

**ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS**

V

**CIVIL
ENGINEERING**

For

**B.TECH. FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2010-2011)**



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA - 533 003, ANDHRA PRADESH, INDIA**

Academic Regulations 2010 for B. Tech. (Regular)

(Effective for the students admitted in to I year from the Academic Year 2010-2011 and onwards)

1. Award of B.Tech. Degree

A student will be declared eligible for the award of the B. Tech. Degree if he fulfills the following academic regulations.

- (a) Pursued a course of study for not less than four academic years and not more than eight academic years. However, the student is permitted to write Supplementary examinations for two more years, giving a facility to the student to complete the Degree within 10 academic years.
- (b) For the award of a degree, candidate has to register for **208** credits and secure **200** credits with compulsory subjects: (compulsory subjects are: all Laboratories and Project work, i.e. the student shall pass all laboratory examinations and project work)

2. Students, who fail to complete their Four years Course of study within Eight years or fail to acquire the 200 Credits for the award of the degree within ten academic years from the year of their admission, shall forfeit their seat in B. Tech course and their admission shall stand cancelled.

3. Courses of study

The following courses of study are offered at present for specialization in the B.Tech. Course.

S. No.	Branch Code	Branch Abbreviation
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01	01-CE	Civil Engineering
02	02-EEE	Electrical and Electronics Engineering
03	03-ME	Mechanical Engineering
04	04-ECE	Electronics and Communication Engineering
05	05-CSE	Computer Science Engineering

06	08-CHEM	Chemical Engineering
07	10-EIE	Electronics and Instrumentation Engineering
08	11-BME	Bio – Medical Engineering
09	12-IT	Information Technology
10	19-ECom.E	Electronics and Computer Engineering
11	21-AE	Aeronautical Engineering
12	23-BT	Bio – Technology
13	24-AME	Auto Mobile Engineering
14	25-PCE	Petrochemical Engineering
15	26-MM	Mining
16	27-PT	Petroleum Technology / Petroleum Engineering
17.	31-MtE	Metallurgical Engineering

And any other course as approved by the authorities of the University from time to time.

4. Distribution and Weightage of Marks

- (i) The performance of a student in each semester shall be evaluated subject – wise with a maximum of 100 marks for theory and 75 marks for practical subject. The project work shall be evaluated for 200 marks.
- (ii) For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End - Examinations.
- (iii) Out of 25 internal marks – 15 marks are assigned for subjective exam, 10 marks for objective “On Line” exam.
- (iv.) For theory subjects, during the semester there shall be 2 tests. Each test consists of 20 minutes duration objective “On Line” exam for 10 marks and **120 minutes** duration subjective exam for **40 marks**. The Objective exam marks for 10 and subjective exam marks scaled for 15 to be added to get test marks for 25. The best of the two tests will be taken for internal marks. The first test to be conducted in 1-4 units and second test in 5-8 units of each semester.

Each Objective question paper shall contain 20 objective type questions for 10 marks. This examination is conducted “**on line**”

to train the student for on line examinations such as GRE, GMAT etc.

Each subjective type test question paper shall contain 4 questions and all questions need to be answered. The subjective type question paper should be for 40 marks.

- (v.) For practical subjects there shall be continuous evaluation during the semester for 25 marks for internal exam and 50 marks for semester end examination. Of the 25 marks for internal, 15 marks shall be awarded as follows: day to day work 10 and Record-5, and 10 marks to be awarded by conducting an internal laboratory test. The end examination shall be conducted by the teacher concerned and external examiner.
- (vi.) For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day – to – day work, and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests.
- (vii.) Out of a total of 200 marks for the project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester Examination. The End Semester Examination (Viva – Voce) shall be conducted by the committee. The committee consists of an external examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project and evaluated by an internal committee.
- (viii) Laboratory marks and the internal marks awarded by the College are not final. The marks are subject to scrutiny and scaling by the University wherever felt desirable. The internal and laboratory marks awarded by the College will be referred to a Committee. The Committee shall arrive at scaling factor and the marks will be scaled as per the scaling factor. The recommendations of the

Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective departments as per the University norms and shall be produced to the Committees of the University as and when they ask for.

5. Attendance Requirements:

- (i.) A student shall be eligible to appear for University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.
- (ii.) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester for genuine reasons and shall be approved by a committee duly appointed by the college. The condonation approved or otherwise can be reviewed by the University.
- (iii.) A Student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek re-admission for that semester when offered next.
- (iv.) **Shortage of Attendance below 65% in aggregate shall in NO case be condoned.**
- (v.) Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
- (vi.) A fee stipulated by the university shall be payable towards condonation of shortage of attendance.

6. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No. 5.

- (i.) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical, design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

- (ii.) A student will be promoted to second year, if he put up the minimum attendance requirement.
- (iii.) A student shall be promoted from II to III year only if he fulfills the academic requirement of total 48 credits from regular and supplementary examinations of I year and II year examinations, irrespective of whether the candidate takes the examination or not.
- (iv.) A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of total 76 credits from regular and supplementary examinations of I Year, II Year and III Year examinations, irrespective of whether the candidate takes the examinations or not.
- (v.) A student shall register and put up minimum attendance in all 208 credits and earn at least 200 credits. Marks obtained in the best of 200 credits shall be considered for the calculation of percentage of marks.
- (vii.) Students, who fail to complete their Four year Course study within Eight years or fail to acquire the 200 Credits for the award of the degree within ten academic years from the year of their admission, shall forfeit their seat in B. Tech course and their admission shall stand cancelled.

7. Course pattern:

- (i.) The entire course of study is of four academic years and each year will have TWO Semesters (Total EIGHT Semesters).
- (ii.) A student eligible to appear for the end examination in a subject, but absent for it or has failed in the end examinations may appear for that subject's **supplementary** examinations, when offered.
- (iii.) When a student is detained due to lack of credits / shortage of attendance, he may be re-admitted when the semester is offered after fulfillment of academic regulations. Whereas the academic regulations hold good with the regulations he/she first admitted.

8. Award of Class:

After having satisfied the requirements prescribed for the completion of the program, the *student* shall be eligible for the award of B. Tech Degree and shall be placed in one of the following grades:

Class Graded	% of marks to be secured	
E	40% to < 50%	From the aggregate marks secured from the best 200 Credits.
D	50% to < 60%	
C	60% to < 70 %	
B	70 % to < 80 %	
A	80 % to < 90%	
O	90 and above	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

9. Minimum Instruction Days:

The minimum instruction days for each semester shall be 95 clear instruction days.

10. There shall be no branch transfer after the completion of admission process.

11. There shall be no transfer within the Constituent Colleges.

12. General:

- (i.) Where the words "he" "him" "his", occur in the regulations, they include "she", "her", "hers".
- (ii.) The academic regulation should be read as a whole for the purpose of any interpretation.
- (iii.) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice – Chancellor is final.
- (iv.) The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the University.

Academic Regulations 2010 for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II year from the Academic Year 2011- 2012 and onwards)

1. Award of B. Tech. Degree

A student will be declared eligible for the award of the B. Tech. Degree if he fulfills the following academic regulations.

- (a.) Pursued a course of study for not less than three academic years and not more than six academic years. However, the student is permitted to write Supplementary examinations for two more years, giving a facility to the student to complete the Degree within 8 academic years.
- (b.) For the award of a degree, candidate has to register for 170 credits and secure 162 credits with compulsory subjects: (compulsory subjects are: all Laboratories and Project work, i.e., the students i.e. the student shall pass all laboratory examinations and project work.

2. Students, who fail to complete their three year Course of study within six years or fail to acquire the 162 Credits for the award of the degree within 8 academic years from the year of their admission, shall forfeit their seat in B. Tech course and their admission shall stand cancelled.

3. Promotion Rule:

- (a.) A lateral entry student will be promoted from II year to III year if he puts up the minimum required attendance in II year.
- (b.) A student shall be promoted from third year to fourth only if he fulfills the academic requirements of 56 credits from the II Year and III Year examinations, whether the candidate takes the examinations or not.

4. Award of Class:

After having satisfied the requirements prescribed for the completion of the program, the *student* shall be eligible for the award of B. Tech

Degree and shall be placed in one of the following grades:

Class Graded	% of marks to be secured	
E	40% to < 50%	From the aggregate marks secured from the best 162 Credits.
D	50% to < 60%	
C	60% to < 70 %	
B	70 % to < 80 %	
A	80 % to < 90%	
O	90 and above	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

5. All other regulations as applicable for B. Tech. Four- year degree course (Regular) will hold good for B.Tech. (Lateral Entry Scheme)

**DISCIPLINARY ACTION FOR MALPRACTICES /
IMPROPER CONDUCT IN EXAMINATIONS**

	Nature of Malpractices/Improper conduct	Punishment
1 (a)	If the candidate possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	If the candidate gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2	If the candidate has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the

		<p>remaining examinations of the subjects of that Semester/year.</p> <p>The Hall Ticket of the candidate is to be cancelled and sent to the University.</p>
3	<p>If the candidate impersonates any other candidate in connection with the examination.</p>	<p>The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.</p>

4	If the candidate smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5	If the candidate uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6	If the candidate refuses to obey the orders of the Chief Superintendent/ Assistant -Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted

	<p>duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.</p>	<p>to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.</p>
7	<p>If the candidate leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</p>	<p>Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course</p>

		by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8	If the candidate possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9	If a student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college, expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

		Person(s) who do not belong to the College will be handed over to police and a police case will be registered against them.
10	If the candidate comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators:

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)
 - (i) A show cause notice shall be issued to the college.
 - (ii) Impose a suitable fine on the college.
 - (iii) Shifting the examination center from the college to another college for a specific period of not less than one year.

Malpractice identified at Nodal Center/Spot Center during valuation

The following procedure is to be followed in the case of malpractice cases detected during valuation, scrutiny etc. at Nodal Center/Spot Center.

- (i) A notice regarding the malpractice, is to be served to the candidate
 - (i) Through the Principal of the concerned college,
 - (ii) To his/her college address
 - (iii) To his/her permanent address.
- (ii) A committee consisting of the following is to be constituted **at nodal center** to process such malpractice cases and the recommendations of the malpractice committee are to be sent to the University.
 1. Nodal Officer : Chairman
 2. Principal of the concerned college : Member
 3. Chief examiner of that subject/Subject expert from Nodal Centre : Member
 4. OIE of nodal centre : Convenor

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, KAKINADA
CIVIL ENGINEERING
COURSE STRUCTURE

I YEAR **I SEMESTER**

S. No.	Subject	T	P	Credits
1	English – I	3	-	2
2	Mathematics - I	3	-	2
3	Engineering Physics – I	3	-	2
4	Engineering Chemistry I	3	-	2
5	C Programming	3	-	2
6	Mathematical Methods	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	-	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	-	3	2
9	C Programming Lab	-	3	2
10	English - Communication Skills Lab - I	-	3	2
	Total			20

I YEAR **II SEMESTER**

S. No.	Subject	T	P	Credits
1	English – II	3	-	2
2	Mathematics – II	3	-	2
3	Engineering Physics – II	3	-	2
4	Engineering Chemistry— II	3	-	2
5	Engineering Drawing	3	-	2
6	Environmental Studies	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -II	-	3	2
8	English - Communication Skills Lab - II	-	3	2
9	IT Workshop	-	3	2
	Total			18

IIYEAR		ISEMESTER		
S. No.	Subject	T	P	Credits
1	Mathematics – III	4	-	4
2	Electrical and Electronics Engineering	4	-	3
3	Mechanics of Materials	4	-	4
4	Construction Materials and Management	4	-	4
5	Surveying	4	-	4
6	Fluid Mechanics	4	-	4
7	Computer aided Engineering Drawing Practice	6	-	3
8	Strength of materials Lab	-	3	2
9	English communication Practice	-	2	1
10	Professional Ethics & Morals-I	2	-	-
	Total			29

IIYEAR		ISEMESTER		
S. No.	Subject	T	P	Credits
1	Probability & Statistics	4	-	4
2	Managerial Economics and Financial Analysis	4	-	4
3	Strength of Materials	4	-	4
4	Hydraulics and Hydraulic Machinery	4	-	4
5	Engineering Geology	4	-	4
6	Structural Analysis - I	4	-	4
7	Fluid Mechanics and Hydraulic Machinery Lab	-	3	2
8	Surveying Lab	-	3	2
9	English communication Practice	-	2	1
10	Professional Ethics & Morals-II	2	-	-
	Total			29

IIIYEAR**I SEMESTER**

S. No.	Subject	T	P	Credits
1	Concrete Technology	4	-	4
2	Structural Analysis - II	4	-	4
3	Design & Drawing of Concrete Structures -I	4	-	4
4	Building Planning & Drawing	2	3	4
5	Water Resources Engineering -I	4	-	4
6	Transportation Engineering-I	4	-	4
7	Engineering Geology Lab	-	3	2
8	Concrete Technology Lab	-	3	2
9	IPR and Patents-1	2	-	-
	Total			28

IIIYEAR**II SEMESTER**

S. No.	Subject	T	P	Credits
1	Design & Drawing of Concrete Structures -II	4	-	4
2	Design & Drawing of Steel Structures	4	-	4
3	Geotechnical Engineering -I	4	-	4
4	Water Resources Engineering-II	4	-	4
5	Water and Wastewater Engineering	4	-	4
6	Transportation Engineering-II	4	-	4
7	Geotechnical Engineering Lab	-	3	2
8	Transportation Engineering Lab	-	3	2
9	IPR and Patents-2	2	-	-
	Total			28

IV YEAR**ISEMESTER**

S. No.	Subject	T	P	Credits
1	Geotechnical Engineering-II	4	-	4
2	Design & Drawing of Irrigation Structures	4	-	4
3	Environmental Engineering	4	-	4
4	Remote Sensing and GIS Applications	4	-	4
5	ELECTIVE-I a) Earthquake Resistant Design b) Ground Improvement Techniques c) Urban Transportation Planning	4	-	4
6	OPEN ELECTIVE a) Air Pollution and Control b) Disaster Management c) Industrial Water & Waste Water Management d) Architecture and Town Planning	4	-	4
7	GIS and CAD Lab	-	3	2
8	Water and Wastewater Engineering Lab	-	3	2
	Total			28

IV YEAR**II SEMESTER**

S. No.	Subject	T	P	Credits
1	Estimation, Specifications & Contracts	4	-	4
2	ELECTIVE – II a) Advanced Structural Design b) Ground Water Development and Management c) Environmental Impact Assessment and Management	4	-	4
3	ELECTIVE – III a) Water Shed Management b) Finite Element Methods c) Pavement Analysis Design and Evaluation	4	-	4
4	ELECTIVE – IV a) Soil Dynamics and Machine Foundations b) Advanced Structural Analysis c) Water Resources System Planning and Management	4	-	4
5	Project Work	4	-	12
	Total			28

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering– I Sem.

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**

<i>Chapter / Grammar & vocabulary</i>	<i>Reading & comprehension</i>	<i>Listening & speaking</i>	<i>Core skills and personal attributes developed through the exercises</i>	<i>Objectives achieved through the exercises</i>	<i>Plan of evaluation</i>
	<p>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.</p>	<p>Dialogues from situations related to what Writing and analysis 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.</p>			<p>A three-tier system, allowing the student to work through self-assessment, assessment by peers, and finally, assessment by the teacher.</p>

<p>Chapter – 1 .Read & Proceed</p> <p>The importance of the language used for communication:</p> <ul style="list-style-type: none"> • Understanding the need for English in the wider world, and the opportunities afforded by a strong command of the language • Assessing one's level within the language, and understanding the ways in which grasp of the language can be bettered • Understanding the basic structure of the sentence. English: subject – verb – object - Functional grammar exercise: <p>Students may discuss in groups or pairs when, why and where English is used. What, for example, if they have to face a job in -</p>	<p>Short extracts from:</p> <ol style="list-style-type: none"> 1.An interview with Arundhati Roy 2.Jawaharlal Nehru's 'Tryst with Destiny' speech 3.Albert Einstein's essay 'The World As I See It' 	<p>Sentences Understanding and using the basic structure of the sentence in English (subject – verb – object); creating sentences; understanding the different kinds of sentences (whether a statement, or a question, or an exclamation, and so on)</p>	<p>Small conversations between :</p> <ol style="list-style-type: none"> 1.A student and a hostel warden 2.An interviewer and an interviewee 3.Two friends together preparing for an oral examination at college 	<p>Communication teamwork, problem solving, learning skills</p>	<p>Enhanced learner-participation, development of linguistic proficiency</p>	<p>Both Teacher's Manual and Sample Test Questions will be provided]</p>
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<p>terview? Or make an official presentation in a State that does not use Telugu? Or even find their way in an unfamiliar city?</p> <p>Possible areas of focus and evaluation:</p> <ul style="list-style-type: none"> • Making sentences from given keywords • Correcting the order of words to make sentences, noting how change in word order can affect meaning. 						
<p>Chapter 2. Travel Nouns, pronouns, and adjectives:</p> <ul style="list-style-type: none"> • Understanding the kinds and uses of nouns • Understanding the use of pronouns to replace nouns • Understanding the ways in which nouns are qualified through adjectives 	<p>Reading and analysis of short extracts from two or more of the following:</p> <ol style="list-style-type: none"> 1. Vikram Seth, From Heaven Lake 2. Ruskin Bond, Landor Days 3. Rabindranath Tagore, The Europe Traveller's Diary 4. Pankaj Mishra, Butter Chicken in 	<p>Paragraphs</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</p>	<p>Snippets of exchanges between:</p> <ol style="list-style-type: none"> 1. A tour guide and tourist 2. A local inhabitant of a city and a visitor 	<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>• Understanding the kinds of adjectives, their degrees and their uses Functional grammar exercise: 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 evoca</p>	<p>Ludhiana</p>	<p>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>3 A photographer and her friend, with the photographer telling about the places of interest she has been to in her recent travels</p>			
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<p>tion? Potential areas of focus and evaluation:</p> <ul style="list-style-type: none"> • Changing nouns to the related adjectives • Changing adjectives to the related nouns • Replacing nouns with pronouns while retaining the meaning of the sentence 						
<p>Chapter 3. Gender Verbs and adverbs: • Understanding the placement of a verb within a sentence • Understanding tenses • Understanding the use of adverbs to describe verbs <i>Functional grammar exercise:</i> Students may be asked to consider recent news headlines for remarkable stories involving women. How are either the events or the women remark</p>	<p>Reading and analysis of short extracts from four newspaper/journal pieces: 1. The Telegraph report on the 20-year old Burdwan girl who walked out of her marriage in revolt of her in-laws' demands for dowry 2. A perspective on astronaut Kalpana Chawla's achievement 3. The inspirational story of a young woman who survived</p>	<p>Essays and arguments 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 tran</p>	<p>Short exchanges between: 1. Two friends, on an issue of contemporary interest 2. A reporter and a talk-show guest 3. A teacher and a student in school</p>	<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>able? 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>Potential areas of focus and evaluation:</p> <ul style="list-style-type: none"> • Changing verbs to the related adverbs • Changing adverbs to the related verbs • Using verbs in their correct tenses, deriving the sense from the rest of the sentence. 	<p>child-marriage 4. Sudha Murthy's write on what it is possible for women to achieve</p>	<p>sitions between ideas and paragraphs (using appropriate connecting words or phrases); winding to a conclusion by drawing the various strings of the argument together</p>			
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<p>Chapter 4. Disaster Management Articles and punctuation:</p> <ul style="list-style-type: none"> • Understanding the uses of 'a', 'an', and 'the' • Understanding the uses of words/phrases expressing quantity, like 'some', 'a bit of', 'more', etc. • Understanding and using correct punctuation to convey meaning <p>Functional grammar exercise: 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 an ambulance to be ar</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>
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<p>ranged for? Or a 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 three different kinds of writing, and comparisons between them: 1.A Government of India report on the success of nationwide campaigns for polio vaccination 2.A vegetarian's perspective on what makes for healthy living 3.An athlete's say on the benefits of lifelong exercise</p>	<p>Reports 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>Brief exchanges between: 1.A father and his son/daughter, as he explains the importance of staying fit 2.A friends discussing the ideal diet 3.A campus counsellor and a student</p>	<p>Personal presentation, stress-management, 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>Chapter 5 –Health Prepositions, conjunctions and exclamations: •Understanding the use of prepositions – words that connect verbs with their objects •Understanding that certain verbs use certain prepositions •Understanding the uses of common prepositions: to, for, at, by, of, and so on •Understanding the uses of conjunctions and exclamations</p>						

<p>Functional grammar exercise: Students may be asked to propose ways in which healthier living might be attained – eating better <i>and</i> exercising, drinking plenty of water, partaking fresh vegetables <i>from</i> the Market, and so on. Possible exercises may be framed around:</p> <ul style="list-style-type: none">• Filling in blanks within sentences• Distinguishing between different meanings possible through the use of different prepositions with the same verbs						
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<p>Chapter 6 Sports : 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>Functional grammar exercise: 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</p>	<p>Reading and analysis of two of four short pieces in depiction of:</p> <ol style="list-style-type: none"> 1. Opportunities for men and women in sports 2. A decisive moment in a game 3. Expectation and failure 4. The attitude of sportsmanship 	<p>Presentations 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"> 1. A fitness instructor and a trainee 2. Two friends discussing a possible career in sports 3. Two friends discussing their favorite game 	<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>
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<p>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>					
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Book: *Step by Step : Learning Language and Life Skills by* Pearson Longman; Pearson Publishers
Lab Manual: Strengthen your Steps (A Multimodal course in communication skills) by Maruthi Publications

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, KAKINADA

I Year B. Tech Civil Engineering – I Sem.

MATHEMATICS-I (Common to All Branches)

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.

TEXTBOOKS:

1. 'A Text Book of Engineering Mathematics – I', 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**I Year B. Tech Civil Engineering – I Sem.****ENGINEERING PHYSICS-1****UNIT-I**

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

I Year B. Tech Civil Engineering – I Sem.

ENGINEERING CHEMISTRY – I

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, application to Desalination process-Types of Membranes used in desalination process-Limitations

3. LECHATLIER'S PRINCIPLE—

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

4. SOLUBILITY PRODUCT & COMMONION 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. IONSELECTIVEELECTRODES–

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. SUPER CONDUCTIVITY –

Definition-Preparation –Properties –Engineering Applications

2. SEMICONDUCTORS-

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

3. STORAGEDEVICES-

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

TEXTBOOK :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering - I Sem.

C- Programming

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:

1. The C – Programming Language' B.W. Kernighan, Dennis M. Ritchie, PHI

REFERENCE BOOKS:

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
I Year B. Tech Civil Engineering – I Sem.

MATHEMATICAL METHODS

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.

TEXTBOOK :

1. 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**I Year B. Tech Civil Engineering – I Sem.****ENGINEERING PHYSICS & CHEMISTRY LABORATORY-1****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 – 1, 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 :

- b. Total Hardness By Edta Method**
- c. Turbidity**
- d. CONDUCTIVITY**
- e. pH**
- f. Total Dissolved Salts**
- g. Florides, Chlorides And Nitrates (Usint Ion Analyser Or By Colorimeter)**
- h. Dissolved Oxygen**
- i. Batcterial 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

I Year B. Tech Civil Engineering – I Sem.

ENGINEERING WORKSHOP

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

Trade:

- | | |
|---------------------|---|
| Carpentry | <ol style="list-style-type: none">1. T-Lap Joint2. Cross Lap Joint3. Dovetail Joint4. Mortise and Tennon Joint |
| Fitting | <ol style="list-style-type: none">1. Vee Fit2. Square Fit3. Half Round Fit4. Dovetail Fit |
| Black Smithy | <ol style="list-style-type: none">1. Round rod to Square2. S-Hook3. Round Rod to Flat Ring4. Round Rod to Square headed bolt |
| House Wiring | <ol style="list-style-type: none">1. Parallel / Series Connection of three bulbs2. Stair Case wiring3. Florescent Lamp Fitting4. Measurement of Earth Resistance |
| Tin Smithy | <ol style="list-style-type: none">1. Taper Tray2. Square Box without lid3. Open Scoop4. Funnel |

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering – I Sem.

C PROGRAMMING LAB

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 = $ut + 1/2at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). 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 from 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
I Year B. Tech Civil Engineering – I Sem.

ENGLISH - COMMUNICATION SKILLS LAB -1

UNIT-1

Section -A Hello, I'm.....

Section –B Practicing Sounds

UNIT – 2

Section –A I Would Love tobut

Section – B practicing Sounds

UNIT-3

Section-A With your permission I would to ...

Section-B Practicing Sounds

UNIT-4

Section-A Why don't we.....

Section-B Practicing Sounds

UNIT-5

Section-A Could you Please.....

Section-B practicing Sounds

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering – II Sem.

MATHEMATICS-II

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.

TEXTBOOK:

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

REFERENCEBOOKS:

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

I Year B. Tech Civil Engineering – II Sem.

ENGINEERING PHYSICS - II

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:

1. 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

I Year B. Tech Civil Engineering – II Sem.

ENGINEERING CHEMISTRY –II

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

NANOMATERIALS

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

TEXTBOOK :

1. A Text book of engineering chemistry by Srinivasulu D. Parshva publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering – II Sem.

ENGINEERING DRAWING

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

ORTHOGRAPHIC PROJECTIONS: 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: 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
I Year B. Tech Civil Engineering – II Sem.

ENVIRONMENTAL STUDIES

UNIT - I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:

Definition, Scope and Importance – Need for Public Awareness. Glossary of terms related to ecology and environment, Stockholm & Rio Summits. Global environment Challenges.

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. - Bio-geographical 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 (Hazardous, Medical and Electronic 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. (Study Report to include multi-disciplinary nature of environment giving quantitative expressions of environment quality studied)

TEXT BOOKS :

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

REFERENCE BOOKS :

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

Manual Cum Record Books :

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

CHEMISTRY LAB – II**1. PRODUCTION OF BIODIESEL: INTRODUCTION TO BIOFUELS**

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

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

ENGLISH - COMMUNICATION SKILLS LAB - II

UNIT-6

Dialogues

UNIT-7

Interviews

UNIT-8

Effective Telephonic Interviews

UNIT-9

Group Discussions

UNIT-10

Presentations

UNIT-11

Debates

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
I Year B. Tech Civil Engineering – II Sem.

IT WORKSHOP

OBJECTIVES:

The IT Workshop for engineers is a 6 training lab course spread over 45 hours.

The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including (word processor, spread sheet, presentation sw) Word, spread sheet Excel, Power Point and Publisher.

PC HARDWARE Identification of basic peripherals, assembling a PC, installation of system software like MS Windows, Linux and the device drivers. Troubleshooting Hardware and software _ some tips and tricks .

INTERNET & WORLD WIDE WEB: Different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet, web browsers, email, newsgroups and discussion forums .Awareness of cyber hygiene(protecting the personal computer from getting infected with the viruses), worms and other cyber attacks .

PRODUCTIVITY TOOLS Crafting professional word documents; excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

(Note: Student should be thoroughly exposed to minimum of 12 Tasks)

PC HARDWARE

TASK 1: Identification of the peripherals of a computer.

To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions.

TASK 2(OPTIONAL) : A practice on disassemble the components of a PC and assembling them to working condition.

TASK 3 : Installation of MS windows and LINUX on a PC.

TASK 4 : Exposure to Basic commands and system administration in Linux including: Basic Linux commands in bash, Create hard and symbolic links.

TASK 5 :**HARDWARE TROUBLESHOOTING (DEMONSTRATION):**

Students have to be given a PC which does not boot due to improper assembly or defective peripherals. Identification of a problem and fixing it for getting to working condition.

SOFTWARE TROUBLESHOOTING (DEMONSTRATION): Students have to be given a malfunctioning CPU due to system software problems. Identification of a problem and fixing it for getting to working condition.

INTERNET & WORLD WIDE WEB

TASK 6 : ORIENTATION & CONNECTIVITY BOOT CAMP AND SURFING THE WEB USING WEB BROWSERS : Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers.

TASK 7: SEARCH ENGINES & NETIQUETTE : Students should know what search engines are and how to use the search engines.

A few topics would be given to the students for which they need to search on Google.

TASK 8 : CYBER HYGIENE (DEMONSTRATION) : Awareness of various threats on the internet. To install an anti virus software and to configure their personal firewall and windows update on their computers.

LATEX AND WORD

WORD ORIENTATION : Importance of LaTeX and MS/ equivalent (FOSS) tool Word as word Processors.

Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

TASK 9 : USING LATEX AND WORD to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

TASK 10: CREATING PROJECT : Abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text

Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

EXCEL

EXCEL ORIENTATION : The mentor needs to tell the importance of MS/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel –

Accessing, overview of toolbars, saving excel files, Using help and resources

TASK 11 : CREATING A SCHEDULER - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

LOOKUP/VLOOKUP

TASK 12 : PERFORMANCE ANALYSIS - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

LATEX AND MS/EQUIVALENT (FOSS) TOOL POWER POINT

TASK 13 : Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting –Images, Clip Art, Tables and Charts in both LaTeX and Powerpoint.

TASK 14 : Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

REFERENCES:

- 1 Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008
- 2 The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B. Tech. Civil Engineering – 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 identification.

UNIT-VII

ARGUMENT PRINCIPLE – ROUCHE’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 .

TEXTBOOK

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 BOOKS :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
II Year B.Tech. Civil Engineering, I-Sem.

ELECTRICAL AND ELECTRONICS ENGINEERING

PART-A ELECTRICAL ENGINEERING

UNIT - I

ELECTRICAL CIRCUITS: Basic definitions, Types of network 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, 2nd 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, 2nd 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.

TEXTBOOKS:

1. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.

2. Industrial Electronics by G.K. Mittal, PHI

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**II Year B.Tech. Civil Engineering, I-Sem.****MECHANICS OF MATERIALS****UNIT – I**

INTRODUCTION TO ENGINEERING MECHANICS: Basic concepts System of Forces- Coplanar Concurrent Forces, 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 IN BEAMS: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

TEXTBOOKS:

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

REFERENCE BOOKS:

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.,
3. ~~Strength~~ Strength of materials by R.K. Rajput, S. Chand & Co, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**II Year B.Tech. Civil Engineering. 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

MASONRY: 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

REFERENCE BOOKS:

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, - ROBERT M. KOERNER McGraw Hill.
3. Construction Planning, Equipment and methods by R.L. Peurifoy etal. – Tata McGraw Hill.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. 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.

REFERENCE BOOKS:

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. 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

HYDROSTATICS : Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Centre 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.

REFERENCE BOOKS:

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
II Year B.Tech. Civil Engineering. 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.

REFERENCE BOOKS:

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: Units I to IV - conventional drawing pattern

Part B:Units 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 be 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**II Year B.Tech. Civil Engineering. 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.

The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relevat Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. I-Sem.

ENGLISH COMMUNICATION PRACTICE
LIFE, LANGUAGE AND CULTURE EXPLORATIONS-I
(Common for all branches)

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. I-Sem.

‘PROFESSIONAL ETHICS AND MORALS -I

UNIT - I

WHAT IS PROFESSION?: Engineering and Professionalism - Two models of Professionalism - Three Types of Ethics or Morality – The Negative face of Engineering Ethics - The Positive Face of Engineering Ethics - Responsibility in Engineering - Engineering Standards - The Standard Care – Blame-Responsibility and causation

UNIT - II

ENGINEERING ETHICS: Variety of moral issues – types of inquiry moral dilemmas – moral autonomy – The problems of Many Hands – Kohlburg’s theory – Gilligan’s theory Impediments to Responsible Action

UNIT - III

ENGINEERING AS SOCIAL EXPERIMENTATION: Framing the problem – Determining the facts codes of ethics – clarifying Concepts – Application issues – Common Ground – General principles – Utilitarian thinking respect for persons

UNIT - IV

ENGINEER’S RESPONSIBILITY: for Safety – Social and Value dimensions of Technology - Technology Pessimism – The Perils of Technological Optimism – The Promise of Technology – Computer Technology Privacy and Social Policy – Risk Benefit Analysis – Collegiality and loyalty–

BOOKS:

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering” McGraw Hill
2. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning”.
3. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. PSR Murthy, “Indian Culture Values and Professional Ethics”, BS Publications

5. Caroline Whitback< Ethics in Engineering Practice and Research, Cambridgs University Press,.
6. Mike Martin and Roland Schinzinger, "Ethics in Engineering" McGraw Hill.
7. Charles D Fleddermann, "Engineering Ethics", Prentice Hall.
8. George Reynolds, "Ethics in Information Technology", Cengage Learning.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
II Year B.Tech. Civil Engineering, 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 χ^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 \bar{x} , 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 BOOKS:

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 BOOKS:

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
II Year B.Tech. Civil Engineering. II-Sem.

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Common to all Branches (w.e.f 2010 batch)

UNIT I

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 - Economics 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. 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 axes.

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

REFERENCE BOOKS:

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

II Year B.Tech. Civil Engineering. 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

REFERENCE BOOKS:

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
4. Physical & Engineering Geology, S.K. Yadav, Khanna Publishers.
5. Engineering Geology by B.S. Sathya Narayanaswami, Dhanpat Rai & Co.
6. Engineering & General Geology by Parbin Singh, S.K. Katrin & Sons 2009.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**II Year B.Tech. Civil Engineering. 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, EARTHQUAKES & LANDSLIDES : 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

GEOPHYSICAL INVESTIGATION : 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. Factors Contributing to the success of a reservoir. Geological factors influencing water tightness and life of reservoirs.

UNIT – VIII

TUNNELS: Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (ie. Lithological, 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.

REFERENCE BOOKS:

1. F.G. Bell, Fundamentals of Engineering Geology Butterworths, Publications, New Delhi, 1992.

2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution,
3. Physical & Engineering Geology, S.K. Yard, Khanna Publishers.
4. Engineering Geology by B.S. Sathya Narayanaswami, Dhanpat Rai & Co.
5. Engineering & General Geology by Parbin Singh, S.K. Katrin & Sons 2009.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
II Year B.Tech. Civil Engineering. II-Sem.

STRUCTURAL ANALYSIS – I

UNIT – I

PROPPED CANTILEVERS: Degree of Static & Kinematic indeterminacy
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 (ILD) 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 Structure 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

REFERENCE BOOKS:

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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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.

Note: The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relevant Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

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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 tacheometric surveying

Part – II

11. Curve setting – different methods.
12. Determination 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 two 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
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ENGLISH COMMUNICATION PRACTICE

Name of the Course: *Explorations II*

Life, Language and Culture

PURPOSE OF THE COURSE: English for Semester 4 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 literary pieces for Explorations II have been selected and another showcasing a holistic approach to life that can help one develop into better individuals and professionals.

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

TIME FRAME/HOURS OF INSTRUCTION: 2 hrs per week (for pre-reading and post reading tasks of the lessons). Total number of hours per semester - 32.

TIME ALLOCATION FOR EACH UNIT: 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.

The title of the book

Explorations- II Life, Language and Culture

The stories included are

1. Morning Bells by Jayashree Mohanraj
2. The Power of the Plate of Rice by Ifeoma Okoye
3. Famadihana and the Other Rituals by Jayashree Mohanraj
4. Dial “000” by Barry Rosenberg
5. Tsunami Religion by Anjali Prashar

1. Prescribed Textbook

Life, Language and Culture : Explorations -2 , Cengage Learning India Pvt. Ltd., New Delhi.

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PROFESSIONAL ETHICS AND MORALS -II

UNIT - I

Human Values - Morals, Values, and Ethics – Integrity - Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Spirituality – Character

UNIT - II

Engineering Ethics – consensus – controversy – Models of Professional Roles – theories about right action – Self – interest – customs and religion – uses of ethical theories

UNIT - III

Engineer’s Responsibility for Rights - respect for authority – conflicts of interest- Occupational crime – professional rights and employee rights – Communicating Risk and Public Policy- collective bargaining

UNIT - IV

Global Issues- Multinational Corporations – Environmental Ethics – Engineers as Managers , Advisors, and experts witnesses – moral leadership sample code of ethics like ASME, ASCE, IEEE, IETE, Institute of Engineers – Problem of Bribery, Extortion and Grease payments – Problem of Nepotism, Excessive Gifts – Paternalism – Different business practices – Negotiating Taxes.

BOOKS:

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering” McGraw Hill
2. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning”.
3. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. PSR Murthy, “Indian Culture Values and Professional Ethics”, BS Publications
5. Caroline Whitback< Ethics in Engineering Practice and Research, Cambridgs University Press,.
6. Mike Martin and Roland Schinzinger, "Ethics in Engineering" McGraw Hill.
7. Charles D Fleddermann, "Engineering Ethics", Prentice Hall.
8. George Reynolds, "Ethics in Information Technology", Cengage Learning.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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CONCRETE TECHNOLOGY

UNIT I

CEMENTS & ADMIXTURES: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrated 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 aggregates – 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

REFERENCE BOOKS:

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

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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

KAN'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.

REFERENCE BOOKS:

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
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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 be 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 consists of two questions in Design and Drawing, out of which one question is to be answered. Part B should consist of five questions and 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

REFERENCE BOOKS:

1. Fundamentals of Reinforced concrete design by M.L. Gambhir, Prentice 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 design of reinforced concrete – P.C.Varghese, Prentice Hall of India, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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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 – King 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 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 consists 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. Weightage 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 BOOKS:

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

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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.

UNIT-VI

IRRIGATION: 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

REFERENCE BOOKS:

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.

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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 GEOMETRIC 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, NewDelhi.
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.

REFERENCE BOOKS:

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.

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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 question on Interpretation of a Geological map along with a geological section.
4. Two questions on Simple strike and Dip problem.

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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

Note: The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relavant Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

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

INTELLECTUAL PROPERTY RIGHTS AND PATENTS – I

UNIT I

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 II

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 – Trademarks Litigations – International Trade mark Law

UNIT III

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 IV

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B.Tech. Civil Engineering. II-Sem.

DESIGN & DRAWING OF CONCRETE STRUCTURES -II

PART-A: RCC

UNIT – I

DESIGN OF FLAT AND GRID SLAB: Direct design method – equivalent frame methods, reinforcement detailing, shear – beam shear and punching shear.

UNIT – II

DESIGN OF COMBINED FOOTINGS: combined slab footing, combined beam and slab footing, raft foundation – design of plain slab raft.

UNIT – III

INTRODUCTION TO EARTHQUAKE RESISTANCE DESIGN: importance of ductility in seismic design – concepts, computation of ductility, factors affecting ductility, design principles & codal provisions.

PART-B: PRE-STRESSED CONCRETE

UNIT – IV

INTRODUCTION: Historic development – General principles of prestressing, pretensioning and post tensioning –Advantages and limitations of prestressed concrete – Materials – High strength concrete and high tensile steel, their characteristics.

UNIT – V

I.S.Code provisions, Methods and Systems of Prestressing; Pre-tensioning and post tensioning methods – Analysis of post tensioning - Different systems of prestressing like Hoyer System, Magnel System Freyssinet system and Gifford – Udall System.

UNIT – VI

LOSSES OF PRESTRESS: Loss of prestress in pre-tensioned and post-tensioned members due to various causes like elastic shortage of concrete, shrinkage of concrete, creep of concrete, Relaxation of steel, slip in anchorage bending of member and frictional losses.

UNIT – VII

ANALYSIS OF SECTIONS FOR FLEXURE: Elastic analysis of concrete beams prestressed with straight, concentric, eccentric, bent and parabolic tendons.

UNIT – VIII

DESIGN FOR FLEXURE AND SHEAR: Allowable stress, Design criteria as per I.S.Code – Elastic design of simple rectangular and I-section for flexure, shear, and principal stresses – design for shear in beams – Kern – lines, cable profile, analysis of anchorage zone by Guyon’s method and Mugnel method, design of anchorage zone reinforcement.

NOTE:

Following plates should be prepared by the students.

1. Reinforcement detailing of Flat slab.
2. Reinforcement detailing of combined footing – combined slab and combined beam and slab footing.
4. Reinforcement detailing of raft foundation – plain raft slab.

FINAL EXAMINATION PATTERN:

The end examination paper should consist of Part A and Part B. part A consists 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. Prestressed Concrete by Krishna Raju; - Tata Mc.Graw Hill Publications.
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.

REFERENCE BOOKS:

1. Fundamentals of Reinforced concrete design by M.L. Gambhir, Prentice 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 Charles W. Dolar, Tata Mc.Graw-Hill, 3rd Edition, 2005.
4. Reinforced concrete structures, Vol.1, by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications Pvt. Ltd., New Delhi
5. Reinforced concrete structures – I.C. Syal & A.K.Goel, S.Chand Publishers
6. Limit state design of reinforced concrete – P.C.Varghese, Prentice Hall of India, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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DESIGN & DRAWING OF STEEL STRUCTURES

UNIT – I

CONNECTIONS: Riveted connections – definition, rivet strength and capacity, Welded connections: Introduction, Advantages and disadvantages of welding- Strength of welds-Butt and fillet welds: Permissible stresses – IS Code requirements. Design of fillet weld subjected to moment acting in the plane and at right angles to the plane of the joints.

UNIT – II

BEAMS: Allowable stresses, design requirements as per IS Code-Design of simple and compound beams-Curtailment of flange plates, Beam to beam connection, check for deflection, shear, buckling, check for bearing, laterally unsupported beams.

UNIT –III

TENSION MEMBERS AND COMPRESSION MEMBERS: General Design of members subjected to direct tension and bending –effective length of columns. Slenderness ratio – permissible stresses. Design of compression members, struts etc.

UNIT – IV

DESIGN OF COLUMNS: Built up compression members – Design of lacings and battern. Design Principles of Eccentrically loaded columns splicing of columns.

UNIT – V

DESIGN OF COLUMN FOUNDATIONS: Design of sign of slab base and gusseted bases. Column bases subjected to moment.

UNIT - VI

ROOF TRUSSES: Different types of trusses – Design loads – Load combinations IS Code recommendations, structural details –Design of simple roof trusses involving the design of purlins, members and joints – tubular trusses.

UNIT – VII

DESIGN OF PLATE GIRDER: Design consideration – I S Code recommendations Design of plate girder-Welded – Curtailment of flange plates, stiffeners – splicing and connections.

UNIT - VIII

DESIGN OF GANTRY GIRDER: impact factors - longitudinal forces, Design of Gantry girders.

NOTE: Welding connections should be used in Units II – VIII.

The students should prepare the following plates.

Plate 1 Detailing of simple beams

Plate 2 Detailing of Compound beams including curtailment of flange plates.

Plate 3 Detailing of Column including lacing and battens.

Plate 4 Detailing of Column bases – slab base and gusseted base

Plate 5 Detailing of steel roof trusses including joint details.

Plate 6 Detailing of Plate girder including curtailment, splicing and stiffeners.

FINAL EXAMINATION PATTERN:

The end examination paper should consist of Part A and Part B. part A consists 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. Steel structures Design and Practice by N.Subramanian, Oxford University Press.
2. Design of steel structures by limit state method as per IS 800-2007 by S.S. Bhavikatti, I.K.international publishing house Pvt. Ltd.

REFERENCE BOOKS:

1. Reinforced Concrete Structures by Park and Pauley, John Wiley and Sons.
2. Structural design in steel by Sarwar Alam Raz, New Age International

Publishers, New Delhi

3. Design of Steel Structures by P.Dayaratnam; S. Chand Publishers
4. Design of Steel Structures by M.Raghupathi, Tata Mc. Graw-Hill
5. Design of Steel Structures by Ramachandra. Vol – 1, Universities Press. KAKINADA
6. Structural Design and Drawing by N.Krishna Raju; University Press, KAKINADA.
7. Design of steel structures by S.K. Duggal, Tata Mcgraw Hill, and New Delhi

IS Codes:

- 1) IS -800 – 2007
- 2) S – 875 – Part III
- 3) Steel Tables.

Note : These codes and steel tables are permitted in the examinations.

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III Year B.Tech. Civil Engineering. II-Sem.

GEOTECHNICAL ENGINEERING - I

UNIT – I

INTRODUCTION: Soil formation – soil structure and clay mineralogy – Adsorbed water – Mass- volume relationship –Relative density.

UNIT – II

INDEX PROPERTIES OF SOILS: Grain size analysis – Sieve and Hydrometer methods – consistency limits and indices – Various Types of soil Classifications – I.S. Soil classification, Unified soil classification, HRB soil classification.

UNIT –III

PERMEABILITY: Soil water – capillary rise – One dimensional flow of water through soils – Darcy’s law- permeability – Factors affecting – laboratory determination of coefficient of permeability –Permeability of layered systems.

UNIT -IV

SEEPAGE THROUGH SOILS: Total, neutral and effective stresses –quick sand condition – Seepage through soils –Flow nets: Characteristics and Uses – Filter requirements.

UNIT – V

STRESS DISTRIBUTION IN SOILS: Geostatic Stresses – Stresses induced by applied loads - Boussinesq’s and Westergaard’s theories for point loads and areas of different shapes– Newmark’s influence chart .

UNIT – VI

COMPACTION: Mechanism of compaction – factors affecting – effects of compaction on soil properties. – Field compaction Equipment - compaction control.

UNIT – VII

CONSOLIDATION: Spring Analogy Mechanism - Terzaghi’s theory of one dimensional Consolidation – Stress history of clay – Over consolidated

and normally consolidated clay – Pressure – Void ratio relations – Determination of coefficient of consolidation.

UNIT - VIII

SHEAR STRENGTH OF SOILS: Basic mechanism of shear strength - Mohr – Coulomb Failure theories – Stress-Strain behavior of Sand - Critical Void Ratio – Liquefaction, Stress-Strain behavior of clay – Shear Strength determination- various drainage conditions.

TEXT BOOKS:

1. Geotechnical Engineering by ShashiKumar Gulhati and Manoj Datta; Mc.Grawhill Publications.
2. Principles of Geotechnical Engineering by Braja.M.Das, Cengage learning.

REFERENCE BOOKS:

1. Fundamentals of Soil Mechanics by D.W.Taylor.
2. Basic and Applied soil mechanics by Gopal Ranjan and A.S.R.Rao, New Age International Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
III Year B.Tech. Civil Engineering. II-Sem.

WATER RESOURCES ENGINEERING-II

UNIT-I

DIVERSION HEAD WORKS : Types of Diversion head works, weirs and barrages, layout of diversion head works, components. Causes and failure of weirs on permeable foundations, Bligh's creep theory, Khosla's theory, design of impervious floors for subsurface flow, exit gradient.

UNIT-II

RESERVOIR PLANNING : Investigations, site selection, zones of storage, yield and storage capacity of reservoir, reservoir sedimentation

DAMS : Types of dams, selection of type of dam, selection site for a dam.

UNIT-III

GRAVITY DAMS : Forces acting on a gravity dam, causes of failure of a gravity dam, elementary profile and practical profile of a gravity dam, limiting height of a dam, stability analysis, drainage galleries, grouting.

UNIT-IV

EARTH DAMS : Types, causes of failure, criteria for safe design, seepage, measures for control of seepage-filters, stability analysis-stability of downstream slope during steady seepage and upstream slope during sudden drawdown conditions.

UNIT-V

SPILLWAYS : Types, design principles of Ogee spillways, types of spillway crest gates. Energy dissipation below spillways-stilling basin and its appurtenances.

UNIT-VI

CANAL FALLS : Types and their location, design principles of Sarda type fall, trapezoidal notch fall and straight glacis fall.

UNIT-VII

CANAL REGULATORS : Head and cross regulators, design principles, canal outlets- types, proportionality, sensitivity and flexibility.

UNIT-VIII

CROSS DRAINAGE WORKS : Types, selection, design principles of aqueduct, siphon aqueduct and super passage.

TEXT BOOKS:

1. Irrigation and water power engineering by B.C Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi
2. Irrigation Engineering and hydraulic structures by S.K Garg, Khanna publishers.
3. Irrigation Water Resources and Water Power Engineering by PN Modi, Standard Book House.

REFERENCE BOOKS:

1. Irrigation and water resources engineering by G.L. Asawa, New Age International Publishers
2. Concrete dams by Varshney, Oxford and IBH publishers.
3. Irrigation Engineering by R.K. Sharma and T.K. Sharma, S. Chand Publishers
4. Water resources engineering by Satyanarayana Murthy. Challa, New Age International Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
III Year B.Tech. Civil Engineering. II-Sem.

WATER AND WASTEWATER ENGINEERING

UNIT – I

INTRODUCTION: Waterborne diseases – protected water supply – Population forecast, design period – water demand – factors affecting – fluctuations – fire demand – storage capacity – water quality and testing – drinking water standards: IS 10500.

UNIT-II

SOURCES OF WATER: Comparison from quality and quantity and other considerations – intakes – infiltration galleries, Distribution systems – Requirements – methods and layouts - Design procedures- Hardy Cross and equivalent pipe methods - Service reservoirs – Capacity by Mass Curve Method. Joints, valves such as sluice valves, air valves, scour valves and check valves, water meters – Laying and testing of pipe lines – pump house.

UNIT III

WATER TREATMENT SEDIMENTATION : Layout and general outline of water treatment units – sedimentation – principles – design factors – coagulation-flocculation clarifier design – coagulants – feeding arrangements.

UNIT –IV

FILTRATION AND DISINFECTION : Filtration – theory – working of slow and rapid gravity filters – multimedia filters – Pressure filters design of filters – troubles in operation comparison of filters – disinfection – theory of chlorination, chlorine demand, other disinfection practices - Miscellaneous treatment methods.

UNIT V

DESIGN OF SEWERS : Conservancy and water carriage systems – sewage and storm water estimation – time of concentration – storm water overflows, Combined flow – Characteristics of sewage – cycles of decay – decomposition of sewage, examination of sewage– C.O.D. – B.O.D. equations. Design of sewers – shapes and materials.

UNIT VI

SEWAGE HANDLING & DISPOSAL : Sewer appurtenances: Manholes –Inverted siphon – catch basins – flushing tanks – ejectors, pumps and pump houses – house drainage – Components - Requirements – sanitary fittings-traps – one pipe and two pipe systems of plumbing – ultimate disposal of sewage – sewage farming – dilution – Oxygen Sag Curve.

UNIT – VII

WASTE WATER TREATMENT : Layout and general outline of various units in a waste water treatment plant – primary treatment - Design of screens – grit chambers – skimming tanks – sedimentation tanks – principles and design – biological treatment – Trickling filters –standard and high rate, Activated sludge process.

UNIT-VIII

TREATMENT OF SEWAGE AND SLUDGE : Construction and design of Anaerobic Ponds and Oxidation ponds - Sludge digestion – factors affecting – design of Digestion tank – Sludge disposal by drying – Septic tanks - working principles and design – soak pits.

TEXT BOOKS:

1. Water Supply and Sanitary Engineering by G.S. Birdi, Dhanpat Rai & Sons Publishers.
2. Environmental Engineering by Peavy, Rowe and Tchobanoglous.

REFERENCE BOOKS:

1. Water and Waste Water Technology by Mark J Hammer and Mark J. Hammer Jr.
2. Water and Waste Water Technology by Steel
3. Water Supply Engineering, Vol. I, Waste water Engineering, Vol. II, B.C. Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt. Ltd., New Delhi.
4. Wastewater Treatment- Concepts and Design Approach by G.L. Karia & R.A. Christian, Prentice Hall of India.
5. Wastewater Engineering by Metcalf and Eddy.
6. Elements of Environmental Engineering by K.N. Duggal, S. Chand Publishers.
7. Unit Operations and Processes in Environmental Engineering by Reynolds. Richard, Cengage Learning.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
III Year B.Tech. Civil Engineering. II-Sem.

TRANSPORTATION ENGINEERING-II

A.RAILWAY ENGINEERING

UNIT – I

INTRODUCTION TO RAILWAY ENGINEERING:

Permanent way components – Railway Track Gauge - Cross Section of Permanent Way - Functions of various Components like Rails, Sleepers and Ballast –Rail Fastenings – Creep of Rails- Theories related to creep – Adzing of Sleepers- Sleeper density – Rail joints.

UNIT – II

GEOMETRIC DESIGN OF RAILWAY TRACK:

Alignment – Engineering Surveys - Gradients- Grade Compensation- Cant and Negative Super elevation- Cant Deficiency – Degree of Curve – safe speed on curves – Transition curve – Compound curves – Reverse curves – Extra clearance on curves – widening of gauge on curves – vertical curves – check rails on curves.

UNIT – III

POINTS & CROSSINGS:

Track layouts – Switches – Design of Tongue Rails – Crossings – Turnouts – Layout of Turnout – Double Turnout – Diamond crossing – Scissors crossing.

UNIT – IV

SIGNALLING AND INTERLOCKING:

Objectives – Classification – Fixed signals – Stop signals – Signalling systems – Mechanical signalling system – Electrical signalling system – System for Controlling Train Movement – Interlocking – Modern signalling Installations.

B.AIRPORT ENGINEERING

UNIT – V

AIRPORT PLANNING & DESIGN:

Airport Master plan – Airport site selection – Air craft characteristics – Zoning laws – Airport classification – Runway orientation – Wind rose

diagram – Runway length – Taxiway design – Terminal area and Airport layout – Visual aids and Air traffic control.

UNIT – VI

RUNWAY DESIGN:

Various Design factors – Design methods for Flexible pavements – Design methods for Rigid pavements – LCN system of Pavement Design – Airfield Pavement Failures – Maintenance and Rehabilitation of Airfield pavements – Evaluation & Strengthening of Airfield pavements – Airport Drainage – Design of surface and subsurface drainage.

C.DOCKS AND HARBOURS

UNIT – VII

PLANNING AND LAYOUT OF DOCKS & HARBOURS

Classification of ports – Requirement of a good port – classification of Harbours – Docks - Dry & wet docks – Transition sheds and workhouses – Layouts.

UNIT – VIII

CONSTRUCTION AND MAINTENANCE OF DOCKS & HARBOURS:

Quays – construction of Quay walls – Wharves – Jetties – Tides - Tidal data and Analysis – Break waters – Dredging – Maintenance of Ports and Harbours – Navigational aids.

TEXT BOOKS:

1. Saxena & Arora - Railway Engineering - Dhanpat Rai, New Delhi.
2. Bindra S.P. - Docks and Harbour Engineering - Dhanpathi Rai & Sons, New Delhi.
3. Virendra Kumar, Airport Engineering, Dhanpat Rai Publishers, New Delhi.

REFERENCE BOOKS:

1. Agarwal M.M. - Indian Railways Tracks, Prabhakar & Co
2. Wright P.H. & Asfort N.J. - Transportation Engineering Planning Design - John Wiley & Sons.
3. Khanna & Arora - Airport Engineering - Nemchand Bros, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
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GEOTECHNICAL ENGINEERING LAB

LIST OF EXPERIMENTS

1. Atterberg's Limits.
2. Field density-Core cutter and Sand replacement methods
3. Relative Density of Sand
4. Grain size analysis - Sieve Analysis Hydrometer analysis
5. Permeability of soil - Constant and Variable head tests
6. Compaction test
7. CBR test
8. Consolidation test
9. Unconfined Compression test
10. Triaxial Compression test
11. Direct Shear test.
12. Vane Shear test.
13. Differential free swell (DFS)
14. Measurement of Swell Pressure.

At least Eight experiments shall be conducted.

LIST OF EQUIPMENT:

1. Casagrande's liquid limit apparatus.
2. Apparatus for plastic and shrinkage limits
3. Field density apparatus for
 - a) Core cutter method
 - b) Sand replacement method
4. Set of sieves: 4.75mm, 2mm, 1mm, 0.6mm, 0.42mm, 0.3mm, 0.15mm, and 0.075mm.

5. Hydrometer
6. Permeability apparatus for
 - a) Constant head test
 - b) Variable head test
7. Universal auto compactor for I.S light and heavy compaction tests.
8. Shaking table, funnel for sand raining technique.
9. Apparatus for CBR test
10. 10 tons loading frame with proving rings of 0.5 tons and 5 tons capacity
11. One dimensional consolidation test apparatus with all accessories.
12. Triaxial cell with provision for accommodating 38 mm dia specimens.
13. Box shear test apparatus
14. Laboratory vane shear apparatus.
15. Hot air ovens (range of temperature 50^o - 150^oC)

REFERENCE BOOK:

1. IS 2720 – relevant parts.

NOTE: The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relevant Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
III Year B.Tech. Civil Engineering. II-Sem.

TRANSPORTATION ENGINEERING LAB

I. ROAD AGGREGATES:

1. Aggregate Crushing value
2. Aggregate Impact Test.
3. Specific Gravity and Water Absorption.
4. Attrition Test
5. Abrasion Test.
6. Shape tests

II. BITUMINOUS MATERIALS:

1. Penetration Test.
2. Ductility Test.
3. Softening Point Test.
4. Flash and fire point tests.
5. Stripping Test
6. Viscosity Test.

III. BITUMINOUS MIX:

1. Marshall Stability test.

IV. TRAFFIC SURVEYS:

1. Traffic volume study at mid blocks.
2. Studies at intersection.
3. Turning movement.
4. Spot speed studies.
5. Parking study.

V. DESIGN & DRAWING:

1. Earthwork calculations for road works.

2. Drawing of road cross sections.
3. Rotary intersection design.

LIST OF EQUIPMENT:

1. Apparatus for aggregate crushing test.
2. Aggregate Impact testing machine
3. Pycnometers.
4. Los angles Abrasion test machine
5. Deval's Attrition test machine
6. Length and elongation gauges
7. Bitumen penetration test setup.
8. Bitumen Ductility test setup.
9. Ring and ball apparatus
10. Viscometer.
11. Marshal Mix design apparatus.
12. Enoscope for spot speed measurement.
13. Stop Watches

TEXT BOOKS:

1. S.K. Khanna, C.E.G Justo and A.Veeraraghavan: Highway Material Testing Manual, Nemchand Brothers New Chand Publications, New Delhi.

REFERENCE BOOKS:

1. IRC Codes of Practice
2. Asphalt Institute of America Manuals
3. Code of Practice of B.I.S.

NOTE: The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relevant Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B.Tech. Civil Engineering. II-Sem.

INTELLECTUAL PROPERTY RIGHTS AND PATENTS – II

UNIT I

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 II

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 III

Introduction to Transactional Law: Creating Wealth and Managing Risk – The Employment Relationship in the Internet and Tech Sector – Contact for the Internet and Tech Sector - Business Assets in Information Age – Symbol and Trademark – Trolls and Landmines and other Metaphors

UNIT IV

Regulatory, Compliance and Liability Issues – State Privacy Law - Data Security – Privacy issues - Controlling Over use or Misuse of 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

GEOTECHNICAL ENGINEERING – II

UNIT – I

SOIL EXPLORATION: Need – Methods of soil exploration – Boring and Sampling methods – Field tests – Penetration Tests– Plate load test – Pressure meter – planning of Programme and preparation of soil investigation report.

UNIT – II

SLOPE STABILITY: Infinite and finite earth slopes in sand and clay – types of failures – factor of safety of infinite slopes – stability analysis by Swedish arc method, standard method of slices, Bishop’s Simplified method – Taylor’s Stability Number-Stability of slopes of dams and embankments - different conditions.

UNIT – III

EARTH PRESSURE THEORIES: Rankine’s & Coulomb’s theory of earth pressure, Rehmann’s graphical method – Culmann’s graphical method – Friction circle method - earth pressures in layered soils.

UNIT-IV

RETAINING WALLS: Types of retaining walls – Design approach of gravity retaining wall, cantilever retaining wall, bulk heads, anchored bulk heads

UNIT – V

SHALLOW FOUNDATIONS: Bearing capacity – criteria for determination of bearing capacity – factors influencing bearing capacity – analytical methods to determine bearing capacity - Terzaghi, Meyerhof and Skempton and IS Methods

UNIT-VI

SHALLOW FOUNDATIONS – SETTLEMENT CRITERIA: Safe bearing pressure based on N- value – allowable bearing pressure; safe bearing capacity and settlement from plate load test – allowable settlements of structures - Settlement Analysis.

UNIT -VII

PILE FOUNDATION: Types of piles – Load carrying capacity of piles based on static pile formulae – Dynamic pile formulae– Pile load tests - Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

UNIT-VIII

WELL FOUNDATIONS: Types – Different shapes of well – Components of well – functions – forces acting on well foundations - Design Criteria – construction and Sinking of wells – Tilt and shift.

TEXT BOOKS:

1. Das, B.M., - (2011) Principles of Foundation Engineering –6th edition (Indian edition) Cengage learning
2. Basic and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New Age International Pvt. Ltd, (2004).

REFERENCE BOOKS:

1. Bowels, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill Publishing Company, Newyork.
2. Theory and practice of foundation design by N.N.SOM & S.C.DAS PHI Learning Private limited.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Civil Engineering. I-Sem.

DESIGN AND DRAWING OF IRRIGATION STRUCTURES

Design and drawing of

1. Surplus weir.
2. Tank sluice with a tower head
3. Canal drop-Notch type.
4. Canal regulator
5. Under tunnel
6. Syphon aqueduct type III.

Final Examination pattern: Any two questions of the above six designs may be asked out of which the candidate has to answer one question. The

duration of examination is three hours.

TEXT BOOKS:

1. Water resources engineering-principles and practice by C.Satyanarayana Murthy, New age International publishers.

REFERENCE BOOKS:

1. Irrigation engineering and Hydraulic structures by S.K.Garg, Standard Book House.
2. Irrigation and water power engineering by B.C Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Civil Engineering. I-Sem.

ENVIRONMENTAL ENGINEERING

UNIT – I

Air Pollution – Sources of pollution – Effects on human beings – Air pollution Control Methods – Particulate control devices – General Methods of Controlling Gaseous Emissions – Air Emission standards.

UNIT – II

Special Treatment Methods – Adsorption – Reverse Osmosis – Defluoridation – Ion exchange – Ultra Filtration - Nitrification and Denitrification – Removal of Phosphates.

UNIT –III

Theories of industrial waste water management – Volume reduction – Strength reduction – Neutralization – Equalization – Proportioning – Common Effluent Treatment Plants - Recirculation of industrial wastes – Effluent standards.

UNIT – IV

Solid Waste Management – sources, composition and properties of solid waste – collection and handling – separation and processing - Solid waste disposal methods – Land filling – Incineration - Composting.

UNIT – V

Hazardous Waste – Nuclear waste – Biomedical wastes – Electronic wastes - Chemical wastes – Disposal and Control methods.

UNIT – VI

Noise Pollution – Effects of Noise, Noise standards, Measurement and control methods – Reducing residential and industrial noise – ISO14000

UNIT – VII

Environmental Sanitation: Environmental Sanitation Methods for Hostels and Hotels, Hospitals, Swimming pools and public bathing places, Melas and fares, Schools and Institutions, Rural Sanitation.

UNIT – VIII

Environmental Impact Assessment – Impact evaluation and analysis, EIA Methodologies, Assessment of Impacts on surface water, Air and biological Environments - Environmental audit, preparation of Environmental impact statement – Case studies.

TEXT BOOKS:

1. Environmental Science and Engineering by J.G. Henry and G.W. Heinke – Pearson Education.
2. Environmental Engineering by Mackenzie L Davis & David A Cornwell by McGraw Hill Publishing.

REFERENCE BOOKS:

1. Physico –Chemical process for water quality control by Weber
2. Air Pollution and Control by M.N. Rao & H.N. Rao
3. Environmental Impact Assessment by Y. Anjaneyulu, BS Publications.
4. Environmental Engineering by Gerard Kiley, Tata McGraw Hill.
5. Social and Preventive Medicine by Park and Park.
6. Environmental Sanitation by KVSG Murali Krishna, Reem Publications, New Delhi.
7. Liquid waste of Industry by Nemerow
8. Unit Operations and Processes in Environmental Engineering by Reynolds. Richard – Cengage Learning.
9. Environmental Engineering, 4th Edition by Ruth F. Weiner and Robin Matthews – Elsevier.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

REMOTE SENSING AND GIS APPLICATIONS

UNIT – I

INTRODUCTION TO REMOTE SENSING: Basic components of remote sensing, electromagnetic radiation, electromagnetic spectrum, interaction with atmosphere, energy interaction with the earth surfaces.

UNIT – II

SENSORS AND PLATFORMS: introduction, passive sensor, active sensor, airborne remote sensing, spaceborne remote sensing, image data characteristics, digital image data formats-band interleaved by pixel, band interleaved by line, band sequential.

UNIT – III

IMAGE ANALYSIS: introduction, elements of visual interpretations, digital image processing- image preprocessing, image enhancement, image classification, supervised classification, unsupervised classification.

UNIT – IV

GEOGRAPHIC INFORMATION SYSTEM: Introduction, key components, application areas of GIS, map projections.

UNIT- V

DATA ENTRY AND PREPARATION: spatial data input, raster data models, vector data models, raster versus vector.

UNIT – VI

SPATIAL DATA ANALYSIS: introduction, overlay function-vector overlay operations, raster overlay operations, arithmetic operators, comparison and logical operators, conditional expressions, overlay using a decision table, network analysis-optimal path finding, network allocation, network tracing.

UNIT – VII

RS AND GIS APPLICATIONS I: Land cover and land use, agriculture, forestry, geology, geomorphology, urban applications.

UNIT – VIII

RS AND GIS APPLICATIONS II: Hydrology-flood zone delineation and mapping, groundwater prospects and recharge, reservoir storage estimation.

TEXT BOOKS:

1. Remote sensing and GIS by Basudeb Bhatta, Oxford University Press
2. Remote sensing and image interpretation by Thomas M. Lillesand and Ralph W. Kiefer, John Wiley and Sons Inc.
3. Principals of Geo physical Information Systems – Peter A Burragh and Rachael A. Mc Donnell, Oxford Publishers 2004.

REFERENCE BOOKS:

1. Remote sensing by Robert A. Schowengerdt, Elsevier publishers.
2. Remote Sensing and its applications by LRA Narayana University Press 1999.
3. Concepts & Techniques of GIS by C.P.Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
4. Remote Sensing and Geographical Information systems by M.Anji Reddy JNTU KAKINADA 2001, B.S.Publications.
5. GIS by Kang – tsung chang, TMH Publications & Co.,
6. Basics of Remote sensing & GIS by S.Kumar, Laxmi Publications.
7. Fundamental of GIS by Mechanical designs John Wiley & Sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

**EARTHQUAKE RESISTANT DESIGN
(ELECTIVE – I)**

UNIT – I

EARTHQUAKE ENGINEERING: - Engineering Seismology – Earthquake phenomenon – Causes and effects of earthquakes – Faults – Structure of earth – Plate Tectonics – Elastic Rebound Theory – Earthquake Terminology – Source, Focus, Epicenter etc - Earthquake size – Magnitude and intensity of earthquakes – Classification of earthquakes – Seismic waves – Seismic zones – Seismic Zoning Map of India – Seismograms and Accelegrams.

UNIT – II

INTRODUCTION TO STRUCTURAL DYNAMICS: – Theory of vibrations – Lumped mass and continuous mass systems – Single Degree of Freedom (SDOF) Systems – Formulation of equations of motion – Undamped and damped free vibration – Damping – Response to harmonic excitation – Concept of response spectrum.

UNIT – III

MULTI-DEGREE OF FREEDOM (MDOF) SYSTEMS: - Formulation of equations of motion – Free vibration – Determination of natural frequencies of vibration and mode shapes – Orthogonal properties of normal modes – Mode superposition method of obtaining response.

UNIT – IV

EARTHQUAKE ANALYSIS : - Introduction – Rigid base excitation – Formulation of equations of motion for SDOF and MDOF Systems – Earthquake response analysis of single and multi-storied buildings – Use of response spectra.

UNIT – V

CODAL DESIGN PROVISIONS: - Review of the Indian seismic code IS:1893 – 2002 (Part-I) provisions for buildings – Earthquake design philosophy – Assumptions – Design by seismic coefficient and response spectrum methods – Displacements and drift requirements – Provisions for torsion.

UNIT – VI

CODAL DETAILING PROVISIONS: - Review of the Indian Seismic codes IS: 4326 and IS: 13920 provisions for ductile detailing of R.C buildings – Beam, column and joints

UNIT – VII

SEISMIC PLANNING: - Plan Configurations – Torsion Irregularities – Re-entrant corners – Non-parallel systems– Diaphragm Discontinuity – Vertical Discontinuities in load path – Irregularity in strength and stiffness – Mass Irregularities –Vertical Geometric Irregularity – Proximity of Adjacent Buildings.

UNIT – VIII

SHEAR WALLS: - Types – Design of Shear walls as per IS: 13920 – Detailing of reinforcements.

TEXT BOOKS:

1. Earthquake Resistant Design of Structures – Pankaj Agarwal & Manish Shrikhande – Prentice Hall of India, New Delhi.
2. Dynamics of Structures by A.K.Chopra – Pearson Education, Indian Branch, Delhi.
3. Earthquake Resistant Design of Structures by S.K.Duggal, Oxford university press.

REFERENCE BOOKS:

1. Dynamics of Structures – Clough & Penzien, McGraw Hill – International Edition.
2. Earthquake Resistant Design of Structures by S.K.Duggal
3. Earthquake Tips by C.V.R.Murty, I.I.T. Kanpur.
4. Structural Dynamics by Mario Paaz.

IS Codes: IS: 1893, IS: 4326 and IS: 13920.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

GROUND IMPROVEMENT TECHNIQUES
(ELECTIVE -I)

UNIT – I

NEED & OBJECTIVES OF GROUND IMPROVEMENT TECHNIQUES.

DEWATERING: Sumps and interceptor ditches- single, multi stage well points - vacuum well points-Horizontal wells-foundation drains-blanket drains- criteria for selection of fill material around drains –Electro-osmosis.

UNIT –II

GROUTING: Objectives of grouting- grouts and their properties- grouting methods- ascending, descending and stage grouting hydraulic fracturing in soils and rocks- post grout test.

UNIT – III

IN-SITU DENSIFICATION METHODS IN GRANULAR SOILS: – Vibration at the ground surface, Impact at the Ground Surface, Vibration at depth, Impact at depth.

UNIT - IV

IN-SITU DENSIFICATION METHODS IN COHESIVE SOILS: – preloading or dewatering, Vertical drains – Sand Drains, Sand wick geodrains – Stone and lime columns – thermal methods.

UNIT – V

STABILIZATION: Methods of stabilization-mechanical-cement- lime-bituminous-chemical stabilization with calcium chloride, sodium silicate and gypsum, use of industrial wastes.

UNIT – VI

REINFORCED EARTH: Principles – Components of reinforced earth – factors governing design of reinforced earth walls – design principles of

reinforced earth walls.

UNIT – VII

GEOSYNTHETICS: Geotextiles- Types, Functions, Properties and applications – geogrids and geomembranes – functions, properties and applications.

UNIT - VIII

EXPANSIVE SOILS: Problems of expansive soils – tests for identification – methods of determination of swell pressure.Improvement of expansive soils – Foundation techniques in expansive soils – under reamed piles.

TEXT BOOKS:

1. Hausmann M.R. (1990), Engineering Principles of Ground Modification, McGraw-Hill International Edition.
2. Purushotham Raj. Ground Improvement Techniques, Laxmi Publications, New Delhi

REFERENCES BOOKS:

1. Moseley M.P. (1993) Ground Improvement, Blackie Academic and Professional, Boca Taton, Florida, USA.
2. Xanthakos P.P, Abramson, L.W and Brucwe, D.A (1994) Ground Control and Improvement, John Wiley and Sons, New York, USA.
3. Robert M. Koerner, Designing with Geosynthetics, Prentice Hall New Jercey, USA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

URBAN TRANSPORTATION PLANNING
(ELECTIVE-I)

UNIT – I

URBAN TAVEL DEMAND : Urban development - Urban transport problems - Urban travel characteristics - Need for planning - Urban travel demand - Trends - Overall planning process - Components of travel demand - Demand Function - Independent Variables - Travel Attributes - Assumptions in demand estimation - Sequential travel demand modeling - Simultaneous travel demand modeling - Study area - Cordon lines - Screen lines - Zoning.

UNIT – II

TRAVEL DEMAND SURVEYS : Data requirements for demand estimation - Highway network characteristics - Sampling methods - Home interview surveys - Road side interview surveys - Terminal surveys - Cordon surveys - Taxi surveys - Onboard surveys - Economic surveys - Data checking.

UNIT - III

TRIP GENERATION : Trip characteristics - factors influencing Trip productions and attractions - Trip rates - Zonal regression models - Category analysis - Personal trip generation models.

UNIT - IV

TRIP DISTRIBUTION : Factors influencing trip distribution - Growth factor mdthods - Trip length frequency diagram - Growth models - LP method - Opportunity models - Gravity opportunity model.

UNIT – V

MODE CHOICE ANAYSIS : Factors influencing passenger mode choice - Zonal regression models - Utility maximization - Discrete choice situation - Binary and Multinomial Logit models - Probability curves - Probit and nested Logit models.

UNIT – VI

TRAFFIC ASSIGNMENT : Need for Assignment - Objectives - Diversion curves - Shortest path Algorithms - All or nothing Assignment technique

- Capacity Restraint Assignment technique - Multi path Assignment technique - Link flows - Sufficiency and Deficiency analysis.

UNIT - VII

PLAN PREPARATION AND EVALUATION : Types of plans- conceptual plan, Master plan etc. - Short term planning vs Long term planning - Corridor Identification and Evaluation - Plan preparation - Evaluation techniques.

UNIT – VIII

MASS TRANSIT SYSTEMS : Need for Mass Transit systems - Role of Mass Transit in Urban Transport - Recommendations of Committee on urbanization & Alternate systems of UT - characteristics & Capacities of different MT systems - LRT, monorail, Metro, BRTS, etc.

TEXT BOOKS:

1. Kadiyali L.R - Traffic Engineering and Transportation Planning - Khanna Publishers, New Delhi.
2. Papacostas C.S. - Fundamentals of Transportation Engineering - Prentice Hall of India Pvt. Ltd; New Delhi.
3. John Khisty C - Transportation Engineering - An Introduction, Prentice Hall, Englewood Cliffs, New Jersey.
4. Nicholas J. Garber, A. Hoel, Raju Sarkar, Cengage learning, Principles of Traffic and Highway Engineering.

REFERENCE BOOKS:

1. Chari, S.R. UTP Lecture Notes - Regional Engg. College, Warangal.
2. Hutchinson, B.G. Introduction to Urban System Planning, McGraw Hill.
3. Mayer M and Miller E, Urban Transportation Planning: A decision oriented Approach, McGraw Hill.
4. Bruton, Urban Transportation Planning.
5. Dicky, Metropolitan Transportation Planning, DC Script Book Co.
6. Saxena, Traffic Planning and Design, Dhanpat Rai Publishers, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVECRSITY KAKINADA

IV Year B.Tech. Civil Engineering. I-Sem.

**AIR POLLUTION AND CONTROL
(OPEN ELECTIVE)**

UNIT – I

Air Pollution – Definitions, Scope, Significance and Episodes, Air Pollutants – Measurements of Pollution - Classifications – Natural and Artificial – Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution- stationary and mobile sources.

UNIT – II

Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains and Ozone Holes - Effects on art treasures.

UNIT-III

Thermodynamics and Kinetics of Air-pollution – Applications in the removal of gases like SO_2 , NO_2 , CO and HC - Air-fuel ratio. Computation and Control of products of combustion.

UNIT – IV

Meteorology and plume Dispersion; Properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity - Influence of Meteorological phenomena on Air Quality - Wind rose diagrams.

UNIT-V

Lapse Rates, Pressure Systems, Winds and moisture, Inversions and Plume behavior; Plume Rise Models; Gaussian Model for Plume Dispersion.

UNIT-VI

Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control Equipments – Settling Chambers, Centrifugal separators – Reverse Flow Cyclones, Fabric filters – Bag House, Dry and Wet scrubbers, Electrostatic precipitators.

UNIT – VII

General Methods of Control of NO_2 and SO_2 emissions – In-plant Control

Measures, process changes, dry and wet methods of removal and recycling.

UNIT – VIII

Ambient Air Quality Management – Monitoring of SPM, SO₂; NO and CO
- Stack Monitoring for flue gases - Micro-meteorological monitoring -
Emission Standards.

TEXT BOOKS:

1. Air Pollution by M.N. Rao and H.V.N. Rao – Tata McGraw Hill Company.
2. Air Pollution and Control by KVSG Murali Krishna.

REFERENCE BOOKS:

1. An Introduction to Air pollution by R.K. Trivedy and P.K. Goel, B.S. Publications.
2. Air pollution by Wark and Warner - Harper & Row, New York.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

**DISASTER MANAGEMENT
(OPEN ELECTIVE)**

UNIT-I

DISASTER MANAGEMENT AN OVER VIEW: Introduction of DM – Inter disciplinary -nature of the subject – Hyogo frame of work of action (HFA) (2005-2015) – Five priorities for action.

UNIT-II

NATURAL HAZARDS AND DISASTER AND THEIR MANAGEMENT: Case study methods of the following: floods, droughts – Earthquakes – global warming, cyclones & Tsunamis – Post Tsunami hazards along the Indian coast – landslides.

UNIT-III

MAN MADE DISASTER AND THEIR MANAGEMENT ALONG WITH CASE STUDY METHODS OF THE FOLLOWING: Fire hazards – transport hazard dynamics – solid waste management – post disaster – bio terrorism -threat in mega cities, rail and air craft's accidents, and Emerging infectious diseases & Aids and their management.

UNIT-IV

RISK AND VULNERABILITY: Building codes and land use planning – social vulnerability – environmental vulnerability – Macroeconomic management and sustainable development, climate change risk rendition – financial management of disaster – related losses.

UNIT-V

ROLE OF TECHNOLOGY IN DISASTER MANAGERMENTS: Disaster management for infra structures, taxonomy of infra structure – treatment plants and process facilities-electrical substations- roads and bridges-mitigation programme for earth quakes –flowchart , geospatial information in agriculture drought assessment-multimedia technology in disaster risk management and training- transformable indigenous knowledge in disaster reduction.

UNIT-VI

EDUCATION AND COMMUNITY PREPAREDNESS: Education in disaster risk reduction-Essentials of school disaster education-Community capacity and disaster resilience-Community based disaster recovery -Community based disaster management and social capital-Designing resilience- building community capacity for action

UNIT-VII

MULTI-SECTIONAL ISSUES: Impact of disaster on poverty and deprivation-Climate change adaptation and human health -Exposure , health hazards and environmental risk-Forest management and disaster risk reduction.-Institutional capacity in disaster management -The Red cross and red crescent movement.-Corporate sector and disaster risk reduction- A community focused approach

UNIT-VIII

FIELD VISIT: Visit to a local area/site where natural or manmade hazard has occurred and prepare a report with the following details i) location of site ii) nature of the hazard(natural or manmade) iii) details of loss of life and property iv) response from the government/NGO etc. v) whether the response is adequate or not vi) the role of technology in risk reduction vii) suggestions for improvement of disaster response/preventive measures viii) conclusions

TEXT BOOKS:

1. Disaster management – Global challenges and local solutions. Edited by Rajib shah and R R Krishnamurthy(2009) published by universities press.
2. Disaster management – future challenges and oppurtutines(2007) editor by Jagbir singh. Published by I K international publishing house pvt.ltd.

REFERENCE BOOK:

1. Disaster management edited by H K Gupta (2003) published by universities press

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Civil Engineering. I-Sem.

**INDUSTRIAL WATER AND WASTE WATER MANAGEMENT
(OPEN ELECTIVE)**

UNIT – I

Quality requirements of boiler and cooling waters – Quality requirements of process water for Textiles – Food processing and Brewery Industries – Boiler and Cooling water requirements and treatment methods.

UNIT – II

Basic Theories of Industrial Wastewater Management – Volume reduction – Strength reduction – Neutralization – Equalization and proportioning. Joint treatment of industrial wastes and domestic sewage – consequent problems.

UNIT – III

Industrial waste water discharges into Streams, Lakes and oceans and problems, Land treatment - Recirculation of Industrial Wastes.

UNIT – IV

Use of Municipal waste water in Industries – Advanced water treatment - Adsorption, Reverse Osmosis, Ion Exchange, Ultra filtration, Defluoridation, Removal of Iron and Manganese, Removal of Colour and Odour.

UNIT – V

Manufacturing Process and origin of liquid waste from Textiles, Paper and Pulp industries, Thermal Power Plants and Special Characteristics, Effects and treatment methods.

UNIT – VI

Manufacturing Process and origin of liquid waste from Fertilizers, Distillers Dairy and Food Processing industries, Special Characteristics, Effects and treatment methods.

UNIT – VII

Manufacturing Process and origin of liquid waste from Sugar Mills, Steel Plants, Oil Refineries, and Pharmaceutical Plants, Special Characteristics, Effects and treatment methods.

UNIT – VIII

Common Effluent Treatment Plants – Advantages and Suitability, Limitations, Effluent Disposal Methods.

TEXT BOOK:

1. Waste Water Treatment by M.N. Rao and A.K. Dutta, Oxford & IBH, New Delhi.

REFERENCE BOOKS:

1. Liquid waste of Industry by Nemerow.
2. Water and Waste Water Technology by Mark J. Hammer and Mark J. Hammer (Jr).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

ARCHITECTURE AND TOWN PLANNING
(OPEN ELECTIVE)

UNIT – I

HISTORY OF ARCHITECTURE: Western Architecture: Egyptian, Greek, Roman Architectures- Orders. Indian Architecture: Vedic age, Indus valley civilization– Buddhist period: Stambas, Stupa, Toranas, Chaityas, Viharas – Hindu temples: Dravidian and Indo Aryan Styles- Principle factors- Temple of Aihole, Mahabalipuram, Madurai, Deogarh, Bhuvaneshwar, Mount Abu. Indo Sarsanic Architecture: Mosque - Palace - Fort - Tomb.

UNIT – II

ARCHITECTURAL DESIGN: Principles of designing – Composition of Plan – relationship between plan and elevation- building elements, form, surface texture, mass, line, color, tone- Principles of Composition: Unity, contrast, proportion, scale, balance, circulation, rhythm, character, expression.

UNIT - III

PRINCIPLES OF PLANNING: Principles of planning a residence- site selection, site orientation- aspect, prospect, grouping, circulation, privacy, furniture requirements, services and other factors.

UNIT - IV

POST-CLASSIC ARCHITECTURE: Introduction of post-classic architecture- contribution of eminent architects to modern period.

Brief summary of post-classic architecture – Indian and western architectural contribution of eminent architects: Edward Lutyens, Le Corbusier, Frank Lloyd Wright, Walter Groping, Vender Rohe, Caarihan, Nervi, Oscar Niemyer, Edward Durell Stone.

UNIT – V

HISTORICAL BACK GROUND OF TOWN PLANNING: Town planning in India – town plans of mythological Manasa – town plans of ancient Indian towns: Harappa, Mohenjodaro, Pataliputra, Vijayanagara, Delhi – Town plans of Egypt, Acropolis, Jerusalem, Mecca, Rome, Paris, London, New York, Istanbul.

UNIT – VI

MODERN TOWN PLANNING: Zoning- Roads and road traffic- Housing- Slums, Parks, Play grounds- Public Utility Services- Surveys and maps for planning- Neighbourhood Planning.

UNIT - VII

STANDARDS OF TOWN PLANNING: Planning new towns, planning standards and specifications, national and regional planning, town planning and legislation-planning regulations and limitations.

UNIT – VIII

Land Scaping and Expansion of Towns: Land scaping for the towns, horizontal and vertical expansion of towns- garden cities, satellite towns- floating towns- sky scrapers-pyramidal cities.

REFERENCE BOOKS:

ARCHITECTURE

1. The great ages of World Architecture by G.K. Hiraskar.
2. Drafting and Design for Architecture by Hepler, Cengage Learning
3. Architect's Portable Handbook by John Patten Guthrie – McGraw.Hill International Publications.
4. Indian Architecture – Vol. I and II by Percy Brown, Taraporevala Publications, Bombay.
5. Planning and Design of Buildings – Section of Architecture by Y. S. Sane.
6. Mordern Ideal Homes for India by R. S. Deshpande.

TOWN PLANNING

1. Fundamentals of Town Planning – G.K.Haraskar.
2. Town and County Planning – A.J.Brown and H.M.Sherrard.
3. Town Design – Federik Glbbard, Architectural press, London.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. I-Sem.

GIS AND CAD LABORATORY.

GIS:

SOFTWARES:

1. Arc GIS 9.0
2. ERDAS 8.7
3. Mapinfo 6.5

Any one or Equivalent.

EXERCISES IN GIS:

1. Digitization of Map/Topsheet
2. Creation of thematic maps.
3. Study of features estimation
4. Developing Digital Elevation model
5. Simple applications of GIS in water Resources Engineering & Transportation Engineering.

COMPUTER AIDED DESIGN AND DRAWING:

SOFTWARE:

1. STAAD PRO / Equivalent/
2. STRAAP
3. STUDDS

EXERCISES:

1. 2-D Frame Analysis and Design
2. Steel Tabular Truss Analysis and Design
3. 3-D Frame Analysis and Design
4. Retaining Wall Analysis and Design
5. Simple tower Analysis and Design

TEXT BOOK:

1. Concept and Techniques of GIS by C.P.L.O. Albert, K.W. Yong, Prentice Hall Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Civil Engineering. I-Sem.

WATER AND WASTEWATER ENGINEERING LAB.

LIST OF EXPERIMENTS

1. Determination of pH and Electrical Conductivity (Salinity) of Water and Soil.
2. Determination and estimation of Total Hardness – Calcium & Magnesium.
3. Determination of Alkalinity/Acidity.
4. Determination of Chlorides in water and soil.
5. Determination and Estimation of total solids, organic solids and inorganic solids and settleable solids by Imhoff Cone.
6. Determination of Iron.
7. Determination of Dissolved Oxygen with D.O. Meter & Wrinklers Method and B.O.D.
8. Determination of Nitrogen.
9. Determination of total Phosphorous.
10. Physical parameters – Temperature, Colour, Odour, Turbidity, Taste.
11. Determination of C.O.D.
12. Determination of Optimum coagulant dose.
13. Determination of Chlorine demand.
14. Presumptive Coliform test.

NOTE: At least 10 of the above experiments are to be conducted.

LIST OF EQUIPMENTS

- 1) pH meter
- 2) Turbidity meter

- 3) Conductivity meter
- 4) Hot air oven
- 5) Muffle furnace
- 6) Dissolved Oxygen meter
- 7) U – V visible spectrophotometer
- 8) COD Reflux Apparatus
- 9) Jar Test Apparatus
- 10) BOD incubator
- 11) Autoclave
- 12) Laminar flow chamber
- 13) Hazen's Apparatus

TEXT BOOKS:

1. Standard Methods for Analysis of Water and Waste Water – APHA
2. Chemical Analysis of Water and Soil by KVSG Murali Krishna, Reem Publications, New Delhi

REFERENCE BOOKS:

1. Relevant IS Codes.
2. Chemistry for Environmental Engineering by Sawyer and Mc. Carty.

NOTE: The Conclusions of the experiment work done must be given after a thorough discussion of the result using Critical Analysis, Standards, Relevant Codes of practice, Range of Values, Applications, Suitability etc. with Quantitative expressions.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Civil Engineering. II-Sem.

ESTIMATING, SPECIFICATION AND CONTRACTS

PART-A

UNIT – I

General items of work in Building – Standard Units - Principles of working out quantities for detailed and abstract estimates –Approximate method of Estimating.

UNIT – II

Rate Analysis – Working out data for various items of work over head and contingent charges.

UNIT-III

Earthwork for roads and canals, Reinforcement bar bending and bar requirement schedules.

UNIT – IV

Contracts – Types of contracts – Contract Documents – Conditions of contract, Valuation of buildings.

UNIT – V

Standard specifications for different items of building construction.

PART-B

Detailed Estimates of Buildings using individual wall method & centre line method.

FINAL EXAMINATION PATTERN:

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

TEXT BOOKS

1. Estimating and Costing by B.N. Dutta, UBS publishers, 2000.
2. Estimating and Costing by G.S. Birdie

REFERENCE BOOKS:

1. Standard Schedule of rates and standard data book by public works department.
2. I. S. 1200 (Parts I to XXV – 1974/ method of measurement of building and Civil Engineering works – B.I.S.)
3. Estimation, Costing and Specifications by M. Chakraborti; Laxmi publications.
4. National Building Code

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering,II-Sem.

ADVANCED STRUCTURAL DESIGN
(ELECTIVE –II)

UNIT – I

Design of Retaining walls, cantilever and counter fort

UNIT – II

Design of RCC water tanks, Circular and rectangular types.

UNIT – III

Design of steel water tanks

UNIT - IV

Introduction to bunkers, silos and Chimney, concepts of loading and Design.

UNIT – V

Introduction to concrete bridges, IRC loading, slab bridges and T - beam bridges design concepts.

UNIT – VI

Design of plate girder railway bridges and gantry girders.

UNIT – VII

Design of steel truss bridges for railway loading

UNIT – VIII

Multistory building system – detailing for Ductility, Design for earthquake and wind forces.

TEXT BOOKS:

1. Advanced Reinforced concrete structures by Varghese, Prentice Hall India.Pvt. Ltd.
2. Design drawing of concrete and steel structures by N.Krishna Raju University Press 2005.
3. Reinforced concrete structures Vol-2 by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications Pvt. Ltd., New Delhi

REFERENCE BOOKS:

1. Essentials of Bridge Engineering by D.Johnson Victor, Oxford and IBM publication Co., Pvt. Ltd.
2. Reinforced concrete design by S.U. Pillai and D.Menon, Tata Mc.Ghrawhill Publishing Company

Codes: Relevant IS: codes.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. II-Sem.

GROUND WATER DEVELOPMENT AND MANAGEMENT
(ELECTIVE –II)

UNIT – I

INTRODUCTION

Ground Water Occurrence, formation properties affecting Ground water-porosity, Specific yield and Specific retention, permeability, transmissivity and storage coefficient. Differential equation governing ground water flow

UNIT – II

WELL HYDRAULICS

Unsteady radial flow into a well – Non-equilibrium equations – Theis solution – Jacob and Chow's methods, Leaky aquifers.

UNIT – III

GEOPHYSICS

Surface and Subsurface Investigations: Surface methods of exploration – Electrical resistivity and Seismic refraction methods, Sub-surface methods – Geophysical logging and resistivity logging. Aerial Photogrammetry applications

UNIT – IV

WELL DESIGN

Water well design-well diameter, well depth, well screen-screen length, slot size, screen diameter and screen selection, design of collector wells, infiltration gallery

UNIT V

WELL CONSTRUCTION AND DEVELOPMENT

Water wells, drilling methods-rotary drilling, percussion drilling, well construction-installation of well screens-pull-back method, open-hole, bail-down and wash-down methods, well development-mechanical surging using compressed air, high velocity jetting of water, over pumping and back washing, well completion, well disinfection, well maintenance.

UNIT VI**ARTIFICIAL RECHARGE**

Artificial Recharge of Ground Water: Concept of artificial recharge, recharge methods-basin, stream-channel, ditch and furrow, flooding and recharge well methods, recharge mounds and induced recharge

UNIT – VII**SEAWATER INTRUSION**

Saline Water Intrusion: Occurrence of saline water intrusion, Ghyben-Herzberg relation, Shape of interface, control of seawater intrusion.

UNIT – VIII**GROUNDWATER BASIN MANAGEMENT**

Concepts-hydrologic equilibrium equation, basin management by conjunctive use.

TEXT BOOKS:

1. Ground water Hydrology by David Keith Todd, John Wiley & Son, New York.
2. Groundwater by H.M.Raghunath, Wiley Eastern Ltd.
3. Ground water assessment and development by KR Karanth

REFERENCE BOOKS:

1. Groundwater by Bower, John Wiley & sons.
2. Groundwater System Planning & Managemnet – R.Willes & W.W.G.Yeh, Prentice Hall.
3. Applied Hydrogeology by C.W.Fetta, CBS Publishers & Distributors.

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IV Year B.Tech. Civil Engineering. II-Sem.

**ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(ELECTIVE –II)**

UNIT – I

Basic concept of EIA : Initial environmental Examination, Elements of EIA, - factors affecting E-I-A Impact evaluation and analysis, preparation of Environmental Base map, Classification of environmental parameters.

UNIT – II

E I A Methodologies: introduction, Criteria for the selection of EIA Methodology, E I A methods, Ad-hoc methods, matrix methods, Network method Environmental Media Quality Index method, overlay methods, cost/benefit Analysis.

UNIT – III

Impact of Developmental Activities and Land use: Introduction and Methodology for the assessment of soil and ground water, Delineation of study area, Identification of activities.

UNIT-IV

Procurement of relevant soil quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measures. E I A in surface water, Air and Biological environment: Methodology for the assessment of Impacts on surface water environment, Air pollution sources, Generalized approach for assessment of Air pollution Impact.

UNIT – V

Assessment of Impact of development Activities on Vegetation and wildlife, environmental Impact of Deforestation – Causes and effects of deforestation.

UNIT – VI

Environmental Audit & Environmental legislation objectives of Environmental Audit, Types of environmental Audit, Audit protocol, stages of Environmental Audit, onsite activities, evaluation of Audit data and preparation of Audit report.

UNIT-VII

Post Audit activities, The Environmental pollution Act, The water Act, The Air (Prevention & Control of pollution Act.), Mota Act, Wild life Act.

UNIT-VIII

Case studies and preparation of Environmental Impact assessment statement for various Industries.

TEXT BOOKS:

1. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B.S. Publication, Sultan Bazar, KAKINADA.
2. Environmental Science and Engineering, by J. Glynn and Gary W. Hein Ke – Prentice Hall Publishers

REFERENCE BOOKS:

1. Environmental Science and Engineering, by Suresh K. Dhaneja – S.K. Kataria & Sons Publication., New Delhi.
2. Environmental Pollution and Control, by Dr H.S. Bhatia – Galgotia Publication (P) Ltd, Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. II-Sem.

WATERSHED MANAGEMENT
(ELECTIVE –III)

UNIT-I

INTRODUCTION: Concept of watershed development, objectives of watershed development, need for watershed development in India, Integrated and multidisciplinary approach for watershed management.

UNIT-II

CHARACTERISTICS OF WATERSHED: size, shape, physiography, slope, climate, drainage, land use, vegetation, geology and soils, hydrology and hydrogeology, socio-economic characteristics, basic data on watersheds.

UNIT-III

PRINCIPLES OF EROSION: Types of erosion, factors affecting erosion, effects of erosion on land fertility and land capability, estimation of soil loss due to erosion, Universal soil loss equation.

UNIT-IV

MEASURES TO CONTROL EROSION: Contour techniques, ploughing, furrowing, trenching, bunding, terracing, gully control, rockfill dams, brushwood dam, Gabion.

UNIT-V

WATER HARVESTING: Rainwater Harvesting, harvesting structures, soil moisture conservation, check dams, artificial recharge, farm ponds, percolation tanks.

UNIT-VI

LAND MANAGEMENT: Land use and Land capability classification, management of forest, agricultural, grassland and wild land. Reclamation of saline and alkaline soils.

UNIT-VII

ECOSYSTEM MANAGEMENT: Role of Ecosystem, crop husbandry, soil enrichment, inter, mixed and strip cropping, cropping pattern, sustainable agriculture, bio-mass management, dry land agriculture, horticulture, social

forestry and afforestation.

UNIT-VIII

Planning of watershed management activities, people's participation, preparation of action plan, administrative requirements.

TEXT BOOKS:

1. Watershed Management by JVS Murthy, - New Age International Publishers.
2. Water Resource Engineering by R.Awurbs and WP James, - Prentice Hall Publishers.

REFERENCE BOOKS:

1. Land and Water Management by VVN Murthy, - Kalyani Publications.
2. Irrigation and Water Management by D.K.Majumdar, Prentice Hall of India.

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IV Year B.Tech. Civil Engineering. II-Sem.

FINITE ELEMENT METHODS
(ELECTIVE –III)

UNIT -I

Introduction: Concepts of FEM, Steps involved, merits & demerits, energy principles, discretization, Rayleigh –Ritz method of functional approximation.

UNIT -II

Principles of Elasticity: Equilibrium equations, strain displacement relationships, constitutive relationships for plane stress, plane strain and axi-symmetric bodies of revolution with axi-symmetric loading.

UNIT -III

One Dimensional Elements: Stiffness matrix for bar element, shape functions for one dimensional elements, one dimensional problems.

UNIT –IV

Two Dimensional Elements: Different types of elements for plane stress and plane strain analysis, Displacement formulation, generalized coordinates, shape functions, convergent and compatibility requirements, geometric invariance, Natural coordinate system, area and volume coordinates, generation of element stiffness matrix and nodal load vector for 3-node triangular element and four node rectangular elements.

UNIT –V

Finite element formulation for Beams: Stiffness matrix, load vector, comparison of FE solution to exact solution.

UNIT –VI

Isoparametric formulation – Concepts of isoparametric elements for 2D analysis -formulation of CST element, 4 –noded and 8-noded iso-parametric quadrilateral elements –Lagrangian and Serendipity elements.

UNIT-VII

Axi-symmetric analysis- Basic principles-Formulation of 4-node iso-parametric axi-symmetric element

UNIT-VIII

Solution Techniques: Numerical Integration using Gauss quadrature, static condensation, assembly of elements and solution techniques for static loads.

TEXT BOOK:

1. Finite Element Methods in Engineering by Tirupati.R. Chandrupatla and AshokD. Belegundu - Pearson Education Publications.
2. A first course in the Finite element method by Daryl L. Logan, Cengage learning India

REFERENCE BOOKS:

1. Concepts and Applications of Finite Element Analysis by Robert D.Cook, David S. Malkus and Michael E.Plesha. John Wiley & Sons.
2. Finite Element analysis – Theory & Programming by C.S.Krishna Murthy- Tata Mc.Graw Hill Publishers.
3. Text book of Finite Element analysis by P.Seshu – Prentice Hall of India.

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IV Year B.Tech. Civil Engineering. II-Sem.

**PAVEMENT ANALYSIS DESIGN AND EVALUATION
(ELECTIVE –III)**

UNIT – I

MATERIAL SPECIFICATIONS:

Types of pavement Construction –MORTH specifications for construction of Gravel roads, WBM layers, bituminous pavement layers, CC pavements.

UNIT – II

PAVEMENT FAILURES

Causes of pavement failures – failures in flexible pavements – alligator cracking – consolidation of pavement failures – shear failure – longitudinal cracking – frost heaving – reflection cracking – formation of waves and corrugation.

FAILURES IN CEMENT CONCRETE PAVEMENTS: factors – scaling of cement concrete – shrinkage cracks – spalling of joints – warping cracks – mud pumping – structural cracking.

UNIT – III

MAINTENANCE OF HIGHWAYS:

Routine maintenance – periodic maintenance – special repairs – maintenance of earth roads – maintenance of WBM roads – maintenance of bituminous surfaces – special repairs in flexible pavements – maintenance of CC roads – special repairs of CC pavements.

UNIT – IV

PAVEMENT EVALUATION:

Functional Evaluation of Pavements : Evaluation of pavement surface condition – pavement surface index – cracking – pot holes – rut depth etc... – **Structural Evaluation of Pavements :** methods evaluation – static loading – Benkelman beam method – falling weight deflection (FWD) – impulse loading – dynamic cone penetration (DCP).

UNIT – V

STRENGTHENING OF EXISTING PAVEMENTS

Objectives – types of overlay – Design of overlay – flexible overlay over flexible pavement – Overlay design by Benkelman beam deflection studies – Rigid overlay over rigid pavement – Flexible overlay over rigid pavement – Rigid overlay over flexible pavement.

UNIT – VI

HIGHWAY DRAINAGE

Importance of highway drainage – requirements of highway drainage system – surface drainage – design of surface drainage system cross drainage – subsurface drainage – lowering of water table – control of seepage flow – control of capillary rise – design of subsurface drainage system.

UNIT – VII

PAVEMENT MANAGEMENT SYSTEM (PMS)

Need for PMS – Pavement deterioration models – HDM – Project level and network level management.

UNIT – VIII

ASSET MANAGEMENT (AM)

Need for AM – Concepts – Network management – Traffic management – safety management – Bridge management.

TEXT BOOKS:

1. Highway Engineering – S.K.Khanna & C.E.J.Justo, New chand & Bros., Roorke.
2. Text book of highway engineering, R. Srinivasa kumar, Universities press pvt. Ltd. 2011.
3. Highway engineering – LR Kadiyali and lal – khanna publishers.

REFERENCE BOOKS:

1. Highway engineering, Paul H. wright and Karen Dixon – John wiley & sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. II-Sem.

SOIL DYNAMICS AND MACHINE FOUNDATIONS
(ELECTIVE –IV)

UNIT – 1

Theory of vibrations: Basic definitions- free and forced vibrations with and without damping for single degree freedom system- Resonance and its effect – magnification – Logarithmic decrement – Transmissibility

UNIT – II

Natural frequency of foundation – Soil system: Barkan’s and IS methods – pressure bulb concept – Pauw’s Analogy.

UNIT – III

Wave propagation: one dimensional wave motion – propagation in an elastic infinite medium- wave propagation in an elastic half space – propagation of flexural waves in beams on elastic foundations

UNIT – IV

Dynamic Soil Properties: Field and Laboratory methods of determination – Uphole, Down hole and cross hole methods –Cyclic plate load test – Block vibration test – Determination of Damping factor.

UNIT – V

Dynamic response of foundations: Shallow and deep foundations – dynamic bearing capacity theory – codal provisions – dynamic response of deep foundations- dynamic testing of piles

UNIT – VI

Block foundation: Degrees of freedom - analysis under different modes of vibration- codal provisions for design and construction of foundations for reciprocating machine, impact type and rotary type

UNIT – VII

Seismic stability of slopes- analysis for stability of slopes- Swedish circle, friction circle, Newmark sliding block method- reliability of slopes of earth dam

Unit – VIII

Vibration Isolation: Generation and propagation of vibrations – basic concept of vibration isolation- base isolation- shock isolation- seismic isolation of bridges

TEXT BOOKS:

1. Soil Dynamics and earth quake of engineering- Bharat Bhushan Prasad, PHI publications
2. Advanced Soil Dynamics and earth quake of engineering- Bharat Bhushan Prasad, PHI publications

REFERENCE BOOKS:

1. Soil Dynamics by Shamsheer Prakash
2. Vibration of soils and foundations by Richart, Hall and Woods, Prentice Hall.

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IV Year B.Tech. Civil Engineering. II-Sem.

ADVANCED STRUCTURAL ANALYSIS
(ELECTIVE –IV)

UNIT - I

Introduction to theory of elasticity: Notations for forces and stresses, components of stresses, components of strains, Hooke's law.

UNIT – II

Plane stress and plane strain: Definitions, differential equations of equilibrium, boundary conditions, and compatibility equations.

UNIT - III

Two dimensional problems in rectangular co-ordinates: Airy stress function, solution by polynomials, saint venant principle, solution of bi-harmonic equation using Fourier series.

UNIT - IV

Two dimensional problems in polar co-ordinates: general equations in polar co-ordinates, solution of bi-harmonic equation for axial symmetry, general solution of bi-harmonic equation, bending of a curved bar, analysis of thick cylinder.

UNIT - V

Introduction to structural dynamics: Dynamic loadings, formulation of equation of motion – Newton's second law of motion, D'Alembert's principle, solution of undamped single degree of freedom system.

UNIT - VI

FREE VIBRATIONS: Damped single degree of freedom system, Viscous damping, equation of motion, critically damped, over damped and under damped system, logarithmic decrement.

UNIT - VII

FORCED VIBRATIONS: Response of one degree of freedom system to harmonic loading: undamped harmonic excitation, damped harmonic excitation, evaluation of damping at resonance, response to support motion.

UNIT - VIII

RESPONSE TO IMPULSIVE LOADING: Duhamel integral, numerical evaluation of Duhamel integral for undamped system.

TEXT BOOKS:

1. Mechanics of solids by Arbind Kumar Singh, Prentice-Hall of India, New Delhi.
2. Theory of Elasticity by Timoshenko and Goodier, McGraw Hill Book Company, New Delhi.
3. Structural Dynamics by Mario Paz, CBS Publishers, New Delhi.

REFERENCE BOOKS:

1. Theory of Elasticity by Sadhu Singh, Khanna Publishers.
2. Dynamics of structures by A. K. Chopra, Prentice Hall of India.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. Civil Engineering. II-Sem.

WATER RESOURCES SYSTEM PLANNING AND MANAGEMENT
(ELECTIVE -IV)

UNIT – I

INTRODUCTION: concepts of systems analysis, definition, systems approach to water resources planning and management, role of optimization models, objective function and constraints, types of optimization techniques.

UNIT – II

LINEAR PROGRAMMING –I: Formulation of linear programming models, graphical method, simplex method, application of Linear programming in water resources.

UNIT – III

LINEAR PROGRAMMING – II: Revised simplex method, duality in linear programming, sensitivity and past optimality analysis.

UNIT – IV

DYNAMIC PROGRAMMING: principles of optimality forward and backward recursive dynamic programming, case of dimensionality, application for resource allocation.

UNIT – V

NON-LINEAR OPTIMATIZATION TECHNIQUES: Clerical of method optimization, Kuch-Tucleer, gradential based research techniques for simple unconstrained optimization.

UNIT – VI

SIMULATION: application of simulation techniques in water resources.

UNIT – VII

WATER-RESOURCES ECONOMICS: Principles of Economic analysis,

benefit-cost analysis socio economic intuitional and pricing of water resources.

UNIT – VIII

WATER RESOURCES MANAGEMENT: Planning of reservoir system, optimal operation of single reservoir system, allocation of water resources, optimal cropping pattern, conjunctive use of surface and sub-surface water resources.

TEXT BOOKS:

1. Water Resources System Analysis – Vedula & Mujumdar – Tata Mc.Graw Hill Company Ltd. 2005.
2. Water Resources Economics - James & Lee. Oxford Publishers 2005.

REFERENCE BOOK:

1. Optimal design of water distribution networks P.R.Bhave, Narosa Publishing house 2003.

