened. If the account has to be detailed and lively, students will be obliged to use the correct forms and tenses. Of course, throughout, not only will the right inflections and articles be necessary, so too will the precise use of prepositions.</p>	<p>Reading and analysis of two of four short pieces in depiction of:</p> <ol style="list-style-type: none"> <li>1. Opportunities for men and women in sports</li> <li>2. A decisive moment in a game</li> <li>3. Expectation and failure</li> <li>4. The attitude of sportsmanship</li> </ol>	<p>Presentations</p> <p>Learning to identify the key elements of any issue and putting them down as succinct points; structuring the points so that they may be elaborated on according to necessity; understanding the progression of points so that no important element is missed out, but also, repetitions are avoided</p>	<p>Small conversations between:</p> <ol style="list-style-type: none"> <li>1. A fitness instructor and a trainee</li> <li>2. Two friends discussing a possible career in sports</li> <li>3. Two friends discussing their favorite game</li> </ol>	<p>Teamwork, integrity, self-motivation, self-esteem, commitment</p>	<p>Development of linguistic proficiency, functional approach to problem solving</p>	<p>[Both Teacher's Manual and Sample Test Questions will be provided]</p>
---	---	---	---	--	--	---

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**MATHEMATICS-I (*Common to All Branches*)**

**Syllabus effective from 2010-2011**

**UNIT – I**

Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

**UNIT – II**

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ , polynomials in  $x$ ,  $e^{ax} V(x)$ ,  $xV(x)$

**UNIT-III**

Generalized Mean Value theorem (without proof) Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints.

**UNIT-IV**

Curve tracing – Cartesian - Polar and Parametric curves.

**UNIT – V**

Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian and Polar Coordinates.

**UNIT – VI**

Multiple integrals - double and triple integrals – change of variables – Change of order of Integration.

**UNIT – VII**

Vector Differentiation: Gradient- Divergence- Curl and their related properties of sums-products- Laplacian and second order operators.

**UNIT-VIII**

Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals  
Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.

**Text Books:** 'A Text Book of Engineering Mathematics – I' by U. M. Swamy, P. Vijaya Lakshmi, Dr. M. P.K.Kishore and Dr. K.L. Sai Prasad – Excel Books, New Delhi

**References:**

1. Engineering Mathematics, Vol- 1, Dr. D. S.C. Prism Publishers
2. Engineering Mathematics, B. V. Ramana , Tata Mc Graw Hill
3. "Advanced Engineering Mathematics", Erwin Kreszig, 8 Ed. Wiley Student Edition



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING PHYSICS -1 (*Common to all branches*)**

**Syllabus effective from 2010-2011**

**UNIT-1**

INTERFERENCE: Superposition of waves - Young's double slit experiment - Coherence - Interference in thin films by reflection - Newton's rings.

**UNIT-II**

DIFFRACTION: Fresnel and Fraunhofer diffractions - Fraunhofer diffraction at a single slit - Double slit - Diffraction grating - Grating spectrum - Resolving power of a grating - Rayleigh's criterion for resolving power.

**UNIT-III**

POLARIZATION: Types of Polarization - Double refraction - Nicol prism - Quarter wave plate and Half wave plate..

**UNIT-IV**

CRYSTAL STRUCTURE: Introduction - Space lattice - Basis - Unit cell - Lattice parameters - Bravais lattices - Crystal systems - Structure and packing fractions of simple cubic, Body centered cubic, Face centered cubic crystals.

**UNIT-V**

X-RAY DIFFRACTION: Directions and planes in crystals - Miller indices - Separation between successive [h k l] planes - Diffraction of X - rays by crystal planes - Bragg's law - Laue method - Powder method.

**UNIT-VI**

LASERS: Introduction - Characteristics of lasers - Spontaneous and Stimulated emission of radiation - Einstein's coefficients - Population inversion - Ruby laser - Helium -Neon laser - Semiconductor laser - Applications of lasers in industry, scientific and medical fields.

**UNIT-VII**

FIBER OPTICS: Introduction - Principle of optical fiber - Acceptance angle and acceptance cone - Numerical aperture - Types of optical fibers and refractive index profiles - Attenuation in optical fibers - Application of optical fibers.

**UNIT-VIII**

NON-DESTRUCTIVE TESTING USING ULTRASONICS: Ultrasonic Testing - Basic Principle - Transducer - Couplant and Inspection Standards - Inspection Methods - Pulse Echo Testing Technique -Flaw Detector - Different Types of Scans - Applications.

**Text Books :**

1.Perspective of Engineering Physics by Dr.M.Sri Rama Rao (Retd Prof. in Physics, Andhra University, Visakhapatnam), Dr.N.Chaudhary and D.Prasad, Pub: Acme Learning.

**Reference books:**

1. Engineering Physics by S. Mani Naidu ( Pearson publishers )
2. Engineering Physics by Sanjay D Jain and Girish G Sahasrabudhe(University press)
3. Engineering Physics by alik and A K Singh(Tata Mc Graw-Hill Publishing company Limited)

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING CHEMISTRY – I (Common to all branches)  
Syllabus effective from 2010- 2011**

**CONCEPTS IN CHEMISTRY –ENGINEERING APPLICATIONS**

**UNIT-I**

**1. JOULE THOMSON EFFECT**

Definitions of Enthalpy, Free Energy, Entropy, Principle and explanation of Joule Thomson Effect, application to Air Conditioning , Refrigeration (WORKING PRINCIPLE AND FLOW DAIGRAMS)

**2. OSMOSIS & REVERSE OSMOSIS**

Principles of Osmosis & Reverse Osmosis, applicaton to Desalination process-Types of Membranes used in desalination process-Limitations

**3. LECHATeliers PRINCIPLE ---**

Definition of Chemical Equilibrium, Factors influence the Chemical Equilibrium, Statement and explanation of Lechateliers principle- Industrial applications for the production of Sulphuric Acid and Ammonia

**4. SOLUBILITY PRODUCT & COMMON ION EFFECT--**

Definition of Solubility & Ionic products, Industrial applications

**UNIT-II**

**1. CATALYSIS**

Explanation of Catalysis, Criteria of Catalysts, Few Industrial Catalysts

**2. COLLOIDS**

Explanation of Colloids- Properties of Colloids, Industrial applications of Colloids

**3. FERMENTATION**

Explanation of Fermentation with examples-Industrial applications

**4. VISCOSITY:**

Definition of Viscosity -Factors influence the Viscosity- Kinematic Viscosity-Determination of Molecular Weight of any one compound-Applications to fluids in motion –Type of flow.

**UNIT-III**

**1. FLUORESCENCE & PHOSPHORESCENCE--- LUMINESCENT COMPOUNDS**

Explanation of Fluorescence & Phosphorescence JOB s Diagram, Industrial applications of Chemiluminiscent compounds

**2. PHOTO & LIGHT RESPONSIVE COMPOUNDS—SENSORS, BIOSENSORS**

Explanation of Sensors & Biosensors-Principle –Few Applications

**3. IONSELECTIVE ELECTRODES –**

Principle- Chemistry & working of Electrode-applications to determination of Fluoride, Chloride and Nitrate

**4. NUCLEAR MAGNETIC RESONANCE(NMR) : Principle –Few Electronic applications**

**UNIT-IV**

1. SUPERCONDUCTIVITY – Definition-Preparation –Properties –Engineering Applications

2. SEMICONDUCTORS - Definition –Types of semiconductors (Stoichiometric, Non stichometric ,Organic, Controlled Valency Semiconductors, Doping )-applications

3. STORAGE DEVICES - Materials used and working of Floppy ,CD,Pendrive etc.

4. LIQUID CRYSTALS - Definition –Types - applications in LCD and Engineering Applications

#### **UNIT – V**

**THERMAL ENERGY**- introduction to solid fuels – definition – calorific value (LCV, HCV) bomb calorimeter, pulverized coal – carbonization – analysis of coal (proximate and ultimate analysis) – working of thermal power station.

#### **UNIT - VI**

Chemical sources of energy – single electrode potential – Nernst Equation- reference electrodes – concentration cells-primary and secondary cells – fuel cells.

#### **UNIT-VII**

**NUCLEAR ENERGY**: Introduction to nuclear fuels – binding energy – nuclear fission and fusion reactions – nuclear reactions – disposal of nuclear wastes.

#### **UNIT-VIII**

**SOLAR CELLS**- introduction – harnessing solar energy – solar heaters – photo voltaic cells – solar reflection – green house concepts.

\*Teachers Are Requested To Provide Information About National And International Status Of Conventional And Non Conventional Sources To The Students

#### **Text Book :**

A Text Book Of Engineering Chemistry By N.Krishan Murthy Anuradha , Maruthi Publications

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**C- Programming (Common to All Branches)**

**Syllabus effective from 2010- 2011**

**UNIT I:**

**INTRODUCTION:** Computer systems, Hardware & software concepts.

**PROBLEM SOLVING:** Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high-level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.

**BASICS OF C:** Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation, Sample programs.

**UNIT II:**

**BIT-WISE OPERATORS:** logical, shift, rotation, masks.

**SELECTION – MAKING DECISIONS:** Two-way selection: if- else, null else, nested if, examples, Multi-way selection: switch, else-if, examples.

**UNIT III:**

**STRINGS:** concepts, c strings.

**ITERATIVE:** Loops - while, do-while and for statements, break, continue, initialization and updating, event and counter controlled loops, Looping applications: Summation, powers, smallest and largest.

**UNIT IV:**

**ARRAYS:** Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, Multidimensional arrays , Array applications: Matrix Operations, checking the symmetricity of a Matrix,

**UNIT V:**

**FUNCTIONS-MODULAR PROGRAMMING:** Functions, basics, parameter passing, storage classes-extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, Recursive solutions for Fibonacci series, Towers of Hanoi, header files, C pre-processor, example c programs. Passing 1-D arrays, 2-D arrays to functions.

**UNIT VI:**

**POINTERS:** Pointers- concepts, initialization of pointer variables, pointers and function arguments, passing by address –dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

**UNIT VII:**

**ENUMERATED, STRUCTURE AND UNION TYPES:** Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.

## **UNIT VIII:**

**FILE HANDLING:** Input and output – concept of a file, text files and binary files, Formatted I/o, file I/o operations, example programs.

**Text Books :** ‘ The C – Programming Language’ B.W. Kernighan, Dennis M. Ritchie, PHI

### **Reference :**

1. C Programming : A Problem - Solving Approach, Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.
2. Programming in C, Stephen G. Kochan, 3/e Pearson, 2007

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENVIRONMENTAL STUDIES (Common to all Branches)**

Syllabus effective from 2010 -2011

**UNIT - I**

**Multidisciplinary nature of Environmental Studies:** Definition, Scope and Importance – Need for Public Awareness.

**UNIT - II**

**Natural Resources :** Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

**UNIT - III**

**Ecosystems :** Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

**UNIT - IV**

**Biodiversity and its conservation :** Introduction - Definition: genetic, species and ecosystem diversity. - Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**UNIT - V**

**Environmental Pollution :** Definition, Cause, effects and control measures of :

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

**Solid waste Management:** Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

## **UNIT - VI**

**Social Issues and the Environment:** From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. – Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

## **UNIT - VII**

**Human Population and the Environment:** Population growth, variation among nations. Population explosion – Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. –Case Studies. Page 37 of 79

## **UNIT - VIII**

**Field work :** Visit to a local area to document environmental assets River /forest grassland/hill/mountain - Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystemspond, river, hill slopes, etc.

### **Text Books :**

1. An Introduction to Environmental Studies by B. Sudhakara Reddy, T. Sivaji Rao, U. Tataji & K. Purushottam Reddy, Maruti Publications.

### **Reference :**

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
3. Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**MATHEMATICAL METHODS (*Common to ALL branches*)**

**Syllabus effective from 2010-2011**

**UNIT – I**

Linear systems of equations: Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination - Gauss Jordan and Gauss Seidal Methods.

**UNIT – II**

Eigen values - Eigen vectors – Properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem.

**UNIT-III**

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

**UNIT – IV**

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

**UNIT-V**

**Interpolation:** Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton’s formulae for interpolation – Interpolation with unevenly spaced points - Lagrange’s Interpolation formula.

**UNIT – VI**

Numerical Differentiation and Integration – Differentiation using finite differences - Trapezoidal rule – Simpson’s 1/3 Rule –Simpson’s 3/8 Rule.

**UNIT – VII**

Numerical solution of Ordinary Differential equations: Solution by Taylor’s series-Picard’s Method of successive Approximations-Euler’s Method-Runge-Kutta Methods –Predictor-Corrector Methods- Milne’s Method.

**UNIT – VIII**

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

**Text Book :** Ravindranath, V. and Vijayalaxmi, A., A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

**Reference Books :**

1. Rukmangadachari, E. Mathematical Methods, Pearson Education, Delhi.
2. Kreszig, Erwin “Advanced Engineering Mathematics”, 8 Ed. Wiley Student Edition.
3. Peter O’ Neil, “Engineering Mathematics”, Cengage Learning. Gordon, “Engineering Mathematics”, Pearson Education



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**ENGINEERING PHYSICS & CHEMISTRY LABORATORY-1 (Common to all branches)**  
**Syllabus effective from 2010- 2011**  
**PHYSICS-I**

**A. Mechanics**

1. Determine the Rigidity Modulus of the material of the wire using Torsional Pendulum.
2. Determine the Frequency of vibration in Transverse and Longitudinal Mode using Melde's Apparatus.
3. Verify the Laws Transverse vibrations in stretched strings using Sonometer.
4. Determine the Velocity of Sound by Volume Resonator method.
5. Determine the Acceleration due to Gravity and Radius of Gyration using Compound Pendulum.

**B. Optics:**

6. Determine the Wavelength of a source by Normal Incidence method using Diffraction Grating.
7. Determine the Radius Curvature of a convex lens by forming Newton's Rings.
8. Determine the Refractive Index of the material of Prism (Minimum Deviation method) using Spectrometer.
9. Determine the Thickness of the Spacer used to form Parallel fringes due to Wedge shaped film.
10. Determination of Single slit diffraction using Lasers.

**Manual/Record Books:**

1. Manual cum Record for Engineering Physics Lab-1, by Prof.Sri M. Rama Rao, Acme Learning.
2. Lab manual of Engineering Physics by Dr. Y.Aparna and Dr. K.Venkateswara Rao (VGS Books links, Vijayawada )

**CHEMISTRY LAB - 1**

**LIST OF EXPERIMENTS**

1. Introduction to Chemistry Lab (the teachers are expected to teach fundamentals like Primary, Secondary Standard Solutions , Normality, Molarity, Molality etc and laboratory ware used, error ,accuracy, precision, Theory of indicators, use of volumetric titrations
  2. **Introduction to Volumetric Analysis:**  
The Teacher has to perform four types of volumetric titrations and will explain about the working of Indicators .(The Teacher has to call the students at random to perform the titrations)
2. ANALYSIS OF WATER
- Estimation of :
- a. **Calcium, Magnesium, Iron (111), Zinc (SEPERATELY)**
  - b. TOTAL HARDNESS BY EDTA METHOD
  - c. TURBIDITY
  - d. CONDUCTIVITY
  - e pH
  - f. TOTAL DISSOLVED SALTS
  - g. FLORIDES, CHLORIDES AND NITRATES ( USING ION ANALYSER OR BY COLORIMETER)
  - h. DISSOLVED OXYGEN
  - i. BACTERIAL COUNT

The student has to get his water sample and the teacher has to explain the analysis and the results are to be compared with the INDIAN STANDRDS.

- All the teachers are requested to give top priority to water analysis as it is very useful for the students and society. complete water analysis may take couple of hours more but this has a unique influence on the system.

### 3.CONSTRUCTION OF GALVANIC CELL

Based on the position of the metals in the electrochemical series a model Electrochemical Cell is constructed and the values are determined and effect of metal ion concentration, Temperature etc. on emf are calculated.

#### **Lab Manual :**

Engineering chemistry laboratory manual & record By srinivasulu .d parshva publications

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING WORKSHOP (Common to all Branches)**

Syllabus effective from 2010- 2011

**I B.Tech – I Sem.**

**Note: At least two exercises to be done from each trade.**

**Trade:**

**Carpentry**

1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tennon Joint

**Fitting**

1. Vee Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

**Black Smithy**

1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

**House Wiring**

1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

**Tin Smithy**

1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**C PROGRAMMING LAB (Common to all Branches)**

Syllabus effective from 2010 -2011

**Objectives:**

- To learn/strengthen a programming language like C, To learn problem solving techniques

**Recommended Systems/Software Requirements:**

- Intel based desktop PC, ANSI C Compiler with Supporting Editors, IDE's such as Turbo C, Bloodshed C,
- Linux with gcc compiler

**Exercise 1**

Solving problems such as temperature conversion, student grading, income tax calculation, etc., which expose students to use basic C operators

**Exercise 2**

2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

**Exercise 3**

a) Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

d) Write a program which checks a given integer is Fibonacci number or not.

**Exercise 4**

a) Write a C program to calculate the following Sum:

$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$

b) Write a C program to find the roots of a quadratic equation.

**Exercise 5**

a) The total distance travelled by vehicle in 't' seconds is given by distance =  $ut + \frac{1}{2}at^2$  where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec<sup>2</sup>). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

b) Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +, -, \*, /, % and use Switch Statement)

**Exercise 6**

- a) Simple programming examples to manipulate strings.
- b) Verifying a string for its palindrome property

**Exercise 7**

Write a C program that uses functions to perform the following operations:

- i. To insert a sub-string in to given main string from a given position.
- ii. To delete n Characters from a given position in a given string.
- iii. To replace a character of string either from beginning or ending or at a specified location

**Exercise 8**

Write a C program that uses functions to perform the following operations using Structure:

- i) Reading a complex number
- ii) Writing a complex number
- iii) Addition of two complex numbers
- iv) Multiplication of two complex numbers

**Exercise 9**

- a) Addition of Two Matrices
- b) Calculating transpose of a matrix in-place manner.
- c) Matrix multiplication by checking compatibility

**Exercise 10**

- a) Write C programs that use both recursive and non-recursive functions for the following
  - i) To find the factorial of a given integer.
  - ii) To find the GCD (greatest common divisor) of two given integers.
  - iii) To solve Towers of Hanoi problem.

**Exercise 11**

- a) Write a C functions to find both the largest and smallest number of an array of integers.
- b) Write a C function that uses functions to perform the following:
  - i) that displays the position/ index in the string S where the string T begins, or -1 if S doesn't contain T.
  - ii) to count the lines, words and characters in a given text.

**Exercise 12**

- a) Write a C function to generate Pascal's triangle.
- b) Write a C function to construct a pyramid of numbers.

**Exercise 13**

Write a C function to read in two numbers, x and n, and then compute the sum of this geometric progression:

$$1+x+x^2+x^3+\dots\dots\dots+x^n$$

Write a C function to read in two numbers, x and n(no. of terms), and then compute sin(x) and cos(x).

#### **Exercise 14**

- a. Pointer based function to exchange value of two integers using passing by address.
- b. Program which explains the use of dynamic arrays.
- c. Program to enlighten dangling memory problem (Creating a 2-D array dynamically using pointer to pointers approach).

#### **Exercise 15**

Examples which explores the use of structures, union and other user defined variables

#### **Exercise 16**

- a) Write a C program which copies one file to another.
- b) Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line)

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**MATHEMATICS-II (*Common to All branches*)**  
**Syllabus effective from 2010-2011**

**UNIT – I**

Laplace transforms of standard functions –Shifting Theorems, Transforms of derivatives and integrals – Unit step function –Dirac’s delta function.

**UNIT – II**

Inverse Laplace transforms– Convolution theorem - Application of Laplace transforms to ordinary differential equations Partial fractions.

**UNIT – III**

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series.

**UNIT – IV**

Fourier integral theorem (only statement) – Fourier sine and cosine integrals - Fourier transform – sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

**UNIT – V**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations.

**UNIT – VI**

Method of Separation of Variables - Applications to wave equation, heat equation and Laplace Equation.

**UNIT – VII**

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems -Inverse z-transform -Convolution theorem – Solution of difference equation by z-transforms.

**UNIT – VIII**

Gamma and Beta Functions – Properties – Evaluation of improper integrals.

**TEXT BOOK:**

1. Swamy,U.M., Vijayalaxmi, P.,Ravikumar, R.V.G., and Phani Krishna Kishore., Mathematics II, Excel Books, New Delhi.

**BOOKS:**

1. B.V.Ramana, Engineering Mathematics, Tata Mc Graw Hill.
2. Iyengar,T.K.V, Krishna Gandhi, et.al Engineering Mathematics Vol-II, S.Chand Co. New Delhi.
3. Erwin Kreszig, “Advanced Engineering Mathematics”, 8 Ed Wiley Student Edition.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING PHYSICS - II (*Common to all branches*)**  
**Syllabus effective from 2010- 2011**

**UNIT-I**

QUANTUM MECHANICS & QUANTUM COMPUTING: Introduction - Schrodinger Time Independent and Time Dependent wave equations - Particle in a box - Operator version - Suitability of Quantum system for Information Processing - Classical Bits and Qu-Bits - Bloch's Sphere - Quantum Gates - Multiple Qu-Bits - Advantages of Quantum Computing over classical Computation.

**UNIT-II**

ELECTRON THEORY OF METALS: Classical free electron theory - Mean free path - Relaxation time and drift velocity - Quantum free electron theory - Fermi - Dirac (analytical) and its dependence on temperature - Fermi energy - Electron scattering and resistance.

**UNIT-III**

BAND THEORY OF SOLIDS: Bloch theorem (qualitative) - Kronig - Penney model - Origin of energy band formation in solids - Classification of materials into conductors, semi- conductors & insulators - Concept of effective mass of an electron.

**UNIT-IV**

MAGNETIC PROPERTIES: Permeability - Magnetization - Origin of magnetic moment - Classification of Magnetic materials - Dia, para and ferro- magnetism - Domain and Weiss field theory - Hysteresis Curve - Soft and Hard magnetic materials.

**UNIT-V**

SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth - Type I and type II superconductors - Flux quantization - DC and AC Josephson effect - BCS Theory - Applications of superconductors.

**UNIT-VI**

DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, ionic and orientational polarizations - Internal fields in solids - Clausius-Mossotti equation - Dielectrics in alternating fields - frequency dependence of the polarizability - Ferro and Piezo electricity.

**UNIT-VII**

SEMICONDUCTORS: Introduction - Intrinsic semiconductor and carrier concentration - Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein's equation - Hall effect - Direct & indirect band gap semiconductors.

**UNIT-VIII**

PHYSICS OF NANO MATERIALS: Introduction - Properties and preparation of Nano Materials - Surface occupancy - Reduction of Dimensionality - 4D - Force vector - Quantum wires - Quantum dots and Quantum wells - Density of states and Energy spectrum - Nanotubes - Applications of nanomaterials.

**Text book:** Perspective of Engineering Physics - II by M Sri Ramarao, Nityananda Choudary, Daruka Prasad, ACME Learning.

- Reference books:**
1. Solid State Physics – by A J Dekker , Mcmilan India Ltd.
  2. A Text Book of Engineering Physics , by Bhattacharya & Bhaskara , Oxford University Press
  3. Engineering Physics by K. Shiva Kumar, Prism Books Pvt. Ltd

\*\*\*



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING CHEMISTRY – II (*Common to all branches*)**  
**Syllabus effective from 2010- 2011**

**UNIT-I**

**POLYMERS:** Introduction - Types of polymers – Classification - Methods of polymerisation – Stereo specific polymers - Ziegler Natta catalysis - Properties of polymers –Conducting Polymers- Engineering applications – Biodegradable polymers - Individual polymers(Preparation ,Properties,Uses of Poly Styrene, PVC, PTFE, Bakelite's, Cellulose derivatives, Poly Carbonates)

**UNIT-II**

**PLASTICS** – Types –Compounding of plastics- Moulding(Four types)- Fiber reinforced , Glass fibre reinforced plastics –Bullet Proof Plastics– Properties of plastics – Engineering applications

**UNIT-III**

**RUBBERS & ELASTOMERS:** Introduction – Preparation – Vulcanization – Properties - Engineering applications.

Buna-S,Buna-N, - Poly Urethane - Engineering applications of Elastomers

**UNIT-IV**

**NANO MATERIALS**

Introduction to Nano materials-preparation of few Nano materials(Carbon Nano Tubes,Fullerenes etc)- Properties of Nano materials- Engineering applications.

**UNIT-V**

**BUILDING MATERIALS(CEMENT,REFRACTORIES,CRAMICS):**

**CEMENT**

Introduction, Manufacturing of Portland Cement(Dry &We Process )-Chemistry of Setting and Hardening of Cement-Effect of Carbon dioxide,Sulphur Dioxide ,Chloride on Cement concrete.

**REFRACTORIES**

Introduction-Classification –Properties-Applications

**CERAMICS**

Introduction-Classification – Glazed &Unglazed Ceramics -Properties-Engineering Applications.

**UNIT-VI**

**FUEL TECHNOLOGY**

Introduction to Liquid Fuels-Classification of Crude Oil-Fractional Distillation-Cracking (Thermal &Catalytic), Polymerization-Refining &Reforming –Working of Internal Combustion Engine, Heated Chambers-Knocking –AntiKnocking Agents-Octane &Cetane Number.

**LUBRICANTS**

Definition and Explanation of Lubrication-Mechanism of Lubrication –Types of Lubricants-Properties of Lubricants-Engineering applications

**UNIT-VII**

**CORROSION** – Mechanism- Factors influence the rate of corrosion - Types of Corrosion -Protection methods (Anodic & Cathodic protection ), - Metallic Coatings - Paints, Varnishes, Enamels , Special paints.

**UNIT-VIII**

**GREEN CHEMISTRY**

Introduction-Concepts- Engineering Applications

**Text Book :** A Text book of engineering chemistry by Srinivasulu D. Parshva publications

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING DRAWING (Common to all Branches)**

Syllabus effective from 2010- 2011

**I B.Tech – II Semester**

**Unit-I**

Polygons-Construction of Regular Polygons using given length of a side; Ellipse- Arcs of Circles and Oblong Methods; Scales-Vernier and Diagonal Scales.

**Unit-II**

Introduction to Orthographic Projections; Projections of Points; Projections of Straight Lines parallel to both planes; Projections of Straight Lines-Parallel to one and inclined to other plane.

**Unit-III**

Projections of Straight Lines inclined to both planes, determination of true lengths, angle of inclinations and traces.

**Unit-IV**

Projections of Planes; Regular Planes Perpendicular / Parallel to one Reference Plane and inclined to other Reference Plane; inclined to both the Reference Planes.

**Unit-V**

Projections of Solids-Prisms and Cylinders with the axis inclined to one Plane.

**Unit-VI**

Projections of Solids- Pyramids and Cones with the axis inclined to one plane.

**Unit-VII**

Conversion of Isometric Views to Orthographic Views.

**Unit-VIII**

Conversion of Orthographic Views to Isometric Projections and Views.

**TEXT BOOK:**

1. Engineering Drawing by N.D. Bhat, Chariot Publications

**REFERENCE BOOKS:**

1. Engineering Drawing by M.B. Shah and B.C. Rana, Pearson Publishers
2. Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill Publishers
3. Engineering Graphics for Degree by K.C. John, PHI Publishers

\*\*\*

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

### ENVIRONMENTAL STUDIES (Common to all Branches)

Syllabus effective from 2010 -2011

#### UNIT - I

**Multidisciplinary nature of Environmental Studies:** Definition, Scope and Importance – Need for Public Awareness.

#### UNIT - II

**Natural Resources :** Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

#### UNIT - III

**Ecosystems :** Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### UNIT - IV

**Biodiversity and its conservation :** Introduction - Definition: genetic, species and ecosystem diversity. - Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

#### UNIT - V

**Environmental Pollution :** Definition, Cause, effects and control measures of :

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

**Solid waste Management:** Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

## **UNIT - VI**

**Social Issues and the Environment:** From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. – Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

## **UNIT - VII**

**Human Population and the Environment:** Population growth, variation among nations. Population explosion – Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. –Case Studies. Page 37 of 79

## **UNIT - VIII**

**Field work :** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystemspond, river, hill slopes, etc.

### **Text Books :**

1. An Introduction to Environmental Studies by B. Sudhakara Reddy, T. Sivaji Rao, U. Tataji & K. Purushottam Reddy, Maruti Publications.

### **Reference :**

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
3. Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**MATHEMATICAL METHODS (*Common to ALL branches*)  
Syllabus effective from 2010-2011**

**UNIT – I**

Linear systems of equations: Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination - Gauss Jordan and Gauss Seidal Methods.

**UNIT – II**

Eigen values - Eigen vectors – Properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem.

**UNIT-III**

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

**UNIT – IV**

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

**UNIT-V**

**Interpolation:** Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unevenly spaced points - Lagrange's Interpolation formula.

**UNIT – VI**

Numerical Differentiation and Integration – Differentiation using finite differences - Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule.

**UNIT – VII**

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods –Predictor-Corrector Methods- Milne's Method.

**UNIT – VIII**

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

**Text Book :** Ravindranath, V. and Vijayalaxmi, A., A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

**Reference Books :**

1. Rukmangadachari, E. Mathematical Methods, Pearson Education, Delhi.
2. Kreszig, Erwin "Advanced Engineering Mathematics", 8 Ed. Wiley Student Edition.
3. Peter O' Neil, "Engineering Mathematics", Cengage Learning. Gordon, "Engineering Mathematics", Pearson Education

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**ENGINEERING PHYSICS&CHEMISTRY LABORATORY- II**

**PHYSICS:**

**Electro-Magnetism and Electronics:**

- 1.Determine the Planck's constant using Photo-Ceil.
- 2.Study the variation of Magnetic Field along the axis of a solenoid coil using Stewart - Gee's apparatus.
- 3.Draw the Frequency Response curves of L-C-R Series and Parallel Circuits.
- 4.Determine the Time Constant for a C-R Circuit.
- 5.Determine the Band Gap of a Semi conductor using a p-n junction diode.
- 6.Study of Characteristic curves (I/V) of a Zener diode to determine its Breakdown voltage.
- 7.Determine the Hall Coefficient of a Semiconductor.
- 8.Draw the characteristic curves and determine the Thermoelectric coefficient of a Thermistor
- 9.Study the Seebeck and Peltier - Thermoelectric Effects and to determine Coefficients and Thermo Electric Effect using Thermocouple.
- 10.Draw the Characteristic curves of a p-i-n and Avalanche Photo Diodes.
- 11.Determination of Numerical Aperture and Bending losses of an Optical Fiber.

**CHEMISTRY LAB – II**

**1.PRODUCTION OF BIODIESEL.**

**INTRODUCTION TO BIO FUELS**

The teacher has to perform the transesterification reaction of FATTY ACID and the Biodiesel thus produced can be used for analysis.( Please give priority to production of Biodiesel from waste cooking oil)

2. Estimation of properties of oil:

- a. Acid Number
- b. Viscosity
- c. Saponification value
- d. Aniline point
- e. Flash and Fire points
- f. Pour and Cloud point

**3.. PREPARATION OF PHENOL –FORMALDEHYDE RESIN**

**4. SOIL ANALYSIS:**

pH, Determination of Zinc, Iron, Copper.

**5.FOOD ANALYSIS:**

Determination Saturated and Unsaturated Fatty Acids, pH,etc.

All the teachers are requested to focus on bio fuels ,soil analysis and food analysis as these are the need of 21 st century and these experiments are so designed to encourage students to carry out lab to land process.

**Lab Manual** : Engineering chemistry laboratory manual &record By Srinivasulu . D. Parshva publications

\*\*\*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**IT WORKSHOP (Common to all Branches)**

Syllabus effective from 2010- 2011

Syllabus Preparation under progress

\*\*\*



2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada 533 003

II B.TECH. (CIVIL ENGINEERING)

COURSE STRUCTURE AND SYLLABUS – 2010-11 BATCH

II Year

II Year I Sem				II Year II Sem			
S.No.	Subject	P	C	S.No.	Subject	P	C
1	Mathematics – III	4+1*	4	1	Probability & Statistics	4+1*	4
2	Electrical and Electronics Engineering	4	3	2	Managerial Economics and Financial Analysis	4+1*	4
3	Mechanics of Materials	4+1*	4	3	Strength of Materials	4+1*	4
4	Construction Materials and Management	4+1*	4	4	Hydraulics and Hydraulic Machinery	4+1*	4
5	Surveying	4+1*	4	5	Engineering Geology	4+1*	4
6	Fluid Mechanics	4+1*	4	6	Structural Analysis - I	4+1*	4
7	Computer aided Engineering Drawing Practice	6	3	7	Fluid Mechanics and Hydraulic Machinery Lab	3	2
8	Strength of materials Lab	3	2	8	Surveying Lab	3	2
9	English communication Practice	2	1	9	English communication Practice	2	1
<b>Total Credits</b>			<b>29</b>	<b>Total Credits</b>			<b>29</b>

\*Tutorial



2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – I Sem.

MATHEMATICS – III

UNIT – I

Bessel functions – properties – Recurrence relations – Orthogonality. Legendre polynomials – Properties – Rodrigue’s formula – Recurrence relations – Orthogonality.

UNIT-II

Functions of a complex variable – Continuity – Differentiability – Analyticity – Properties – Cauchy-Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions – Milne – Thompson method.

UNIT-III

Elementary functions: Exponential, trigonometric, hyperbolic functions and their properties – General power  $Z^c$  (c is complex), principal value.

UNIT-IV

Complex integration: Line integral – evaluation along a path and by indefinite integration – Cauchy’s integral theorem – Cauchy’s integral formula – Generalized integral formula.

UNIT-V

Complex power series: Radius of convergence – Expansion in Taylor’s series, Maclaurin’s series and Laurent series. Singular point – Isolated singular point – pole of order m – essential singularity.

UNIT-VI

Residue – Evaluation of residue by formula and by Laurent series - Residue theorem.

Evaluation of integrals of the type

(a) Improper real integrals  $\int_{-\infty}^{\infty} f(x)dx$       (b)  $\int_c^{c+2\pi} f(\cos \theta, \sin \theta)d\theta$

(c)  $\int_{-\infty}^{\infty} e^{imx} f(x)dx$       (d) Integrals by indentation.

## UNIT-VII

Argument principle – Rouché's theorem – determination of number of zeros of complex polynomials - Maximum Modulus principle - Fundamental theorem of Algebra, Liouville's Theorem.

## UNIT-VIII

Conformal mapping: Transformation by  $e^z$ ,  $\ln z$ ,  $z^2$ ,  $z^n$  ( $n$  positive integer),  $\sin z$ ,  $\cos z$ ,  $z + a/z$ . Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties – invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points .

### Text book

1. A text Book of Engineering Mathematics, Shahnaz Bathul, Prentice Hall of India.
2. A text Book of Engineering Mathematics, Vol-1 T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.

### Reference

1. A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill.
2. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.

**2010-11**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

**II Year B.Tech. – I Sem.**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**Part-A Electrical Engineering**

**UNIT - I**

**ELECTRICAL CIRCUITS:** Basic definitions, Types of net work elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations.

## **UNIT - II**

**DC MACHINES** : Principle of operation of DC Generator – emf equation - types – DC motor types –torque equation – applications – three point starter.

## **UNIT - III**

**TRANSFORMERS** : Principle of operation of single phase transformers – emf equation – losses –efficiency and regulation

## **UNIT - IV**

**AC MACHINES** : Principle of operation of alternators – regulation by synchronous impedance method –Principle of operation of induction motor – slip – torque characteristics – applications.

## **TEXT BOOKS:**

1.Basic Electrical Engineering by Nagsarkar,Sukhija, Oxford Publications,2<sup>nd</sup> edition

## **REFERENCE BOOKS:**

1.Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah,TMH Publications

2.Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications,2<sup>nd</sup> edition

## **Part – B Electronics Engineering**

## **UNIT V**

**DIODE AND ITS CHARACTERISTICS:** PN Junction Diode, Symbol, V-I Characteristics, Diode Applications, Rectifiers – Half wave, Full wave and Bridge Rectifiers (Problems)

## **UNIT VI**

**TRANSISTORS:** PNP and NPN Junction Transistor, Transistor as an Amplifier, Single Stage CE Amplifier, Frequency Response of CE Amplifier, Concepts of Feedback Amplifier, Necessary conditions for Oscillators, SCR Characteristics and applications

## **UNIT VII**

**INDUCTION HEATING:** Theory of Induction Heating, Application to Industries

**DIELECTRIC HEATING:** Theory of Dielectric Heating and its Industrial Applications

**ULTRASONICS:** Generation, Flow detection and other Applications

**UNIT VIII**

**TRANSDUCERS AND MEASURING INSTRUMENTS:** Principles of Strain Gauge, LVDT, Thermocouples, Thermistors, Piezo-electric transistors, CRO Principles and application, Voltage, Current and Frequency Measurements, Digital Multimeters.

**TEXT BOOKS:**

1. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9<sup>th</sup> edition, PEI/PHI  
2006.
2. Industrial Electronics by G.K. Mittal, PHI

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – I Sem.

MECHANICS OF MATERIALS

UNIT – I

**Introduction of Engineering Mechanics** – Basic concepts System of Forces- Coplanar Concurrent Forces – Components in Space – Resultant- Moment of Forces and its Application – Couples and Resultant of Force System - Equilibrium of System of Forces- Free body diagrams- Equations of Equilibrium of Coplanar Systems and Spatial Systems.

UNIT – II

**Friction:** Types of friction – Limiting friction – Laws of Friction – static and Dynamic Frictions – Motion of Bodies – Wedge, Screw jack and differential Screw jack.

UNIT – III

**Transmission of Power:** Belt Drivers – Open, Crossed and compound belt drives –length of belt – tensions - tight side - slack side - Power transmitted and condition for maximum power.

UNIT – IV

**Centroid and Center of Gravity:** Centroids – Theorem of Pappus- Centroids of Composite figures – Centre of Gravity of Bodies - Area moment of Inertia: – Polar Moment of Inertia – Transfer – Theorems - Moments of Inertia of Composite Figures - product of Inertia - Transfer Formula for product of Inertia.

**Mass Moment of Inertia:** Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia - Mass moment of inertia of composite bodies.

UNIT – V



**SIMPLE STRESSES AND STRAINS:** Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

**STRAIN ENERGY** – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

## **UNIT – VI**

**SHEAR FORCE AND BENDING MOMENT:** Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, u.d.l., uniformly varying loads and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam.

## **UNIT – VII**

**FLEXURAL STRESSES:** Theory of simple bending – Assumptions – Derivation of bending equation:  $M/I = f/y = E/R$  Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

## **UNIT – VIII**

**SHEAR STRESSES:** Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

## **TEXT BOOKS:**

- (1) Strength of Materials Vol. I by D.S. Prakasa Rao University Press
- (2) Engineering Mechanics by R.K. Bansal, Laxmi Publications(p) Ltd., New Delhi

## **REFERENCES:**

1. Engineering Mechanics by S. Timashenko, D.H. Young and J.V. Rao
2. Strength of Materials by S.S. Rattan, Tata McGraw Hill Education Pvt., Ltd.,
3. Strength of materials by R.K. Rajput, S. Chand & Co, New Delhi.

**2010-11**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

**II Year B.Tech. – I Sem.**

**CONSTRUCTION MATERIALS AND MANAGEMENT**

**UNIT – I**

**STONES, BRICKS AND TILES:**

Properties of building stones – relation to their structural requirements. Classification of stones – Stone quarrying – precautions in blasting, Dressing of stone, Composition of good brick earth, various methods of manufacture of bricks. Comparison between clamp burning and kiln burning. Qualities of a good brick. Characteristics of good tile – manufacturing methods, Types of tiles. Use of Materials like aluminium, gypsum, glass and bituminous materials – their quality.

## UNIT-II

**MASONARY:** Types of masonry, English and Flemish bonds, Rubble and Ashlar masonry, cavity and partition walls.

**WOOD:** Structure – properties – Seasoning of timber. Classification of various types of woods used in buildings – Defects in timber. Alternative materials for wood, Galvanized Iron, Fiber-reinforced plastics, steel, Aluminum.

## UNIT – III

### LIME AND CEMENT:

**Lime:** Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime.

**Cement:** Portland cement – Chemical Composition - hydration, Setting and Fineness of cement. Various types of cement and their properties. Various field and laboratory tests for Cement. Various ingredients of Cement concrete and their importance – various tests for concrete.

## UNIT-IV

**BUILDING COMPONENTS:** Lintels, Arches, Vaults - stair cases – Types. Different types of floors-Concrete, Mosaic, Terrazzo floors, Pitched, flat and curved Roofs. Lean-to-Roof, Coupled Roofs, Trussed roofs- King and Queen Post Trusses. RCC Roofs, Madras Terrace/Shell Roofs.

**FINISHINGS:** Proofing Damp and water proofing- materials used. Plastering, pointing, white washing and distempering – Painting – Constituents of a paint – Types of paints – Painting of new/old Wood – Varnish – Form work and scaffolding.

## UNIT - V

**Aggregates:** Classification of aggregate – Coarse and fine aggregates – Particle shape and Texture – Bond and strength of Aggregate – Specific gravity – Bulk density porosity and Absorption – Moisture content of Aggregate – Bulking of sand- Sieve analysis – Grading curves – Fineness modulus- Grading requirements – Practical Grading – Road Note. No.4 method Grading of Fine and Coarse Aggregates – Gap graded aggregate.

Highway Materials – Soil, Aggregate and Bitumen- Tests on aggregates – Aggregate Properties and their Importance - Tests on Bitumen – Bituminous Concrete- Requirements of Design Mix- Marshall's Method of Bituminous Mix design.

## **UNIT – VI**

**GEOSYNTHETICS:** Introduction, Functions and their Applications-tests on geo-textiles, geo-grids, geo-membranes and geo-composites

**CONSTRUCTION EQUIPMENT:** Crashing for optimum cost – Resources leveling and Resource allocation.

## **UNIT –VII**

Planning of construction projects – scheduling, monitoring and controlling – Bar chart – CPM Network planning –computation of times and floats – their significance.

## **UNIT – VIII**

PERT Networks – time estimates – event slack – probability of achieving project targets - comparison between CPM and PERT – network updating.

### **TEXT BOOKS:**

1. Building material by S K Duggal – New Age International Publishers
2. Building Construction by B.C. Punmia, A.K. Jain and A.K. Jain - Laxmi Publications

### **REFERENCES:**

1. PERT and CPM – Project planning and control with by Dr. B.C. Punmia & Khandelwal – Laxmi publications.
2. Construction and Geotechnical Methods in Foundation Engineering, - ROPERT M. KOERNER McGraw Hill.
3. Construction Planning, Equipment and methods by R.L. Peurifoy etal. – Tata McGraw Hill.

2010-11

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

II Year B.Tech. – I Sem.

**SURVEYING**

**UNIT – I**

**INTRODUCTION:** Overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications.

**UNIT – II:**

**DISTANCES AND DIRECTION:** Distance measurement conventions and methods; use of chain and tape, Electronic distance measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

**UNIT – III**

**LEVELING AND CONTOURING:** Concept and Terminology, Temporary and permanent adjustments- method of leveling.

Characteristics and Uses of contours- methods of conducting contour surveys and their plotting.

**UNIT – IV**

**COMPUTATION OF AREAS AND VOLUMES:** Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

**UNIT – V**

**THEODOLITE:** Theodolite, description, uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite. Trigonometrical leveling, Traversing.

**UNIT – VI**

**TACHEOMETRIC SURVEYING:** Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

#### **UNIT – VII**

**Curves:** Types of curves, design and setting out – simple and compound curves.

#### **UNIT – VIII**

Introduction to geodetic surveying, Total Station and Global positioning system, Introduction to Geographic information system (GIS).

#### **TEXT BOOKS:**

1. "Surveying (Vol – 1, 2 & 3), by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi
2. Duggal S K, "Surveying (Vol – 1, 2 & 3), Tata McGraw Hill Publishing Co. Ltd. New Delhi.

#### **REFERENCES:**

1. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi
2. Arora, K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004
3. Chandra A M, "Higher Surveying", New Age International Pvt. Ltd., New Delhi.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – I Sem.

FLUID MECHANICS

UNIT I

**INTRODUCTION** : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion, pressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure- measurement of pressure. Pressure gauges, Manometers: Differential and Micro Manometers.

UNIT – II

Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNIT – III

**FLUID KINEMATICS**: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two, three dimensional flows – stream and velocity potential functions, flow net analysis.

UNIT – IV

**FLUID DYNAMICS**: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, Navier – Stokes equations (Explanatory) Momentum equation and its application – forces on pipe bend.

UNIT – V

Approximate Solutions of Navier-Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent Boundary layers, no deviations BL in transition, separation of BL, Control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

## **UNIT – VI**

Reynold's experiment – Characteristics of Laminar & Turbulent flows. Flow between parallel plates, Flow through long tubes, flow through inclined tubes.

## **UNIT – VII**

**CLOSED CONDUIT FLOW:** Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems, variation of friction factor with Reynold's number – Moody's Chart.

## **UNIT – VIII**

**MEASUREMENT OF FLOW:** Pitot tube, Venturi meter and Orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and Stepped notches – Broad crested weirs.

### **TEXT BOOKS:**

1. Fluid Mechanics by Modi and Seth, Standard book house.
2. Introduction to Fluid Machines by S.K. Som & G. Biswas, Tata McGraw Hill Pvt. Ltd.

### **REFERENCES:**

1. Fluid Mechanics by Merie C. potter and David C. Wiggert, Cengage learning
2. Introduction to Fluid Machines by Edward J. Shaughnessy, Jr, Ira M. Katz and James P. Schaffer, Oxford University Press, New Delhi
3. Fluid Mechanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi





2010-11

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

II Year B.Tech. – I Sem.

**COMPUTER AIDED ENGINEERING DRAWING PRACTICE**

**PART A:**

**UNIT – I**

**PROJECTIONS OF PLANES & SOLIDS** : Projections of Regular Solids inclined to both planes – Auxiliary Views. Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

**UNIT – II**

**DEVELOPMENT AND INTERPENETRATION OF SOLIDS:** Development of Surfaces of Right

Regular Solids – Prisms, Cylinder, Pyramid Cone and their parts.

Interpenetration of Right Regular Solids – Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

**UNIT – III**

**ISOMETRIC PROJECTIONS** : Principles of Isometric Projection – Isometric Scale – Isometric Views

– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric

Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

**TRANSFORMATION OF PROJECTIONS:** Conversion of Isometric Views to Orthographic Views – Conventions.

**UNIT – IV**

**PERSPECTIVE PROJECTIONS:** Perspective View: Points, Lines, Plane Figures and Simple Solids,

Vanishing Point Methods(General Method only).

**PART B:**

**UNIT – V**

**Introduction to Computer aided Drafting:** Generation of points, lines, curves, polygons, dimensioning.

## **UNIT – VI**

**Types of modeling** : object selection commands – edit, zoom, cross hatching, pattern filling, utility commands, 2D wire frame modeling, 3D wire frame modeling,.

## **UNIT – VII**

**View points and view ports:** view point coordinates and view(s) displayed, examples to exercise different options like save, restore, delete ,joint , single option.

## **UNIT-VIII**

**Computer aided Solid Modeling:** Isometric projections, orthographic projections of isometric projections ,Modeling of simple solids, Modeling of Machines & Machine Parts.

## **TEXT BOOKS :**

1. Engineering Graphics, K.C. John, PHI Publications
2. Machine Drawing, K.LNarayana ,P. Kannaiah and K.venkata reddy / New age international publishers.

## **References:**

1. Autocad 2009 , Galgotia publications , New Delhi
2. Text book of Engineering Drawing with Auto-CAD , K.venkata reddy/B.S . publications.
3. Engineering drawing by N.D Bhatt , Charotar publications.

## **Mode of examination for Computer Aided Engineering Graphics Practice**

The syllabus in respect of the subject "Computer Aided Graphics Practice" for II B Tech I sem (Mech, Civil, Automobile, Aeronautical, Mining Engg) students consists of two major portions

Part A: Unit I to IV - conventional drawing pattern

Part B: Unit V to VIII - computer lab pattern using any drafting packages

Classwork - 6 hrs per week & Credits - 3

Max Marks - 100 Internal Marks: 25 & External Marks: 75

It is suggested that the examination in respect of the above may conducted on par with lab by the concerned college with the following pattern:

**Mid Exam:** I Mid Exam from Part A (first Four Units) - Conventional Drawing Exam

II Mid Exam Part B (from last Four Units) - In Computer Lab

**End Exam:** Duration - 4 hrs

**Part A** - Conventional Drawing test in Drawing Hall from Part A (first FOUR Units) - 2 hrs duration.

**Part B** - Exam in Computer Lab using any drafting package Part B (last four units) - 2 hrs duration.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – I Sem.

STRENGTH OF MATERIALS LAB

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

**List of Major Equipment:**

1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Setup for spring tests
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine

10. Beam setup for Maxwell's theorem verification.

11. Continuous beam setup

12. Electrical Resistance gauges.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech.–I Sem. (Common to All Branches)

**ENGLISH COMMUNICATION PRACTICE  
LIFE, LANGUAGE AND CULTURE EXPLORATIONS-I**

**Purpose of the Course:** English for Semesters 3 is designed to provide the learners an opportunity to enhance their language skills through a reading of literary texts which will also help them relate themselves to different cultures vis-à-vis their own. Independent reading is also expected to increase spontaneity in expression among the learners.

**Objectives:** The Course aims at exposing the learners to nuances in culture, inculcating the habit of independent reading which provides the learners an opportunity to develop critical thinking and analytical skills that can be applied to any subject.

**Content of the course:** The literary pieces are carefully chosen from across cultures as samples of contemporary life and issues of global interest. This is meant to encourage students to relate language to personality development. In all, five stories have been selected for English Communication Practice.

**Topics:** Culture and traditions, philosophy, familial relationships, ethics, inter-personal relationships, ability to face disaster and poverty, tolerance.

**Time frame/Hours of instruction:** 2hrs per week (for pre-reading and post reading tasks of the lessons). Total number of hours per semester - 32.

**Time Allocation:** Reading of the text should be done at home. The class hours are meant for discussion, analysis and related activities. Project should be completed in consultation with the teacher.

**Evaluation:** The learner will be assessed on a continuous basis by way of projects and work-sheets given at the end of each story.

Stories selected for English Communication Practice

*Life, Language and Culture:*

**1. The Cop and the Anthem by O. Henry**

**2. The Festival of the Sacred Tooth Relic in Sri Lanka**

(based on the Travelogues of FA Hien Compiled by Ashok Jain Assisted by Dhurjjati Sarma) **3. The Hawk and the Tree** by Mohammad Azam Rahnaward Zaryab

**4. To Be or Not To Be** by Zaheda Hina

**5. Bade Bhai Saab**(My Elder Brother) by Munshi Premchand

**Recommended Book:** Life, Language and Culture Explorations-I, Cengage Learning India Pvt. Ltd., New Delhi.



2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

**PROBABILITY AND STATISTICS**

**UNIT-I**

Probability: Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem.

**UNIT-II**

Random variables – Discrete and continuous distributions - Distribution function.

**UNIT-III**

Binomial, Poisson, normal distribution – related properties. Moment generating function, Moments of standard distributions – properties.

**UNIT-IV**

Population and samples. Sampling distribution of mean (with known and unknown variance), proportion, variances. - Sampling distribution of sums and differences. Point and interval estimators for means, variances, proportions.

**UNIT-V**

Statistical Hypothesis – Errors of Type I and Type II errors and calculation. One tail, two-tail tests. Testing hypothesis concerning means, proportions and their differences using Z-test.

**UNIT-VI**

Tests of hypothesis using Student's t-test, F-test and  $\chi^2$  test.. Test of independence of attributes - ANOVA for one-way and two-way classified data.

**UNIT-VII**

Statistical Quality Control methods – Methods for preparing control charts – Problems using x-bar, p, R charts and attribute charts – Simple Correlation and Regression.

## **UNIT-VIII**

Queuing Theory: Pure Birth and Death Process M/M/1 Model and Simple Problems.

### **TEXT BOOK**

1. Probability and Statistics for Engineers, Miller and John E. Freund, Prentice Hall of India.
2. Probability and Statistics, D. K. Murugeson & P. Guru Swamy, Anuradha Publishers.

### **REFERENCE**

1. Probability, Statistics and Random processes. T. Veerajan, Tata Mc.Graw Hill, India.
2. Probability, Statistics and Queuing theory applications for Computer Sciences 2 ed, Trivedi, John Wiley.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to all Branches )

Unit I

**Introduction to Managerial Economics:**

**Introduction to Managerial Economics & Demand Analysis:** Definition of Managerial Economics, Characteristics and Scope – Managerial Economics and its relation with other subjects- Basic economic tools in Managerial Economics

**Demand Analysis:** Meaning- Demand distinctions- Demand determinants- Law of Demand and its exceptions.

Unit-II

**Elasticity of Demand & Demand Forecasting:** Definition -Types of Elasticity of demand - Measurement of price elasticity of demand: Total outlay method, Point method and Arc method- Significance of Elasticity of Demand.

**Demand Forecasting:** Meaning - Factors governing demand forecasting - Methods of demand forecasting (survey of buyers' Intentions, Delphi method, Collective opinion, Analysis of Time series and Trend projections, Economic Indicators, Controlled experiments and Judgmental approach) - Forecasting demand for new products- Criteria of a good forecasting method.

Unit-III

**Theory of Production and Cost Analysis:** Production Function- Isoquants and Isocosts, MRTS, Law of variable proportions- Law of returns to scale- Least Cost Combination of Inputs, Cobb-Douglas Production function - Economies of Scale.

**Cost Analysis:** Cost concepts, Opportunity cost, Fixed Vs Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs.-Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEP.

UNIT-IV

**Introduction to Markets, Managerial Theories of the Firm & Pricing Policies:** Market structures: Types of competition, Features of Perfect Competition, Monopoly and Monopolistic Competition. Price-Output Determination under Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly Managerial theories of the firm - Marris and Williamson's models.

**Pricing Policies:** Methods of Pricing-Marginal Cost Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Bundling Pricing, and Peak Load Pricing. Internet Pricing Models: Flat rate pricing, Usage sensitive pricing, Transaction based pricing, Priority pricing, charging on the basis of social cost, Precedence model, Smart market mechanism model.

#### **Unit V**

**Types of Industrial Organization & Introduction to business cycles:** Characteristic features of Industrial organization, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, State/Public Enterprises and their types.

**Introduction to business cycles:** Meaning-Phases of business cycles- Features of business cycles.

#### **Unit VI**

**Introduction to Financial Accounting:** Introduction to Double-entry system, Journal, Ledger, Trial Balance- Final Accounts (with simple adjustments)- Limitations of Financial Statements.

#### **Unit VII**

**Interpretation and analysis of Financial Statement:** Ratio Analysis – Liquidity ratios, Profitability ratios and solvency ratios – Preparation of changes in working capital statement and fund flow statement.

#### **Unit VIII**

**Capital and Capital Budgeting:** Meaning of capital budgeting, Need for capital budgeting – Capital budgeting decisions (Examples of capital budgeting) - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), IRR and Net Present Value Method (simple problems)

#### **Text Books:**

1. **J.V.Prabhakar Rao:** Managerial Economics and Financial Analysis, Maruthi Publications, 2011
2. **N. Appa Rao. & P. Vijaya Kumar:** 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi, 2011

#### **References:**

1. A R Aryasri - Managerial Economics and Financial Analysis, TMH 2011
2. Suma damodaran- Managerial Economics, Oxford 2011
3. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, 2011.

2010-11

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

**II Year B.Tech. – II Sem.**

**STRENGTH OF MATERIALS**

**UNIT – I**

**DEFLECTION OF BEAMS:** Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load.-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

**UNIT – II**

**THIN CYLINDERS:** Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, and volume of thin cylinders – Thin spherical shells.

**THICK CYLINDERS:** Introduction Lamé's theory for thick cylinders – Derivation of Lamé's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

**UNIT III**

**PRINCIPAL STRESSES AND STRAINS:** Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses

accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions.

**THEORIES OF FAILURES:** Introduction – Various Theories of failures like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

#### **UNIT – IV**

**TORSION OF CIRCULAR SHAFTS:** Theory of pure torsion – Derivation of Torsion equations:  $T/J = q/r = N\theta/L$  – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

**SPRINGS:** Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

#### **UNIT – V**

**COLUMNS AND STRUTS:** Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns- assumptions- derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry's formula.

Laterally loaded struts – subjected to uniformly distributed and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

#### **UNIT – VI**

**DIRECT AND BENDING STRESSES:** Stresses under the combined action of direct loading and B.M. Core of a section – determination of stresses in the case of chimneys, retaining walls and dams – conditions for stability – stresses due to direct loading and B.M. about both axis.

#### **UNIT – VII**

**UNSYMMETRICAL BENDING:** Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis Deflection of beams under unsymmetrical bending.

**BEAMS CURVED IN PLAN:** Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semi-circular beam simply-supported on three equally spaced supports.

## **UNIT – VIII**

**ANALYSIS OF PIN-JOINTED PLANE FRAMES:** Determination of Forces in members of plane, pin-jointed, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply supported trusses by method of joints, method of sections.

### **TEXT BOOKS:**

- (1) Mechanics of Materials- by B.C. Punmia, Lakshmi Publications, New Delhi.
- (2) Analysis of Structures-Vol.- I & II by V.N. Vazirani & M.M. Ratwani, Khanna Publications, New Delhi

### **REFERENCES:**

1. Fundamentals of Solid Mechanics M.L. Gambhir, PHI Learning Pvt. Ltd., New Delhi
2. Introduction to text book of Strength of Material by U.C. Jindal, Galgotia publications.
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

HYDRAULICS AND HYDRAULIC MACHINERY

UNIT – I

**OPEN CHANNEL FLOW:** Types of flows - Type of channels – Velocity distribution – Energy and momentum correction factors – Chezy's, Manning's; and Bazin formulae for uniform flow – Most Economical sections.

Critical flow: Specific energy-critical depth – computation of critical depth – critical sub-critical and super critical flows.

UNIT II

**OPEN CHANNEL FLOW II:** Non uniform flow-Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method- Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT – III

**HYDRAULIC SIMILITUDE:** Dimensional analysis-Rayleigh's method and Buckingham's pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations.

UNIT – IV

**BASICS OF TURBO MACHINERY:** Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle, Applications to radial flow turbines.

UNIT – V



**HYDRAULIC TURBINES – I:** Layout of a typical Hydropower installation – Heads and efficiencies - classification of turbines - Pelton wheel - Francis turbine - Kaplan turbine - working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and function efficiency.

#### **UNIT – VI**

**HYDRAULIC TURBINES – II:** Governing of turbines-surge tanks-unit and specific turbines-unit speed-unit quantity-unit power-specific speed performance characteristics-geometric similarity-cavitation.

#### **UNIT – VII**

**CENTRAIFUGAL-PUMPS:** Pump installation details-classification-work done- Manometric head-minimum starting speed-losses and efficiencies-specific speed, multistage pumps-pumps in parallel- performance of pumps-characteristic curves- NPSH-Cavitation.

#### **UNIT – VIII**

**Hydropower Engineering:** Classification of Hydropower plants – Definition of terms – load factor, utilization factor, capacity factor, estimation of hydropower potential.

#### **TEXT BOOKS:**

1. Open Channel flow by K. Subramanya, Tata McGraw Hill Publishers
2. A text of Fluid mechanics and hydraulic machines by Dr. R.K. Bansal - Laxmi Publications (P) Ltd., New Delhi

#### **REFERENCES:**

1. Fluid mechanics and fluid machines by Rajput, S. Chand &Co.
2. Hydraulic Machines by Banga & Sharma Khanna Publishers.
3. Fluid Mechanics & Fluid Power Engineering by D.S. Kumar Kataria & Sons.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

ENGINEERING GEOLOGY

UNIT – I

**INTRODUCTION:** Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological drawbacks. Importance of Physical geology, Petrology and Structural geology.

**WEATHERING OF ROCKS:** Its effect over the properties of rocks importance of weathering with REFERENCE to dams, reservoirs and tunnels weathering of common rock like “Granite”

UNIT – II

**MINERALOGY:** Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

UNIT – III

**PETROLOGY:** Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features, Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT – IV

**STRUCTURAL GEOLOGY:** Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints - their important types. Their importance In-situ and drift soils, common types of soils, their origin and occurrence in India, Stabilisation of soils.

## **UNIT – V**

Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration. Earth quakes, their causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Land slides, their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earth quakes and land slides.

## **UNIT – VI**

Importance of Geophysical studies Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and Geothermal method. Special importance of Electrical resistivity

methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

## **UNIT – VII**

**GEOLOGY OF DAMS AND RESERVOIRS:** Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's Contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs.

## **UNIT – VIII**

**TUNNELS:** Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (ie. Tithological, structural and ground water) in tunneling over break and lining in tunnels.

## **TEXT BOOKS:**

- 1) Principals of Engineering Geology by K.V.G.K. Gokhale – B.S publications
- 2) Engineering Geology by N. Chennkesavulu, McMillan, India Ltd. 2005.

## **REFERENCES:**

1. F.G. Bell, Fundamental of Engineering Geology Butterworths, Publications, New Delhi,

1992.

2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution,

2010-11

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**II B.TECH. (CIVIL ENGINEERING)**

**II Year B.Tech. – II Sem.**

**STRUCTURAL ANALYSIS – I**

**UNIT – I**

**PROPPED CANTILEVERS:** Analysis of propped cantilevers-shear force and Bending moment diagrams-Deflection of propped cantilevers.

**UNIT – II**

**FIXED BEAMS** – Introduction to statically indeterminate beams with U.D.load central point load, eccentric point load. Number of point loads, uniformly varying load, couple and combination of loads shear force and Bending moment diagrams-Deflection of fixed beams effect of sinking of support, effect of rotation of a support.

**UNIT – III**

**CONTINUOUS BEAMS:** Introduction-Clapeyron's theorem of three moments- Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spans-Effects of sinking of supports-shear force and Bending moment diagrams.

#### **UNIT-IV**

**Slope-Deflection Method:** Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports.

#### **UNIT – V**

**ENERGY THEOREMS:** Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's first theorem-Deflections of simple beams and pin jointed trusses.

#### **UNIT – VI**

**MOVING LOADS:** Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load U.D load longer than the span, U.D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

#### **UNIT – VII**

**INFLUENCE LINES:** Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a sections, single point load, U.D. load longer than the span, U.D. load shorter than the span-Influence lines for forces in members of Pratt and Warren trusses.

#### **UNIT –VIII**

**INDETERMINATE STRUCTURAL ANALYSIS:** Indeterminate Structural Analysis –Determination of static and kinematic indeterminacies –Solution of trusses with upto two degrees of internal and external indeterminacies –Castigliano's theorem

#### **TEXT BOOKS:**

1. Structural Analysis by V.D. Prasad Galgotia publications, 2nd Editions.
2. Analysis of Structures by T.S. Thandavamoorthy, Oxford University Press, New Delhi

**REFERENCES:**

1. Theory of Structures by Gupta, Pandit & Gupta; Tata McGraw Hill, New Delhi.
2. Theory of Structures by R.S. Khurmi, S. Chand Publishers
3. Structural analysis by R.C. Hibbeler, Pearson, New Delhi.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

**SYLLABUS:**

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice by a constant head method.
3. Determination of Coefficient of discharge for an external mouth piece by variable head method.
4. Calibration of contracted Rectangular Notch and /or Triangular Notch
5. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Efficiency test on centrifugal pump.
12. Efficiency test on reciprocating pump.

**LIST OF EQUIPMENT:**

1. Venturimeter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouthpiece setup.
5. Rectangular and Triangular notch setups.

6. Friction factor test setup.
7. Bernoulli's theorem setup.
8. Impact of jets.
9. Hydraulic jump test setup.
10. Pelton wheel and Francis turbines.
11. Centrifugal and Reciprocating pumps.



2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II B.TECH. (CIVIL ENGINEERING)

II Year B.Tech. – II Sem.

SURVEYING LAB

LIST OF EXERCISES:

Part – I

1. Survey of an area by chain survey (closed traverse) & Plotting
2. Chaining across obstacles
3. Determination of distance between two inaccessible points with compass.
4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method, intersection methods by plane Table survey
6. Two point and three point problems in plane table survey
7. Fly leveling (differential leveling)
8. One exercises on contouring.
9. Trigonometric Leveling - Heights and distance problem
10. Heights and distance using Principles of tachometric surveying

Part – II

11. Curve setting – different methods.
12. Determine of area using total station
13. Traversing using total station
14. Contouring using total station
15. Determination of remote height using total station
16. Distance, gradient, Diff, height between tow inaccessible points using total stations

**LIST OF EQUIPMENT:**

1. Chains, tapes, Ranging rods, cross staff, arrows
2. Compasses and Tripods, Optical square.
3. Plane tables, Alidade, Plumbing fork, trough compasses
4. Leveling instruments and leveling staves
5. Box sextants, planimeter.
6. Theodolites, and leveling staffs.
7. Tachometers.
8. Total stations.

**Note:** Two experiments from part – I should be conducted in a one session. One experiment from Part – II should be conducted in one session.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Civil Engineering – I Sem.

### CONCRETE TECHNOLOGY

#### UNIT I

**CEMENTS & ADMIXTURES:** Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Test for physical properties – Different grades of cements – Admixtures – Mineral and chemical admixtures – accelerators, retarders, plasticizers, super-plasticizers, fly ash and silica fume.

#### UNIT – II

**AGGREGATES:** Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded and well graded aggregate as per relevant IS code – Maximum aggregate size.

#### UNIT – III

**FRESH CONCRETE:** Workability – Factors affecting workability – Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete – Quality of mixing water, Ready mixed concrete, Shotcrete.

#### UNIT – IV

**HARDENED CONCRETE:** Water / Cement ratio – Abram's Law – Gelspae ratio – Nature of strength of concrete – Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength - Curing.

#### UNIT – V

**TESTING OF HARDENED CONCRETE:** Compression tests – Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Non-destructive testing methods – codal provisions for NDT.

#### UNIT – VI

**ELASTICITY, CREEP & SHRINKAGE** – Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage.

#### UNIT – VII

**MIX DESIGN:** Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design.

#### UNIT – VIII

**SPECIAL CONCRETES:** Light weight aggregates – Light weight aggregate concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Different types of fibres – Factors

affecting properties of F.R.C, Polymer concrete – Types of Polymer concrete – Properties of polymer concrete, High performance concrete – Self consolidating concrete – SIFCON, self healing concrete.

**TEXT BOOKS:**

1. Concrete Technology by A.R. Santha Kumar, Oxford University Press, New Delhi
2. Concrete Technology by M.S.Shetty. – S.Chand & Co.; 2004
3. Properties of Concrete by A.M.Neville – PEARSON – 4th edition

**REFERENCES:**

1. Concrete Technology by M.L. Gambhir. – Tata Mc. Graw Hill Publishers, New Delhi
2. Text Book of Concrete Technology, Mahaboob Bhasha, Anuradha publications,



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**III Year B. Tech. Civil Engineering – I Sem.**

**STRUCTURAL ANALYSIS – II**

**UNIT I**

**Three hinged arches:** Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature.

**UNIT – II**

**Two hinged arches:** Determination of horizontal thrust, bending moment, normal thrust and radial shear – Rib shortening and temperature stresses, tied arches – fixed arches – ( No analytical question).

**UNIT-III**

**Lateral load analysis using approximate methods:** application to building frames. (i) Portal method (ii) Cantilever method.

**UNIT – IV**

**Cable structures and Suspension bridges:** Introduction, characteristics of cable, analysis of cables subjected to concentrated and uniformly distributed loads, anchor cable, temperature stresses, analysis of simple suspension bridge, three hinged and two hinged stiffening girder suspension bridges.

**UNIT – V**

**Moment Distribution method** – Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – storey portal frames – including Sway-Substitute frame analysis by two cycle.

**UNIT – VI**

**Kani's Method** - Analysis of continuous beams – including settlement of supports and single bay portal frames with and without side sway.

**UNI – VII**

**Flexibility methods:** Introduction, application to continuous beams (maximum of two unknowns) including support settlements.

**UNIT – VIII**

**Stiffness method:** Introduction, application to continuous beams (maximum of two unknowns) including support settlements.

**TEXT BOOKS:**

1. Structural Analysis by T.S.Thandavamoorthy, Oxford university press, India.
2. Structural Analysis by R.C. Hibbeler, Pearson Education, India
3. Structural Analysis (Matrix Approach) by Pundit and Gupta – Tata Mc.Graw Hill publishers.

**REFERENCES:**

1. Intermediate Structural Analysis by C. K. Wang, Tata McGraw Hill, India
2. Theory of structures by Ramamuratam
3. Structural Analysis by C.S. Reddy, Tata Mc-graw hill, New Delhi.
4. Analysis of structures by Vazrani & Ratwani – Khanna Publications.
5. Comprehensive Structural Analysis-Vol.I&2 by Dr. R. Vaidyanathan & Dr. P.Perumal- Laxmi publications pvt. Ltd., New Delhi



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**III Year B. Tech. Civil Engineering – I Sem.**

**DESIGN AND DRAWING OF CONCRETE STRUCTURES - I**

**UNIT –I**

**Introduction:** Materials for reinforced concrete, Design codes and handbooks, loading standards – Dead, live, wind and earthquake loads, elastic theory, design constants, modular ratio, neutral axis depth and moment of resistance, balanced, under-reinforced and over-reinforced sections, working stress method of design of singly and doubly reinforced beams.

**UNIT –II**

**Introduction of Limit State Design:** Concepts of limit state design – Basic statistical principles – Characteristic loads –Characteristic strength – Partial load and safety factors – representative stress-strain curves for cold worked deformed bars and mild steel bars. Assumptions in limit state design – stress - block parameters – limiting moment of Resistance

**UNIT –III**

**Design for flexure:** Limit state analysis and design of singly reinforced, doubly reinforced and flanged (T and L) beam sections.

**UNIT – IV**

**Design for Shear, Torsion and Bond:** Limit state analysis and design of section for shear and torsion – concept of bond, anchorage and development length, I.S. code provisions. Design examples in simply supported and continuous beams, detailing.

**UNIT – V**

**Design of compression members:** Effective length of a column, Design of short and long columns – under axial loads, uniaxial bending and biaxial bending – Braced and un-braced columns – I S Code provisions.

**UNIT –VI**

**Footings:** Different types of footings – Design of isolated and combined footings - rectangular and circular footings subjected to axial loads, uni-axial and bi-axial bending moments.

**UNIT – VII**

**Slabs:** Classification of slabs, design of one - way slabs, two - way slabs, and continuous slabs using IS Coefficients (conventional), design of waist-slab staircase.

#### **UNIT –VIII**

**Limit state design for serviceability:** deflection, cracking and codal provision, Design of formwork for beams and slabs.

**NOTE:** All the designs to taught in Limit State Method

Following plates should be prepared by the students.

1. Reinforcement detailing of T-beams, L-beams and continuous beams.
2. Reinforcement detailing of columns and isolated footings.
4. Detailing of one-way, two-way and continuous slabs and waist-slab staircase.

#### **FINAL EXAMINATION PATTERN:**

The end examination paper should consist of Part A and Part B. Part A consist of two questions in Design and Drawing out of which one question is to be answered. Part B should consist of five questions and design out of which three are to be answered. Weightage for Part – A is 40% and Part- B is 60%.

#### **TEXT BOOKS:**

1. Reinforced concrete design by S.Unnikrishna Pillai & Devdas Menon, Tata Mc.Graw Hill, New Delhi.
2. Fundamentals of reinforced concrete by N.C. Sinha and S.K Roy, S. Chand publishers
3. Reinforced concrete design by N. Krishna Raju and R.N. Pranesh, New age International Publishers, New Delhi
4. Design of reinforced concrete foundations by P.C. Varghese, PHI Learning private limited

#### **REFERENCES:**

1. Fundamentals of Reinforced concrete design by M.L. Gambhir, Printice Hall of India Private Ltd., New Delhi.
2. Reinforced concrete structural elements – behaviour, Analysis and design by P.Purushotham, Tata Mc.Graw-Hill, 1994.
3. Design of concrete structures – Arthus H.Nilson, David Darwin, and Chorles W. Dolar, Tata Mc.Graw-Hill,3rd Edition, 2005.
4. Reinforced Concrete Structures by Park and Pauley, John Wiley and Sons.
5. Reinforced concrete structures – I.C. Syal & A.K.Goel, S.Chand Publishers
6. Limit state designed of reinforced concrete – P.C.Varghese, Printice Hall of India, New Delhi.



### **JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**III Year B. Tech. Civil Engineering – I Sem.**

#### **BUILDING PLANNING AND DRAWING PART-A**

##### **UNIT – I**

##### **BUILDING BYELAWS AND REGULATIONS:**

Introduction – Terminology – Objectives of building byelaws – Floor Area Ratio (FAR) – Floor Space Index (FSI) – Principles underlying building byelaws – classification of buildings – Open space requirements – built up area limitations – Height of Buildings – Wall thickness – lighting and ventilation requirement.

##### **UNIT – II**

**RESIDENTIAL BUILDINGS:** Minimum standards for various parts of buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings.

##### **UNIT – III**

**PUBLIC BUILDINGS:** Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks, industrial buildings, hotels and motels, buildings for recreation.

#### **UNIT – IV**

**PLANNING OF CONSTRUCTION PROJECTS:** Planning scheduling and monitoring of building construction projects, Bar chart – CPM and PERT Network planning –Computation of times and floats – their significance.

### **PART-B**

#### **UNIT – V**

**SIGN CONVENTIONS AND BONDS:** Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Copper alloys, Aluminum alloys etc., Lead, Zinc, tin, and white lead etc., Earth, Rock, Timber and Marble. English bond & Flemish bond odd & even courses for one, one and half, two and two and half brick walls in thickness at the junction of a corner.

#### **UNIT - VI**

**DOORS WINDOWS, VENTILATORS AND ROOFS:** Panalled Door – paneled and glazed door, glazed windows – paneled windows – Swing ventilator – Fixed ventilator-Couple roof – Collar roof – Kind Post truss – Queen post truss.

#### **UNIT – VII**

**SLOPED AND FLAT ROOF BUILDINGS:** Drawing plans, Elevations and Cross-sections of a given sloped roof buildings.

#### **UNIT - VIII**

**PLANNING AND DESIGNING A BUILDING:** Given line diagram with specification to draw, plan, sections section and elevation of a residential of public buildings.

#### **FINAL EXAMINATION PATTERN:**

The end examination paper should consist of Part A and Part B. Part A consist of five questions in planning portion out of Which three questions are to be answered. Part B should consist of two questions from drawing part out of which one is to be answered in drawing sheet. Weight age for Part – A is 60% and Part-B is 40%.

#### **TEXT BOOKS:**

1. Construction Planning, Equipment and methods by R.L. Peurifoyetal. – Tata Mc. Graw Hill Publications.
2. PERT and CPM – Project planning and control with by Dr.B.C.Punmia & Khandelwal – Laxmi publications.
3. 'A' Series & 'B' Series of JNTU Engineering College, Anantapur,

#### **REFERENCE:**

1. Building by laws by state and Central Governments and Municipal corporations.
2. Planning, Designing and scheduling – Girescharan Singh & Jagadish Singh.



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**

**III Year B. Tech. Civil Engineering – I Sem.**

**WATER RESOURCES ENGINEERING-I**

## **UNIT I**

**Introduction:** Engineering hydrology and its applications, Hydrologic cycle. Precipitation: Types and forms of precipitation, rainfall measurement, types of rain gauges, rain gauge network, average rainfall over a basin, consistency of rainfall data, frequency of rainfall, intensity-duration-frequency curves, probable maximum precipitation

## **UNIT-II**

**Abstractions:** Evaporation, factors affecting evaporation, measurement of evaporation, evaporation reduction, evapotranspiration, factors affecting evapotranspiration, measurement of evapotranspiration - Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices.

## **UNIT-III**

**Runoff :** Factors affecting runoff ,components of runoff, computation of runoff-rational and SCS methods, separation of base flow ,Unit Hydrograph, assumptions, derivation of Unit Hydrograph, unit hydrographs of different durations, principle of superposition and S-hydrograph methods, limitations and applications of UH, Synthetic Unit Hydrograph,

## **UNIT-IV**

**Floods and Flood Routing:** Stream gauging, direct and indirect methods, floods-causes and effects, flood frequency analysis-Gumbel's method, log Pearson type III method, flood control methods flood routing-hydrologic routing, channel and reservoir routing-Muskingum and Pulse method of routing.

## **UNIT-V**

**Ground water :** Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, types of wells, Darcy's law, Dupuit's equation- steady radial flow to wells in confined and unconfined aquifers, yield of a open well-recuperation test.

## **Irrigation**

### **UNIT-VI**

Necessity and Importance of Irrigation, advantages and ill effects of Irrigation, types of Irrigation, methods of application of Irrigation water, water logging and drainage, standards of quality for Irrigation water, principal crops and crop seasons, crop rotation.

### **UNIT-VII**

Soil-water-plant relationship, vertical distribution of soil moisture, soil moisture tension, consumptive use, estimation of consumptive use, duty and delta, factors affecting duty, depth and frequency of Irrigation, irrigation efficiencies.

### **UNIT-VIII**

**Canals:** Classification of canals, design of canals by Kennedy's and Lacey's theories, balancing depth of cutting, canal lining, design of lined canal, economics of canal lining.

## **TEXT BOOKS:**

1. Engineering Hydrology by K. Subramanya, TATA McGraw-HILL Education Private Limited.
2. Engineering Hydrology P. Jayaram Reddy, Laxmi publications pvt. Ltd., New Delhi
3. Irrigation and water power engineering by B.C. Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi

## **REFERENCES:**

1. Hand book of applied hydrology by Ven Te Chow, Tata-McGraw Hill.
2. Hydrology by HM Raghunath, New Age International Publishers.
3. Irrigation and Water Resources & Water Power by P.N.Modi, Standard Book House.



4. Irrigation and Hydraulic structures by SK Garg, Khanna Publishers.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Civil Engineering – I Sem.

### TRANSPORTATION ENGINEERING-I

#### UNIT I

##### HIGHWAY DEVELOPMENT AND PLANNING:

Highway development in India – Necessity for Highway Planning- Different Road Development Plans- Classification of Roads- Road Network Patterns – Planning Surveys-Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports.

#### UNIT – II

##### HIGHWAY GEOMETIC DESIGN:

Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements- Stopping sight Distance, Overtaking Sight Distance and Intermediate Sight Distance- Design of Horizontal Alignment- Design of Super elevation and Extra widening- Design of Transition Curves- Design of Vertical alignment- Gradients- Vertical curves.

#### UNIT – III

##### TRAFFIC ENGINEERING AND MANAGEMENT:

Basic Parameters of Traffic- Volume, Speed and Density- Traffic Volume Studies- Data Collection and Presentation- Speed studies- Data Collection and Presentation- Parking Studies and Parking characteristics- Road Accidents- Causes and Preventive measures- Accident Data Recording – Condition Diagram and Collision Diagrams - Road Traffic Signs – Types and Specifications – Road markings- Need for Road Markings- Types of Road Markings.

#### UNIT – IV

##### INTERSECTION DESIGN:

Types of Intersections – Conflicts at Intersections- Types of At-Grade Intersections- Channelization: Objectives – Traffic Islands and Design criteria- Design of Traffic Signals – Webster Method – IRC Method. Types of Grade Separated Intersections- Rotary Intersection – Concept of Rotary and Design Criteria- Advantages and Disadvantages of Rotary Intersection.

#### UNIT – V

##### HIGHWAY MATERIALS:

Subgrade soil: classification – Group Index – Subgrade soil strength – California Bearing Ratio – Modulus of Subgrade Reaction. Stone aggregates: Desirable properties – Tests for Road Aggregates – Bituminous Materials: Types – Desirable properties – Tests on Bitumen – Bituminous paving mixes: Requirements – Marshall Method of Mix Design.

#### UNIT – VI

##### DESIGN OF FLEXIBLE PAVEMENTS:

Objects & Requirements of pavements – Types – Functions of pavement components – Design factors – Flexible Pavement Design Methods – CBR method – IRC method – Burmister method – Mechanistic method – IRC Method for Low volume Flexible pavements.

#### UNIT – VII

##### DESIGN OF RIGID PAVEMENTS:

Design Considerations – wheel load stresses – Temperature stresses – Frictional stresses – Combination of stresses – Design of slabs – Design of Joints – IRC method – Rigid pavements for low volume roads – Continuously Reinforced Cement Concrete Pavements – Roller Compacted Concrete Pavements.

## **UNIT – VIII**

### **HIGHWAY CONSTRUCTION:**

Types of Highway Construction – Earthwork – Proportion of Subgrade – Construction of Earth Roads – Construction of Gravel Roads – Construction of Water Bound Macadam Roads – Construction of Bituminous Pavements – Construction of Cement Concrete Pavements.

### **TEXT BOOKS:**

1. Khanna S.K., And Justo C.E.G - Highway Engineering – Nem Chand Bros., Roorkee.
2. Kadiyali L.R - Traffic Engineering and Transportation Planning - Khanna Publishers, New Delhi.
3. Most Publications - Specifications for Roads and Bridges - Manual for Maintenance of roads.
4. Nicholas J. Garber, Lester A. Hoel, Principles of Traffic and Highway Engineering.

### **REFERENCES:**

1. Papacostas C.S. - Fundamentals of Transportation Engineering - Prentice Hall of India Pvt.Ltd; New Delhi.
2. Kadiyali LR, Principles of Highway Engineering; Khanna Publishers, New Delhi
3. Saxena, Traffic Planning and Design, Dhanpat Rai Publishers, New Delhi
4. Jotin Khisty C - Transportation Engineering - An Introduction, Prentice Hall, Englewood Cliffs, New Jersey.
5. Mc Shane, WR and RP Roess, Traffic Engineering, Prentice Hall
6. Yang H. Huang, Pavement Analysis & Design, Prentice Hall Inc.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

### III Year B. Tech. Civil Engineering – I Sem.

#### ENGINEERING GEOLOGY LAB.

1. Physical properties of minerals: Mega scopic identification of
  - a) Rock forming minerals – Quartz group, Feldspar group, garnet group, mica group & talc, chlorite, olivine, kyanite, asbestos, tourmelene, calcite, gypsum, etc...
  - b) Ore forming minerals – magnetite, hematite, pyrite, pyralusite, graphite, chromite, etc...
2. Megascopic description and identification of rocks.
  - a) Igneous rocks – Types of granite, pegmatite, gabbro, dolerite, syenite, Granite porphyry, Basalt, etc...
  - b) Sedimentary rocks – sand stone, ferruginous sand stone, lime stone, shale, laterite, conglomerate, etc...
  - c) Metamorphic rocks – biotite – granite gneiss, slate, muscovite & biotiteschist, marble, khondalite, etc...
3. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
4. Simple Structural Geology problems.

#### LAB EXAMINATION PATTERN:

1. Description and identification of FOUR minerals
2. Description and identification of FOUR (including igneous, sedimentary and metamorphic rocks)
3. ONE Interpretation of a Geological map along with a geological section.
4. TWO Simple strike and Dip problems.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

### III Year B. Tech. Civil Engineering – I Sem.

#### CONCRETE TECHNOLOGY LAB.

1. Normal Consistency and fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity and soundness of cement.
4. Compressive strength of cement.
5. Workability test on concrete by compaction factor, slump and Vee-bee.
6. Young's modulus, compressive strength, split tensile strength of concrete.
7. Sieve analysis, Specific gravity and Bulking of sand.
8. Tests on Coarse aggregate: Flakiness index, elongation index, specific Gravity and sieve analysis.
9. Non-Destructive testing on concrete (for demonstration)

#### LIST OF EQUIPMENT:

1. Length and elongation gauges
2. Vicat's apparatus
3. Specific gravity bottle.
4. Lechatlier's apparatus.
5. Slump and compaction factor setups
6. Longitudinal compresso meter
7. Rebound hammer, Pulse velocity machine

#### INTELLECTUAL PROPERTY RIGHTS AND PATENTS – 1

- Unit 1** Introduction to Intellectual Property Law – The Evolutionary Past - The IPR Tool Kit- Para - Legal Tasks in Intellectual Property Law – Ethical obligations in Para Legal Tasks in Intellectual Property Law - Introduction to Cyber Law – Innovations and Inventions Trade related Intellectual Property Right
- Unit 2** Introduction to Trade mark – Trade mark Registration Process – Post registration procedures – Trade mark maintenance - Transfer of Rights - Inter partes Proceeding – Infringement - Dilution Ownership of Trade mark – Likelihood of confusion - Trademarks claims – Trade marks Litigations – International Trade mark Law –
- Unit 3** Introduction to Copyrights – – Principles of Copyright Principles -The subjects Matter of Copy right – The Rights Afforded by Copyright Law – Copy right Ownership, Transfer and duration – Right to prepare Derivative works – Rights of Distribution – Rights of Perform the work Publicity Copyright Formalities and Registrations - Limitations - Copyright disputes and International Copyright Law – Semiconductor Chip Protection Act
- Unit 4** Introduction to Trade Secret – Maintaining Trade Secret – Physical Security –Employee Limitation - Employee confidentiality agreement - Trade Secret Law - Unfair Competition – Trade Secret Letigation – Breach of Contract – Applying State Law

#### Books:

1. Deborah E.Bouchoux: "Intellectual Property". Cengage learning , New Delhi
2. Kompal Bansal & Parishit Bansal "Fundamentals of IPR for Engineers", BS Publications (Press)
3. Cyber Law. Texts & Cases, South-Western's Special Topics Collections
4. Prabhuddha Ganguli: ' Intellectual Property Rights" Tata Mc-Graw –Hill, New Delhi
5. Richard Stim: "Intellectual Property", Cengage Learning, New Delhi.

6. R.Radha Krishnan, S.Balasubramanian: "Intellectual Property Rights", Excel Books. New Delhi
7. M.Ashok Kumar and Mohd.Iqbal Ali: "Intellectual Property Right" Serials Pub.

## **INTELLECTUAL PROPERTY RIGHTS AND PATENTS – II**

- Unit 1** Intellectual Property Law Basics – Types of Intellectual Property – Agencies responsible for Intellectual Property Registration - Cyber crime and E-commerce – International Aspects of Computer and Online Crime
- Unit 2** Introduction to Patent Law – Rights and Limitations – Rights under Patent Law –Patent requirements - Ownership - Transfer - Patents Application Process – Patent Infringement - Patent Litigation - International Patent Law – Double Patenting – Patent Searching – Patent Law Treaty - New developments in Patent Law - Invention Developers and Promoters
- Unit 3** Introduction to Transactional Law: Creating Wealth and Managing Risk – The Employment Relationship in the Internet and Tech Sector – Contract for the Internet and Tech Sector - Business Assets in Information Age – Symbol and Trademark – Trolls and Landmines and other Metaphors
- Unit 4** Regulatory , Compliance and Liability Issues – State Privacy Law - Data Security – Privacy issues - Controlling Over use or Misuse of 1 Intellectual Property Rights

### Books:

1. Deborah E.Bouchoux: "Intellectual Property". Cengage learning , New Delhi
2. Kompal Bansal & Parishit Bansal "Fundamentals of IPR for Engineers", BS Publications (Press)
3. Cyber Law. Texts & Cases, South-Western's Special Topics Collections
4. Prabhuddha Ganguli: ' Intellectual Property Rights" Tata Mc-Graw –Hill, New Delhi
5. Richard Stim: "Intellectual Property", Cengage Learning, New Delhi.
6. R.Radha Krishnan, S.Balasubramanian: "Intellectual Property Rights", Excel Books. New Delhi
7. M.Ashok Kumar and Mohd.Iqbal Ali: "Intellectual Property Right" Serials Pub.