ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

CIVIL ENGINEERING

For

B.TECH FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2002-2003)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KUKATPALLY, HYDERABAD - 500 072.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

B. Tech. (Regular) Four Year Degree Course (Revised) Academic Regulations

(Effective for the students studying I year
from the Academic Year 2002-2003 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:

   i. He has pursued a course of study for not less than four academic years and not more than eight academic years.

   ii. He has registered for and studied all the subjects for a total of 212 credits and secured all the 212 credits.

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in the course and their seat shall stand cancelled.

3. **Courses of study:**

   The following courses of study are offered at present for specialization for the B. Tech. Degree:

   1. Aeronautical Engineering
   2. Bio-Medical Engineering
   3. Bio-Technology
   4. Chemical Engineering
   5. Civil Engineering
   6. Computer Science and Engineering
   7. Computer Science and Systems Engineering

8. Electrical and Electronics Engineering
9. Electronics and Communication Engineering
10. Electronics and Computer Engineering
11. Electronics and Control Engineering
12. Electronics and Instrumentation Engineering
13. Electronics and Telematics Engineering
14. Information Technology
15. Instrumentation and Control Engineering
16. Mechanical (Mechatronics) Engineering
17. Mechanical (Production) Engineering
18. Mechanical Engineering
19. Metallurgical Engineering
20. Metallurgy and Material Technology

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

4. Credits:

	Semester Pattern		Yearly Pattern	
	Periods / Week	Credits	Periods / Week	Credits
Theory	04	04	03	06
Practicals	03	02	03	04
Practicals	06	04	06	08
Project	08	08	—	—

5. Distribution and Weightage of Marks:

i. The performance of a student in each semester / I year shall be evaluated subject –wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, project shall be evaluated for 200 marks.

ii. For theory subjects the distribution shall be 20 marks for Internal Evaluation and 80 marks for the End-Examination.

iii. For theory subjects, there shall be 5 objective type tests for a duration of 20 minutes each during the semester. Each test shall contain 20 objective type questions for 20 marks. The best 4 tests will be considered for awarding 20 sessionals marks. For the I year class which shall be on yearly basis, there shall be 6 tests of the same duration and weightage as mentioned above. However, the performance in the best 4 tests will be considered for awarding 20 sessional marks.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 End Examination marks. Of the 25 marks for internal, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned and another member of the staff of the same department of the same institution.

v. For the subject having design and / or drawing, and estimation, the distribution shall be 20 marks for internal evaluation (10 marks for day-to-day work and 10 marks for internal tests). There shall be two internal tests in a Semester and the better of the two will be taken into consideration. However in the I year class, there shall be three tests and the best two will be taken into consideration for a maximum of 20 marks. The End Examination shall be for a total of 80 marks.

vi. The Engineering Drawing Practice Course wherever offered is to be treated as a practical course. Evaluation method adopted for practicals shall be followed here also.

vii. Out of a total of 200 marks for the project work, 40 marks shall be for Internal Evaluation and 160 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by a board of examiners consisting of Guide, Head of the Department and an external examiner. 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.

viii. Laboratory marks and the sessional marks awarded by the College are not final. They are subject to scrutiny and scaling by the University wherever felt desirable. The uniform distribution of awarding of Sessional marks and Laboratory marks will be referred to a Committee. The Committee will arrive at a 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 visit the College.

6. **Attendance:**

i. A student has to put in a minimum of 75% of attendance in aggregate of all the subjects for acquiring credits in the I year and / or each semester thereafter.

ii. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester or I year may be granted by the College Academic Committee.

iii. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / I year.

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 / I year are not eligible to take their end examination of that class and their registration shall stand cancelled. They may seek re-admission for that semester / I year when offered next.

vi. Condonation of shortage of attendance as stipulated in 6 (ii) above shall be granted on genuine and valid grounds with supporting evidence.

vii. A stipulated fee shall be payable towards condonation of shortage of attendance.

7. **Minimum Academic Requirements:**

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 6.

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 shall successfully complete all the I year subjects from 3 regular consecutive examinations and 3 supplementary consecutive examinations of I year from the date of admission. If he has failed to do so he shall forfeit the seat in course and his seat shall stand cancelled.

iii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 56 credits from the ~~consecutive~~ one regular and supplementary examinations of I year and ~~from~~ the regular and one supplementary examination of II year I semester irrespective of whether the candidate takes the examination or not.

Revised U.O. No. 1807/04 4.6.04

iv. A student shall be promoted from third year to fourth year only if he passes all the subjects of I year and fulfils the academic requirements of total 100 credits (including 56 credits of I year) from the examinations,

a. Two regular and Two supplementary examinations of I year.

b. Two regular and ~~one~~ two supplementary examinations of II Year I Semester

c. Two regular and one supplementary examinations of II Year II Semester

d. One regular III year I Semester examination.

v. A student shall earn all the 212 credits offered as indicated in the course structure.

vi. Students who fail to earn all the 212 credits offered as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in the course and their seat shall stand cancelled.

8. **Withholding of Results:**

The result of a student shall be withheld if:

i. He has not cleared any dues to the Institution / Hostel;

ii. A case of disciplinary action against him is pending disposal;

9. **Course pattern:**

i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.

ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

10. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

First Class with Distinction	70% and above	From the aggregate marks secured for 212 Credits.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

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

11. Minimum Instruction Days:

The minimum instruction for each semester / I year shall be 90/180 working days excluding examination days.

12. There shall be no branch transfers after the completion of admission process.

13. There shall be no place transfer within the Constituent Colleges of Jawaharlal Nehru Technological University for B.Tech. Regular / FDH / CCC and P. G. Programmes.

General:

14. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

15. The academic regulation should be read as a whole for the purpose of any interpretation.

16. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.

17. 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.

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First Class with Distinction	70% and above	From the aggregate marks secured for 156 Credits. (i.e II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

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

6. All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (LES)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

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

(Effective for the students getting admitted into II year from the Academic Year 2003-2004 and onwards)

1. The Students have to acquire 156 credits from II to IV year of B.Tech. Programme (Regular) for the award of the degree.

2. Students, who fail to fulfill the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.

3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4. Promotion Rule:

   A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 44 credits from the examinations following

   a. Two regular and one supplementary examinations of II Year I Semester

   b. One regular and one supplementary examinations of II Year II Semester

   c. One regular III year I Semester examination

5. Award of Class:

   After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I B.TECH

CIVIL ENGINEERING: ANNUAL PATTERN
(Common with Mech. Engg: - Mechanics & Mech. Engg. Production)

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	D	C
CE 1021	ENGLISH	3	0	0	6
CE 1022	MATHEMATICS – I	3+1*	0	0	6
CE 1023	ENGG.PHYSICS	2+1*	0	0	4
CE 1024	APPLIED CHEMISTRY	2	0	0	4
CE 1025	ENGG.MECHANICS	3	0	0	6
CE 1026	INTRODUCTION TO COMPUTERS	3	0	0	6
CE 1027	ENGG. GRPAHICS	0	0	6	8
CE 1028	ENGG.PHYSICS LAB	0	3/2	0	2
CE 1029	AAPLIED CHEMISTRY LAB	0	3/2	0	2
CE 1030	COMPUTER LAB	0	6	0	8
CE 1031	WORKSHOP PRACTICE	0	3	0	4
	TOTAL	**16+2***	**12**	**6**	**56**

Note : All University examinations (theory and practical) are of 3 hours duration.

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	C
CE 2121	MATHEMATICS – II	4	0	4
CE 2122	MECHANICAL & ELECTRICAL SCIENCES	4	0	4
CE 2123	STRENGTH OF MATERIALS - I	4	0	4
CE 2124	BUILDING MATERIALS AND CONSTRUCTION	4	0	4
CE 2125	SURVEYING - I	4	0	4
CE 2126	FLUID MECHANICS	4	0	4
CE 2127	STRENGTH OF MATERIALS LABORATORY - I	0	3	2
CE 2128	SURVEYING FIELD WORK -I	0	3	2
	TOTAL	**24**	**6**	**28**

Note : All University examinations (theory and practical) are of 3 hours duration.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	C
CE 2221	PROBABILITY & STATISTICS	4	0	4
CE 2222	BUILDING PLANNING & CONSTRUCTION MANAGEMENT	4	0	4
CE 2223	STRENGTH OF MATERIALS - II	4	0	4
CE 2224	HYDRAULICS & HYDRAULICS MACHINERY	4	0	4
CE 2225	SURVEYING – II	4	0	4
CE 2226	STRUCTURAL ANALYSIS – I	4	0	4
CE 2227	SURVEYING FIELD WORK LABORATORY	0	3	2
CE 2228	FLUID MECHANICS & HYDRAULIC MACHINERY LAB.	0	3	2
	TOTAL	**24**	**6**	**28**

Note : All University examinations (theory and practical) are of 3 hours duration.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	C
CE 3121	MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS	4	0	4
CE 3122	STRUCTURAL ENGG., DESIGN&DRAWING –I (RCC)	4	0	4
CE 3123	CONCRETE TECHNOLOGY &PRESTRESSED CONCRETE	4	0	4
CE 3124	WATER RESOURCES ENGINEERING -I	4	0	4
CE 3125	ENVIRONEMENTAL ENGG.,-I	4	0	4
CE 3126	ENGINEERING GEOLOGY	4	0	4
CE 3127	ENGINEERING GEOLOGY LAB.	0	3	2
CE 3128	ENVIRONMENTAL ENGG. LAB	0	3	2
	TOTAL	**24**	**6**	**28**

Note : All University examinations (theory and practical) are of 3 hours duration.

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
CE 3221	GEOTECHNICAL ENGINEERING	4	0	4
CE 3222	STRUCTURAL ANALYSIS - II	4	0	4
CE 3223	STRUCTURAL ENGG., DESIGN& DRAWING –II (STEEL)	4	0	4
CE 3224	WATER RESOURCES ENGG. –II	4	0	4
CE 3225	ESTIMATING, QUANTITY SURVEYING AND VALUATION	4	0	4
CE 3226	TRANSPORTATION ENGG.	4	0	4
CE 3227	GEOTECHNICAL ENGINEERING LAB	0	3	2
CE 3228	BUILDING DRAWING	0	3	2
	TOTAL	**24**	**6**	**28**

Note : All University examinations (theory and practical) are of 3 hours duration.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. I SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	C
CE 4121	FOUNDATION ENGINEERING	4	0	4
CE 4122	STRUCTURAL ENGINEERING DESIGN & DRAWING -III	4	0	4
CE 4123	FINITE ELEMENT METHODS	4	0	4
CE 4124	COMPUTER AIDED ANALYSIS & DESIGN	4	0	4
	ELECTIVE –I	4	0	4
CE 4125	SOIL DYNAMICS AND MACHINE FOUNDATIONS			
CE 4126	ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT			
CE 4127	HYDROLOGY			
CE 4128	BRIDGE ENGINEERING.			
CE 4129	DATA STRUCTURES THROUGH C			
	ELECTIVE - II	4	0	4
CE 4130	GROUND IMPROVEMENT TECHNIQUES			
CE 4131	PAVEMENT ANALYSIS, DESIGN AND EVALUATION			
CE 4132	ARCHITECTURE AND TOWN PLANNING			
CE 4133	ADVANCED COMMUNICATION SKILLS			
CE 4134	Air Pollution and Control			
CE 4135	COMPUTER -AIDED ANALYSIS & DESIGN LAB.	0	3	2
CE 4136	CONCRETE & HIGHWAY LAB	0	3	2
	TOTAL	**24**	**6**	**28**

(SYLLABI FOR THE ELECTIVES ARE GIVEN SEPARATELY)

Note : All University examinations (theory and practical) are of 3 hours duration.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. II SEMESTER

CIVIL ENGINEERING

COURSE STRUCTURE

CODE.NO	SUBJECT	T	P	C
	ELECTIVE – III	4	0	4
CE 4221	ADVANCED FOUNDATION ENGINEERING			
CE 4222	HYDRO POWER ENGINEERING			
CE 4223	DISASTER, MANAGEMENT AND REHABILITATION OF STRUCTURES			
CE 4224	DATA BASE MANAGEMENT SYSTEM.			
CE 4225	INDUSTRIAL WASTE AND WATE WATER MANAGEMENT			
	ELECTIVE – IV	4	0	4
CE 4226	GEOENVIRONMENTAL ENGINEERING			
CE 4227	PROFESSIONAL PRACTICE AND ENTREPRENEURSHIP			
CE 4228	ADVANCED STRUCTURAL ENGINEERING			
CE 4229	TRANSPORTATION PLANNING AND DESIGN			
CE 4230	REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS			
CE 4231	PROJECT WORK	0	-	8
	TOTAL	**8**	**-**	**16**

(SYLLABI FOR THE ELECTIVES ARE GIVEN SEPARATELY)

Note : All University examinations (theory and practical) are of 3 hours duration.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I B.Tech. **3 – 0 – 0 – 6** **CE1021**

ENGLISH

(Common for all branches)

The following text books of English are prescribed for I-B.Tech. Class of all branches in the Colleges of Engineering and Technology affiliated to Jawaharlal Nehru Technological University, Hyderabad. The exercises given are expected to be covered by the teacher in the classroom, the objective of the course being development of linguistic skills of the learners.

1. Text book of English for Engineers and Technologists, O.L
2. Masterminds, O.L.

UNIT – I

1. Energy, Unit 3: Alternative Sources (from A Text Book of English for Engineers and Technologists (O.L))
2. Jagadish Chandra Bose, (a Profile from The Trailblazers in Masterminds, O.L.).

UNIT II:

1. Computers, Unit 2: New Frontiers (from A Text Book of English for Engineers and Technologists, O.L)
2. Chandrasekhara Venkata Raman, (a Profile from The Trailblazers in Masterminds, O.L.)

UNIT – III:

1. Technology, Unit 3: Evaluating Technology (from A Text Book of English for Engineers and Technologists, O.L)
2. S. S. Bhatnagar, (a Profile from The Institution Builders in Masterminds, O.L.)

UNIT – IV:

1. Environment, Unit 1: Pollution,(from A Text Book of English for Engineers and Technologists, O.L)

2. Homi Jehangir Bhabha, (a Profile from The New Age in Masterminds, O.L.)

UNIT -V:

1. Industry, Unit 2: Safety and Training, (from A Text Book of English for Engineers and Technologists, O.L)
2. Salim Ali, (a Profile from The Living World in Masterminds, O.L.)

UNIT VI:

Common errors
Sentence completion
Synonyms and Antonyms
Analogy
Report Writing
Comprehension
General Essay
Situational Dialogues

NOTE:

The establishment of an English language laboratory in each affiliated college of Engineering and Technology is recommended from the academic year 2002-2003 for the following reasons.

1. to expose the students to TOEFL and GRE model of training and practice.
2. to help the students learn correct pronunciation, accent and intonation.
3. to enable the students to improve and strengthen their communicative skills
4. to expose the students to different variations in English expression

It is also recommended that the English Language Laboratory training and practice be treated as a Non-examination item of the Curriculum.

BOOKS RECOMMENDED:

1. Strengthen your Writing by V.R. Narayana Swami (O.L)
2. Success with Grammar and Composition by K.R. Narayana Swamy (O.L)
3. Examine Your English by Margaret M. Maison (O.L)
4. English for Professional students by S.S. Prabhakara Rao
5. TOEFL (AARCO & BARRONS, USA) & Cliff's TOEFL.
6. GRE (AARCO & BARRONS, USA) & Cliff's TOEFL.
7. Communication Skills for Technical Students, by T. M. Farhathullah (O.L)
8. Strategies for Engineering Communication by Susan Stevenson & Steve Whitmore (John Wiley and Sons.)
9. Basic Communication Skills for Technology, 2 ed. by Andrea J. Rutherford (Pearson Education Asia).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **3+1* - 0 – 0 – 6** **CE 1022**

MATHEMATICS – I

(Common to all Branches)

UNIT – I

Sequences – Series – Convergence and divergence – Ratio test-Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence.

Rolle's theorem – Lagrange's Mean Value theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem)

UNIT – II

Functions of several variables – limit and continuity – partial differentiation – Chain rule – Total derivative – Euler's theorem, Jacobian – Functional dependence. Maxima and Minima of functions of two variables with and without constraints, Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

UNIT – III

Curve tracing – Cartesian, polar and Parametric curves. Applications of integration to lengths, volumes and surface areas in Cartesian and Polar coordinates.

UNIT – IV

Differential equations of first order and first degree – formation. Exact, linear and Bernoulli.

Applications to Newton's Law of cooling, Law of natural growth and decay. Orthogonal trajectories, Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, sinax, cosax, polynomial in x, e^{ax} V(x),xV(x). method of variation of parameters.

UNIT – V

Laplace transform of standard functions – Inverse transform – Linearity – first shifting

Theorem. Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Differentiation and integration of transforms –

Multiple integrals : Double and tripe integrals – change of variables – Change of order of integration..

UNIT – VI

Vector Differential Calculus :

Gradient,. Divergence, Curl and their related properties of sums, Products, Laplacian and second order operators.

Vector integral Calculus : Vector integration – Line integral – work done – Potential function – area, surface and volume integrals. Green's theorem, Stoke's and Gauss' Divergence Therem. Verification of Green's stoke's and Gauss' Theorem. Curvilinear Coordinates – Cylindrical, Spherical Coordinates – Expressions of Grad, div, curl in Spherical, Cylindrical and Curvilinear Coordinates.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – I, 2002
   T.K.V. Iyengar, B.Krishna Gandhi, and others, S. Chand and Company
2. Engineering Mathematics
   B.V.Ramana, Tata McGraw_Hill 2002
3. Engineering Mathematics – I
   C. Sanakraiah, Vijaya Publications-2002
4. Engineering Mathematics – I - 2002
   P. Nageswara Rao, Y. Narsimhulu, Prabhakara Rao

REFERENCE BOOKS :

1. Engineering Mathematics
   S.K.V.S.Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S. Publications 2000
2. Advanced Engineering Mathematics (Eighth edition)
   Erwin Kreyszig , John Wiley & Sons (ASIA) Pvt . Ltd. 2001
3. Advanced Engineering Mathematics (Second edition)
   Michael D. Green Berg , Prentice Hall.
4. Engineering Mathematics by Sarveswara Rao Koneru, Orient Longman Pvt. Ltd. 2002 (Inpress)
4. Engineering Mathematics – I
   N.P. Bali, Laxmi Publications (P) Ltd., New Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **2+1* – 0 – 0 – 6** **CE 1023**

ENGINEERING PHYSICS

(Common to CE, ME, Prt, Chem., Mett., PE. Mectr., MMT and MME)

UNIT I

Interference of light: Introduction – Superposition of waves – Young's double slit experiment – Coherence – Types of interference – Interference in thin films – Colours of thin films - Newton's rings.

Diffraction of light: Introduction – Fraunhofer diffraction at a single slit – Fraunhofer diffraction due to two parallel slits – Fraunhofer diffraction due to n-parallel slits – Diffraction-a qualitative description – Diffraction grating – Grating Spectrum – Fraunhofer diffraction at a circular aperture – Rayleight's criterion for resolving power – Electron microscope.

UNIT II

Polarization of light: Introduction – Representation of polarized and unpolarized light – Production of polarized light – Circular and elliptical polarization – Calculation of the phase difference when a linearly polarized light passes through a double refracting crystal.

Non-destructive Testing: Introduction – Theory and practice of ultrasonic testing – Ultrasonic testing systems – Ultrasonic testing methods – Applications of ultrasonics.

UNIT III

Laser: Introduction – Characteristics of laser light – Basic concepts of laser – Types of lasers : Ruby laser, He-Ne laser – Applications of lasers.

Fibre Optics: Introduction – Basic principles – Light wave communication using optical fibres – Numerical aperture – Acceptance angle – Fibre optics in medicine & industry.

UNIT IV

Thermal properties: Specific heat of solids – Einstein model, Phonons – Thermal conductivity – Thermal expansion – Thermoelectric effect – thermo-analyzers – thermo-gravimetry – Thermo-mechanical analysis.

Dielectric materials: Introduction – Dielectric constant or relative permittivity – Loss tangent or dielectric loss – Polarization – Dielectric strength – Classification of dielectrics – Porcelain – Glass.

UNIT V

Magnetic materials: Introduction – Magnetic moment of electrons and atoms – Basic definitions – Classification of Magnetic materials – Diamagnetic materials – Paramagnetic materials – Ferromagnetic materials – Anti-ferromagnetic and Ferri-magnetic materials – Soft and Hard magnetic materials.

Superconductivity: Introduction – Properties of superconductors – BCS theory of superconductivity – Applications of superconductors.

UNIT VI

Deformation & Creep in materials: Plastic deformation – Stress-strain curve – deformation by slip – Strength of crystals – dislocations – multiplication of dislocations – mechanism of creep – creep resistant materials.

Materials for Space Applications: Space programme – structural materials and their properties – High temperature materials – Materials for thermal protection.

TEXT BOOK

PHYSICS FOR ENGINEERS by M.R.Srinivasan (New Age International, New Delhi)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. 2 – 0 – 0 – 4 CE1024

APPLIED CHEMISTRY

UNIT I: Science of Corrosion:

Definition, Examples, Types of Corrosion: Dry Corrosion, Wet Corrosion, Principles of Corrosion, Galvanic Corrosion, Concentration cell Corrosion, Mechanism of Wet Corrosion. Passivity, Atmospheric Factors Influencing Corrosion. Under Ground, Soil Corrosion, Pitting Corrosion, Stress Corrosion – Season Cracking, Caustic Embrittlement.

UNIT II: Corrosion Control and Protection:

Corrosion Control Methods: (1) Proper Designing (2) Using Pure Metal (3) Using Metal Alloys (4) Cathodic Protection (5) Modifying The Environment (6) Uses of Inhibitors.

Protective Coatings:

Surface Preparations: (1) Solvent Cleaning (2) Alkali Cleaning (3) Pickling and Etching (4) Sand Blasting (5) Mechanical Cleaning.

Types Of Protective Coatings: Metallic Coatings And Metal Cladding (A) Anodic Coating – Galvanization. (B) Cathodic Coating – Tinning (C) Metal Cladding (D) Electroplating Ex: Chromium Plating.(E) Metal spraying (F) Cementation – (I) sheradizing (ii) colourizing (iii) chromizing

Chemical Conversion Coatings: (1) Phosphate (2) Chromate (3) Chemical Oxide (4) Anodized Coatings.

Ceramic Protective Materials: (1) Vitreous Enamels (2) Ceramics.

Organic Coatings: (1) Paints – Constituents and their functions (2) Varnishes And (3) Lacquers (4) Enamels (5) Emulsion Paints (6) Distempers.

UNIT III: Polymer Science and Technology:

Polymerisation – Definition, Types of Polymerisation; Basic Concepts; Plastics – Definition and Classification; Thermosetting and Thermoplastics; Compounding and Fabrication of Plastics.

Composition, Properties and Engineering Uses of The Following: Polyethylene, PVC, Teflon, Bakelite, Nylon, Polymethyl Methacrylate, Urea-Formaldehyde and Silicone Resins.

Rubber – Processing of Natural Rubber, Vulcanisation and Compounding. Elastomers – Buna S, Buna N, Thiokol. Polyurethane Rubber; Silicone Rubber.

UNIT IV: Water Technology:

Sources, Impurities in Water; Water Quality; Hardness of Water; Units – Its Determination; Boiler Troubles, Water Treatment; Lime-Soda Process, Zeolite Process, Ion-Exchange Process; Problems.

Water For Drinking Purposes and Its Treatment; Analysis of Water; Alkalinity; Chlorides and Dissolved Oxygen.

UNIT V: Refractories and Insulators:

Refractories – Definition, Classification With Examples; Criteria of a Good Refractory Material; Causes For The Failure of a Refractory Material; Insulators – Definition and Classification with Examples; Characteristics of Insulating Materials; Thermal Insulators, Electrical Insulators - Their Characteristics and Engineering Applications.

UNIT VI: Inorganic Cementing Materials:

Lime: Classification of Limes, Manufacturing of Lime, Properties of Lime.

Cement: Chemical Constituents and Composition of Cement, Manufacture, Setting and Hardening, Analysis of Cement.

BOOKS RECOMMENDED:

1. Text book of Engineering Chemistry by Jain & Jain.
2. Chemistry of Engineering Materials by C. V. Agarwal.
3. Text book of Engineering Chemistry by P. C. Jain.
4. Text book of Engineering Chemistry by M. S. N. Raju.
5. Engineering Chemistry by Dara, Published by Pearson Education, Asia.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I B.Tech. **3–0–0–6 CE1025**

APPLIED MECHANICS

(Common with Mech.Engg-Mechatronics-and Mech.Engg.- Production)

UNIT – I

Introduction to Engg. Mechanics – Basic Concepts System of Forces Coplanar Concurrent Forces – Components in Space – Resultant – Moment of Forces and its Application – Couples and Resultant of Force Systems. 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, Screw-jack and differential screw - jack.

Transmission of Power : Belt Drivers: Open, Crossed and compound – length of belt, tensions, tight side, slack side, initial and centrifugal – Power transmitted and condition for Max. Power.

UNIT – III

Centroid and Center of Gravity: Centroids – Theorem of Pappus, Centroids of Composite figures – Centre of Gravity of Bodies. Area moments of Inertia: Definition – Polar Moment of Inertia, Transfer Theorem. Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

UNIT - IV

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

Kinematics : Rectilinear and Curvelinear motion - Velocity and Acceleration – Motion of a Rigid Body – Types of their Analysis in Planar Motion.

UNIT – V

KINETICS : Analysis as a Particles and analysis as a Rigid Body in Translation – Central Forces motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies. Work – Energy Method: Equation for Translation, work – Energy application to Particle Motion, Connected System – Fixed – Axis Rotation and Plane Motion.

UNIT – VI

Mechanical Vibrations : Definitions, Concepts – Simple Harmonic motion – free vibrations, simple and compound pendulums – torsional vibrations.

TEXT BOOKS :

Engineering Mechanics by Irving H. Shames – Prentic - Hall

Engineering Mechanics, by Ferdinand L. Singer Published by Row Publishers, New York.

Engineering Mechanics (Dynamics) by R.C. Hibbeler

Engineering Mechanics of Solids by E.P.Popor 2nd Edition, by Mariam

A Text Book of Engineering Mechanics of Solids by R.K.Bansal

REFERENCE BOOKS:

1. Engineering Mechanics by Irving H. Shames – Prentic – Hall
2. Engineering Mechanics by Timoshenko & Young
3. Engineering Mechanics by Tayal
4. Engineering Mechanics (Statics) by R.C. Hibbeler
5. Engineering Mechanics (Dynamics) by R.C.Hibbeler
6. Strength of Materials & Applied Mechanics by IB Prasad
7. Applied Mechanics by Kurmi
8. Engineering Mechanics by K.L. Kumar (TMH)
9. Engineering Mechanics by Mir Shoukath Ali & G.Swaminatham (The Hi-Tech Publishers)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **3 – 0 – 0 – 6** **CE1026**

INTRODUCTION TO COMPUTERS

(Common with Mech.Engg –Mechatronics and Mech.Engg. – Production)

UNIT–I

(Computer Awareness – Qualitative Treatment only)

Computer, capabilities, types of computers, application areas, computer anatomy, functional block diagram, central processing unit, functions of ALU and Control unit in CPU purpose of Registers in CPU, micro-processors CIRC/RISC processors, memory functions, address, word, RAM, ROM, Cache memory associate memory, magnetic disk, tape floppy, optical disk, address bus, data bus, control bus, functions of I-O devices: key board, mouse, light pen, dot matrix printer, line printer, laser printer, ink jet printer CRT monitor, colour monitor, CGA, Screen resolution, Flat panel display unit, machine language, compiler, Operating system, Types of operation systems, Number systems, Binary, Hex, Octal, BCD Code, Character Codes, 3 methods of binary representation, of integers floating point numbers.

UNIT – II : Computer Programming -I

Algorithm, flow chart program development steps, Basic Structures of C Languages, C tokens, Data types, declaration of variables, assigning values, arithmetic, relational and logical operators, increment and decrement operators, control operator, bit-wise operators, expressions, evaluation, input-output operation, IF and SWITCH statements WHILE, DO – WHILE, and FOR statement, C Programs covering all the aspects.

UNIT – III : Computer Programming - II

String Variables in C, declaration, reading. Writing, string, handling functions, user-defined functions, variables and storage classes, structures unions, pointers, file management in C, opening, closing and I /O operations on files, C programs covering the above aspects.

UNIT – IV : Numerical Methods – I

Iterative methods, bisection, false position, Newton-Raphson, Successive approximation method, algorithms, comparison of iterative methods, solution of linear simultaneous algebraic equations, Gauss Jordon and Gauss Siedel's methods, algorithms.

UNIT – V : Numerical Methods – II

Interpolation, Language interpretation, forward difference, Backward difference and central difference interpolation method, algorithms, errors in interpolation, least square approximation of functions, linear regression. Polynomial regression, algorithms.

UNIT – VI : Numerical Methods – III

Numerical integration by trapezoidal and Simpson's rules, algorithms, Numerical solution of differential equations, Euler Method, Runge Kutta fourth order methods, Milne-predictor corrector method, algorithms, comparison of Runge – Kutta and predictor – Corrector method.

TEXT BOOKS :

1. Computers and Commonsense by Shelly and Hunt, 4th Edn. PHI
2. Programming in ANSI C by E.Balaguruswamy
3. Computer-Oriented Numerical Methods by V.Rajaraman
4. Numerical Methods by E. Balagurusswamy.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **0 – 0 – 6 – 8** **CE 1027**

ENGINEERING GRAPHICS

(Common with Mech. Engg – Mechatronics and Mech. Engg. – Production)

INTRODUCTION TO ENGINEERING DRAWING

UNIT – I

Principles of Engineering Graphics and their significance, Engineering Drawing – Drawing Instruments and their use – Conventions in Drawing – Lettering – BIS Conventions. Scales used in Engineering Practice and Representative Fraction – Construction of Plain Diagnal and Vernier Scale.

PLANE GEOMETRIC DRAWING :

Construction of Polygons – Inscription and Superscription of Polygon given the diameter of the Circles., Curves used in Engineering Practice and their Constructions.

a) Conic Sections including the Rectangular Hyperbola- General method only
b) Cycloid, Epicycloid and Hypocyloid – Trochoids
c) Involute.

UNIT – II

DRAWING OF PROJECTIONS OR VIEWS OTHOGRAPHIC PROJECTION IN FIRST ANGLE PROJECTION ONLY.

Principle of Orthographic Projections Conventions Projections of Points and Lines.

* Projections of Plane regular geometric figures.

UNIT – III

* projections of Regular Solids – Auxiliary Views.
* Sections of Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, cone – Auxiliary views – Sections – of Sphere.

UNIT – IV

* Development of Surfaces of Right Regular Solids – Prism Cylinder, Pyramid and Cone.

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

UNIT – V

ISOMETRIC PROJECTION

Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of lines, Plane figures, Simple and Compound Solids – Isometric Projection of Spherical Parts.

TRANSFORMATION OF PROJECTIONS

Conversion of Isometric Views to Orthographic Views and Vice-Versa conventions :

UNIT – VI

PERSPECTIVE PROJECTION

Perspective View: Points, Lines, Plane Figures and Simple Solids (General Method only)

TEXT BOOKS :

1. Engineering Drawing – N.D.Bhat
2. Engineering Drawing – Narayana and Kannaiah
3. Engineering Drawing – Venugopal

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **0 – 3/2 – 0 – 2** **CE1028**

ENGINEERING PHYSICS LAB

(Common to CE, ME, Prt, Chem., Mett., PE, Mectr., MMT, and MME)

Any TEN of the following experiments are to be performed during the academic year.

1. Determination of Rigidity Modulus of the material of a wire (Torsional Pendulum).
2. Study of the normal modes in a string using forced vibrations in rods (Melde's experiment).
3. Study of Resonance – Using audio generator.
4. Coupled Oscillator.
5. Diffraction grating.
6. Dispersion of Light – (Prism – Spectrometer method).
7. Determination of thickness of a thin object by optical method – Parallel fringes.
8. Newton's Rings.
9. Lasers – Single slit and double slit experiments.
10. Study of electrical resonance – LCR circuit.
11. Time constant of an R-C circuit.
12. Sonometer – Verification of laws of stretched strings.
13. Frequency of A.C. Supply.
14. Magnetic field along the axis of a current carrying coil – Stewart and Gee's Method.
15. Optical Fibres – Numerical aperture measurement.
16. Optical Fibres – Study of losses.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I-B.Tech. **0 – 3/2 – 0 – 2** **CE1029**

APPLIED CHEMISTRY LAB

REDOX TITRATIONS :

1. preparation of standard Potassium Dichromate and estimation of Ferrous Iron.
2. Preparation of Standard Potassium Dichromate and estimation of Ferric Iron.

IODOMETRY :

3. Preparation of Standard Potassium Dichromate and estimation of Copper, by Iodometry.

COMPLEXOMETRY :

4. Preparation of Standard EDTA solution and estimation of Calcium/Hardness of Water.
5. Preparation of Standard EDTA and estimation of Cu or

PRECIPITATION TITRATION :

6. Preparation of Standard solution of Zinc and estimation of Ferro Cyanide.

ANALYSIS OF MINERALS :

7. Percentage Purity of Pyrolusite
8. Percentage Purity of Lime Stone.

COLORIMETRIC ESTIMATIONS :

9. Manganese in steel
10. Iron in Cement

TEXT BOOKS :

1. Chemistry Pre-lab manual by Dr K.N.Jayaraman and K.B. Chandra Mouli, S.M. Enterprizes Ltd.
2. Vogel's Book of Quantitative In-Organic Analysis, ELBS Edition.

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

I Year B.Tech

CE1030

COMPUTER PROGRAMMING LAB

(Common with Production Engg. – Mechatronics)

1. Write a C program that evaluates the following algebraic expressions after reading necessary values from the user:

a) ax+b/ax-b

b) $2.5 \log x + \cos 32^0 + |x^2 - y^2| + v\ 2xy$

c) 1/av2? e- (x-m/ v2s)^2

2. Write a C program for the following

a) Printing three given integers in ascending order

b) Sum of 1 + 2+ 3 + _ _ _ _ _ n

c) $1 + x^2/2! + x^2/4!$+ _ _ _ _ _ upto ten terms

d) $x + x^3/3! + x^5/5!$+ _ _ _ _ _ upto 7^{th} digit accuracy

e) Read x and compute Y =1 for x > 0

Y=0 for x = 0

Y= -1 for x<0

3. Write C program using FOR statement to find the following from a given set of 20 integers.

i) Total number of even integers. ii) Total number of odd integers.

iii) Sum of all even integers. iv) Sum of all odd integers.

4. Write a C program to obtain the product of two matrices A of size (3X3) and B of size (3X2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.

5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer.

(consider operators +,-,/,* and %).

6. Write C procedures to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.

7. The total distance traveled 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/sec^2). Write C program to find the distance traveled a

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'.

8. A cloth show room has announced the following seasonal discounts on purchase of items.

Purchase Amount	Discount (Percentage)	
	Mill Cloth	Handloom items
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using switch and If statements to complete the net amount to be paid by a customer.

9. Given a number, write C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

10. The Fibonacci sequence of numbers is 1,1,2,3,5,8... based on the recurrence relation f(n) = f (n-1) + f (n-2) for n>2.

Write C program using d0-while to calculate and print the first m fibonacci numbers.

11. Write C programs to print the following outputs using for loop.

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

```
    1
  2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

12. Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	Month of sales	Price (Rs)
Maruthi – 800	02 / 87	75,000
Maruthi – DX	07 / 87	95,000
Gypsy	04 / 88	1,10,000
Maruthi Van	08 / 88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

14. Write a function that will scan a character string passed as an argument and covert all lower case characters into their upper case equivalents.

15. f(x) = x sin x + cos x = 0 using bisection method. Write a program & Evaluate the root of the equation.

16. f(x) = x sin x + cos x = 0 using false position method. Write a program & Evaluate the root of the equation.

17. f(x) = x sin x + cos x = 0 using Newton Raphson method. Write a program & Evaluate the root of the equation.

18. f(x) = x sin x + cos x = 0 using successive approximation method. Write a program & Evaluate the root of the equation.

19. Solve

$9x_1 + 2x_2 + 4x_3 = 0$ ..... (1)

$x_1 + 10x_2 + 4x_3 = 6$ ..... (2)

$2x_1 - 4x_2 + 10x_3 = -15$ ..... (3) using Gauss - Jordan method.

20. Solve

$9x_1 + 2x_2 + 4x_3 = 0$ ..... (1)

$x_1 + 10x_2 + 4x_3 = 6$ ..... (2)

$2x_1 - 4x_2 + 10x_3 = -15$ ..... (3) using Gauss - scidel method.

21. Write a computer program to implement LaGrange interpolation technique. Check the working of the program with suitable example.

22. Write a computer program to implement Newton - Gregory forward interpolation. Check the working of the program with suitable example.

23. Write a program to implement Trapezoidal method. Check the working of the program with suitable example.

24. Write a program to implement Simpson method. Check the working of the program with suitable example.

25. Implement, in C, the linear regression algorithm. Check the working of the program with suitable example.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I. B.Tech. **0 – 3 – 0 – 4** **CE1031**

WORKSHOP PRACTICE

(common with Mech.Engg. – Mechatronics and Mech.Engg. – Production)

TRADES FOR EXERCISES :

1. Carpentry & Pattern Making
2. Fitting
3. Tin – Smithy
4. Black Smithy
5. House – Wiring
6. Foundry

TRADES FOR DEMONSTRATION & EXPOSURE :

1. Plumbing
2. Welding
3. Machine Shop

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH I-Semester **4 – 0 – 4** **CE 2121**

MATHEMATICS – II

(Common to all Branches)

UNIT – I

Matrices – brief review – Inverse of a matrix by adjoint ,elementary row transformations – Rank - Normal form – eachelon form. Agumented matrix – Consistency – solution of system of simultaneous linear homogeneous and non-homogeneous equations.

UNIT – II

Eigen values, eigen vectors – properties – Cayley – Hamilton Theorem (Inverse and powers of a matrix by Cayley – Hamilton theorem).Quadratic forms – positive, negative definite – Diagnolization of matrix. Calculation of powers of matrix – Modal and sprectral matrices. Real matrices – Symmetric, skew-symmetric, orthogonal. Linear Transformation – Orthogonal Transformation. Quadratic forms – Reduction of quadratic form to canonical form – index – signature.

Complex matrices : Hermitian, Skew-Herimitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties.

UNIT – III : Fourier Series

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half – range Fourier sine and cosine expansions.

UNIT – IV :

Formation of Partial differential equations by elimination of arbitrary constants and arbitrary fuctions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations. Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation wave equation and two-

dimensional Laplace's equation under initial and boundary conditions.

UNIT – V

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms. – properties – Inverse transforms – Finite Fourier transforms. Solution of one dimensional wave, heat equations and two dimensional Laplace's equation by Fourier transforms. Z-transform – Inverse z – transform – properties – Damping rule – shifting rule – Initial and final value theorems.

Convolution theorem – Solution of difference equations equations by Z – transorms.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – II - 2002
   T.K.V.Iyengar, B. Krishna Gandhi and others, S. Chand and Company
2. Engineering Mathemtics
   B.V. Ramana, Tata McGraw-Hill -2002
3. Engineering Mathemtics – II - 2002
   C.Sankaraiah, Vijaya Publications
4. Engineering Mathematics – II - 2002
   P.Nageswara Rao, Y. Narsimhulu, Prabhakar Rao

REFERENCE BOOKS:

1. Engineering Mathematics
   S.K.V.S.Sri Rama Chary, N. Bhujanga Rao, P.Bhaskara Rao,B.S.Publications 2000
2. Advanced Engineering Mathematics (Eighth edition)
   Erwin Kreyszig John Wiley & Sons (ASIA) Pvt. Ltd. - 2001
3. Advanced Engineering Mathematics (Second edition)
   Michael D. Green Berg , Prentice Hall, Upper saddal River, New Jersey-1998
4. Engineering Mathematics by Sarveswara Rao Koneru Orient Longman (Pvt.) Ltd. 2002
5. Engineering Mathematics - II
   N.P.Bali, Laxmi Publications (P) Ltd., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH I-Semester . 4 – 0 – 4 CE 2122

MECHANICAL AND ELECTRICAL SCIENCES

UNIT – I

THERMAL ENGINEERING :

IC Engines – Classification working principles of petrol, Diesel engines – two stroke and four stroke engines – comparison

Refrigeration : Block diagram – working principle – Refrigerants and properties – Basic principles of Air conditioning.

UNIT – II

PRODUCTION ENGINEERING :

Welding : Introduction – classification – Arc welding – Gas welding – equipment and materials required Arc and Gas cutting.

Machine Tools : Lathe, drilling, milling,. Shaper and planer – description – function of various parts – applications.

UNIT – III

HANDLING EQUIPMENT :

Earth moving equipment – bull dozers, power showels, escavators conveyors – screw, rollers, pneumatic, hydraulic concrete mixers.

ELECTRICAL :

UNIT – IV

DC MACHINES AND TRANSFORMERS :

Principle of operation of DC Generator – emf equation – types – DC motor types – torque equation – applications – three point

starter – Principle and Operation of single phase transformer – emf equation losses – efficiency & regulation.

UNIT – V

AC MACHINES & INSTRUMENTS :

Principles of operation alternators – regulation by synchronous impedance method – Principle of operation of Induction motor – slip – torque characteristics – Application – Basic principles of indicating instruments – Permanent magnet moving coil and moving iron instruments.

MECHANICAL

REFERENCES :

1. Mechanical Technology by Khurmi
2. Mechanical Technology by Kodandaraman CP
3. Mechanical Technology by Mathur & Domukundawar
4. Construction, Planning, Equipment & Methods by Peurify

ELECTRICAL

TEXT BOOKS :

1. Electrical Technology by Edward Hughes, ELBS Longman Publisher.
2. Introduction of Electrical Engineering by M S Naidu & S Kamakshaiah, TMH Publications.

REFERENCE BOOKS :

1. Fundamentals of Electrical Engineering – by Ashafaq Hussain, 2nd edition Dhanpat Rai & Co.
2. Theory and Problems of Basic Electrical Engineering – by DP Kothair & I J Nagrath, PHI Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH I-Semester **4 – 0 – 4** **CE 2123**

STRENGTH OF MATERIALS – I

UNIT – I

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.

UNIT – II

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 contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

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 – III

SHEAR STRESSES :

Derivation of formula – Shear stress distribution across various beams sections like rectangular, circular, triangular, I, T angle sections.

ANALYSIS OF PIN-JOINTED PLANE FRAMES :

Determination of Forces in members of plane, pin-joined, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply – supported trusses.- Method of tension coefficients.

UNIT – IV

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 – V

RIVETED JOINTS :

Types of riveted joints – Lap and Butt joints – Modes of failure of a riveted joint – Efficiency of a riveted joint – Unwin's formula – design of lap and butt joints.

THIN CYLINDERS :

Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Reveted boiler shells – Thin spherical shells.

TEXT BOOKS :

1. Analysis of Structures Vol-I, by Vazirani & Ratwani
2. Strength of Material -By Ramamrutham

REFERENCE BOOKS

1. Solid Mechanics, by Popor
2. Strength of Materials and Mechanics of Solids – Vol-I, by B.C. PUNIMIA
3. Strength of Materials and Mechanics of Solids, by C.S.Reddy
4. Mechanics of Structures Vol-III, by S.B.Junnarkar.
5. Strength of Materials by S.Tomshenko
6. Strength of Materials by Andrew Pytel and Ferdinond L. Singer (Longman)
7. Mechanics of Solids by Adbul Mubeen

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH I-Semester **4 – 0 – 4** **CE 2124**

BUILDING MATERIALS AND CONSTRUCTION

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 bricks. Characteristics of good tile – manufacturing methods, Types of tiles. Use of Materials like aluminium, gypsum glass and bituminous materials – their quality.

UNIT – II

LIME, CEMENT AND WOOD :

Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime. Various types of cement and their properties. Various filed and laboratory tests for Cement.
Various in gradients of Cement concrete and their importance – various test for concrete.
Wood : Structure – properties – Seasoning of timber. Classification of various types of woods used in buildings – Defects in timber. Alternative materials for wood, Galanized Iron, Fiber-reinforced plastics, steel, Aluminium.

UNIT – III

FOUNDATIONS AND MASONARY :
Foundations : Shallow foundations – Spread, combined strap and mat footings.

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

UNIT –IV

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

UNIT – V

FINISHINGS :

Methods of 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.

TEXT BOOKS :

1. Building material by S C Rangwala
2. Building Construction by Sushil Kumar
3. Engineering Materials by Surendra Sing, Vikas Publishers
4. Materials of Construction by D.N.Ghosh
5. Civil Engineering Materials by S.Somayaji, Prentice Hall.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH I-Semester **4 – 0 – 4** **CE 2125**

SURVEYING - I

UNIT – I

CHAIN SURVEYING: Object and definition of Surveying, Principles of surveying, classification, methods of measuring distance, ranging a survey line – chain surveying : equipment needed, types of offsets and their measurement, limiting length of an offset, triangularisation with chain and tape, field work, conventional sings and plotting, corrections to a measured tape length, shrunk scales and maps, errors and mistakes in chain surveying, cross-staff survey inaccessible points. Linear rangers, prism square, Box Sextant.

UNIT – II

Compass Surveying: Magnetic compass – types – construction and working of a prismatic compass, comparison, with surveyor's compass, measurement of bearings with a prismatic compass, reduction of bearings, chain and compass traversing, determination of included angles of a closed traverse from observed bearings, plotting a closed transverse methods and correction to closing error, local attraction and its determination dip and declination of the magnetic needle, isogoenic charts, errors in compass survey and precautions.

UNIT – III

PLANE TABLE SURVEYING : Advantages and disadvantages, equipments, method of plane tabling, two point and three-point problems, Lehmann's rules, strength of a fix errors in plane table survey and their elimination. Clino-meter, Pantographs.

UNIT – IV

Levelling: Definitions of terms used-different types of instruments with brief description- temporary and permanent adjustments- method of taking readings and their entry in field book – methods of reduction of levels-Merits and demerits of these methods- different problems-numerical-expressions for curvature and refraction. Combined correction and problems-

Classification of leveling-reciprocal leveling-problems. Ghat tracer.

Contouring: Uses of contours- methods of conducting contour surveys and their plotting-characteristics of contour –Establishing great contours.

UNIT – V

Computation of areas : from field notes and from plan by dividing into triangles, square etc. computation of areas along boundaries using Simpon's rule, and their comparison, computation of areas using plan meter, construction and working of plan meter. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity reservoir, volume of barrow pits.

TEXT BOOKS :

1. Surveying and Levelling-part I by TP Kanetkar and S.P.Kularkarni
2. Text Book of Surveying by C.Venkataramaiah
3. Surveying Vol-I by B.C.Punimia.

Reference Books:

1. Plane Surveying – By David Clark
2. Elements of Plane Surveying by A.R. Benton and PJ Taetz, McGrawHills

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH **CE (2126)**

FLUID MECHANICS
(Common to Civil, Mech., Metallurgy)

UNIT – I

INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion- atmospheric, gauge and vacuum pressure-measurement of pressure. Board-on pressure gauge, Manometers: differential and Micro Manometers- Hydrostatic forces on submerged plane and curved surfaces – Center of pressure.

UNTI – II

FLUID KINEMATICS : 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.

UNIT – III

FLUID DYNAMICS : Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line. Momentum equation and its application – Boundary layer along a thin flat plate – Separation of boundary layer – Drag and lift.

UNIT – IV

CLOSED CONDUIT FLOW: Characteristics of real fluids – Reynolds experiments – Flow between parallel process Hagen – Poiseuille's equation – Turbulent flow, variation of friction factor with Reynold's Number – Darcy's equation Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line.

UNIT – V

MEASUREMENT OF FLOW : Pitot tube, venture meter and orifice meter – flow through nozzle – flow through orifices, flow over rectangular, triangular and trapezoidal and Stepped notches –Broad crested weirs.

TEXT BOOKS :

1. Fluid Mechanics by Modi and Seth
2. Fluid Mechanics by A.K.Jain
3. Fluid Mechanics by Bansal

Reference Books

1. Fluid Mechanics by J.F.Douglas, J.M. Gaserek and J.A.Swaffirld (Longman)
2. Fluid Mechanics and Fluid Machines by S.K.Som & G.Biswas (TMH)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH I-Semester **0 – 3 – 2** **CE 2127**

STRENGTH OF MATERIALS LAB

1. Tension test
2. Bending test (Steel / Wood)
3. Torsion test
4. Hardness test
5. Spring test
6. Compression test on wood or concrete
7. Impact test
8. Shear test

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH I-Semester **0 – 3 – 2** **CE 2128**

SURVEYING FIELD WORK – I

1. Measuring distance between two points, principles of ranging, and taking offsets to points from the survey line.
2. Survey of an area by chain survey (closed traverse) & Plotting
3. Chaining across obstacles
4. Determination of distance between two inaccessible points with compass.
5. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
6. Radiation method, intersection methods by plane Table survey
7. Traversing by plane table survey
8. Fly leveling (differential leveling)
9. An exercise of L.S and C.S and plotting
10. An exercise on contouring.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2221**

PROBABILITY AND STATISTICS

(Common to Computer Science, Civil and Mechanical Engineering)

UNIT – I

PROBABILITY :

Sample space and events – probability - The axioms of probability – Some elementary theorems – conditional probability – Baye's theorem

UNIT – II

PROBABILITY DSITRIBUTIONS :

Random variables – Discrete and continuous – Distribution – Distribution function – Distributions – Binomial, poisson and normal distribution – related properties

UNIT – III

SAMPLING DISTRIBUTION :

Populations and samples – Sampling distributions of mean (known and unknown) Proportions, sums and differences.

UNIT – IV

INFERENCES CONCERNING MEANS AND PROPORTIONS :

Point estimation – Interval estimation – Bayesian estimation – Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means-Type I and Type II errors. One tail, two-tail tests- Tests of significance, - Student t- test, F-tests, - χ^2 test. estimation of proportions .

UNIT – V

CURVE FITTING :

The method of least squares – inferences based on the least squares estimations – Curvilinear regression – multiple regression- Correlation for univariate and bivariate distributions.

TEXT BOOKS :

1. Probability and Statistics for Engineers by Irwin Miller and John E. Freund.

   Prentice-Hall of India Private Limited, 6th edition.

2. Engineering Mathematics – B.V. Ramana, Tata McGraw-Hill -2002

REFERENCE BOOK :

1. Probability and Statistics for Engineers. By Walpole and Meyer.

2. Advanced Engineering Mathematics (Eighth edition) Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt Ltd., 2001

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2222**

BUILDING PLANNING AND CONSTRUCTION MANAGEMENT

UNIT – I :

Building Bylaws and Regulations :

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

UNIT – II :

DESIGN OF BUILDINGS :

Residential Buildings : Minimum standards for various parts of buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings .

Public Buildings : Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks , industrial buildings, hotels and motel, buildings for recreation.

UNIT – III :

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

UNIT – IV :

Updating of Network – Crashing for optimum cost – Resource leveling and Resource allocation.

UNIT – V:

CONSTRUCTION EQUIPEMENT:

Cost of owning and operation – Estimation of outputs of power showels, Bulldozers, trucks and other earth – moving equipment – Belt – Conveyors – functioning – Earth compaction equipment.

TEXT BOOKS :

1. Construction Planning, Equipment and methods by R.L. Peurifoy etal.
2. PERT and CPM – Principles and Applications by L.S.Srinath
3. A Management Guide to PERT/ CPM by J. De Wiest and F.K. Levy
4. Construction Equipment by Mahesh Verma.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2223**

STRENGTH OF MATERIALS - II

UNIT – I

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 failure like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT – II

TORSION OF CIRCULAR SHAFTS :

Theory of pure torsion – Derivation of Torsion equations : T/J = q/r = N/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 – Type of springs – relation of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

UNIT – III

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 – IV

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 chimney's retaining walls and dams – conditions for stability – stresses due to direct loading and B.M – about both axes.

THICK CYLINDERS :

Introduction Lame's theory for thick cylinders – Derivation of Lame'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 – V

BEAMS CURVED IN PLAN :

Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semi-circle beams simply-supported on three equally spaced supports.

UNSYMETRICAL 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 – Resolution of bending moment into two components along – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis Deflection of beams under symmetrical bending.

TEXT BOOKS :

1. Strength of Materials and Mechanics of Structures Vol.I by Dr B.C.Punimia.
2. Strength of Materials Vol.II S. Ramamrutham
3. Analysis of Structure-II by Vazirani & Ratwani.
4. Strength of Materials by Bansal

REFERENCE BOOKS :

1. Strength of Materials by Andrew Pytal and Ferdinand L. Singers, by Bansal
2. Mechanics of Deformable Solids by Irving H.Shames
3. Advanced Mechanics of Materials by L.S.Srinath
4. Advanced Mechanic of Materials by Glenn Murphy
5. Strength of Materials Vol. I & II by Timoshenko

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2224**

HYDRAULICS AND HYRAULIC MACHINERY

UNIT – I

OPEN CHANNEL FLOW I : 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.
OPEN CHANNEL FLOW II : Specific energy-critical depth – Specific force computation of critical depth – critical and super ;critical flows. Elements of stream gauging.

UNIT II
OPEN CHANNEL FLOW III : Non uniform flow-Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method-hydraulic jump.
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 - III
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.
HYDRAULIC TURBINES – I : Elements of typical Hydropower installations – Heads and efficiencies-classification of turbines-pelton wheel-Francis turbine-Kaplan turbine-Draft Tube-Types.

UNIT – IV
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 – V

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.

TEXT BOOKS :

1. Hydraulics, Fluid Mechanics & Hydraulic Machines By. P.N.Modi & S.M Seth.
2. Fluid Mechanics, Hydraulics & Hydraulic Machinery By K.R.Arora
3. Hydraulic Machinery & Systems By Banga & Sarma

REFERENCE BOOKS :

1. Elements of Open channel flow by Ranga Raju
2. Fluid Mechanics & Hydraulic Machinery by Ramadurgaiah

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2225**

SURVEYING – II

UNIT – I

THEODOLITE AND THEODOLITE TRAVERS :

Main parts of a theodolite, description, uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Elecectronic theodolite, Electronic distance meter and electronic total station.

Traversing : Methods of Traversing, Traverse computations, Balancing the traverse, different methods, Gale's traverse table, Omitted Measurements.

UNIT – II

TACHEOMETRICAL LEVELING :

Principles of Stadia method of tachemoetry for horizontal and inclined sights. Distance and Elevation formulae for Staff vertical and normal position – Anallatic lens.

UNIT – III

CURVES :

Theory of simple, compound, reverse, transition and vertical curves, methods of curve ranging and obstacles in curve ranging.

UNIT – IV

TRIGONOMETRICAL LEVELLING :

Observations for the heights and distances, Geodietical observations, corrections for curavature, refraction and combined corrections, axis signal correction, Determination of difference in elevation, Single station observation and reciprocal observations. Introduction to triangulation and Base line measurement.

UNIT – V

MINOR TRAINGULATION :

General priciples, selection of triangulation station, Inter-visibility of Station. Distance between stations and relative elevations of

stations, towers and signals, phase of signal, Satellite station, Determination of heights of signals.
Triangulation Adjustment : Principle of least squares, laws of weights normal equation – Determination of most probably values. Station adjustment, figure adjustment, adjustment of trangle and chain of triangles, Adjustment of quadrilater with central station by the method of equal shifts.

TEXT BOOKS :

1. Surveing and Levelling Part II by T.P.Kanetkar and S.V.Kulkarni,
2. Surveing Vol.II by Dr. B.C.Punmia
3. Text book of Surveing by D. Venkata Ramaiah (Universities Press)

REFERENCE BOOKS :

1. Geodetic Surveying Vol-III by David clark

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **4 – 0 – 4** **CE 2226**

STRUCTURAL ANALYSIS – I

UNIT – I

PROPPED CANTILEVERS : Analysis of propped cantilevers-shear force and Bending moment diagrams-Deflection of propped cantilevers 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 – II

CONTINIOUS 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 – III

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 – IV

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.

INFLUENCE LINES : Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a section-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 -V

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

TEXT BOOKS :

1. Analysis of Structures-Vol I & Vol II by V.N. Vazirani & M.M.Ratwani.
2. Strength of Materials and Mechanics of Structures-Vol II by B.C.Punmia.
3. Theory of Structures by Ramamrutham.
4. Structural Analysis by WANG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **0 – 3 – 2** **CE 2227**

SURVEYING FIELD WORK – II

LIST OF EXERCISES :

1. Study of theodolite in detail - practice for measurement of horizontal and vertical angles.
2. a) Measurement of horizontal angles by method of repetition

   b) Measurement of horizontal angles by reiteration.
3. Heights and distance problem
4. Determination of distance between inaccessible points.
5. Determination of elevation of a given object keeping the instrument station and object in the same vertical plane. (Two Exercises)
6. Heights and distance using Principles of tacheometric surveying (Two Exercises)
7. Curve setting – different methods. (Two Exercises)
8. Setting out works.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH II-Semester **0 – 3 – 2** **CE 2228**

FLUID MECHANICS AND HYDRAULIC MACHINERY LAB.

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 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. Performance and suitability test on single stage centrifugal pump
8. Performance test on reciprocating pump
9. Impact of jet on vanes
10. Performance and Specific speed test on Peltonwheel (or Turbo Wheel)
11. Performance and specific speed test on Francis Turbine (or Kaplan Turbine)
12. Study of Hydraulic jump.
13. Performance test on multi stage pump
14. Suitability test on centrifugal pump

Any eight of the above experiments are to be conducted.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3121**

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (Common for all Branches)

UNIT I

Introduction to Managerial Economics: Managerial economics: Definition, nature and scope -Demand analysis: Law of Demand, demand determinants- Elasticity of Demand: definition, types, measurement and significance- Demand Forecasting methods.

UNIT II

Theory of Production: Firm and industry – Production Function – Cobb Douglas Production Function-Laws of Returns- Internal and External economies of scale.

Cost Analysis: Cost concepts, fixed vs variable costs, explicit vs implicit costs, out-of-pocket costs vs imputed costs, opportunity cost, sunk costs and abandonment costs.

Break-even analysis: Concept of Break-even Point (BEP) - Break Even Chart - Determination of BEP in volume and value- Assumptions underlying and practical significance of BEP. (Simple Problems).

UNIT III

Introduction to Markets and Business organizations: Market Structures – Types of Competition - Features of Perfect competition, Monopoly, Monopolistic Competition –Price-output determination. Types of Business Organisation –Features, merits and demerits of Sole proprietorship, Partnership and Joint stock companies – Types of companies – Public Enterprises – Types and Features.

UNIT IV

Introduction to Capital: Capital and its significance –Types of capital – Estimation of Fixed and working capital requirements – Methods of raising capital.

Introduction to capital budgeting methods: Pay back method, Accounting Rate of Return (ARR) and Net Present Value (NPV) method. (Simple Problems).

UNIT V

Introduction to Financial Accounting and Financial Analysis: Double Entry Book keeping – Journal – Ledger – Trial Balance – Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

Ratio Analysis: Computation of liquidity ratios (current ratio and quick ratio), activity ratios (inventory turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS). Analysis and Interpretation.

REFERENCE BOOKS

1. Joel Dean, *Managerial Economics,* Prentice Hall of India, 2001.
2. James C. Van Horne, *Financial Management Policy*, PHI, 2002.
3. Varshney & Maheshwari, *Managerial Economics*, S. Chand and Co., 2000.
4. Y. K. Bhushan, *Fundamentals of Business Organisation and Management*, Sultan Chand, New Delhi.
5. Narayana Swamy, *Financial Accounting,* Prentice Hall of India, 2001.
6. A.R. Aryasri, *Managerial Economics and Financial Analysis (MEFA) for JNTU (B.Tech.)*, Tata McGraw-Hill. New Delhi.
7. R.K. Mishra et al, *Readings in Accounting and Finance.*
8. R. L. Gupta, *Financial Accounting,* Volume I , Sultan Chand, New Delhi, 2001.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3122**

STRUCTURAL ENGINEERING DESIGN AND DRAWING– I

UNIT –I

Introduction Materials, Constituents of concrete, recommendation of IS 456 – 2000, grades of concrete,
Introduction of Limit State Design : Concepts of limit states – 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.

UNIT – II

Assumption in limit state design – stress - block parameters – limiting moment of resistance
Beams : Limit state analysis and design of singly reinforced, doubly reinforced, T and L beam sections.

UNIT – III

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 provision.
Design examples in simply supported and continuous beams, detailing.

UNIT – IV

Short and Long columns – under axial loads and uniaxial bending biaxial bending – Braced and un-braced columns – I S Code provisions.
Footings : Different types of footings – Design of isolated, square, rectangular and circular footings.

UNIT – V

Design of 2-Way slabs Using I S Coefficients . limit state design for serviceability for deflection and cracking codal provision indicate limit state method.

NOTE : All the designs to taught in Limit State Method

TEXT BOOKS :

1. Reinforced Concrete Design by Dr. P. Dayaratnam
2. Limit State Design by A.K. Jain
3. Limit State Design by Ramachandra

REFERENCE BOOKS :

1. Reinforced Concrete Design by Chu-Kia wan and charales G. Solmon (Longman)
2. Reinforced Concrete Structural Elements – Behaviour, Analysis ;and Design by P. Purushothaman
3. Reinforced Concrete Fundamentals by Phil M. Fergnson

NOTE :
Alternate weeks two periods of drawing class should be conducted,. The end examination paper should consist of Part – A and Part – B. Part - A should consist of two questions in design and drawing out of which one question to be answered. Part B should consist of five questions in design out of which three to be answered. Weightage for Part – A is 40 % and Part – B is 60 %

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3123**

CONCRETE TECHNOLOGY AND PRESTRESSED CONCRETE

UNIT – I

Cement and Admixtures : Portland Cement – Chemical Composition – Hydration, Setting and Fineness of cement – Structure of Hydrated Cement – Mechanical Strength of Cement Gel-Water held in Hyderabad Cement- Paste-Heat of Hyderation of cement – Influence of the compound composition and properties of cement – tests of Physical Properties of cement – consistency, setting time, soundness and strength tests – Types of Portland cement – Aluminious Cement – admixtures – Accelerations and Retarders.

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-seive analysis – Grading curves – Fineness modulus – Grading requirements – Practical Gradings – Road Note.No.4 method - Grading of Fine and Coarse Aggregates – Gap graded aggregate.

UNIT – II

FRESH CONCRETE: Workability – Factors affecting workability – Measurement of workability – slump test, compacting factor test Flow Test, Remolding test, Vee-bee Test and Ball penetration test Effect of time and temperature on workability – Segregation and Bleeding.

HARDENED CONCRETE: Water/Cement Ratio-Abrams Law-Gel space Ratio-Effective Water in the mix – strength in tension and Compression – Griffith hypothesis – Influence of coarse aggregate on strength – Effect of age on strength of concrete

Relationship between compressive and tensile strength of - concrete curing of concrete-stream curing – Influence of temperature on strength of concrete – Quality of Mixing Water, Creep ;and Shrinkage.

UNIT – III

Testing of Hardened Concrete : Compression tests on cubes and cylinders – Factors affecting strength – Flexure test – splitting test – Round Hammer Test – Variation in test results – Distribution of strength – Standard deviation – coefficient of variation.

Proportioning of concrete mixes by British method (Modified Road.No.4 method) (ACI method) ISI method. Factors in the choice of mix proportions, strength. Relation between mean and minimum strengths – Durability, Workability – Max. Size of aggregate – Grading and Type of Aggregate – Aggregate/Cement Ratio. Quality Control of concrete : Sampling – Statistical Approach – Acceptance Criteria.

UNIT – IV

Introduction; Historical 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 – I.S. Code provisions. Methods and Systems of Prestressing; Pre-tensioning and post tensioning methods – Different systems of presstressing like Hoyer System Magnel System Freyssinet system and Gifford – Udall System. Losses of prestress; Loss of prestress in pretensioned and post tensioned members due to various causes like elastic shortening of concrete, shrinkage of concrete, creep of concrete, Relaxation of steel, slip in anchorage bending of member and frictional losses.

UNIT – V

Design of Sections for Flexure and Shear; Allowable stresses, 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.

TEXT BOOKS :

1. Properties of Concrete by A.M. Neville,
2. Concrete Technology by S.M.K. Shetty.
3. Text Book of Concrete Technology by P.D. Kulkarni, R.K. Ghosh and Y.R. Phaul.
4. Concrete Technology by A.M.Neville and Brooks (Longran)
5. Concrete by Mehta (Ambuja cements 41 C.I. 1996)
6. Prestressed Concrete By Krishna Raju
7. Prestressed Concrete By Ramamrutham

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3124**

WATER RESOURCES ENGINEERING – I

UNIT – I

INTRODUCTION : Necessity and importance of Irrigation. Advantages and ill-effect of irrigation – Types of Methods of application of Water to crops – Indian Agricultural soils – Methods of improving soils fertility – preparation of land for irrigation, standards of quality for irrigation water.

CROP WATER REQUIREMENTS : Principal Indian crops – their water requirements – Crops seasons – duty, delta and base period – factor affecting duty – irrigation efficiencies – field capacity – readily available moisture estimating depth and frequency of irrigation on basis of soil moisture regime concept – Crop rotation.

UNIT – II

SURFACE HYDROLOGY – I : Hydrologic cycle – Types and forms of precipitation – rainfall measurement, recording and non-recording guages, density of guage network – computation of average rainfall over a basin – elementary concepts-evaporation, transpiration, infillitration and run-off-factors effecting run-off

SURFACE HYDROLOGY – II : Method of computing run-off from formulae, table and infiltration indices – maximum flood discharge – Elementary concepts of unit Hydrograph.

UNIT – III

GROUND WATER HYDROLOGY : Ground water occurrence – types of aquifers, types of well – porosity, specific yield, permeability Transmissibility and storage coefficient – Steady state discharge of a fully penetrating well in confined and unconfined aquifers assumptions involved.

UNIT – IV

IRRIGATION CANALS : Classification of canals – design of silt transporting canals by Kennedy's and Lacey's theories – different canal section – Balancing depth of cutting, canal lining.

UNIT – V

DIVERSION WORKS- I : Type of Head works – storage and diversion works – layout and component parts of diversion head works – functions and design criteria of different component parts – silt excluders and ejectors.

DIVERSION WORKS – II : Design of weirs and barrages on permeable foundations – cause of failure and remedial measures – design of impervious floor by Bligh's and Khosla's theories – use of Khosla's theory – Use of Khosla's formulae for computing key point pressure and exit gradient.

TEXT BOOKS :

1. Irrigation and Water Power engineering by B.C. Punmia, Pande and Lal
2. Irrigation and Hydraulic structures by R.K. Sharma.
3. Elements of water resources Engineering by K.N. Duggal and J.S. Soni (New age)
4. Irrigation Engineering by G.L. Asawani (Newage).
5. Irrigation Engineering by K.A. Arora

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3125**

ENVIRONMENTAL ENGINEERING –I

UNIT – I

Introduction : Waterborne diseases – protected water supply – Population forecasts, design period – water demand – factors affecting – fluctuations – fire demand – water quality and testing – drinking water standards.

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 –storage capacity – pipe specialis – joints, valves such as sluice valves, air valves, scour valves and check valves water meters – laying and testing of pipe lines – pump house.

UNIT II

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 – B.O.D.Equation – C.O.D.

Design of sewers – shapes and materials – sewer appurtenances manholes – inverted siphon – catch basins – flushing tanks – ejectors, pumps and pumphouses – house drainge – components requirements – sanitary fittings-traps – one pipe and two pipe systems of plumbing – ultimate disposal of sewage – sewage farming – dilution.

UNIT III

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

UNIT –IV

Filtration – theory – working of slow and rapid gravity filters – multimedia filters – design of filters – troubles in operation

comparison of filters – disinfection – theory of chlorination, chlorine demand, other disinfection practices.

UNIT – V

Layout and general out line of various units in a waste water treatment plant – primary treatment design of screens – merit chambers – skimming tanks – sedimentation tanks – principles of design – biological treatment – trickling filters – standard and high rate – construction and design of oxidation ponds. Sludge digestion – factors effecting – 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
2. Water and Waste Water Engineering by Fair Geyer and Okun
3. Text book of Environemental Engineering by P. Venugopal Rao (PHI)
4. Waste water Engineering by Metcalf and Eddy.
5. Unit operations in Environmental Engineering by R. Elangovan and M.K. Sasutharam (Newage)
6. Waste Water Management by KVSG Murali Krishna

REFERENCE BOOK :

1. Water and Waste Water Technology by Mark J Hammar and Mark J. Hammar Jr.
2. Water and Waste Water Technology by Steel

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH I-Semester **4 – 0 – 4** **CE 3126**

ENGINEERING GEOLOGY

UNIT – I

Introduction : Branches of Geology, importance of Geology in the field of Civil Engineering.

General Geology : Geological Agents, Weathering of rocks and its importance from Civil Engineering point of view – River as a Geological Agent.

UNIT – II

Mineralogy : Physical properties of minerals – Their importance in mineral identification – brief study of physical properties of quartz, feldspar, Mica, Augite, Hornblend, Olivine, Garnet, Kyanite, Talc, Chlorite, Asbestos, Calcite, Bauxite, Magnetite, Hematite, Pyrite and Chromite.

UNIT – III

Petrology : Igneous, Sedimentary and metamorphic rocks, simple classification of Igneous rocks – Dykes, Sills, Vesicular Structure porphyritic texture. Megascopic description of Granite, Basalt, Dolerite, Pegmatite, Charnockite. Classification of sedimentary rocks – their common structures and textures. Magascopic description of laterite, shale, sand stone, conglomerate and lime stone, metamorphic agents, grade of metamorphism. Common structures and textures of metamorphic rocks. Megascopic description of Gneiss, Schist, Quarzites, marble and slate.

UNIT – IV

Structural Geology : Brief description of common types of folds, faults, joints and unconformity with sketches – their civil Engineering Importance.

Stratigraphy : Geological Time Scale, a brief account of Archaeans, Cuddapahs, Vindhyans, Gondwanas and Deccan Traps.

UNIT – V

Engineering Geology " A "

1. Earthquakes : Causes and effects – types – precautions to be taken for buildings in seismic areas.
2. Land Slides : Causes and effects, precautionary measures to prevent occurrence of landslides.
3. Ground Water : Water table – cone of depression – Ground water Exploration.

Engineering Geology : " B "

1. Dams : Bearing of Geological Factors in the Selection of a dam site.
2. Reservoirs : Geological Factors affecting life and leakage of Reservoirs.
3. Tunnels : Types of – Overbreak lining, geological considerations in tunneling.

TEXT BOOKS :

1. Text Book of Engineering Geology By Dr. N.Chenna Keasaulu,
2. Engineering and General Geology By Parbin Singh.
3. A Text Book of Engineering Geology by R.B. Gupta.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH I-Semester **0 – 3 – 2** **CE 3127**

ENGINEERING GEOLOGY LAB.

1. Study of physical properties and identification of minerals referred under theory.
2. Megascopic description and identification of rocks referred under theory.
3. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
4. Simple Structural Geology problems.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH I-Semester **0 – 3 – 2** **CE 3128**

ENVIRONMENTAL ENGINEERING LAB.

LIST OF EXPERIMENTS

1. Determination of pH and Turbidity
2. Determination of Conductivity and Total dissolved solids.
3. Determination of Alkalinity/Acidity.
4. Determination of Chlorides.
5. Determination and Estimation of total solids, organic solids and inorganic solids.
6. Determination of iron.
7. Determination of Dissolved Oxygen.
8. Determination of Nitrogen.
9. Determination of total Phosphorous.
10. Determination of B.O.D
11. Determination of C.O.D
12. Determination of Optimum coagulant dose.
13. Determination of Chlorine demand.
14. Presumptive coliform test.

NOTE : At least 8 of the above experiments are to be conducted.

TEXT BOOKS :

1. Chemistry for Environmental Engineering by Sawyer and Mc. Carty
2. Standard Methods for Analysis of water and Waste Water – APHA
3. Relevant IS Codes.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3221**

GEOTECHNICAL ENGINEERING

Unit – 1

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

Compaction – Mechanism of compaction – factors effecting – effects of compaction on soil properties. – compaction control.

Unit – 2

Index properties of soils – grain size analysis – Sieve and Hydrometer methods – consistency limits and indices – I.S. Classification of soils

Unit – 3

Soil water – capillary rise – flow of water through soils – Darcy's law- permeability – Factors effecting – laboratory determination of coefficient of permeability – Total, neutral and effective stresses – quick sand condition – Flownets – Uses.

Unit – 4

Stress distribution in soils – Boussinesq's and Wester gaard's theories for point loads and areas of different shapes – Newmark's influence chart .

Consolidation – stress history of clay; e-p and e-logp curves – magnitude and rate of 1-D consolidation

Unit – 5

Shear strength of soils – Mohs – Couloumb Failure theories – Types of laboratory strength tests – strength tests based on drainage conditions – shear strength of sands – dilatancy – critical void ratio – shear strength of clays – strength envelopes – Introduction to stress path.

Text Books:

1) Basics and Applied Soil Mechanics by Gopal Ranjan & ASR Rao
2) Geotechnical Engineering by Purushotham Raj
3) Geotechnical Engineering by C. Venkataramah

Reference Books:

1) An introduction to Geotechnical to Geotechnical Engineering – Holtz and Kovacs
2) Soil Mechanics – R.F. Craig
3) Soil Mechanics – T.W. Lambe and Whitman

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3222**

STRUCTURAL ANALYSIS – II

UNIT – I

ARCHES : Three hinged arches, Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – influence lines – effect of temperature. Two Hinged Arches – Determination of horizontal thrust bending moment, normal thrust and radial shear – influence lines – Ribshortening and temperature stresses, tied arches – fixed arches – (No analytical question). Concepts of cables and suspension Bridges.

UNIT – II

Analysis of continuous beams – including settlement of supports and single bay portal frames with side sway by Kani's method.

Slope deflection method : Derivation of slope deflection equation including settlement of supports – application to continuous beams.

UNIT – III

Moment Distribution method – Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – single bay, single storey portal frames – with and without Sway – Substitute frame analysis by two cycle moment distribution. Introduction to flexibility and stiffness method of structural analysis – Matrix approach, application to continuous beams.

UNIT – IV

Introduction to matrix analysis – Flexibility methods.

UNIT V

Stiffness method; Introduction to finite element method –simple applications.

TEXT BOOKS :

1. Analysis of Structures – C.S. Reddy
2. Theory of Structures by Ramamrutham
3. Theory of Structures – R.S. Kurmi
4. Structural Analysis (Matrix Approach) by Pundit and Gupta

REFERENCE BOOKS :

1. Elementary Structural Analysis by Norris, Willium, Ufku

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3223**

STRUCTURAL ENGINEERING DESIGN & DRAWING – II (STEEL)

UNIT – I

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

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 subjected to direct tension and bending – effective length of columns. Slenderness ratio – permissible stresses. Design of compression members – built up sections – Design of lacings and battern. Design principles of eccentrically loaded columns, splicing of columns.

UNIT – IV

DESIGN OF COLUMN FOUNDATIONS : Design of slab base and gusseted bases.

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

UNIT – V

Plate Girder : Design consideration – I S Code recommendations Design of plate girder-Welded – Curtailment of flange plates stiffners – splicings and connections. Gantry girder impact factors - longitudinal forces design of Gantry girders.

TEXT BOOKS

1. Structural Designs and Drawing By N. Krishna Raju
2. Design of Concrete & Steel by Ramachandra
3. Design of Steel Structures by P. Dayaratnam.
4. Design of Steel Structures by A.S. Arya & J.L.Azmani

REFERENCE :

1. Steel Structures Design and Behaviour by charles G. Soloman and J.E. Johnson

NOTE :

Alternate weeks two periods of drawing class should be conducted. The end examination paper should consist of Part – A and Part – B. Part- A should consist of two questions in design and drawing out of which one question to be answered. Part – B should consist of five questions in design out of which three to be answered weightage for Part – A is 40 % and Part –B is 60 %

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3224**

WATER RESOURCES ENGINEERING – II

UNIT – I

RESERVOIR PLANNING: Types of reservoirs – Investigations for reservoir planning – selection of site for a reservoir – Zones of storage in a reservoir-yield and demand-mass curve and capacity of reservoir-estimation of life of reservoir.

UNIT – II

DAMS : Dams and their classification – merits and demerits of various types of dams-physical factors governing selection of types of dam –selection of site for a dam-forces acting on a gravity dam.

UNIT – III

GRAVITY DAM : Types of failure and stability requirements – principal and shear stresses-elementary profile and practical profile of a low dam- limiting height of a low gravity dam – stability analysis of a gravity dam-drainage gallery and construction joints.

UNIT – IV

EARTH DAMS : Types and classifications-causes of failure of earth dam-criteria for safe design of earth dam-phreatic line flow – control design criteria for filters.

SPILLWAYS : Types of spillways-ogee, side channel, siphon, shaft, chute-design of ogee spillway-emergency spillways – types of spillway gates.

UNIT – V

ENERGY DISSIPATORS : Types of hydraulic jump-jump height and tail water rating curves-types of stilling basins-selection of types of energy dissipater based on different conditions – stilling basin appurtenances.

CANAL REGULATION WORKS : Canal falls-necessity and location of falls-classification of falls-head regulator and cross regulator-Irrigation outlets-modular and non-modular.

CROSS DRAINAGE WORKS : Necessity and Design principles of aqueduct, under Tunnel,.super passage and level crossing.

TEXT BOOKS :

1. Punmia & Pande P.B.B.LAL : Irrigation & Water power Engineering.
2. Varshney, Gupta & Gupta : Theory & Design of Hydraulic Structure
3. Garg : Irrigation Engineering and Hydraulic Structures.
4. Irrigation Engineering by K.R.Arora.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3225**

ESTIMATING QUANTITY SURVEY AND VALUATION

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
Detailed Estimates of residential Building.

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

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

UNIT – V
Standard specifications for different items of building construction.

NOTE : NUMBER OF EXERCISES PROPOSED :
1. 3- in flat Roof & 1 in Sloped Roof
2. Exercise on Data – 3 Nos.

TEXT BOOKS
1. Estimating and Costing by B.N. Dutta
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. Chakraborthi
4. Valuation of Real properties by R.C. Rangwala.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **4 – 0 – 4** **CE 3226**

TRANSPORTATION ENGINEERING

HIGHWAY ENGINEERING :

UNIT – I
HIGHWAY DEVELOPMENT AND PLANNING : Highway Development in India – Plans – Road Patterns – Alignment – Engineering – Surveys for highway locations – Drawings and reports.
Highway Geometric Design : Elements of cross-section - sight distance – Horizontal and Vertical Alignment.

UNIT – II
TRAFFIC ENGINEERING : Traffic Studies : Volume, Origin and destination studies: accident studies – Traffic signs – Traffic islands – Intersection design – All grade and grade – separated intersections.

UNIT – III
Highway Design construction and Maintenance : Design Construction and maintenance of gravel, water-bound, bituminous pavement and concrete pavements – maintenance of roads.

RAILWAY ENGINEERING :

UNIT – IV
Permanent way components : Rails – types – defects – Creep – Welding of rails – sleepers – types, ballast of fastenings – rigid and elastic fastenings.
Geometric Design : Grade compensation, Degree of curvature – Super elevation – negative super elevation – transition curves – shift – widening of track on curves – speed on curves. Signaling & Interlocking Systems.

UNIT – V

Airport Engineering: Components of airport- Runway – Tax way – Terminal building – Orientation of runway – wind rose diagram – components of aircraft – Difference of runway payment design to Highway payment design (only factors no details).

TEXT BOOKS :

1. Highway Engg., by S.K. Khanna and C.E Justo.
2. Highway Engg., by Kadiyali
3. Text Book of Railway Engg., by Arora and Sarma
4. Text Book of Railway Engg., by Rangwala.
5. Principles of Transporation and Highway Engineering by G.V.Rao
6. Airport Engineering by Khanna & Arora.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH II-Semester **0 – 3 – 2** **CE 3227**

GEOTECHNICAL ENGINEERING LAB

LIST OF EXPERIMENTS

1. Atterberg's Limits.
2. Field density-core cutter and sand replacement method
3. Grain size analysis
4. Permeability of soil, constant and variable head test
5. Vane shear test
6. Compaction test
7. Unconfined compression test
8. Consolidation test
9. Triaxial Compression test
10. Direct shear test.

Any eight experiments may be completed.

REFERENCE BOOK

1. Measurement of Engineering Properties of Soils by. E. Saibaba Reddy & K. Rama Sastri

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH II-Semester **0 – 3 – 2** **CE 3228**

BUILDING DRAWING

1. SIGN CONVENTIONS OF THE FOLLOWING:

   Brick, Stone, Plaster, Sand, Concrete, Glass, Steel, Cast iron, copper alloys, Aluminium alloys etc., Lead, Zinc, tin, white lead etc., Earth, Rock, Timber and Marble. (PLATE 1)

2. BONDS:

   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 (PLATE No.2)

3. DOORS WINDOWS & VENTILATORS: Panelled Door – panelled and glazed door, glazed windows – panelled windows – Swing ventilator – Fixed ventilator (PLATE. No. 3)

4. TYPES OF ROOFS:

   Couple roof – Collar roof – Kind Post truss – Queen post truss. (PLATE.No.4)

5. SLOPED ROOF BUILDINGS (PLATES.No.5)

   FLAT ROOF BUILDING (PLATE.No.6)

6. TWOSTOREYED BUILDINGS (PLATE.No.7)

   COLUMN TYPE BUILDING (PLATE.No.8)

7. Given line diagram with specification to draw, plan, sections section and elevation (PLATE.No.9,10)

TEXT BOOKS :

1. 'A' Series & 'B' Series of JNTU Engineering College, Anantapur,

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4121**

FOUNDATION ENGINEERING

Unit – I

Soil Exploration – Need – Methods of soil exploration – Dynamics & Static Boring and Sampling methods – Field tests – Penetration Tests – Plate load test – Pressure meter – vane shear test – planning of programme and preparation of soil investigation report.

Unit – II

Earth slope stability : Infinite and finite earth slopes – types of failures – factors of safety of infinite slopes – types of failure of finite slopes – stability analysis by Swedish arc method, standard method of slices – Stability of earth dams for different conditions.

Unit – III

Earth pressure Theories: Rankin's theory of earth pressure – earth pressures in layered soils – Coulomb's earth pressure theory – Culmann's and trial wedge graphical methods – Types of retaining walls – stability of retaining walls.

Unit – IV

Shallow Foundations – Types - choice of foundation – Location of depth – Safe Bearing Capacity – Terzaghi's theory – Safe bearing pressure based on N- value – allowable bearing pressure; safe bearing capacity and settlement from plate load test – allowable settlements of structures.

Unit – V

Pile Foundation – Types of piles – Load carrying capacity of piles based on static pile formulae – α and β methods – Dynamic pile formulae – Pile load testing – load carrying capacity of pile groups in sands and clays.

TEXT BOOKS:

1) Basics and Applied Soil Mechanics by Gopal Ranjan & ASR Rao
2) Geotechnical Engineering by Purushotham Raj
3) Geotechnical Engineering by C. Venkataramah

REFERENCE BOOKS:

1) Principles of Foundation Engineering – B.M. Das
2) Foundation Analysis and Design – J.E. Bowles
3) Analysis and Design of Substructures – Swami Saran
4) Measurement of Engineering Properties of soils – E. S. Reddy and K.R. Sastri , New Age International, Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4122**

STRUCTURAL ENGINEERING (DESIGN & DRAWING)–III

UNIT – I

SLAB BRIDGE: Introduction to R.C. Bridges different types of bridges – Economic span length – I.R.C. loading and other code provision – Effective width method of analysis – Working stress Design and detailing of deck slab bridge for I.R.C. loading.

UNIT – II

T-BEAM BRIDGE : Introduction, wheel load analysis – B.Ms in slab – Pigeaud' s Theory – Analysis of longitudinal girders by Courbon's theory – working stress design and detailing and of R.C. T-beam bridges for I.R.C. loading.

UNIT – III

PLATE GIRDER BRIDGE : Introduction to steel bridges – Deck and through type of Bridges – Indian Standard railway loading – Code provisions – Structural design and detailing of plate girder Bridge.

TRUSS BRIDGE : Structural design and details of simple steel truss bridge for railway loadings – Foot bridges.

UNIT – IV

STAIR CASES : Technical terms – General design considerations I.S.Code provisions – design and detailing of simple types of R.C. stairs.

UNIT – V

WATER TANKS : . Working stress Design and detailing of various components of R.C. Intzetype of tank excluding staging.

NOTE : Alternate weeks 2 periods of drawing class should be conducted. The end examination paper should consist of Part A and Part B. Part A should consist of two questions in Design and Drawing from (RC & Steel Bridges) out of which one question is to be answered. Part B should consist of five question set from remaining units out of which three questions

are to be answered, Part A should have a weightage of 40% and Part B should have a weightage of 60%

TEXT BOOKS :

1. Reinforced Concrete Design by Dr P. Dayaratnam.
2. Reinforced Concrete Design by Chu-Kia wang, Charles G. Salmon.
3. Advanced R.C.C. Design by Krishna Raju.
4. Design of Reinforced Concrete structures by S. Ramamurtham.
5. Essentials of Bridge Engineering by Ponnuswamy.

REFERENCE BOOKS

1. Design of Reinforced Concrete Structures by Vazirani & Ratwani.
2. Desing of Steel Structures by Vazirani & Ratwani
3. Design of Steel Structures by Arya and Azmani
4. Bridge Engineering by D.R. Pathak
5. Bridge Engineering by S. Ponnuswamy
6. Concrete Bridge Practice by V.K. Raina (Analysis, Designed and Economics)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4123**

FINITE ELEMENT METHODS

Unit –I

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

Unit –II

Principles of Elasticity: Stress equations – strain displacement relationships in matrix from –plane stress, plain strain and Axi-symmetric bodies of revolution with axi-symmetric loading.

Unit –III

One Dimensional FEM : Stiffness matrix for beam and Bar element shape functions for 1D elements –Static condensation of global stiffness matrix – solution –initial strain and temperature effects.

Unit – IV

Two Dimensional FEM : Different types of elements for plane stress and plain strain analysis – Displacement models – generalized coordinates – shape functions – convergent and compatibility requirements – Geometric invariance – Natural coordinate system – area and volume coordinate – generation of element stiffness and nodal load matrices – static condensation.

Unit – V

Isoparametric formulation – Concept, different isoparametric elements for 2D analysis formulation of 4 –noded and 8-noded

isoparametric quadrilateral elements –Lagrangian elements – serendipity elements.

REFERENCE BOOKS:

1) Finite Element Method By O.C. Zienkiewicz

2) Finite element analysis – Theory & programming by C.S. Krishna Murthy

3) Introduction to finite element method – Triupathi Chandra Putla & Belugnudu

4) Introduction to Finite element Method – J. N. Reddy

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4124**

COMPUTER AIDED ANALYSIS AND DESIGN

UNIT – I

CAD and Auto CAD – Fundamentals of Computer for design – Benefits of CAD.

CAD Hard Ware: Soft ware and graphics Design – Work station – Graphics – terminal – Input devices – Cursor control devices – Digitization – Key Board terminals – plotters and other output devices – C.P.U

UNIT – II

Soft Ware Configuration of a graphic system – graphics system-graphics package- graphics – Two dimensional transformation – Three dimensional transformation – Data base structure and content – wire frame versus solid modeling.

UNIT – III

Displacement Method : Stiffness properties of members, element and structure stiffness formulation co-ordinate transformation and global assembly-Boundary conditions. Application to plane pin-jointed trusses and rigid jointed plane frames.

UNIT – IV

Finite Difference Method – Differential equation of beams and plates – Solution of beams and plates problems – Boundary condition – Beams on elastic foundations – Raft foundation supported on elastic sub-grade – Solution using finite difference method.

UNIT – V

Linear Programming : (I) : Simplex Method : Standard form of Linear programming problem. Geometry of linear programming problems – Definitions and theorem – Solution of system of linear simultaneous equations – Pivotal reduction – Simplex – algorithm – Two phase of the simplex method – Additional applications.

Linear Programming (II) : Additional topics : Revised simplex method - Duality in linear programming – Decomposition principle – Sensitivity or post optimality analysis – Transportation problem.

REFERENCES BOOKS :

1. Computer AidedDesign and Manufacturing : Mikel P. Groover & C.W. Zimers Jr.
2. Matrix Analysis of Structures : M.B.Kanchi
3. Foundation Design : Teng.
4. Foundation Analysis and Design : J.E.Bowles
5. Optimization theory and application : S.S. Rao
6. Theory of Plates and shells : S. Timoshenko
7. Advanced Mechanics of Materials : Seeley and Smith.
8. Computer Programming and Engineering Analysis : I.E Syal S.P. Gupta.
9. Computer Aided Design : C. S. Krishna Murthy & S. Rawer.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4125**

SOIL DYNAMICS AND MACHINE FOUNDATIONS (ELECTIVE – I)

UNIT – I

Types of machine foundations – general requirements design – criteria for machine foundations, permissible amplitudes and bearing pressure.

Resonance and its effect – free and forced Vibrations with and without damping – constant force and rotating mass type excitation – magnification steady state vibrations – logarithmic decrement.

UNIT – II

Natural frequency of foundation – soil system – Barkan's and I.S. methods of determining natural frequency.

UNIT – III

Elastic properties of soil for dynamic purpose and their experimental determination – Elastic waves and their characteristics – Experimental determination of shear modulus from wave theory.

UNIT – IV

Apparent soil mass – bulb of pressure concept – Pauw's analogy of foundation – soil systems (Concept only)

Theory of elastic half space – lamb and the dynamic Boussinesq's problem – Relsner's solution and its limitations – Quinlan and Sung's modifications – Hsiegh's equations for vertical vibration.

UNIT – V

Principles of design of foundations for reciprocating and impact type of machine – as per I.S. Codes.

Vibration isolation – types and methods of isolation – isolating materials and their properties.

REFERENCE BOOKS:

1. Hand Book of Machine Foundations by S. Srinivasulu and Vaidanathan.
2. Soil Mechanics & Foundation Engineering by B.C. Punmia.
3. Analysis and Design of Foundation and retaining structures-Sham Sher Prakets, Etal.
4. Vibration of Soils & Foundations – Richant Hall & Woods.
5. Soil Dynamics of Shamshare Prakash.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4126**

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT (ELECTIVE – I)

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, Methodology for the assessment of soil and ground water, Delineation of study area, Identification of actives, Procurement of relevant soil quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measure.

UNIT – IV:
E I A an 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, Assessment of Impact on development Activities of Vegetation and wildlife, environmental Impact of Deforestation – Courses and effects of deforestation.

UNIT – V :
Environmental Audit & Environmental legislation objectives of Environmental Audit, Types of environmental Audit, Audit protocol, stages of Environmental Audit, on-site activities, evaluation of Audit data and preparation of Audit report, Post

Audit activities, The Environmental pollution Act, The water ;Act, The Air (Prevention & Control of pollution Act.).

REFERENCE BOOKS :

1. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B.S. Publication, Sultan Bazar, Hyderabad.
2. Environmental Science and Engineering, by J. Glynn and Gary W. Hein Ke – Prentice Hall Publishers
3. Environmental Science and Engineering, by Suresh K. Dhaneja – S.K.,Katania & Sons Publication., New Delhi.
4. Environmental Pollution and Control, by Dr H.S. Bhatia – Galgotia Publication (P) Ltd, Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4127**

HYDROLOGY (ELECTIVE –I)

UNIT – I:

INTRODUCTION: Hydrology –Definition, Surface water Hydrology and Ground water Hydrology, Hydrology cycle – Different forms, Global Water Budget.

PRECIPITATION: Rain-gauge – Recording and non recording types, Mass rainfall curve – Characteristics mean rainfall on a basin – arithmetic, Theissen and Isohyetal methods, Intensity – Duration Analysis, Intensity – frequency – duration analysis, Depth – area – duration curves, PMP, Missing Rainfall data – Estimation, Consistency of Rainfall records Double mass curve, rain gauge networks analysis.

UNIT – II:

GROUND WATER HYDROLOGY: Occurrence, movement and distribution of ground water, aquifers – types, specific yield, permeability, storage coefficient, Transmissibility, Rock properties affecting Groundwater.

UNIT – III :

WELL HYDRAULICS: Steady radial flows into well confined and unconfined aquifers; Recuperation tests, well interference, well characteristics.

UNIT – IV :

EVAPORATION: Evaporation process, Factors affecting evaporation Estimation of evaporation, Measurement of evaporation – Evaporation pans, control of Evaporation, Transpiration, Evapo-transpiration, PET, Consumptive use, Lysimeter, Formulae for estimation of PET.

INFILTRATION : Infiltration process, Factors affecting, Measurement of infiltration, Infiltrometer, Infiltration capacity curve, Horton's relation, Infiltration Indices, O- Index, W- Index and W_{min} Index.

UNIT – V

RUN OFF : Components of Runn off, Factors affecting run off, Estimation of run off, Basin yield, Flow duration curves mass curve of Run off – Analysis, Estimation of safe yield from a Reservoir of given capacity.

HYDROGRAPHS : Hydrograph – components, separation of Hydrology into Base flow and DRO – Methods, Unit hydrograph – Principles, Derivation of UH of Isolated unit storms, UH for various duration – S – Curve techniques, Estimation of run off from UH Average UH, Limitations of UH Theory Synthetic UH, IUH.

TEXT BOOKS:

1. Hydrology by K. Subramanya,TMH Publications.
2. Hydrology by HM Raghunath
3. Groundwater Hydrology by D.K. Todd.
4. Hydrology by P. Jayarami Reddy.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4128**

BRIDGE ENGINEERING

Unit-I :

Standard Specifications for Road Bridges:

Introduction-Indian Roads Congress, Bridge Code-Width of carriageway-Clearances-Loads to be considered-Dead load-I.R.C. standard live loads-Impact effect-Review of I.R.C.loadings-Application of live loads on deck slabs-Wind load-Longitudinal forces-Centrifugal forces-Horizontal forces due to water currents-Buoyancy effect-Earth pressure-Temperature effects-Deformation stresses-Secondary stresses-Erection stresses-Seismic force.

Unit-II:

General Design Consideration:

Introduction-Reinforced concrete; Elastic design constants; Reinforcing bars; Concrete grades; Permissible stresses under different load conditions; Cover to reinforcement; Effective flange width of T-beams and L-beams; Curtailment of bars; Detailing of reinforcement-Concrete mix design-Notation for detailing R.C. bridges-Steel construction; Materials; Permissible stresses; General details- Prestressed concrete; Materials; Design considerations-Traffic aspects of highway bridges-Aesthetics of bridge design.

Unit-III:

Culverts:

Introduction-Reinforced concrete slab and Box culvert-Example for R.C. Slab culvert-Author's charts for design of deck slab of slab bridges-Skew slab culvert-Pipe culvert-Reinforced concrete box culvert-Sub-mersible bridges. Analysis & Design Box culvert bridges.

Unit-IV:

Reinforced Concrete Bridges:

Introduction --T-beam bridges-Illustrative example of T-beam bridge-Hollow girder bridges-Balanced cantilever bridges-

Continuous girder bridges-Rigid frame bridges-Arch bridges-Bow string girder bridge-Example of bow string girder bridge.

Unit-V:

Substructure:

Definition-Bed block-Materials for piers and abutments-Piers-Forces due to wave action and collision-Example of design of pier-Abutments-Example of design of abutment-Backfill behind abutment-Approach slab. Construction and Maintenance:

Construction method-Short span bridges-Long span bridges-Formwork and falsework for concrete bridges-Construction management-Numbering of bridges-Maintenance-Bridge failures

REFERENCE BOOKS:

1. Bridge Engineering by D. Johnson Victor,
2. Bridge Analysis and Design by V.K.Raina
3. Bridge Engineering by N. Krishna Raju.
4. Bridge Engineering by Aswani, Vatvani & Ratvani.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4129**

DATA STRUCTURES THROUGH C (Elective –I)

UNIT – I

One dimensional and multidimensional arrays, initialization, applications, program examples.

UNIT – II

Single linked list, double linked list, header, circular list, applications, program examples.

UNIT – III

Stacks, representation, infix, postifix, and prefix programs, recursion, recursion in C , applications of stacks, queues, representation, queues, circular queues applications, program examples.

UNIT – IV

Binary tree, representation, three traversals, graph, representation, graph traversals, spanning tree.

UNIT – V

Searching techniques, linear and binary search methods, sorting method, exchange sort, Pelection sort, quick sort, tree sort, C programs.

BOOKS:

1. Data Structure through C by A M. Tanenbaum and others.
2. Programming in 'C' by D. Ravichandram (New Age)

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HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4130**

GROUND IMPROVEMENT TECHNIQUES
(ELECTIVE – II)

UNIT – I

In – situ densification Methods in granular Soils – Introduction Vibration at the ground surface, Impact at the Ground Surface, Vibration at depth, Impact at depth.

In – situ Densification Methods in Cohesive soils – Introduction, preloading or dewatering, Drainwalls – Sand Drains, Sandwitch geodrains – Stone and lime columns – thermal methods.

UNIT – II

Reinforced Earth : Principles – Components of reinforced earth – factors – governing design of reinforced earth walls – design principles of reinforced earth walls.

UNIT – III

Geotextiles : Introduction – Types of geotextiles : Functions and their applications, tests for geotextiles materials – geogrids – functions.

Expansive soils : Problems of expansive soils – tests for identification – I.S. Test methods of determination of swelling – pressure. Improvement of expansive soils – Foundation techniques in expansive soils – under reamed piles – I.S.Code practice – Remedial measure.

UNIT – IV

Mechanical stabilization : Soil aggregate mixtures-properties and proportioning techniques – soft aggregate stabilization – compaction – field compaction control.

Cement stabilization : Mechanism – factors affecting and properties – Use of additives – design of soils cement mixtures – construction techniques.

UNIT – V

Lime and Bituminous stabilization : Type of admixtures – mechanism – factors affecting – design of mixtures – construction methods.

REFERENCES BOOKS:

1. ROBERT M. KOERNER : Construction and Geotechnical Methods in Foundation Engineering, Mc Graw Hill.
2. E.J.YODER : Principles of Pavement Design, John Wiley and Sons.
3. LEONARDS G.A : Foundation Engineering.
4. Khanna S.K. and JUSTO C.E.G : Highway Engineering (Nemchand Publication)
5. SOWERS G.F: Introductory Soil Mechanics and Foundations.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4131**

PAVEMENT ANALYSIS, DESIGN AND EVALUATION

(Elective II)

Unit – I

Pavement types, wheel loads and design factors, comparison of highway pavements, wheel loads, tire pressure, contact pressure, Design factors: Traffic and loading, Environment, materials, failure criteria.

Unit -II

Stresses in flexible pavements, Layered system concepts: one layer system: Boussinesq theory, two layer theory: Burmisters's theory.

Unit – III

Stresses in Rigid pavements, relative stiffness of slabs, Modulus of subgrade reaction, stresses due to warping, stresses due to friction, stresses due to load, IRC recommendations.

Unit – IV

Pavement Design: IRC method of flexible pavement design, IRC method for Rigid pavements.

Unit – V

Pavement Evaluation: Roughness measurements, load man concept, skid resistance measurement, Benkleman beam deflection method.

REFERENCES:

1. Yodir and Witzorack, "Principles of Pavement design" John Wiley & sons.
2. Yang, H. Huong, " Pavement Analysis and design", Prentice Hall Publications.
3. Sargious, M.A. "Pavements and Surfacings for Highways and Airports", - Applied Science Publishers Limited.
4. Ralps Hass and Hudson, W.R., "Pavement Management System", McGrawhills, Book Company.
5. IRC load of Practice

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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IV B.TECH I-Semester **4 – 0 – 4** **CE 4132**

ARCHITECTURE AND TOWN PLANNING
(ELECTIVE – II)

UNIT – I
ARCHITECTURE :

1. History of Architecture :

a). Western Architecture: Egyptian, Greek, Roman Architectures; influences- Comparative Analysis - Orders.

b). Indian Architecture: Vedic age – Indus Valley civilization – Buddhist period; Stambas, Slenstas. Roranas, Chaityans, Viharas with one example for each Hindu temples – Evaluation of Dravidian and Indo – Aryan Styles – Principle factors. Temple of Aibole, Mahabalipuram, Madurai, Deograph, Bhuvaneshwar, Mount Abu.

c). Indo – Sarsanic Architecture ; Mosque – Place- Fort – Tomb.

UNIT – II

2. Architectural Design :

a). Principle of desing : Composition of plan – Relationship between plan and elevation elements, form, surface Mass, Texture, Color, Tone.

b). Principles of Compositions : Unity, contrast, proportion, scale, Bab Rhuthm, character.

UNIT - III

3) Principles of Planning a Residence ; Site Orientation – prospect, Grouping, circulation, privacy, services and other factors.

4) Introduction of Post-classic Architecture and contribution of eminent architects to morden period.
Brief summary of post – classic architecture – Indian and Western Architecturall contribution of Edward Lutyens, Le Corbusier, Frank Lloyd Wrigt, Walter Groping, Vender Rohe, Caarihan, Nervi, Oscar Niemyer, Edward Durell stone.

UNIT – IV
B) TOWN PLANNING :

5. Histroical Back Ground :

a) Town planning in India – town plans of Manasa – town plans of ancient Indian towns ; Molr, Pataliputra vijayanagara, Delhi.

b) Town planning in the West-town plans of Acropolis,Rome, Paris, London, Karrissulre.

6. Components of Planning;
   a). Zoning
   b). Roads and road Traffic.
   a) Housing-Slums, Parks, Play grounds.
   b) Public Utility Services.
   c) Surveys and maps for planning.
   d) Neighbourhood Planning.

UNIT – V

6. Planning New town, planning standards, National and regional Planning, town planning and legislation.

7. Garden cities and satellite town

Note : The question paper is to be set in two sections – one for Architecture and the other for "Town planning".

REFERENCES :

A. ARCHITECTURE

1. Indian Architecture – Vol:- I and II by Percy Brown, Taraporevala Publications, Bombay.

2. Planning and Design of Building – Section of Architecture by Y.S.Sane.

3. Mprdermn Architecture and Design by Nikolans, Pevshar.

4. Mordern Ideal Homnes for India by R.S.Deshpande.

B) TOWN PLANNING

1. Town and Country Planning – A.J.Brown and H.M.Sherrard.

2. Town Design – Federik Glbbard, Architectural press, London.

3. National Building Code of India.

4. Town Planning in India – Town and Country Planning Organisation, New Delhi 1962.

5. Regional Planning - Misra R.P., Mysore University.

6. Urban and Regional Planning ; Principles and case studies by K.S.Rama Gouda,Mysore University Publications.

7. Town and Country Planning – P. Abercrombe, Oxford University press.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4133**

ADVANCED COMMUNICATION SKILLS (ELECTIVE – II)

UNIT – I :
Fundamental of interpersonal communication – Internal operational communication, External – operational communication – Informal conversation Vs Formal expression – Verbal and non-verbal communication, barriers to effective communication – kinesics

UNIT – II :
Types of Communication – Horizontal, Vertical (Upward downward), Grape wine, Consensus – Oral, Qural, Writing and reading – Word – Power – Vocabulary- Jargon – rate of speech, pitch, tone – Clarity of voice

UNIT – III :
Technical presentations – types of presentation – participation is meetings – chairing sessions.

UNIT – IV :
Formal and informal interviews – polymics – interviewing in different settings and for different purposes eg., gathering information, recruiting, performance appraisal.

UNIT – V :
Written communication – differences between spoken and written comprehensions – Indianisons – Correction of sentences – Structures – Tenses – ambiguity – idiomatic distortions – features of effective writing such as clarity, brevity, appropriate tone, ority, balance etc. – GRE, TOFEL models.

Letter writing – business letters – proforma culture – format – style – effectiveness promptness – Analysis of sample letters collected from industry – email, fax.

Technical Report writing – Business and Technical Reports – Possible and feasible reports – progress reports, routine reports – Annual reports – format – Analysis of sample reports from industry – Synopsis and thesis writing

REFERENCES:

1. Susan Stevenson / Steve whitmore with a chapter by Margaret Hope : Strategies for Engineering Communication; John Wiley & Sons, Inc., New York; Indian Edition printed by Replika Press Pvt. Ltd., EOU, Delhi – 110 040.
2. Rajendra Pal, J S Korlahalli : Essentials of Business Communication; Sultan Chand & Sons, New Delhi.
3. Andrea J. Rutherford : Basic Communication Skills for Technology; Pearson Education Asia, Patparganj, New Delhi-92.
4. V. Prasad :Advanced Communication Skills; Atma Ram Publications, New Delhi.
5. Raymond V. Lesikav; John D. Pettit Jr.; Business Communication; Teory & Application, All India Traveller Bookseller, New Delhi-51.
6. K.R. Lakshminarayana : English for Technical Communication – Vol. 1 and 2 , SCITECH Publications (India) Pvt. Ltd., T. Nagar, Chennai-600 017.
7. Edmond H Weiss : Writing Remedies : Practical Exercises for Technical Writing, Universities Press, Hyderabad.
8. Cliffs Test Prep for GRE and TOEFL : Computer Based Test, IDG Books India (P) Ltd. New Delhi-002.
9. GRE and TOEFL ; Bavon's Series, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **4 – 0 – 4** **CE 4134**

AIR POLUTION AND CONTROL (ELECTIVE – II)

UNIT – I

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

UNIT – II

Effects of Airpollutants on man, material and vegetation; Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

Thermodynamics and Kinetics in Air-pollution – Applications in the removal of gases like SO; NO; CO; HC etc., air-fuel ratio. Computation and Control of products of combustion.

UNIT – III

Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity; Influence of Mateorogical phenomena on Air Quality.

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

UNIT – IV

General Methods of Control of NO and SO emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT – V

Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control.

Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

Air Quality Management – Monitoring of SPM, SO; NO and CO Emission Standards.

TEXT BOOKS

1. AIR POLLUTION By H.G. Perkins, C.S. Rao, M.N.Rao and H.V.N.Rao
2. ENVIRONMENTAL POLLUTION CONTROL ENGINEERING By C.S.Rao
3. AIR POLLUTION AND CONTROL By K.V.S.Q.Murali Krishna

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH I-Semester **0 – 3 – 2** **CE 4135**

COMPUTER AIDED ANALYSIS LABORATORY

EXPERIMENTALS LIST

- Elementary graphics Design :
- Exposure to Graphic Packages like Auto CAD 3D-Studio,
- Analysis of simple pin jointed plane frame using stiffness method.
- Analysis of a multistoried multi bay portal frame b y stiffness method.
- Solution of Beam problem by finite difference method.
- Solution of plate problem by finite difference method.
- Solution of system of linear simultaneous equations.
- Simple method of linear programming.
- Solution of transportation problem

Any 8 programs using C

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IV B.TECH I-Semester **0 – 3 – 2** **CE 4136**

CONCRETE AND HIGHWAY 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.

II. BITUMINOUS MATERIALS :

1. Penetration Test.
2. Ductility Test.
3. Softening Point Test.

III. CEMENT AND CONCRETES :

TESTS ON CEMENTS :

1. Normal Consistency of 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 and compressive strength of concrete.
7. Bulking of sand.
8. Non-Destructive testing on concrete (for demonstration)

REFERENCE :

1. Concrete Technology by S.M.K. Shetty
2. Laboratory Manual in Highway Engineering by Ajay K. Duggal and Vijay P. Puri (Newage)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH II-Semester **4 – 0 – 4** **CE 4221**

ADVANCED FOUNDATION ENGINEERING (ELECTIVE – III)

UNIT – 1.

Bearing capacity of Footings subjected to Eccentric and Inclined Loading – Meyrhoff's and Hanse's theories – elastic settlement of Footings embedded in sands and clays of Infinite thickness – Footings on soils of Finite thickness-Schmertamaunn's method, Jaubu and Morgenstern method.

UNIT – 2.

Pile Foundations – settlement of Pile groups resting in sands and clays – Negative skin friction – in single piles and groups of piles – under – reamed piles – specifications – load – carrying capacity in sands and clays.

UNIT – 3.

Caissons and well foundations : Types of caissons – well foundation Different shapes of wells – Components of wells – functions and Design – Design Criteria – Sinking of wells – lateral stability by Terzaghi's analysis.

UNIT – 4. Cantilever sheet piles and anchored bulkheads Earth pressure diagram – Determination of Depth of embedment in sands and clays – Timbering of trenches- Earth pressure diagrams – Forces in struts.

UNIT – 5.

Foundations in Expansive soils – Problems in Expansive soils – Mechanism of swelling – Swell Pressure and Swelling potential – Heave – foundation practices – Sand cushion – CNS cushion –

under –reamed pile Foundations – Granular pile – anchor technique, stabilization of expansive soils.

TEXT BOOKS :

1. Analysis and Design of Substractenes – Swami Saran
2. Basic and Applied Soil Mechanics – Gopal Ranjan and A.S.R.Rao
3. Soil Mechanics & Foundation Engineering, Foundation Engineering – II - V.N.S. Murthy.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV B.TECH II-Semester **4 – 0 – 4** CE 4222

HYDRO POWER ENGINEERING
(ELECTIVE - III)

UNIT – I

INTRODUCTION :

Different sources of energy – Hydropower and its advantages and disadvantages – Role of hydropower in a power system – Hydropower development in India with special reference to South India – Estimation of water power potential.

ELECTRICAL LOAD ON HYDROTURBINES :

Load curve – load factor – capacity factor Utilization factor – Diversity factor – Load – duration curve – Firm power and secondary power – Prediction of load.

UNIT – II

TYPES OF HYDRO – POWER PLANTS :

Classification of hydal plants – Run – off river plants and their general arrangement – storage plants – Diversion tunnel plants – Storage and pondage – Pondage factor – Flow and power duration curves.

PUMPED STORAGE PLANTS :

Basic features - Advantages – Types – Two unit, three unit, and four unit installations and their merits and demerits – Reversible pump turbines – Efficiency of pumped storage plants.

UNIT – III

WATER CONVEYANCE SYSTEM :

Classification penstocks – design criteria for penstocks – Economical diameter of penstocks – Anchor blocks – Conduit valves – Types of valves, Bends and manifold – Types of Intakes – Losses in Intakes.

WATER HAMMER AND SURGE TANKS

Water hammer phenomenon – rigid and elastic water column theories – Allievicharts – types of surge tanks – Channel surges.

UNIT – IV

TURBINES :

Hydraulic features – Layout of turbines – Euler's equation and hydraulics of turbines – Draft tubes – Cavitation in turbines Model testing of turbines – Characteristic curves – Selection, governing of turbines.

UNIT – V

POWER HOUSE :

Surface power stations – arrangement of unit loading and control bays – Underground power stations – Types, advantages and components of underground power stations.

TEXT-BOOK :

1. Hydroelectric Hand Books : Creager and Justin, John Wiley & Sons, New York.
2. Water Power Engineering : Barrows, Tata Mc. Graw Hill Co., New Delhi.
3. Hydro Elect. Engineering for Civil Engineering : Liliavsy (Vol.8 of Design Text Books in Civil Engineering) Oxford IBH Pub. Co., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH II-Semester **4 – 0 – 4** **CE 4223**

Disaster Management and Rehabilitation of Structures
(Elective III)

Unit -I

Disaster : Earth quake, floods, cyclones, fire and its effects on Engineering structures. Risk evaluation, analysis, vulnerability analysis – Economy, poverty, social structure, Urbanization, Infrastructure, Housing disaster management.

Action Plan (DMAP) – planning , objectives, Institutional arrangements, operating procedure, guidelines, standards, operating procedures for warning.

Mitigation strategy – Partnership for building safer communities, goals, cost mitigation analysis, applied research and Technology transfer, public awareness and training, Mitigation measures – structural attraction for buildings, flood mitigation, earth quakes, Cyclones, Fire Accedents.

Unit – II

Damage in Structures: Distress signals, cracking signs, concrete quality. Influence of environment, option for repairs. Accidental over loading. Faulty construction practice, faulty materials, maintenance of preventive system – repair strategy – replacing – demolition of structural elements need for assessment.

Unit – II

Assessment of structural Conditions: (Condition Monitoring) – Inspection Testing – types of cracks – Longitudinal, transverse, shear cracks, plastic shrinkage cracks, plastic settlement cracks, map cracks, surface cracking. Visibility, crack magnitude.

Unit – IV

Significance of cracking: Sounding the concrete surface, testing for carbonation, determination of chloride content, Estimation of thickness of cover, estimation of in-situ strength, taking core samples. UV pulse measurement, water absorption and

permeability. Electrical potential survey, measurement of electrical resistivity.

Unit – V

Methods of Rehabilitation: Repairing cracks, Plastic Shrinkage, Plastic settlements, shear cracks, transfers cracks, live cracks, longitudinal cracks caused by rusting. Removing concrete cover, treatment of patch edges, depth of removal, lateral extent of removal, removing concrete from joints, safety from collapse, cleaning, adding and coating reinforcement.

Replacing concrete, recasting, replacing old concrete surface, Bonding coats, concrete mix design, compacting recast concrete. – Form work for repairs, spraying concrete dry and wet process. Surface treatments cathodic protection.

REFERENCE BOOK :

1. Corrosion damaged concrete assessment and repair by Peter Pullar and Strecker Butterworth Publication.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH II-Semester **4 – 0 – 4** **CE 4224**

DATA BASE MANAGEMEN SYSTEMS (ELECTIVE – III)

UNIT – I

Introduction : Definition, purpose data abstraction, models, instances and schemes, data independence, DDL, DML, database manager, administrator, users, overall structures.

Entity-relationship model : Entry and entity sets, relationships and relationship sets, attributes, mapping constraints, keys ER diagrams, reduction to tables, generalization, aggregation, design of ER database scheme.

UNIT – II

Relational model : Structure of relational database, database scheme, keys, query language, relational algebra, select, project, Cartesian product, rename union, set difference operation, modifying database, views.

UNIT – III

Commercial query languages : WOL,basic structure, set operation, predicates and join, set membership, triple variables, set comparison, ordering of display, aggregate simple queries in OBE.

UNIT – IV

Relational database design : Pit falls in relational database design, representation of information, loss of information, normalization using functional dependencies, desirable properties of decomposition, loss-less decomposition, dependency preservation, repetition of information, BCNF, third normal form, comparison of BCNF and BNF.

UNIT – V

Recovery, Security and Integrity : failure classification, storage types, failure types, storage hierarchy, transaction mode., log-based recovery, buffer management, check points, shadow paging, security and integrity violations, authorization and views, security specification in SQL.

Case Studies : Study of the features of d-base, foxpro and Oracle,

TEXT BOOK :

Database System Concepts by H.F.Korth and A.S.Schatz, Mc Graw Hill.

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IV B.TECH II-Semester **4 – 0 – 4** **CE 4225**

INDUSTRIAL WASTE AND WASTE WATER MANAGEMENT
(ELECTIVE-III)

UNIT – I
Quality requirements of boiler and cooling waters – Quality requirements of process water for Textiles – Food processing and Brewery Industries – Special Treatment processes.

UNIT – II
Basic Theories of Industrial Waste water 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.

UNIT – IV
Recirculation of Industrial Wastes – Use of Municipal Waste Water in Industries.

UNIT – V
Industrial Wastes – Special characteristics & Treatment of Liquid Wastes from the following industries : Textile, Tannery, Paper and Pulp, Distilleries, Dairy, Fertilizer Plant, Sugar Mill, Steel plants, oil Refineries –Pharmaceutical plants – thermal power plants.

TEXT BOOKS :
1. Liquid waste of Industry by Newmerow.
2. Waste Water Treatment by Rao and Dutta.
3. Water and Waste Water technology by Mark J. Hammer and Mark J. Hammer (Jr)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH II-Semester **4 – 0 – 4** **CE 4226**

GEOENVIRONMENTAL ENGINEERING (ELECTIVE - IV)

UNIT – I

Introduction to Ground water contamination, pollutant transport and ground water remediation. Sources and Types of ground water contamination – introduction- under ground storage tanks, Land fills, surface impoundments, waste disposal injection wells, septic system, Agricultural wastes, land application, radioactive contamination, other sources of contamination.

UNIT – II

Data- Collection methods: Introduction, Geological data acquisition – Drilling methods – solid flight auger drilling – Hollow stem auger drilling – wet rotating drilling – hand auger soil boring – sample collection – soil core logging – cone penetration testing – geophysical methods; Hydrologic data acquisition – monitoring well construction – well material – screen interval selection – installation procedure – survey specification – protective casing requirements – well development procedures; Acquisition of soil and ground water quality data.

UNIT – III

Contaminant Transport Mechanisms: Introduction – advection process- diffusion - dispersion process; Mass transport Equations : Derivation of advection dispersion equation for solute transport; One dimensional Models – continuous source in one dimension – instantaneous source in one dimension – adsorption effects – transport in one dimensional with first order decay – Sorption: the concept of sorption, factors influencing sorption – contaminant characteristics, soil characteristics, fluid media characteristics. Sorption Isothers: Linera sorption Isotherm – Freundlich Sorption isotherm – Langmuir

Sorption Isotherm, Sorption effects on fate and transport of pollutants.

UNIT –IV

Flow and transport of pollutants in unsaturated zone: Capillarity, soil-water characteristic curves, Unsaturated Hydraulic conductivity, Governing equation for unsaturated flow, measurement of soil properties.

UNIT –V

Non-Aqueous Phase Liquids(NAPLs): Introduction-comparison of fate of dissolved mass versus NAPL mass – Types of NAPLs – LNAPL – DNAPL; NAPL Transport-general process – NAPL transport at the pore level – Downward Migration of DNAPLs – in saturated zone – NAPL movement through Vadose zone – LNAPL behaviour at the water table – NAPL transport at the site level – LNAPL conceptual models – DNAPL conceptual models. NAPL transport.

TEXT BOOK

Ground water Contamination (Transport and Remediation) By Philip. B. Bedient, Hanadi. S. Rifai & Charles . J. Newell, Prentice Hall Publishers.

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IV B.TECH II-Semester **4 – 0 – 4** **CE 4227**

PROFESSIONAL PRACTICE AND ENTREPRENEURSHIP (ELECTIVE– IV)

UNIT – I :

Feasibility Radius : Location of industries – Project Institution – Working with project teams – Planning and control of operations and resources – Division making.

UNIT – II :

Earth estimates, Budgeting, Cost Engineering – Procurements – Quality assistance – Total Quality Management – I.S.O Standards – Consideration of Environmental Features.

UNIT – III :

Industrial Relations – Safety Engineering – Workmen's consumption -

Risk Management – Stores Organization and control – Infected property – Planning Resources Management.

UNIT – IV :

Definition of Entrepreneur and Entrepreneurship – Entrepreneur Vs Manager functions of an Entrepreneur – Entrepreneurial motivation risks and rewards – Entrepreneurial Development – Assistance programmes.

UNIT – V :

Finance and Financing – working capital – Marketing and sales – Finance Management and Control – Inventory – Valuation – Methods – Simplified Accounting – Cost Flow Analysis.

TEXT BOOKS :

1. Professional Construction Management 3rd Edition, by Denald
2. Construction Planning for Engineers by Fisher Griffith.
3. Project Management for Engineering & Construction by Girold D. Oborlander
4. Entrepreneurship by R.D. Harich

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IV B.TECH. II- Semester **CE 4228**

ADVANCED STRUCTURAL ENGINEERING
(Elective IV)

Unit – I
RC Grid floor system – Analysis and design.

Unit – II
Design of Composite Bridge Deck System General aspects- Shear connectors – Analysis and Design.

Unit – III
Design of RC Chimneys

Unit – IV
Design of RC Silos

Unit – V
b) Design of RC Bunkers
c) Introduction to plate and shell structures – Different types of folded plates and shells used in practice (Analysis not included)

REFERENCE:

1) Structural Design & Drawing by N. Krishnam Raju
2) Advanced RCC by N. Krishnam Raju
3) Introduction to shell structures by N. Ramaswamy.

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IV B.TECH II-Semester **4 – 0 – 4** **CE 4229**

CE(4229) TRANSPORTAITION PLANNING AND DESIGN
(ELECTIVE – IV)

UNIT - I
Concept of Travel Demand; Travel Characteristics – origin, Destination, Route mode, purpose; travel Demand as a function of independent variables; Assumptions in Demand Estimation Relation between land use and Travel; Four step process of Transportation planning.

UNIT – II
Transportation planning process; General concept of Trip; trip Generation; Trip Distribution, Traffic assignment and mode split, Aggregate and disaggregate Models. Date collection and Sequential and sequential Recursive models. Date collection and Inverntories; Definition of study area; Zoning Principles; Types and sources of Date, Home Interview surveys; Road side interview surveys; Goods Taxi, IPT surveys; sampling techniques; Explansion factors and accuracy check; Desire line diagram and use.

UNIT – III
Trip Generation Models; Factors governing Trip Generation and Attraction; multiple linear Regression Models, Category Analysis, Trip Distribution Models Methods of Trip Distribution; Growth Factor Models Uniform Growth Factor Method; Average Growth Factor Method; Fraton Method; Furnes Method; limitation of Growth Factor Models; Concept of Gravity Model.

UNIT – IV
Traffic assignment and Mode Split; Purpose of Assignment and General Principles; Assignment Techniques – All - or- nothing. Assignment; Multiple route assignment, Capacity restraint method. Minimum path trees; diversion curves. Factors affecting mode split; probit, logit and discriminant Analysis.

UNIT – V

Transportation and Environment Deterimental effect of Traffic on Environment; Noise pollution; Air pollution; Vibrations; visual Instrusion – Effects and remedial measures.

Economic Evaluation of Transportation plans; Costs and benefits of transportation projects; vehicle operating cost; timesaving Accident costs. Methods of Economic Evaluation – Benefit cost Ratio Method; Net present value method; Internal Rate of Return method.

REFERENCES;

1. L.R.Kadiyalli; Traffic Engineering and Transporation Planning Khanna Publishers, Delhi.
2. Papa Costas C.S.; Fundamentals of Transportation Engineering, Prentice Hall, India.
3. Bruton M.J. Introduction to Transportation Planning Hutchinson of London.
4. Khistry C.J.Transportation Engineering –An Introduction Prentic Hall.
5. G.Venkatappa Rao – Transporation used Highway Engineering.

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IV B.TECH II-Semester **4 – 0 – 4** **CE 4230**

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS (ELECTIVE – IV)

UNIT – I :

Remote Sensing : Definition, elements ;involved in Remote sensing, Ideal Vs Real remote Sensing, Characteristics of Real Remote Sensing System, Nature of Electromagnetic radiation. The electromagnetic spectrum, Remote sensing terminology and units, energy interaction with earth features, Vegetation, soils and water bodies, Energy interaction in the atmosphere. Spatial Resolution, Spectral Resolution and Radiometric Resolution Characteristics of Various sensors and satellites: LANDSAT, SPORT, IRS, ERS.

UNIT – II :

Introduction to GIS : What is GIS – Components of GIS, Overview of GIS, Examples of GIS application for Agriculture and Land use planning, Geology and Municipal applications. Using a GIS for Decision making under uncertainty, Geo-referenced data. Us of GIS.

Data Input/Output: Keyboard entry, Manual Digitizing, Scanning, remotely sensed data, Existing Digital data – Cartographic database, Natural resources data sets, Digital elevation data and census related data sets, Data output devices.

UNIT – III :

Data Quality: Components of data quality, Sources of error.

Data Management : Data Base approach, Three classic data models (Hierarchical network Relational data models), Query languages, Nature of Geographic data.

Spatial data models : Raster and Vector data models. Data bases for GIS Managing Spatial and attribute data together – Organizing Geographic Information within a DBMS, Limitations and practical approaches.

UNIT – IV :

GIS Analysis functions : Organizing data for analysis, classification of GIS analysis function, Maintenance and analysis of spatial data – Transformations, Conflation, Edge matching and editing, Maintenance and analysis of non-spatial attribute data – editing and query functions.

UNIT – V :

GIS analysis functions for Integrated analysis of spatial and attribute data : Retrieval and Classification functions, Overlay operations, neighborhood operations, connectivity function, output, Formatting – Map annotation, text pattern and line styles, Graphic symbols, Cartographic modeling by GIS analysis procedure with an example.

TEXT BOOKS :

1. Remote Sensing and Geographical Information Systems – 2nd Edition by M. Anji Reddy.
2. Principles of Remote Sensing by Paul J Curran
   Geographic Information Systems – A Management Perspective b y STAN ARONOFF, Published by WDL Publications, Ottawa, Canada.
3. Michael Hord, Remote Sensing Methods and Applications, John Wiley.

REFERENCE BOOKS :

1. Remote sensing and Image Interpretation by LILESAND and KIEFER, Published by john Wiley and sons.
2. Fundamentals of GIS by MICHAEL N DEMERS Published by John Wiley & Sons Inc.

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