D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Approved by AICTE, New Delhi & Permanently Affiliated to JNTUK, Kakinada

Accredited by NBA (B. Tech – CSE, ECE & EEE) & NAAC with A^{++} Grade

Balusumudi, Bhimavaram-2, West Godavari District, Andhra Pradesh

Ph: 08816-221238 Email: dnrcet@gmail.com **website:** https://dnrcet.org

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DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

(Held on 04-04-2025, A.Y: 2025-26)

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INDEX

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DEPARTMENT OF CIVIL ENGINEERING

Date: 01-04-2025

CIRCULAR

This is to inform all faculty members that the second Board of Studies (BoS) meeting of the Civil Engineering Department will be held on 04-04-2025 (Friday) at 10:30 AM in the Board Room, DNRCET (A), through online mode. All BoS members are requested to attend the meeting on time without fail.

Agenda

1. To Discuss the detailed syllabus for B.Tech (DR24) Second Year, First & Second Semesters.
2. To Discuss the Academic Regulations of the B.Tech (DR24) Second Year.
3. To Discuss B.Tech eligibility criteria for Honors & Minors.
4. To Discuss the detailed syllabus for M.Tech (DR24) Second Year, First & Second Semesters.
5. To Discuss the Academic Regulations of the M.Tech (DR24) Second Year.
6. Any other item with the permission of the chair.

HoD

Head of the Department
Civil Engineering
DNR College of Engg. & Tech.
BHIMAVARAM-534 202.

Copy to
1. The faculty members of BOS
2. The Principal, DNRCET (A)
3. To Dean Academics
4. Office File

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DEPARTMENT OF CIVIL ENGINEERING

Dt: 01-04-2025

S.No.	Category	Name	Position	Signature
1	Faculty member	Dr.M.L.Kumar	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
2	Faculty member	Mr.K L A V Harnadh	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
3	Faculty member	Mr.P.Chakradhar prasad	Assistant Professor Civil Engineering Department DNRCET (A) , Bhimavaram-2	
4	Faculty member	Mr.CH.Vinay Chandra sekhar	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
5	Faculty member	Mrs.V.S.Divya teja	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
6	Faculty member	Mr.M.Venkata Krishna	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
7	Faculty member	Mr.M.Yesuratnam	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
8	Faculty member	Mr.P.V.V Satya Kishore	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	
9	Faculty member	Mr.Muhammed B. .Wasim akram	Assistant Professor, Civil Engineering Department DNRCET (A), Bhimavaram-2	

Dr.B.V.Ramana Murthy
HOD-CE
Head of the Department
Civil Engineering
DNR College of Engg. & Tech.

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Drafts

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Labels

COURSE FILES DATA

EXAMSECTION DOCUM...

Upgrade

Invitation to Second BoS Meeting – Civil Engineering Department, DNRCI ,Bhimavaram

DNR CIVIL <dnrcet.civil@gmail.com> A
to srpalivela, Bhadradri, M, PYCE, vijayakumarpeeram@gmail.com

The Department of Civil Engineering, DNR College of Engineering & Technology (Autonomous), Bhimavaram Studies (BOS) meeting to discuss the curriculum and academic regulations for B.Tech and M.Tech programs for

The meeting is set for April 4, 2025, from 10:00 AM to 11:00 AM and will be conducted online (ZOOM). We s and valuable insights for this discussion.

Agenda:

1. Discuss the detailed syllabus for B.Tech (DR24) Second Year, First & Second Semesters.
2. Discuss the Academic Regulations of the B.Tech (DR24) Second Year.
3. Discuss B.Tech eligibility criteria for Honors & Minors.
4. Discuss the detailed syllabus for M.Tech (DR24) Second Year, First & Second Semesters.
5. Discuss the Academic Regulations of the M.Tech (DR24) Second Year.
6. Any other item with the permission of the chair.

We look forward to your participation and valuable contributions.

With Regards
Dr.B.V.Ramana Murthy
Head of the Department
Civil Engineering
DNRCET(A), Bhimavaram, West Godavari, Andhra Pradesh
Contact No: 9381949823

Invitation to Second BoS Meeting – Civil Engineering Department, DNRCET (A) ,Bhimavaram

DNR CIVIL <dnrcet.civil@gmail.com> Apr 2, 2025, 8:33 PM

to srpalivela, Bhadradri, M, PYCE, vijayakumarpeeram@gmail.com

The Department of Civil Engineering, DNR College of ... econd Board of Studies (BOS) meeting to discuss the curriculum and ac... 26.

The meeting is set for April 4, 2025, from 10:00 AM to ... emed presence and valuable insights for this discussion.

Agenda:

1. Discuss the detailed syllabus for B.Tech (DR24) S...
2. Discuss the Academic Regulations of the B.Tech (...
3. Discuss B.Tech eligibility criteria for Honors & M...
4. Discuss the detailed syllabus for M.Tech (DR24)
5. Discuss the Academic Regulations of the M.Tech
6. Any other item with the permission of the chair.

We look forward to your participation and valuable contributions.

With Regards
Dr.B.V.Ramana Murthy
Head of the Department
Civil Engineering
DNRCET(A), Bhimavaram, West Godavari, Andhra Pradesh
Contact No: 9381949823

from:	**DNR CIVIL** <dnrcet.civil@gmail.com>
to:	srpalivela@jntucek.ac.in, Bhadradri Raghuram Kadali <brkadali@nitw.ac.in>, M Pavan Kumar <pavanidea@gmail.com>, "Dr P V Surya Prakash Principal, PYCE , Kakinada" <princengg@pydah.edu.in>, "vijayakumarpeeram@gmail.com" <vijayakumarpeeram@gmail.com>
date:	Apr 2, 2025, 8:33 PM
subject:	Invitation to Second BoS Meeting – Civil Engineering Department, DNRCET (A) ,Bhimavaram
mailed-by:	gmail.com

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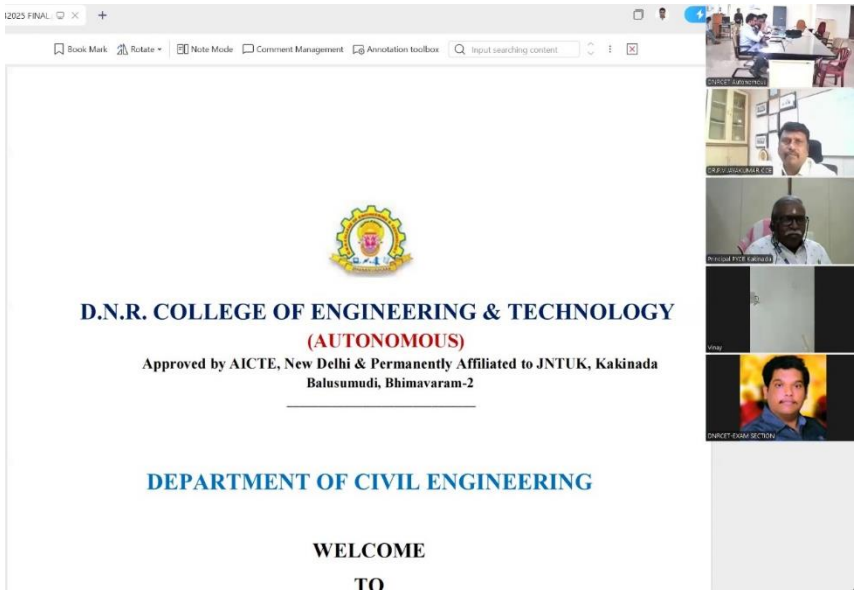
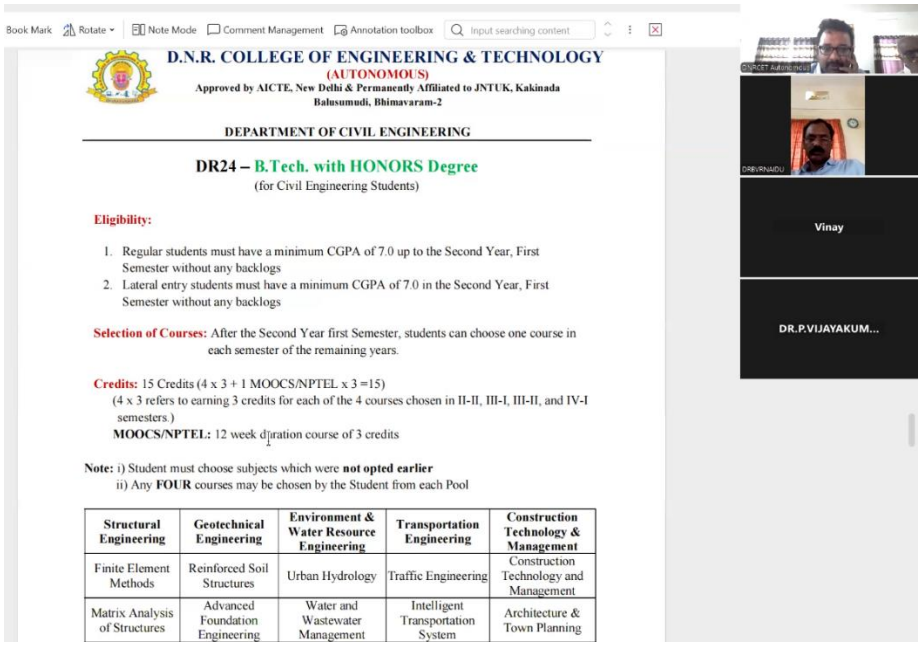
Screenshots taken during the Online BOS meeting on 4th April 2025





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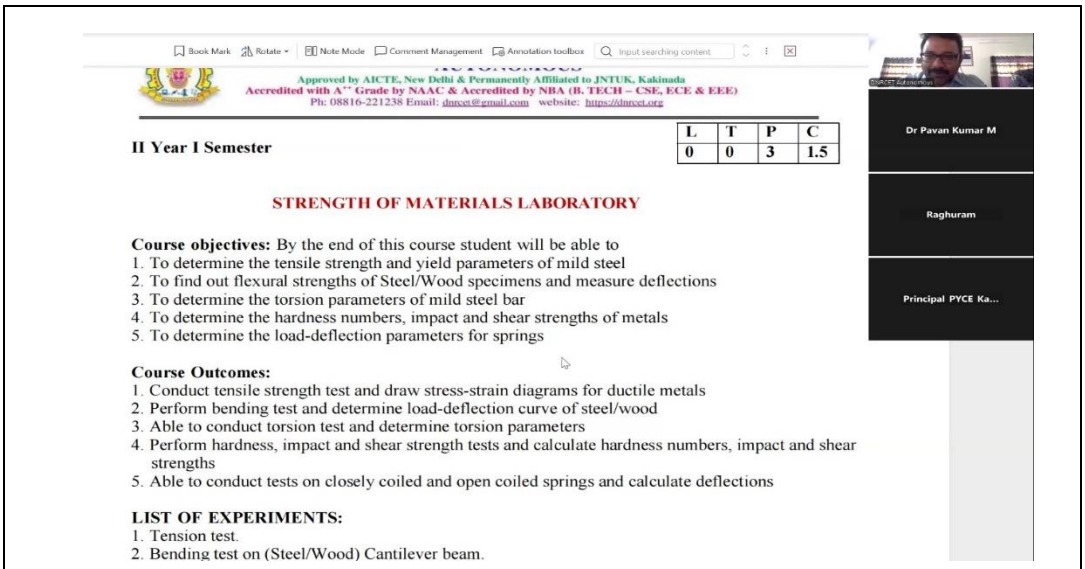

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II Year I Semester

L	T	P	C
0	0	3	1.5

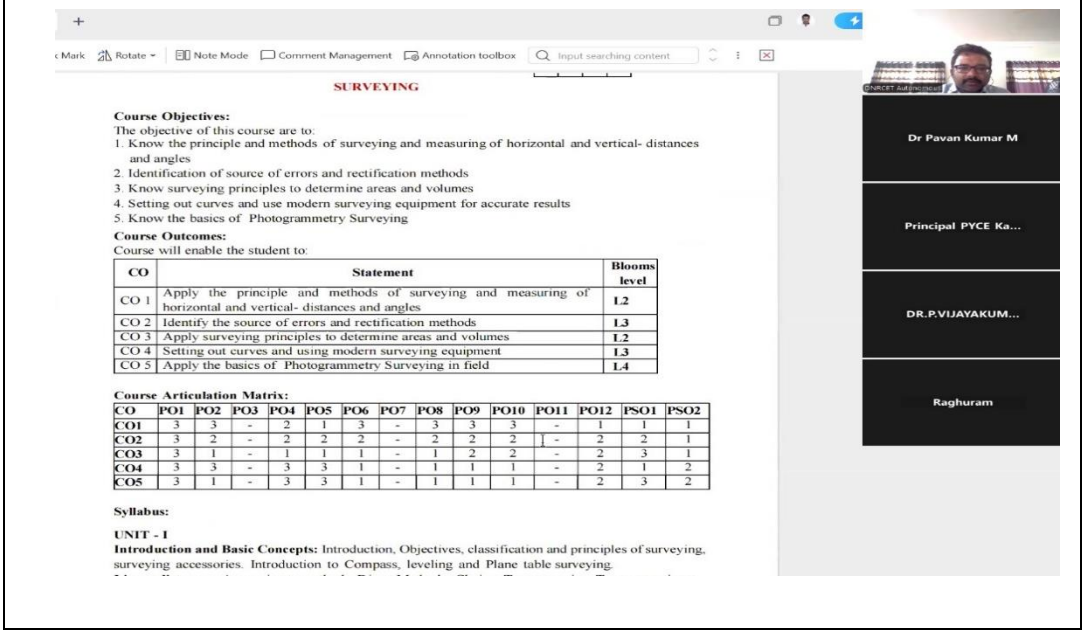
STRENGTH OF MATERIALS LABORATORY

Course objectives: By the end of this course student will be able to
1. To determine the tensile strength and yield parameters of mild steel
2. To find out flexural strengths of Steel/Wood specimens and measure deflections
3. To determine the torsion parameters of mild steel bar
4. To determine the hardness numbers, impact and shear strengths of metals
5. To determine the load-deflection parameters for springs

Course Outcomes:
1. Conduct tensile strength test and draw stress-strain diagrams for ductile metals
2. Perform bending test and determine load-deflection curve of steel/wood
3. Able to conduct torsion test and determine torsion parameters
4. Perform hardness, impact and shear strength tests and calculate hardness numbers, impact and shear strengths
5. Able to conduct tests on closely coiled and open coiled springs and calculate deflections

LIST OF EXPERIMENTS:
1. Tension test.
2. Bending test on (Steel/Wood) Cantilever beam.

Dr Pavan Kumar M
Raghuram
Principal PYCE Ka...



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SURVEYING

Course Objectives:
The objective of this course are to:
1. Know the principle and methods of surveying and measuring of horizontal and vertical- distances and angles
2. Identification of source of errors and rectification methods
3. Know surveying principles to determine areas and volumes
4. Setting out curves and use modern surveying equipment for accurate results
5. Know the basics of Photogrammetry Surveying

Course Outcomes:
Course will enable the student to:

CO	Statement	Blooms level
CO 1	Apply the principle and methods of surveying and measuring of horizontal and vertical- distances and angles	L2
CO 2	Identify the source of errors and rectification methods	L3
CO 3	Apply surveying principles to determine areas and volumes	L2
CO 4	Setting out curves and using modern surveying equipment	L3
CO 5	Apply the basics of Photogrammetry Surveying in field	L4

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	2	1	3	-	3	3	3	-	1	1	1
CO2	3	2	-	2	2	2	-	2	2	2	-	2	2	1
CO3	3	1	-	1	1	1	-	1	2	2	-	2	3	1
CO4	3	3	-	3	3	1	-	1	1	1	-	2	1	2
CO5	3	1	-	3	3	1	-	1	1	1	-	2	3	2

Syllabus:

UNIT - I
Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, surveying accessories. Introduction to Compass, leveling and Plane table surveying.

Dr Pavan Kumar M
Principal PYCE Ka...
DR.P.VIJAYAKUM...
Raghuram

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DEPARTMENT OF CIVIL ENGINEERING

Second BOS Meeting (A.Y. 2025-26)

Venue: Board Room, DNRCET (A)

Date & Time: 04-04-2025 & 10.20 AM-12.20PM

Mode of conducting meeting: Zoom (online platform)

Meeting link:

https://us06web.zoom.us/j/2664871556?pwd=pFKnG7HYNLabpf3yYPHq0tnDoHPNdj.1&omn=88569248416

Agenda:

1. To Discuss the detailed syllabus for B.Tech (DR24) Second Year, First & Second Semesters.
2. To Discuss the Academic Regulations of the B.Tech (DR24) Second Year.
3. To Discuss B.Tech eligibility criteria for Honors & Minors.
4. To Discuss the detailed syllabus for M.Tech (DR24) Second Year, First & Second Semesters.
5. To Discuss the Academic Regulations of the M.Tech (DR24) Second Year.
6. Any other item with the permission of the chair.

Minutes of meeting with the following Resolutions

Dr.B.V.Ramana Murthy, Head of the Department & Chairman, BOS Civil Engineering, welcomed and introduced the eminent members of BOS Meeting. The chairman of BOS placed the agenda for the deliberation of the members. The BOS members expressed their appreciation for novel structure of curriculum and content of the course. The following deliberations were made as per the items of circular agenda.

1. **Discussed the detailed syllabus for B.Tech (DR24) Second Year, First & Second Semesters**

i) The title of the subjects, along with their respective credits and categories, for the B.Tech Second Year - First and Second Semesters have been listed and the detailed syllabus of each subject have been discussed.

ii) Some modifications have been suggested in the **Strength of Materials lab** (II year – I semester) and **Structural Analysis** course (II year – II semester)

iii) **Environmental Science (Audit Course):** The detailed syllabus of this course has been discussed for approval in the Civil Engineering Board of Studies (BoS) meeting.

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Civil Engineering
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Resolution 1:

- The detailed syllabus for each subject in the B.Tech Second Year – First and Second Semesters has been followed as prescribed by JNTUK, Kakinada, without any modifications, except for minor changes in the experimental titles of the *Strength of Materials Lab* and the content incorporated into the *Structural Analysis* course. **(Ref: Annexure-I)**
- The necessary modifications have been incorporated. In the Strength of Materials Lab (II Year – I Semester) and the Structural Analysis course (II Year – II Semester),

a) Strength of Materials lab: The titles of the experiments in this laboratory have been revised as follows:

S.No	Experiment Name (Existing)	Experiment Name (Revised as)
1	Tension test	Tension test on rebar
2	Torsion test	Torsion test on steel bars
3	Hardness test	Hardness test on steel bars
4	Compression test on wood /concrete	Compression test on wood /concrete/bricks

b) Structural Analysis course: In Unit–III (Fixed Beams and Continuous Beams), **Clapeyron's Theorem of Three Moments** has been newly included for the **analysis of continuous beams.**

- **Environmental Science (Audit Course):** There is **no modifications** in the syllabus of Environmental Science Course as prescribed by JNTUK, Kakinada and the same has been followed. **(Ref: Annexure –II)**

2. Discussed the Academic Regulations of the B.Tech (DR24) Second Year

The key points of the academic regulations and course structure of regular & elateral entry students for the B.Tech (Civil Engineering) program, as prescribed by JNTUK, Kakinada, Andhra Pradesh, have been discussed.

i) **Award of the Degree:**

- Student (Regular) Registers for 160 credits and secures all 160 credits.
- Student (Lateral) Registers for 120 credits and secures all 120 credits.

ii) **Promotion Rules:**

- A student will be promoted from **II to III year** if he/she fulfils the academic requirement of securing **40% of the credits** (any ***decimal*** fraction should be ***rounded off*** to ***lower*** digit) up to in the subjects that have been studied up to III semester.
- A student shall be promoted from **III year to IV year** if he/she fulfils the academic requirements of securing **40% of the credits** (any ***decimal*** fraction should be ***rounded off*** to ***lower*** digit) in the subjects that have been studied up to V semester.

Head of the Department
Civil Engineering
DNR College of Engg. & Tech.
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iii) **Evaluation Process**

Program	Marks					
	Theory			Practical		
	Internal Assessment	Semester End Exam	Total Marks	Internal Assessment	Semester End Exam	Total Marks
UG (B.Tech)	30	70	100	30	70	100

iv) **Summer Internships**

- Two summer internships either **onsite or virtual** each with a minimum of **08 weeks** duration, done at the **end of second and third years**, respectively are mandatory.
- It shall be completed in collaboration with local industries, Govt. Organizations, construction agencies, Power projects, software MNCs or any industries in the areas of concerned specialization of the Undergraduate program.

Resolution 2:

The academic regulations for the B.Tech program, as prescribed by JNTUK, Kakinada, Andhra-Pradesh, have been implemented **without any modifications**. **(Ref: Annexure –III)**

3. Discussed B.Tech eligibility criteria for Honors & Minors

The eligibility criteria, course selection, and credit requirements for Honors and Minors programs have been discussed.

i) **For Regular students**

a) Eligibility:

- Regular students must have a minimum CGPA of 7.0 up to the Second Year, First Semester without any backlogs
- Lateral entry students must have a minimum CGPA of 7.0 in the Second Year, First Semester without any backlogs

b) Selection of Courses: After the Second Year first Semester, students can choose one course in each semester of the remaining years in the prescribed list of courses.

c) Credits: 15 Credits (4 x 3 + 1 MOOCS/NPTEL x 3 =15)

- (4 x 3 refers to earning 3 credits for each of the 4 courses chosen in II-II, III-I, III-II, and IV-I semesters.)
- MOOCS/NPTEL: 12 week duration course of 3 credits.

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Civil Engineering
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ii) **For Lateral entry students**

d) **Eligibility:**

- Regular students must have a minimum CGPA of 7 up to the Second Year. First Semester without any backlogs
- Lateral entry students must have a minimum CGPA of 7 in the Second Year, First Semester without any backlogs

e) **Credits:** 12 Credits (4 x 3 =12 credits)

- (4 x 3 refers to earning 3 credits for each of the 4 courses chosen in II-II, III-I, III-II, and IV-I semesters)

Note: Student must choose subjects which were not opted earlier

Resolution 3:

- The eligibility criteria for the **B.Tech Degree with Honors** and **B.Tech Degree with Minors** as prescribed by JNTUK, Kakinada, AndhraPradesh, have been implemented **without** any modifications. **(Ref: Annexure –IV)**

4. Discussed the detailed syllabus for M.Tech (DR24) Second Year, First & Second Semesters

i) The titles of the subjects, along with their respective credits and categories, for the M.Tech Second Year – First and Second Semesters have been listed, and the detailed syllabus of each subject has been discussed.

ii) A minor modification in the *Industrial Buildings* course, along with the inclusion of *Fire Service Management* and the concept of *SHE* (Safety, Health, and Environment), has been recommended for incorporation into the relevant courses in the academic curriculum.

Resolution-4:

The subjects and detailed syllabus for the M.Tech. Second Year – First and Second Semesters, as prescribed by JNTUK, Kakinada, have been implemented with minor modifications.
(Ref: Annexure-V)
The modifications are as follows:

- In the **Industrial Structures** course (II Yr.- I semester), the topic in Unit-II i.e Roofs for Industrial Buildings has been revised as **Design of Roof Systems for Industrial Buildings** and shifted from Unit–II to Unit–III to ensure a more balanced distribution of syllabus weightage
- In the course **Construction Management** (Open Elective), offered in II Year – I Semester, the topic **Fire Service Management** & concept of **SHE** has been incorporated in place of the earlier content on Human Factors in Safety, Legal and Financial Aspects of Accidents in Construction, and Occupational and Safety Hazard Assessment.

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Civil Engineering
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The revised content are

- Role of Management in Fire Safety
- Planning for Fire Safety
- Management by Objectives and its Role in Safety, Health, and Environment (SHE)
- Coordination of the Three Components of SHE.

5. Discussed the Academic Regulations of the M.Tech (DR24) Second Year

The key points of the academic regulations and course structure for the M.Tech -Structural Engineering specialization program, as prescribed by JNTUK, Kakinada, Andhra Pradesh, have been discussed.

i) Award of the Degree:

- The student shall register for all 68 credits and secure all the 68 credits.

ii) Evaluation Process

Program	Marks					
	Theory			Practical		
	Internal Assessment	Semester End Exam	Total Marks	Internal Assessment	Semester End Exam	Total Marks
PG (M.Tech)	25	75	100	25	75	100

iii) Evaluation of Project/Dissertation Work:

- A candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work for approval. The student can initiate the Project work, only after obtaining the approval from the Project Review Committee (PRC).
- Continuous assessment of Dissertation-I and Dissertation-II during the Semester(s) will be monitored by the PRC.
- A candidate shall submit his status report in two stages to the PRC, at least with a gap of 3 months between them.
- The total marks allotted for Project / Dissertation (Phase I &II) is 100
- If the report of the Viva -Voce is unsatisfactory (i.e.,<50 % of marks), the candidate shall retake the Viva-Voce examination, only after three months.
- If he fails to get a satisfactory report at the second Viva-Voce examination, the candidate has to re-register for the project and complete the project within the stipulated time after taking the approval from the Institution.

Head of the Department
Civil Engineering
DNR College of Engg. & Tech.
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Resolution 5:

The academic regulations for the M.Tech. program, as prescribed by JNTUK, Kakinada, Andhra Pradesh, have been implemented **without any modifications**.
(Ref: Annexure –VI)

6. Any other item with the permission of the chair

With the permission of the Chair, the model question paper was discussed under 'Any Other Item' on the agenda.

Resolution 6:

The **model question paper and the list of proposed paper setters** from various reputed institutions were presented and discussed under 'Any Other Item' on the agenda. **No changes** were suggested. **(Ref: Annexure –VII & VIII)**

Head of the Department &
Chairman, BOS

Head of the Department
Civil Engineering
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DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - I

(Pages: 1 to 44)

ANNEXURE-I

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B.Tech. II Year I Semester (DR24) - Civil Engineering

S.No.	Category	Title	Subject Code	L	T	P	Credits
1	BS	Numerical Techniques and Statistical Methods	BT24BS2101	3	0	0	3
2	HSMC	Universal human values – Uunderstanding harmony and Ethical human conduct	BT24HS2101	2	1	0	3
3	Engineering Science	Surveying	BT24CE2101	3	0	0	3
4	Professional Core	Strength of Materials	BT24CE2102	3	0	0	3
5	Professional Core	Fluid Mechanics	BT24CE2103	3	0	0	3
6	Professional Core	Surveying Field work Lab	BT24CE2104	0	0	3	1.5
7	Professional Core	Strength of Materials Lab	BT24CE2105	0	0	3	1.5
8	Skill Enhancement Course	Building Planning and Drawing	BT24CE2106	0	1	2	2
9	Audit Course	Environmental Science	BT24BS2106	2	0	0	-
Total				**16**	**2**	**8**	**20**

B.Tech. II Year II Semester (DR24) - Civil Engineering

S.No.	Category	Title	Subject Code	L	T	P	Credits
1	Management Course-I	Managerial Economics and Financial Analysis	BT24HS2201	2	0	0	2
2	Engineering Science / Basic Science	Engineering Geology	BT24CE2201	3	0	0	3
3	Professional Core	Concrete Technology	BT24CE2202	3	0	0	3
4	Professional Core	Structural Analysis	BT24CE2203	3	0	0	3
5	Professional Core	Hydraulics & Hydraulic Machinery	BT24CE2204	3	0	0	3
6	Professional Core	Concrete Technology Lab	BT24CE2205	0	0	3	1.5
7	Professional Core	Engineering Geology lab	BT24CE2206	0	0	3	1.5
8	Skill Enhancement course	Remote Sensing & Geographical Information Systems	BT24CE2207	0	1	2	2
9	Engineering Science	Design Thinking & Innovation	BT24HS2203	1	0	2	2
10	Mandatory course	Building materials and Construction	BT24CE2208	3	0	0	-
Total				**15**	**1**	**10**	**21**
Mandatory **Community Service Project** Internship of **08 weeks** duration during summer vacation							

UG - Civil Engineering Programme

Second Year First Semester

Detailed Syllabus

L	T	P	C
3	0	0	3

II Year I Semester

NUMERICAL TECHNIQUES AND STATISTICAL METHODS

Course Objectives:

- To elucidate the different numerical methods to solve nonlinear algebraic equations
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the students with the foundations of probability and statistical methods.
- To equip the students to solve application problems in their disciplines.

Course Outcomes:

1. Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)
2. Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3)
3. Apply discrete and continuous probability distributions (L3)
4. Design the components of a classical hypothesis test (L6)
5. Infer the statistical inferential methods based on small and large sampling tests (L4)

UNIT – I: Iterative Methods:

Introduction – Solutions of algebraic and transcendental equations: Bisection method – Secant method – Method of false position – Iteration method – Newton-Raphson method (One variable and simultaneous Equations)
Interpolation: Newton's forward and backward formulae for interpolation – Interpolation with unequal intervals – Lagrange's interpolation formula

UNIT–II: Numerical integration, Solution of ordinary differential equations with initial conditions:
Trapezoidal rule– Simpson's $1/3^{rd}$ and $3/8^{th}$ rule– Solution of initial value problems by Taylor's series– Picard's method of successive approximations– Euler's method–Runge -Kutta method (second and fourth order) – Milne's Predictor and Corrector Method.

UNIT – III: Probability and Distributions:
Baye's theorem – Random variables – Discrete and Continuous random variables – Distribution functions – Probability mass function, Probability density function and Cumulative distribution functions – Mathematical Expectation and Variance – Binomial, Poisson, Uniform and Normal distributions.

UNIT – IV: Sampling Theory:

Introduction – Population and Samples – Sampling distribution of Means and Variance (definition only) – Point and Interval estimations – Maximum error of estimate – Central limit theorem (without proof) – Estimation using t, z^2 and F-distributions.

UNIT – V: Tests of Hypothesis:
Introduction – Hypothesis – Null and Alternative Hypothesis – Type I and Type II errors – Level of significance– One tail and two-tail tests – Test of significance for large samples and Small Samples: Single and difference means – Single and two proportions – Student's t- test, F-test, z^2-test.

TEXT BOOKS:

1. **B. S. Grewal,** Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. **Miller and Freund's**, Probability and Statistics for Engineers,7/e, Pearson, 2008.

REFERENCE BOOKS:

1. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and Science, Tata Mc. Graw Hill Education.
2. M.K.Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.
3. Lawrence Turyn, Advanced Engineering Mathematics, CRC Press.
4. S.C.Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.
5. Shron L.Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
6. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage.

II Year I Semester

L	T	P	C
2	1	0	3

UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

Course Objectives:

- To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.

Course Outcomes:

- Define the terms like Natural Acceptance, Happiness and Prosperity (L1, L2)
- Identify one's self, and one's surroundings (family, society nature) (L1, L2)
- Apply what they

Course Topics

- The course has 28 lectures and 14 tutorials in 5 modules.
- The lectures and tutorials are of 1- hour duration.
- Tutorial sessions are to be used to explore and practice what has been proposed during the lecture sessions.
- The Teacher's Manual provides the outline for lectures as well as practice sessions.
- The teacher is expected to present the issues to be discussed as propositions and encourage the students to have a dialogue.

UNIT I Introduction to Value Education (**6 Lectures and 3 Tutorials** for Practice session)

Lecture 1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)

Lecture 2: Understanding Value Education

Tutorial 1: Practice Session PS1 Sharing about Oneself

Lecture 3: self-exploration as the Process for Value Education

Lecture 4: Continuous Happiness and Prosperity – the Basic Human Aspirations

Tutorial 2: Practice Session PS2 Exploring Human Consciousness

Lecture 5: Happiness and Prosperity – Current Scenario

Lecture 6: Method to Fulfill the Basic Human Aspirations

Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

UNIT II Harmony in the Human Being (**6 Lectures and 3 Tutorials for Practice session**)
Lecture 7: Understanding Human being as the Co-existence of the self and the body.
Lecture 8: Distinguishing between the Needs of the self and the body
Tutorial 4: Practice Session PS4 Exploring the difference of Needs of self and body.
Lecture 9: The body as an Instrument of the self
Lecture 10: Understanding Harmony in the self
Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the self
Lecture 11: Harmony of the self with the body
Lecture 12: Programme to ensure self-regulation and Health
Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body

UNIT III Harmony in the Family and Society (**6 Lectures and 3 Tutorials for Practice session**)
Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction
Lecture 14: 'Trust' – the Foundational Value in Relationship
Tutorial 7: Practice Session PS7 Exploring the Feeling of Trust
Lecture 15: 'Respect' – as the Right Evaluation
Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect
Lecture 16: Other Feelings, Justice in Human-to-Human Relationship
Lecture 17: Understanding Harmony in the Society
Lecture 18: Vision for the Universal Human Order
Tutorial 9: Practice Session PS9 Exploring Systems to fulfil Human Goal

UNIT IV Harmony in the Nature/Existence (**4Lectures and 2Tutorials for P ractice session**)
Lecture 19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature
Tutorial 10: Practice Session PS10 Exploring the Four Orders of Nature
Lecture 21: Realizing Existence as Co-existence at All Levels
Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session PS11 Exploring Co-existence in Existence.

UNIT V Implications of the Holistic Understanding – a Look at Professional Ethics (**6 Lectures and 3 Tutorials for Practice session**)
Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education
Lecture 27:Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession
Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order

Practice Sessions for **UNIT I** – Introduction to Value Education PS1 Sharing about Oneself PS2 Exploring Human Consciousness PS3 Exploring Natural Acceptance

Practice Sessions for **UNIT II** – Harmony in the Human Being
PS4 Exploring the difference of Needs of self and body
PS5 Exploring Sources of Imagination in the self
PS6 Exploring Harmony of self with the body

Practice Sessions for **UNIT III** – Harmony in the Family and Society
PS7 Exploring the Feeling of Trust
PS8 Exploring the Feeling of Respect
PS9 Exploring Systems to fulfil Human Goal

Practice Sessions for **UNIT IV** – Harmony in the Nature (Existence)
PS10 Exploring the Four Orders of Nature
PS11 Exploring Co-existence in Existence

Practice Sessions for **UNIT V**–Implications of the Holistic Understanding– a Look at Professional Ethics
PS12 Exploring Ethical Human Conduct
PS13 Exploring Humanistic Models in Education
PS14 Exploring Steps of Transition towards Universal Human Order

READINGS:

Textbook and Teachers Manual

a The Textbook

R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

b The Teacher's Manual

R R Gaur, R Asthana, G P Bagaria, *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics,* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

REFERENCE BOOKS

1. JeevanVidya: EkParichaya, A Nagaraj, Jeevan VidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj – PanditSunderlal

9. Rediscovering India - by Dharampal

10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

Mode of Conduct:

Lecture hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them. Tutorial hours are to be used for practice sessions. While analyzing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements. In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self- exploration. Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than "extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life. Depending on the nature of topics, worksheets, home assignment and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values. It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate, higher courses. This course is to be taught by faculty from every teaching department, not exclusively by any one department. Teacher preparation with a minimum exposure to at least one 8-day Faculty Development Program on Universal Human Values is deemed essential.

Online Resources:

1. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%201- Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHVII%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20 Family.pdf
4. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3-S2%20Respect%20July%2023.pdf
5. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%205- Harmony%20in%20the%20Nature%20and%20Existence.pdf
6. https://fdp-si.aicte-india.org/download/FDPTeachingMaterial/3-days%20FDP-SI%20UHV%20Teaching%20Material/Day%203%20Handouts/UHV%203D%20D3-S2A%20Und%20Nature-Existence.pdf
7. https://fdp-si.aicte- india.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%2023-25%20Ethics%20v1.pdf
8. https://www.studocu.com/in/document/kiet-group-of-institutions/universal-human-values/chapter-5-holistic-understanding-of-harmony-on-professional-ethics/62490385
9. https://onlinecourses.swayam2.ac.in/aic22_ge23/preview

II Year – I Semester

L	T	P	C
3	0	0	3

SURVEYING

Course Objectives:

The objective of this course are to:

1. Know the principle and methods of surveying and measuring of horizontal and vertical- distances and angles
2. Identification of source of errors and rectification methods
3. Know surveying principles to determine areas and volumes
4. Setting out curves and use modern surveying equipment for accurate results
5. Know the basics of Photogrammetry Surveying

Course Outcomes:

Course will enable the student to:

CO	Statement	Blooms level
CO 1	Apply the principle and methods of surveying and measuring of horizontal and vertical- distances and angles	**L2**
CO 2	Identify the source of errors and rectification methods	**L3**
CO 3	Apply surveying principles to determine areas and volumes	**L2**
CO 4	Setting out curves and using modern surveying equipment	**L3**
CO 5	Apply the basics of Photogrammetry Surveying in field	**L4**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	2	1	3	-	3	3	3	-	1	1	1
CO2	3	2	-	2	2	2	-	2	2	2	-	2	2	1
CO3	3	1	-	1	1	1	-	1	2	2	-	2	3	1
CO4	3	3	-	3	3	1	-	1	1	1	-	2	1	2
CO5	3	1	-	3	3	1	-	1	1	1	-	2	3	2

Syllabus:

UNIT - I

Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, surveying accessories. Introduction to Compass, leveling and Plane table surveying.

Linear distances- Approximate methods, Direct Methods- Chains- Tapes, ranging, Tape corrections.

Prismatic Compass- Bearings, included angles, Local Attraction, Magnetic Declination, and dip – systems and W.C.B and Q.B systems of locating bearings.

UNIT - II

Leveling- Types of levels, methods of levelling, and Determination of levels, Effect of Curvature of Earth and Refraction.

Contouring - Characteristics and uses of Contours, methods of contour surveying.

Areas - Determination of areas consisting of irregular boundary and regular boundary.

Volumes - Determination of volume of earth work in cutting and embankments for level section, capacity of reservoirs.

UNIT - III

Theodolite Surveying: Types of Theodolites, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometrical leveling when base is accessible and inaccessible.

Traversing: Methods of traversing, traverse computations and adjustments, Introduction to Omitted measurements.

UNIT - IV

Curves: Types of curves and their necessity, elements of simple, compound, reverse curves. Introduction to Tachometric Surveying.

Modern Surveying Methods: Principle and types of E.D.M. Instruments, Total station- advantages and Applications. Introduction to Global Positioning System. Introduction to Drone survey and LiDAR Survey (Light Detection and Ranging).

UNIT - V

Photogrammetry Surveying:

Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods; photographic mapping- mapping using paper prints, mapping using stereo-plotting instruments, mosaics, map substitutes.

Text Books:

1. Surveying (Vol – 1 & 2) by Duggal S K, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 5th edition, 2019.
2. Textbook of Surveying by C Venkatramaiah, Universities Press 1st Edition, 2011.

Reference Books:

1. Surveying (Vol–1), by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi, 18th edition 2024.
2. Surveying (Vol – 2), by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi 17th 2022.
3. Surveying (Vol – 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi

Publications (P) ltd., New Delhi 16th 2023

4. Plane Surveying and Higher Surveying‖ by Chandra A M, New age Internation1al Pvt. Ltd. Publishers, New Delhi, 3rd Edition, 2015.
5. Surveying and Levelling by N.Basak Tata McGraw Hill Publishing Co. Ltd. New Delhi, 4th edition, 2014.
6. Surveying (Vol 1, 2 & 3), by Arora K R, Standard Book House, Delhi. Edition: 12th, 2015.

Web Resources: https://koha.srmap.edu.in/cgi-bin/koha/opac detail.pl?biblionumber=11522&shelf browse_itemnumber=23066

II Year – I Semester

L	T	P	C
3	0	0	3

STRENGTH OF MATERIALS

Course Learning Objectives:

1. To impart Fundamental concepts of Strength of Material and Principles of Elasticity and Plasticity Stress
2. To impart concepts of shear force and bending moment on various types of beams and loading conditions
3. To impart concepts of stresses developed in the cross section and bending equations calculation of section modulus of sections with different cross sections.
4. To the concepts above will be utilized in measuring deflections in beams under various loading and support conditions.
5. To classify cylinders and columns based on their thickness and to derive equations for measurement of stresses across the cross section when subjected to external pressure

Course Outcomes:

At the end of completion of the course, the student will be able

CO	Statement	Blooms level
CO 1	To understand the basic materials behavior under the influence of different External loading conditions and the support conditions.	**L2**
CO 2	To draw the diagrams indicating the variation of the key performance features like axial forces, bending moment and shear forces in structural members.	**L3**
CO 3	To acquire knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams	**L2**
CO 4	To analyze the deflections due to various loading conditions.	**L3**
CO 5	To assess stresses across section of the thin, thick cylinders and columns to arrive at optimum sections to withstand the internal pressure using Lame's equation	**L4**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	2	-	-	-	-	-	2	1	3	3	1
CO2	2	1	-	1	-	-	-	-	-	1	1	2	3	1
CO3	2	2	-	1	-	-	-	-	-	2	1	2	3	2
CO4	1	2	-	1	-	-	-	-	-	2	1	1	3	2
CO5	2	1	-	2	-	-	-	-	-	1	1	2	3	2

1-Slightly; 2- Moderately; 3- Substantially

UNIT - I:

Simple Stresses and Strains: Elasticity and plasticity - Types of stresses and strains - Hooke's law - Factor of safety, Poisson's ratio - Relationship between Elastic constants - Bars of varying section -

stresses in composite bars.

UNIT -II:

Shear Force and Bending Moment: Definition of beam - Types of beams - Concept of shear force and bending moment - Point of contra flexure - Relation between S.F., B.M and rate of loading at a section of a beam; S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads, partial uniformly distributed loads, couple and combination of these loads.

UNIT -III:

Flexural and Shear Stresses:

Flexural Stresses: Theory of simple bending-Assumptions - Derivation of bending equation, Neutral axis - Determination of bending stresses - section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections - Design of simple beams

Shear Stresses: Derivation of formula - Shear stress distribution across various beam sections like rectangular, circular, I, T Angle sections.

Torsion – circular shafts only.

UNIT -IV:

Deflection of Beams: Double integration and Macaulay's methods — Determination of slope and deflection for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed loads, uniformly varying loads, partial uniformly distributed loads, couple and combination of these loads. Mohr's theorems — Moment area method — application to simple cases of cantilever.

UNIT -V:

Introduction – Classification of columns – Axially loaded compression members – Euler's crippling load theory – Derivation of Euler's critical load formulae for various end conditions – Equivalent length – Slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Eccentric loading and Secant formula – Prof. Perry's formula.

Thin and Thick cylindrical shells — Derivation of formula for longitudinal and circumferential stresses - hoop, longitudinal and volumetric strains — changes in diameter, and volume of thin cylinders. Lames theory for thick cylinders, Derivation of Lames formulae, distribution of hoop and radial stresses across the thickness, compound cylinders- distribution of stresses

TEXTBOOKS:

1. Strength of Materials by R. K. Bansal, Lakshmi Publications, 16th Edition, 2022.
2. Strength of Materials by B. S. Basavarajaiah and P. Mahadevappa, Universities Press 3rd Edition, 2010
3. Strength of Materials by J.K. Gupta and S.K. Gupta, Cengage publications 2nd edition,2024

REFERENCES:

1. Advanced Mechanics of Solids, L.S Srinath, McGraw Hill Education, 2017, 3rd Edition
2. Strength of Materials - Fundamentals and Applications, T.D.Gunneswara Rao and Mudim by Andal, Cambridge University Press, 2018, 1st Edition
3. Mechanics of Materials, Beer and Johnston, McGraw Hill India Pvt. Ltd., 2020, 8th Edition (SI Units).
4. Mechanics of Solids — E P Popov, Prentice Hall, 2nd Edition, 2015.
5. A Textbook of Strength of Materials, by R. K. Rajput, 7e (Mechanics of Solids) SI Units S. Chand & Co, New Delhi 7th edition 2022.
6. Strength of Materials by S.S.Ratan Tata McGill Publications 3rd Edition, 2016.

II Year – I Semester

L	T	P	C
3	0	0	3

FLUID MECHANICS

Pre-requisite:

Course Objectives:

1. To explain basics of statics, kinematics and dynamics of fluids and various measuring techniques of hydrostatic forces on objects.
2. To impart ability to solve engineering problems in fluid mechanics
3. To enable the students measure quantities of fluid flowing in pipes, tanks and channels
4. To teach integral forms of fundamental laws of fluid mechanics to predict relevant pressures, velocities and forces.
5. To strengthen the students with fundamentals useful in application-intensive courses dealing with hydraulics, hydraulic machinery and hydrology in future courses.

Course Outcomes:

On Completion of the course, the students will be able to

COs	STATEMENTS	Blooms level
CO1	Understand the principles of fluid statics, kinematics and dynamics	L2
CO2	Apply the laws of fluid statics and concepts of buoyancy	L3
CO3	Understand the fundamentals of fluid kinematics and differentiate types of fluid flows	L2
CO4	Apply the Principle of conservation of energy for flow measurement.	L3
CO5	Analyze the losses in pipes and discharge through pipe network.	L4

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	-	-	-	2	-	-	1	-	1	1	3	1
CO2	3	3	-	-	-	2	-	-	3	-	3	3	3	1
CO3	3	1	-	-	-	3	-	-	1	-	1	1	3	2
CO4	3	2	-	-	-	1	-	-	2	-	2	2	3	2
CO5	3	3	-	-	-	2	-	-	3	-	3	3	3	2

1-Slightly; 2- Moderately; 3- Substantially

UNIT - I

Basic concepts and definitions: Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; Variation of viscosity with temperature, Newton law of viscosity; Vapor pressure, Boiling point, Surface tension, Capillarity, Bulk modulus of elasticity, Compressibility

UNIT – II

Fluid statics: Fluid Pressure: Pressure at a point, Pascal‘s law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U- Tube

Differential Manometer. Pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies

UNIT - III

Fluid kinematics:

Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One, two and three - Dimensional continuity equations in Cartesian coordinates.

UNIT - IV

Fluid Dynamics: Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – Derivation; Energy Principle; Practical applications of Bernoulli's equation : Venturimeter, orifice meter and Pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced; Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number;

UNIT - V

Analysis Of Pipe Flow: Energy losses in pipelines; Darcy – Weisbach equation; Minor losses in pipelines; Hydraulic Grade Line and Total Energy Line; Concept of equivalent length – Pipes in Parallel and Series.

TEXTBOOKS:

1. P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd edition 2018

REFERENCE BOOKS:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications(P) Ltd., New Delhi 11th edition, 2024.
2. N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.
3. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition, 2022.
4. C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
5. Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty Tata McGraw Hill, 3rd edition 2011

Online Learning Resources:

1.https://archive.nptel.ac.in/courses/112/105/112105269/

2 . https://nptel.ac.in/courses/112104118

3.https://nptel.ac.in/courses/105103192

II Year I Semester

L	T	P	C
0	0	3	1.5

SURVEYING FIELD WORK

Course Objectives:

By the end of this course student will be able to

1. Know about various linear and angular measuring instruments
2. Take Measurements in the linear and angular view
3. Determine the area and volume by interpreting the data obtained from surveying activities
4. Know modern equipment such as total station
5. Draft field notes from survey data

Course Outcomes:

Upon the successful completion of this course, the students will able to:

1. Handle various linear and angular measuring instruments
2. Measure the linear and angular measurements
3. Calculate the area and volume by interpreting the data obtained from surveying activities
4. Handle modern equipment such as total station
5. Prepare field notes from survey data

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	-	2	1	-	-	-	3	2	2	2	2	-
CO2	2	2	-	2	1	-	-	-	3	3	3	2	2	-
CO3	2	2	-	2	1	-	-	-	3	2	2	2	2	-
CO4	1	2	-	-	3	-	-	-	3	2	2	1	1	-
CO5	2	1	-	-	-	-	-	-	3	2	2	1	1	-

1-Slightly; 2- Moderately; 3- Substantially

List of Field Works:

1. Chain survey of road profile with offsets in case of road widening.
2. Determination of distance between two inaccessible points by using compass.
3. Plane table survey ;finding the area of a given boundary by the method of Radiation
4. Fly levelling : Height of the instrument method (differential leveling)
5. Fly levelling: rise and fall method.
6. Theodolite survey: determining the horizontal and vertical angles by the method of repetition method
7. Theodolite survey: finding the distance between two in accessible points.
8. Theodolite survey: finding the height of far object.
9. Determination of area perimeter using total station.
10. Determination of distance between two inaccessible points by using total station.
11. Setting out a curve
12. Determining the levels of contours

II Year I Semester

L	T	P	C
0	0	3	1.5

STRENGTH OF MATERIALS LABORATORY

Course objectives: By the end of this course student will be able to
1. To determine the tensile strength and yield parameters of mild steel
2. To find out flexural strengths of Steel/Wood specimens and measure deflections
3. To determine the torsion parameters of mild steel bar
4. To determine the hardness numbers, impact and shear strengths of metals
5. To determine the load-deflection parameters for springs

Course Outcomes:
1. Conduct tensile strength test and draw stress-strain diagrams for ductile metals
2. Perform bending test and determine load-deflection curve of steel/wood
3. Able to conduct torsion test and determine torsion parameters
4. Perform hardness, impact and shear strength tests and calculate hardness numbers, impact and shear strengths
5. Able to conduct tests on closely coiled and open coiled springs and calculate deflections

LIST OF EXPERIMENTS:
1. Tension test on rebar
2. Bending test on (Steel/Wood) Cantilever beam.
3. Bending test on simply supported beam.
4. Torsion test on steel bars
5. Hardness test on steel bars
6. Compression test on Open coiled springs
7. Tension test on Closely coiled springs
8. Compression test on wood /concrete/bricks
9. Izod / Charpy Impact test on metals
10. Shear test on metals
11. Use of electrical resistance strain gauges.
12. Continuous beam – deflection test.

II Year I Semester

L	T	P	C
0	0	3	1.5

BUILDING PLANNING AND DRAWING

Course Objectives:

1. Initiating the student to different building bye-laws and regulations.
2. Imparting the planning aspects of residential buildings and public buildings.
3. Giving training exercises on various signs and bonds.
4. Giving training exercises on different building units.
5. Imparting the skills and methods of planning of various buildings.

Course Outcomes: Upon successful completion of this course the students will be able to:

1. Plan various buildings as per the building by-laws.
2. Distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings.
3. Draw signs and bonds
4. Draw different building units
5. Learn the skills of drawing building elements and plan the buildings as per requirements.

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	-	-	3	3	2	-	2	2	2	3	-	2
CO2	1	1	2	-	-	3	2	-	-	2	1	1	-	-	-
CO3	1	1	2	-	-	3	3	2	-	2	2	2	3	1	1
CO4	1	1	2	-	-	3	3	2	-	2	2	2	3	1	1
CO5	1	1	2	-	-	3	3	2	-	2	2	2	3	1	1

1-Slightly; 2- Moderately; 3- Substantially

SYLLABUS:

1. Detailing & Drawing of Sign Conventions.
2. Detailing & Drawing of English Bond.
3. Detailing & Drawing of Flemish Bond.
4. Detailing & Drawing of Doors.
5. Detailing & Drawing of Windows.
6. Detailing & Drawing of Ventilators &Roofs.
7. Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws.
8. Drawing of Plan, Elevation & Section from line diagram for a single Storey Building.
9. Drawing of Plan, Elevation & Section for Hospital Building.
10. Drawing of Plan, Elevation & Section for Industrial Building.

TEXT BOOKS:

1. Planning, designing and Scheduling, Gurcharan Singh and Jagdish Singh
2. Building planning and drawing by M. Chakraborty.
3. Building drawing, M G Shah, C M Kale and S Y Patki,Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. National Building Code 2016 (Volume- I & II).
2. Principles of Building Drawing, M G Shah and C M Kale, Trinity Publications, New Delhi.
3. Civil Engineering drawing and House planning, B. P. Verma, Khanna publishers, New Delhi.
4. Civil Engineering Building practice, Suraj Singh: CBS Publications, New Delhi, and Chennai
5. Building Materials and Construction, G. C Saha and Joy Gopal Jana, McGrawHill Education (P) India Ltd. New Delhi.

II Year I Semester

L	T	P	C
2	0	0	--

ENVIRONMENTAL SCIENCE

Course Objectives:

1. To make the students to get awareness on environment
2. To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day-to-day activities of human life
3. To save earth from the inventions by the engineers.

Course Outcomes:

COs	Statements	Blooms Level
CO1	Grasp multi-disciplinary nature of environmental studies and various renewable and non-renewable resources.	L2
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.	L2
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	L2
CO4	Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation.	L2
CO5	Illustrate the causes of population explosion, value education and welfare programs.	L3

UNIT – I

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

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNIT – II

Ecosystems: Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation: Introduction and Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local

levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III

Environmental Pollution: Definition, Cause, effects and control measures of: Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards

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

UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, and watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies

Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, and ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

Fieldwork: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.

TEXTBOOKS:

1. Erach Bharucha, Text book of Environmental Studies for Undergraduate Courses, University Press (India) Private Limited, 2019.
2. Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
3. S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
4. K.Raghavan Nambiar, "Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS:

1. Deeksha Dave and E.SaiBaba Reddy,Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
2. M.Anji Reddy, Textbook of Environmental Sciences and Technology, BS Publication, 2014.
3. J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
4. J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering, Prentice Hall of

India Private limited, 1988.
5. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House, 2018.
6. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Online Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc23_hs155/preview
2. https://www.edx.org/learn/environmental-science/rice-university-ap-r-environmental-science-part-3-pollution-and-resources?index=product&objectID=course-3a6da9f2-d84c-4773-83881b2f8f6a75f2&webview=false&campaign=AP%C2%AE+Environmental+Science++Part+3%3A+Pollution+and+Resources&source=edX&product_category=course&placement_url=https%3A%2F%2Fwww.edx.org%2Flearn%2Fenvironmental-science
3. http://ecoursesonline.iasri.res.in/Courses/Environmental%20Science- I/Data%20Files/pdf/lec07.pdf
   https://www.youtube.com/watch?v=5QxxaVfgQ3k

UG - Civil Engineering Programme

Second Year Second Semester

Detailed Syllabus

II Year II Semester

L	T	P	C
2	0	0	2

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objectives:

1. To inculcate the basic knowledge of microeconomics and financial accounting
2. To make the students learn how demand is estimated for different products, input- output relationship for optimizing production and cost
3. To Know the Various types of market structure and pricing methods and strategy
4. To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
5. To provide fundamental skills on accounting and to explain the process of preparing financial statements.

Course Outcomes:

1. Define the concepts related to Managerial Economics, financial accounting and management(L2)
2. Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
3. Apply the Concept of Production cost and revenues for effective Business decision (L3)
4. Analyze how to invest their capital and maximize returns (L4)
5. Evaluate the capital budgeting techniques. (L5)
6. Develop the accounting statements and evaluate the financial performance of business entity (L5)

UNIT - I Managerial Economics

Introduction – Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.

UNIT - II Production and Cost Analysis

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least-cost combination– Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).

UNIT - III Business Organizations and Markets

Introduction – Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition– Oligopoly-Price-Output Determination - Pricing Methods and Strategies

UNIT - IV Capital Budgeting

Introduction – Nature, meaning, significance. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features,

Proposals, Methods and Evaluation. Projects – Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)

UNIT - V Financial Accounting and Analysis

Introduction – Concepts and Conventions- Double-Entry Bookkeeping, Journal, Ledger, Trial Balance-Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

TEXTBOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

REFERENCE BOOKS:

1. Ahuja Hl Managerial economics S chand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Online Learning Resources:

1. https://www.slideshare.net/123ps/managerial-economics-ppt
2. https://www.slideshare.net/rossanz/production-and-cost-45827016
3. https://www.slideshare.net/darkyla/business-organizations-19917607
4. https://www.slideshare.net/balarajbl/market-and-classification-of-market
5. https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
6. https://www.slideshare.net/ashu1983/financial-accounting

II Year II Semester

L	T	P	C
3	0	0	3

ENGINEERING GEOLOGY

Course Learning Objectives:

The objective of this course is:

- To know the importance of Engineering Geology to the Civil Engineering.
- To enable the students understand what minerals and rocks are and their formation and identification.
- To highlight significance/ importance/ role of Engineering Geology in construction of Civil Engineering structures.
- To enable the student realize its importance and applications of Engineering Geology in Civil Engineering constructions.
- Concepts of Groundwater and its geophysical methods.

Course Outcomes:

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

- Understand the significance of geological agents on Earth surface and its significance in Civil Engineering.
- Identify and understand the properties of Minerals and Rocks.
- Understand the concepts of Groundwater and its geophysical methods.
- Classify and measure the Earthquake prone areas, Landslides and subsidence to practice the hazard zonation.
- Investigate the project site for mega/mini civil engineering projects and site selection for mega engineering projects like Dams, Reservoirs and Tunnels.

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	1	2	-
CO2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO4	3	3	3	2	3	-	2	-	-	-	2	2	2	2
CO5	3	3	2	2	3	-	2	-	-	-	2	2	2	2

1-Slightly; 2- Moderately; 3- Substantially

SYLLABUS:

UNIT-I:

Introduction: Branches of Geology, Importance of Geology in Civil Engineering with case studies, weathering of rocks, Geological agents, weathering process of Rock, Rivers and geological work of rivers.

UNIT-II

Mineralogy And Petrology: Definitions of mineral and rock-Different methods of study of mineral and rock. Physical properties of minerals and rocks for megascopic study for the following minerals and rocks. Common rock forming minerals: Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite and ore forming minerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite. Classification, structures, textures and forms of Igneous rocks, Sedimentary rocks, Metamorphic rocks, and their megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite, Gneiss, Schist, Marble, Khondalite and Slate.

UNIT-III

Structural Geology: Strike , Dip and Outcrop study of common geological structures associating with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in Civil Engineering.

UNIT-IV

Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques.

Earthquakes and Land Slides: Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence at Landslides.

Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties of rocks.

UNIT-V

Geology of Dams, Reservoirs and Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Geology consideration for successful constructions of reservoirs, Life of Reservoirs. Purpose of Tunneling, effects, Lining of Tunnels. Influence of Geology for successful Tunneling.

TEXT BOOKS:

- Engineering Geology by N. ChennaKesavulu, Laxmi Publications. 2nd Edn 2014.
- Engineering & General Geology by Parbin Singh Katson educational series 8th 2023

REFERENCES:

- Engineering Geology by Subinoy Gangopadhay Oxford University press 1st edition, 2012.
- Engineering Geology by D. Venkat Reddy, Vikas Publishing, 2nd Edn, 2017,
- Geology for Engineers and Environmental Society' Alan E Kehew, 3rd edn., 2013) Pearson publications.
- 'Environmental Geology' (2013) K.S.Valdiya, 2nd ed., McGraw Hill Publications.

Web Materials:

1. http://nptel.iitm.ac.in/video.php?subjectId=105105106
2. http://nptel.iitm.ac.in/video.php?courseId=1055&p=1
3. http://nptel.iitm.ac.in/video.php?courseId=1055&p=3
4. http://nptel.iitm.ac.in/video.php?courseId=1055&p=4

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II Year II Semester

L	T	P	C
3	0	0	3

CONCRETE TECHNOLOGY

Course Learning Objectives

Upon successful completion of this course, the student will be able to

- Learn materials and their properties used in the production of concrete
- Learn the behavior of concrete at fresh stage
- Learn the behavior of concrete at hardened stage
- Learn the influence of elasticity, creep and shrinkage on concrete
- Learn the mix design methodology and special concretes

Course Outcomes: At the end of the course, the student will be able to

- **CO1-**Familiarise the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field
- **CO2-**Test the fresh concrete properties and the hardened concrete properties. Understand the basic concepts of concrete. Design the concrete mix by BIS method.
- **CO3-**Evaluate the ingredients of concrete through lab test results, realize the importance of quality of concrete
- **CO4-**Understand the behaviour of concrete in various environments.
- **CO5-**Familiarize the basic concepts of special concrete and their production and applications.

Detailed Syllabus:

UNIT- I:-

CEMENTS: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement – Test for physical properties – Different grades of cements – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air Entrainers, Plasticizers, super Plasticizers, fly ash and silica fume

AGGREGATES: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand –Deleterious substances – Soundness – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Maximum aggregate size- Quality of mixing water

UNIT-II: FRESH CONCRETE: Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting Workability – Measurement of Workability by different tests, Setting times of concrete, Effect of time and temperature on Workability – Segregation & bleeding – Mixing and vibration of concrete, Ready mixed concrete, Shotcrete.

UNIT-III: HARDENED CONCRETE: Water / Cement ratio – Abram's Law – Gel/space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength – Curing, Testing of Hardened Concrete: Compression test – Tension test – Factors affecting strength – Flexure test –Splitting test –

Non-destructive testing methods – Codal provisions for NDT.

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

UNIT-V:- MIX DESIGN AND SPECIAL CONCRETES: Fibre reinforced concrete – Different types of fibers – Factors affecting properties of FRC, High performance concrete – Self consolidating concrete, Self-healing concrete. Factors in the choice of mix proportions –Quality control of concrete- Statistical methods- Acceptance Criteria-Concepts Proportioning of concrete mixes by ACI method and IS Code method

TEXT BOOKS

- Properties of Concrete by A.M. Neville – PEARSON – 4th edition
- Concrete Technology by M.L. Gambhir. – Tata Mc.Graw Hill Publishers, New Delhi 5th edition 2013.
- Concrete Technology by Job Thomas, Cengagae Publications, 1st edition, 2015

REFERENCES

- Concrete Microstructure, Properties of Materials by P.K. Mehta and Moterio. McGraw Hill 4th edition 2014
- Concrete Technology, J.J. Brooks and A. M. Neville, Pearson, 2019, 2nd Edition.
- Concrete Technology by M. S. Shetty. – S. Chand & Co.; 2004
- Concrete Technology by A.R. Santha Kumar, Oxford University Press, New Delhi

II Year – II Semester

L	T	P	C
3	0	0	3

STRUCTURAL ANLAYSIS

Course Learning Objectives

Upon successful completion of this course, the student will be able to

- Learn energy theorems
- Learn the analysis of indeterminate structures
- Analysis of fixed and continuous beams\
- Learn about slope-deflection method
- Learn about Moment – distribution method

Course Outcomes: At the end of the course, the student will be able to

- Apply energy theorems to analyze trusses
- Analyze indeterminate structures by using Castigliano‘s–II theorem
- Analysis of fixed and continuous beams
- Analyze continuous beams and portal frames by using slope-deflection method
- Analyze continuous beams and portal frames by using Moment – distribution method

UNIT – I

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 - II

ANALYSIS OF INDETERMINATE STRUCTURES: Indeterminate Structural Analysis – Determination of static and kinematic indeterminacy – Solution of trusses with up-to two degrees of internal and external indeterminacy – Castigliano's‘s–II theorem.

UNIT - III

FIXED BEAMS & CONTINUOUS BEAMS : Introduction to statically indeterminate beams with uniformly distributed 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-**Calpeyron's Theorem of Three Moments for the analysis of continuous beams.**

UNIT - IV

SLOPE-DEFLECTION METHOD: Introduction-derivation of slope deflection equations- application to continuous beams with and without settlement of supports - Analysis of single bay portal frames without sway.

UNIT - V

MOMENT DISTRIBUTION METHOD: Introduction to moment distribution method- Application to continuous beams with and without settlement of supports-Analysis of single bay storey portal frames without sway.

TEXTBOOKS:

- Analysis of Structures – Vol-I & II by V.N.Vazirani & M.M.Ratwani, Khanna Publications, New Delhi.
- Basic Structural Analysis by C.S.Reddy., Tata McGraw Hill Publishers. 3rd edition 2017.

REFERENCE BOOKS:

- Structural analysis by Aslam Kassimali Cengage publications 6th edition 2020.
- Structural analysis Vol. I and II by Dr.R.Vaidyanathan and Dr.PPerumal– Laxmi publications. 3rd 2016
- Introduction to structural analysis by B.D.Nautiyal, New Age international publishers, New Delhi.
- Structural Analysis – D.S.Prakasarao -Univeristy press.
- Strength of Materials and Mechanics of Structures by B.C.Punmia, Khanna Publications, New Delhi.

II Year II Semester

L	T	P	C
3	0	0	3

HYDRAULICS AND HYRAULIC MACHINERY

Pre-requisite: Fluid Mechanics

Course Objectives:

- To Introduce concepts of laminar and turbulent flows
- To teach principles of uniform flows through open channel.
- To teach principles of non-uniform flows through open channel.
- To impart knowledge on design of turbines.
- To impart knowledge on design of pumps

Course Outcomes:

On Completion of the course, the students will be able to:

COs	STATEMENTS	Blooms level
CO1	Understand the characteristics of laminar and turbulent flows.	L2
CO2	Apply the knowledge of fluid mechanics to address the uniform flow problems in open channels.	L3
CO3	Solve non-uniform flow problems and hydraulic jump phenomenon in open channel flows.	L3
CO4	Evaluate the performance of impact of jets on plates and design Pelton wheel, Francis and Kaplan turbine	L5
CO5	Understand the principles, losses and its efficiencies of centrifugal pumps	L2

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	2	-	-	-	-	2	-	3	1
CO2	3	3	-	-	-	3	-	-	-	-	3	-	3	1
CO3	3	3	-	-	-	3	-	-	-	-	3	-	3	1
CO4	3	3	-	-	-	3	-	-	-	-	3	-	3	2
CO5	3	2	-	-	-	2	-	-	-	-	2	-	3	2

1-Slightly; 2- Moderately; 3- Substantially

UNIT – I

Laminar & Turbulent flow in pipes: Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates. Stoke‘s law, Measurement of viscosity. Reynolds experiment, Transition from laminar to turbulent flow. Resistance to flow of fluid in smooth and rough pipes-Moody‘s diagram – Introduction to boundary layer theory.

UNIT - II

Uniform flow in Open Channels: Open Channel Flow - Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Hydraulically efficient channel sections: Rectangular, trapezoidal and triangular channels, Energy and Momentum correction factors

UNIT - III

Non-Uniform flow in Open Channels: Specific energy, critical flow, discharge curve, Specific force, Specific depth, and Critical depth. Measurement of Discharge and Velocity – Gradually Varied Flow-Dynamic Equation of Gradually Varied Flow. Hydraulic Jump and classification - Elements and characteristics- Energy dissipation.

UNIT - IV

Impact of Jets: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - Velocity triangles at inlet and outlet - Work done and efficiency Hydraulic Turbines: Classification of turbines; Pelton wheel and its design. Francis turbine and its design - efficiency - Draft tube: theory - characteristic curves of hydraulic turbines. Cavitation: causes and effects.

UNIT – V

pumps: Working principles of a centrifugal pump, work done by impeller; heads, losses and efficiencies; minimum starting speed; Priming; specific speed; limitation of suction lift, net positive suction head (NPSH); Performance and characteristic curves; Cavitation effects; Multistage centrifugal pumps; troubles and remedies

TEXT BOOKS: -

1. P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd edition 2018

REFERENCE BOOKS:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition, 2022.
3. C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
4. Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty 3rd edition 2011

Online Learning Resources:

1. https://nptel.ac.in/courses/105105203
2. https://archive.nptel.ac.in/courses/112/106/112106300/
3. https://archive.nptel.ac.in/courses/112/103/112103249/

II Year II Semester

L	T	P	C
0	0	3	1.5

CONCRETE TECHNOLOGY LABORATORY

Course Learning Objectives

Upon successful completion of this course, the student will be able to
Test basic properties of ingredients of concrete fresh and hardened concrete properties

Course Outcomes: At the end of the course, the student will be able to

CO1 Outline importance of testing cement and its properties
CO2 Assess different properties of Aggregates
CO3 Assess fresh concrete properties and their relevance to hardened concrete
CO4 Assess hardened concrete properties

Detailed Syllabus:

Tests on Cement

1. Normal Consistency and Fineness of cement. Initial setting time and Final setting time of cement.
2. Specific gravity and soundness of cement.
3. Compressive strength of cement.

Tests on Fine Aggregates

1. Grading and fineness modulus of Fine aggregate by sieve analysis. Specific gravity of fine aggregate
2. Water absorption and Bulking of sand.

Tests on Coarse Aggregates

1. Grading of Coarse aggregate by sieve analysis. Specific gravity of coarse aggregate
2. Water absorption of Coarse aggregates

Tests on Fresh Concrete

1. Workability of concrete by compaction factor method Workability of concrete by slump test
2. Workability of concrete by Vee-bee test.

Tests on Hardened Concrete

1. Compressive strength of cement concrete and Modulus of rupture Young's Modulus and Poisson's Ratio
2. Split tensile strength of concrete.
3. Non-Destructive testing on concrete (for demonstration)

II Year II Semester

L	T	P	C
0	0	3	1.5

ENGINEERING GEOLOGY LABORATORY

Course Learning Objectives:

The objective of this course is:

- To identify the Megascopic types of Ore minerals & Rock forming minerals.
- To identify the Megascopic types of Igneous, Sedimentary, Metamorphic rocks.
- To identify the topography of the site & material selection

Course Outcomes:

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

- Identify Megascopic minerals & their properties.
- Identify Megascopic rocks & their properties.
- Identify the site parameters such as contour, slope & aspect for topography.
- Know the occurrence of materials using the strike & dip problems.

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	1	1	1	-	-	-	-	-	-	1	1	-	1	1
CO4	1	-	-	-	-	-	-	-	-	-	-	-	-	-

1-Slightly; 2- Moderately; 3- Substantially

LIST OF EXPERIMENTS

1. **Physical properties of minerals:** Mega-scopic identification of

Rock forming minerals – Quartz group, Feldspar group, Garnet group, Mica group & Talc, Chlorite, Olivine, Kyanite, Asbestos, Tourmelene, Calcite, Gypsum, etc.
Ore forming minerals – Magnetite, Hematite, Pyrite, Pyralusite, Graphite, Chromite, etc.

2. Mega-scopic description and identification of rocks.

Igneous rocks – Types of Granite, Pegmatite, Gabbro, Dolerite, Syenite, Granite Poryphery, Basalt, etc.
Sedimentary rocks – Sand stone, Ferruginous sand stone, Lime stone, Shale, Laterite, Conglamorate, etc.
Metamorphic rocks – Biotite – Granite, Gneiss, Slate, Muscovite & Biotite schist, Marble, Khondalite, etc.

3. Interpretation and drawing of sections for geological maps showing tilted beds,faults, unconformities etc.

4. Simple Structural Geology problems.
5. Bore hole data.
6. Strength of the rock using laboratory tests.
7. Field work – To identify Minerals, Rocks, Geomorphology& Structural Geology.

LAB EXAMINATION PATTERN:

- Description and identification of FOUR minerals\
- Description and identification of FOUR (including igneous, sedimentary and metamorphic rocks)
- ONE Question on Interpretation of a Geological map along with a geological section.
- TWO Questions on Simple strike and Dip problems.
- Bore hole problems.
- Project report on geology.

REFERENCES:

1. 'Applied Engineering Geology Practicals' by M T Mauthesha Reddy, New Age International Publishers, 2nd Edition.
2. 'Foundations of Engineering Geology' by Tony Waltham, Spon Press, 3rd edition, 2009.

II Year II Semester

L	T	P	C
3	0	0	3

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS

Course Learning Objectives:

The course is designed to

1. Introduce the basic principles of Remote Sensing and GIS techniques and its application to Civil Engineering.
2. Learn various types of sensors and platforms and understand the principles of spatial analysis techniques in GIS.
3. Introduce GIS software to understand the process of digitization, creation of thematic map from toposheets and maps.

Course outcomes

At the end of the course the student will be able to

1. Acquire knowledge about concepts of remote sensing, sensors and their characteristics.
2. Familiarize with data models and data structures to introduce various Raster and Vector Analysis capabilities in GIS.
3. Digitize and create thematic map and extract important features to calculate geometry.
4. Perform surface analysis over Contour to develop digital elevation model.
5. Use GIS software to perform simple analysis in water resources and transportation engineering.

Course Articulation Matrix:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	2		1	1			2					2	1		1
CO2	2		1	1			2					2	1		1
CO3	1	2	2	1	2	2	3		2	2	1	3	1		2
CO4	1	2	2	1	2	2	3		2	2	1	3	2		2
CO5	1	2	2	1	2	2	3		2	2	1	3	2		2

1-Slightly; 2- Moderately; 3- Substantially

SYLLABUS:

UNIT – I

Introduction to Remote sensing: History of Remote Sensing, Electromagnetic Radiation, Electromagnetic Spectrum, Energy Interaction with Atmosphere, Energy Interaction with the Earth Surfaces - Characteristics of Remote Sensing Systems, Sensor Resolutions, Advantages & Limitations - Platforms: Types of Sensors, Airborne Remote Sensing, Spaceborne Remote Sensing - IRS, LANDSAT, SPOT & Recent satellite.

UNIT – II

Digital Image analysis: Digital Image Characteristics, Digital Image Data Formats, Band Interleaved by Pixel (BIP), Band Interleaved by Line (BIL), Band Sequential (BSQ) - Visual Interpretation Elements, Preprocessing, Enhancement, Classification, Supervised classification, Unsupervised classification.

UNIT – III

Introduction to Geographic Information System: Principles, Components and Applications of GIS - Map projections, Spatial Data Structures, Raster and Vector Data Formats, Data Inputs, Data Manipulation, Data Retrieval, Data Analysis - Spatial data analysis: Overlay Function-Vector Overlay Operations, Raster Overlay Operations, Arithmetic Operators, Comparison and Logical Operators, Conditional Expressions - Network Analysis: Components of network, Transportation network - Optimum path analysis.

TEXT BOOKS:

1. Basudeb Bhatta (2021). 'Remote sensing and GIS', 3rd edn., Oxford University Press.
2. S. Kumar, (2016) 'Basics of Remote sensing & GIS', Laxmi Publications.
3. Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2022) 'Remote Sensing and Image Interpretation', 7th edn., Wiley India Pvt. Ltd.
4. Demers, M.N, (2013) 'Fundamentals of Geographic Information Systems', 4th edn., Wiley India Pvt. Ltd.

LIST OF EXPERIMENTS:

Expt. 1 : Georeferencing a Topo sheet or Map
Expt. 2 : Digitization and Attribute table creation.
Expt. 3 : Creation of Thematic Map
Expt. 4 : Calculation of Feature geometry – Length, Area & Perimeter.
Expt. 5 : Contour map – developing TIN & DEM from Contour.
Expt. 6 : Stream network – Stream ordering map.
Expt. 7 : Watershed - calculate Hydro-geomorphological parameters.
Expt. 8 : Transportation Network Map – Route analysis.

GIS Software: QGIS / Arc GIS

TEXTBOOK FOR PRACTICAL

1. QGIS User Guide
2. Arc GIS User Manual by ESRI

REFERENCES:

1. Schowengerdt, R. A (2006) 'Remote Sensing', Elsevier publishers.
2. Burrough P A and R.A. McDonnell, (1998) 'Principals of Geographical Information Systems', Oxford University Press.
3. George Joseph (2013) 'Fundamentals of Remote Sensing', Universities Press.

Web references: https://nptel.ac.in/courses/10510319

II Year II Semester

L	T	P	C
1	0	2	2

DESIGN THINKING & INNOVATION

Course Objectives: The objectives of the course are to
1. Bring awareness on innovative design and new product development.
2. Explain the basics of design thinking.
3. Familiarize the role of reverse engineering in product development.
4. Train how to identify the needs of society and convert into demand.
5. Introduce product planning and product development process.

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	**L1**
CO2	Explain the fundamentals of Design Thinking and innovation.	**L2**
CO3	Apply the design thinking techniques for solving problems in various sectors.	**L3**
CO4	Analyze to work in a multidisciplinary environment.	**L4**
CO5	Evaluate the value of creativity.	**L5**

SYLLABUS:

UNIT – I Introduction to Design Thinking
Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process
Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development
Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT - III Innovation
Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.
Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT - IV Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V Design Thinking in Business Processes

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

TEXTBOOKS:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

REFERENCE BOOKS:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

Online Learning Resources:

1. https://nptel.ac.in/courses/110/106/110106124/
2. https://nptel.ac.in/courses/109/104/109104109/
3. https://swayam.gov.in/nd1_noc19_mg60/preview
4. https://onlinecourses.nptel.ac.in/noc22_de16/preview

II Year II Semester

L	T	P	C
3	0	0	0

BUILDING MATERIALS AND CONSTRUCTION

(Mandatory Course)

Objectives of the course:

- Initiating the student with the knowledge of basic building materials and their different properties.
- Imparting the knowledge of course pattern in masonry construction and flat roofs and techniques of forming foundation, columns, beams, walls, sloped roofs and flat roofs.
- The student is to be exposed to the various patterns of floors, walls, different types of paints and varnishes.
- Imparting the students with the techniques of form work and scaffolding.
- The students should be exposed to classification of aggregates, moisture content of the aggregate.

Course Outcomes:

COs	Statements	Blooms Level
CO1	The student should be able to identify different building materials and their importance in building construction.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyze to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

SYLLABUS

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 manufacturing of bricks. Characteristics of good tile-manufacturing methods, types of tiles. Uses of materials like Aluminium, Gypsum, Glass and Bituminous materials

UNIT II:

Masonry: Types of masonry, English and Flemish bonds, Rubble and Ashlar Masonry. Cavity and partition walls. Wood: Structure– Properties-Seasoning of timber- Classification of various types

of woods used in buildings- Defects in timber. Alternative materials for wood–Galvanized Iron, Fiber Reinforced Plastics, Steel, Aluminum.

UNIT III:

Lime and Cement:

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

Cement: Portland cement- Chemical Composition – Hydration, setting and fineness of cement. Various types of cement and their properties. Various field and laboratory tests for Cement.Variousing redients of cement concrete and their importance–various tests for concrete.

UNIT IV:

Building Components: Lintels, arches, vaults, staircases–types. Different types of floors–Concrete, Mosaic, Terrazz floors, Pitched, flat roofs. Lean to roof, Coupled Roofs. Trussed roofs–King and Queen post Trusses. R.C.C Roofs, Madras Terrace and Pre-fabricated roofs.

UNIT V:

Finishings: Damp Proofing and water proofing materials and uses–Plastering Pointing, white washing and distempering. Paints: Constituents of a paint–Types of paints– Painting of new/old wood-Varnish. Form Works and Scaffoldings.

Aggregates: Classification of aggregates–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 sands–Sieve analysis.

TEXT BOOKS:

1. Building Materials, S.S.Bhavikatti, Vices publications House private ltd.
2. Building Construction, S.S.Bhavikatti, Vices publications House private ltd.
3. Building Materials, B.C.Punmia, Laxmi Publications private ltd.
4. Building Construction, B.C.Punmia, Laxmi Publications (P) ltd.

REFERENCES:

1. Building Materials, S.K. Duggal, New Age International Publications.
2. Building Materials, P.C.Verghese, PHI learning (P) ltd.
3. Building Materials, M.L.Gambhir, Tata McGraw Hill Publishing Co.Ltd. New Delhi.
4. Building construction, P.C.Verghese, PHI Learning (P)Ltd.
5. Building Materials, Construction and Planning, S.Mahaboob Basha, Anuradha Publications, Chennai

ANNEXURE-II

D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY
AUTONOMOUS
Approved by AICTE, New Delhi & Permanently Affiliated to JNTUK, Kakinada
Accredited with A^{++} Grade by NAAC & Accredited by NBA (B. TECH – CSE, ECE & EEE)
Ph: 08816-221238 Email: dnrcet@gmail.com website: https://dnrcet.org

DEPARTMENT OF BASIC SCIENCES & HUMANITIES

Year/Semester	II.B.Tech-I Sem	L	T	P	C
Regulation Year	DR-24	2	0	0	-
Name of the Subject	**Environmental science (BT24BS2106)**				
Branch	**Common For All Branches (CE, EEE, ME ,ECE, CSE, IT, AIML,AIDS)**				

Course Objectives:

- To make the students to get awareness on environment
- To understand the importance of protecting natural resources, ecosystems for future.
- To save earth from the inventions by the engineers.

Course Outcomes:

COs	STATEMENTS	Blooms Level
CO1	Grasp multidisciplinary nature of environmental studies and various renewable and non-renewable resources.	Remembered
CO2	Understand flow and bio-geo-chemical cycles and ecological pyramids.	Understand
CO3	Understand various causes of pollution and solid waste management and related preventive measures	Understand
CO4	Solid Waste Management: Causes, effects and control measures of urban and industrial Wastes.	Create
CO5	About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation	Apply
CO6	Casus of population explosion, value education and welfare programmes	Analyze

UNIT – 1: Multidisciplinary Nature of Environmental Studies

Definition, Scope and Importance – Need for Public Awareness Natural Resources :Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems– Mineral resources :Use and exploitation, environmental effects of extracting and using mineral resources, case studies– Food resources :World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity ,case studies.–Energy resources:

UNIT – II: Ecosystems:

Concept to of an ecosystem.–Structure and function of an ecosystem–Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and

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ecological pyramids–Introduction, types, characteristic features, structure and function of the following ecosystem:
a) Forest ecosystem.
b) Grassl and ecosystem
c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
Biodiversity And Its Conservation: Introduction Definition: genetic, species and ecosystem diversity–Bio-geographical classification of India–Value of biodiversity: consumptive use Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and locallevels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss,poaching of wildlife, man-wildlife conflicts– Endangered and endemic species of India – Conservation of biodiversity:In-situand Ex-situ conservation of biodiversity.

UNIT – III: Environmental Pollution

Environmental Pollution: Definition, Cause, effects and control measures of:
a) Air Pollution.
b) Water pollution
c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal pollution
g) Nuclear hazards
Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earth quake, cyclone and landslides.

UNIT – IV: Social Issues and the Environment

From Unsustainable to Sustainable development– Urban problems related to energy – Water conservation, rain water harvesting, watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions–Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wastel and

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reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act–Wild life Protection Act–Forest Conservation Act–Issues involved in enforcement of environment allegislation –Public awareness.

UNIT – V: Human Population And The Environment

Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education– HIV/AIDS–Women and Child Welfare–Role of information Technology in Environment and human health–Case studies. Field Work: Visit to a local area to document environmental assets River/ forest grassland/ hill/ mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds–river, hills lopes, etc..

Text Books:

1) Text book of Environmental Studies for Undergraduate Courses ErachBharucha for University Grants Commission,Universities Press.
2) Palaniswamy, "Environmental Studies ",Pearson education
3) S.AzeemUnnisa,"Environmental Studies"Academic Publishing Company
4) K.RaghavanNambiar,"Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", Scitech Publications (India), Pvt.Ltd.

Reference Books:

1)Deeksha Dave and E .Sai Baba Reddy, "Text book of Environmental Science", Cengage Publications.
2)M.AnjiReddy, "Text book of Environmental Sciences and Technology",BSPublication.
3) J.P.Sharma, Comprehensive Environmental studies,Laxmi publicati
4) J.GlynnHenryandGaryW.Heinke,"Environmental Sciences and Engineering",Prentice Hall of India Private limited
5) G.R.Chatwal,"A Text Book of Environmental Studies"Himalaya Publishing House
6) Gilbert M.Masters and WendellP.Ela,"Introduction to Environmental Engineering and Science, Prentice Hall of India Private limited

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Balusumudi, Bhimavaram-2

DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - III

(Pages: 1 to 18)

Academic Regulations (DR24) for B. Tech (Regular-Full time) Programme

(Effective for the students admitted into I year from the Academic Year **2023-24** onwards)

1. **Award of the Degree**
   (a) Award of the B.Tech. Degree / B.Tech. Degree with a Minor if he/she fulfils the following:
      (i) Pursues a course of study for not less than four academic years and not more than eight academic years. However, for the students availing Gap year facility this period shall be extended by two years at the most and these two years would in addition to the maximum period permitted for graduation (Eight years).
      (ii) Registers for 160 credits and secures all 160 credits.

   (b) Award of B.Tech. degree with Honors
   A student will be declared eligible for the award of the B.Tech. with Honors if he/she fulfils the following:
      (i) Student secures additional 15 credits fulfilling all the requisites of a B.Tech. programme. i.e., 160 credits.
      (ii) Registering for Honors is optional.
      (iii) Honors is to be completed simultaneously with B.Tech. programme.

2. Students, who fail to fulfil 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 B.Tech. course and their admission stands cancelled. This clause shall be read along with clause 1 a) i).

3. **Admissions**
   Admission to the B. Tech Program shall be made subject to the eligibility, qualifications and specialization prescribed by the A.P. State Government/University from time to time. Admissions shall be made either based on the merit rank obtained by the student in the common entrance examination conducted by the A.P. Government/University or any other order of merit approved by the A.P. Government/University, subject to reservations as prescribed by the Government/University from time to time.

4. **Program related terms**
   Credit: A unit by which the course work is measured. It determines the number of hours of instruction required per week. One credit is equivalent to one hour of teaching (Lecture/Tutorial) or two hours of practical work/field work per week.

   Credit definition:

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credit
2 Hrs. Practical (Lab) per week	1 credit

a) Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year.

b) Choice Based Credit System (CBCS): The CBCS provides a choice for students to select from the prescribed courses.

5. Semester/Credits:

i) A semester comprises 90 working days and an academic year is divided into two semesters.

ii) The summer term is for eight weeks during summer vacation. Internship/ apprenticeship / work-based vocational education and training can be carried out during the summer term, especially by students who wish to exit after two semesters or four semesters of study.

iii) Regular courses may also be offered during the summer on a fast-track mode to enable students to do additional courses or complete backlogs in coursework.

iv) The Universities/HEIs can decide on the courses to be offered in the summer term depending on the availability of faculty and the number of students.

6. Structure of the Undergraduate Programme

All courses offered for the undergraduate program (B. Tech.) are broadly classified as follows:

S.No.	Category	Breakup of Credits (Total 160)	Percentage of total credits	AICTE Recommendation (%)
1.	Humanities and Social Science including Management (HM)	13	8 %	8 – 9%
2.	Basic Sciences (BS)	20	13 %	12 - 16%
3.	Engineering Sciences (ES)	23.5	14%	10 – 18%
4.	Professional Core (PC)	54.5	34 %	30 – 36%
5.	Electives – Professional (PE) &Open(OE);Domain Specific Skill Enhancement Courses (SEC)	33	21 %	19 - 23%
6.	Internships & Project work (PR)	16	10 %	8 – 11%
7.	Mandatory Courses (MC)	Non-credit	Non-credit	-

7. Course Classification:

All subjects/ courses offered for the undergraduate programme in Engineering & Technology (B.Tech. degree programmes) are broadly classified as follows:

S.No.	Broad Course Classification	Course Category	Description
1.	Foundation Core Courses	Foundation courses	Includes Mathematics, Physics and Chemistry; fundamental engineering courses; humanities, social sciences and management courses
2.	Core Courses	Professional Core Courses (PC)	Includes subjects related to the parent discipline/department/branch of Engineering
3.	Elective Courses	Professional Elective Courses (PE)	Includes elective subjects related to the parent discipline/department/ branch of Engineering
		Open Elective Courses (OE)	Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering
		Domain specific Skill Enhancement Courses (SEC)	Interdisciplinary/job-oriented/domain courses which are relevant to the industry
4.	Project & Internships	Project	B.Tech. Project or Major Project
		Internships	Summer Internships – Community based and Industry Internships; Industry oriented Full Semester Internship
5.	Audit Courses	Mandatory non- credit courses	Covering subjects of developing desired attitude among the learners

8. Programme Pattern

i. Total duration of the B. Tech (Regular) Programme is four academic years.
ii. Each academic year of study is divided into two semesters.
iii. Minimum number of instruction days in each semester is 90 days.
iv. There shall be mandatory student induction program for freshers, with a three-week duration before the commencement of first semester. Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept. /Branch & Innovations etc., are included as per the guidelines issued by AICTE.
v. Health/wellness/yoga/sports and NSS /NSS /Scouts & Guides / Community service activities are made mandatory as credit courses for all the undergraduate students.
vi. Courses like Environmental Sciences, Indian Constitution, and Technical Paper Writing & IPR are offered as non-credit mandatory courses for all the undergraduate students.
vii. Design Thinking for Innovation & Tinkering Labs are made mandatory as credit courses for all the undergraduate students.

viii. Increased flexibility for students through an increase in the elective component of the curriculum, with 05 Professional Elective courses and 04 Open Elective courses.

ix. Professional Elective Courses, include the elective courses relevant to the chosen specialization/branch. Proper choice of professional elective courses can lead to students specializing in emerging areas within the chosen field of study.

x. A total of 04 Open Electives are offered in the curriculum. A student can complete the requirement for B.Tech. Degree with a Minor within the 160 credits by opting for the courses offered through various verticals/tracks under Open Electives.

xi. While choosing the electives, students shall ensure that they do not opt for the courses with syllabus contents similar to courses already pursued.

xii. A pool of interdisciplinary/job-oriented/domain skill courses which are relevant to the industry are integrated into the curriculum of all disciplines. There shall be 05 skill-oriented courses offered during III to VII semesters. Among the five skill courses, four courses shall focus on the basic and advanced skills related to the domain/interdisciplinary courses and the other shall be a soft skills course.

xiii. Students shall undergo mandatory summer internships, for a minimum of eight weeks duration at the end of second and third year of the programme. The internship at the end of second year shall be community oriented and industry internship at the end of third year.

xiv. There shall also be mandatory full internship in the final semester of the programme along with the project work.

xv. Undergraduate degree with Honors is introduced by the University for the students having good academic record.

xvi. Each college shall take measures to implement Virtual Labs (https://www.vlab.co.in) which provide remote access to labs in various disciplines of Engineering and will help student in learning basic and advanced concept through remote experimentation. Student shall be made to work on virtual lab experiments during the regular labs.

xvii. Each college shall assign a faculty advisor/mentor after admission to a group of students from same department to provide guidance in courses registration/career growth/placements/opportunities for higher studies/GATE/other competitive exams etc.

xviii. Preferably 25% of course work for the theory courses in every semester shall be conducted in the blended mode of learning.

9. Evaluation Process

The performance of a student in each semester shall be evaluated subject wise with a maximum of 100 marks for theory and 100 marks for practical subject. Summer Internships shall be evaluated for 50 marks, Full Internship &Project work in final semester shall be evaluated for 200 marks, and mandatory courses with no credits shall be evaluated for 30 mid semester marks.

A student has to secure not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the mid semester and end examination marks taken together for the theory, practical, design, drawing subject or project etc. In case of a mandatory course, he/she should secure 40% of the total marks.

THEORY COUSES

Assessment Method	Marks
Continuous Internal Assessment	30
Semester End Examination	70
Total	100

i) For theory subject, the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.
ii) For practical subject, the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End- Examination.
iii) If any course contains two different branch subjects, the syllabus shall be written in two parts with 3 units each (Part-A and Part-B) and external examination question paper shall be set with two parts each for 35 marks.
iv) If any subject is having both theory and practical components, they will be evaluated separately as theory subject and practical subject. However, they will be given same subject code with an extension of 'T' for theory subject and 'P' for practical subject.

a) Continuous Internal Evaluation

i) For theory subjects, during the semester, there shall be two midterm examinations. Each midterm examination shall be evaluated for 30 marks of which 10 marks for objective paper (20 minutes duration), 15 marks for subjective paper (90 minutes duration) and 5 marks for assignment.
ii) Objective paper shall contain for 05 short answer questions with 2 marks each or maximum of 20 bits for 10 marks. Subjective paper shall contain 3 either or type questions (totally six questions from 1 to 6) of which student has to answer one from each either-or type of questions. Each question carries 10 marks. The marks obtained in the subjective paper are condensed to 15 marks.

Note:

- The objective paper shall be prepared in line with the quality of competitive examinations questions.
- The subjective paper shall contain 3 either or type questions of equal weightage of 10 marks. Any fraction shall be rounded off to the next higher mark.
- The objective paper shall be conducted either online or offline by the respective institution on the day of subjective paper test.
- If conducted offline, the midterm examination shall be conducted first by distribution of the Objective paper, simultaneously marking the attendance, after 20 minutes the answered objective paper shall be collected back. The student is not allowed to leave the examination hall.
  Then the descriptive question paper and the answer booklet shall be distributed. After 90 minutes the answered booklets are collected back.
- Assignments shall be in the form of problems, mini projects, design problems, slip tests, quizzes etc., depending on the course content. It should be continuous assessment throughout the semester and the average marks shall be considered.

iii) If the student is absent for the mid semester examination, no re-exam shall be conducted and mid semester marks for that examination shall be considered as zero.

iv) First midterm examination shall be conducted for I, II units of syllabus with one either or type question from each unit and third either or type question from both the units. The second midterm examination shall be conducted for III, IV and V units with one either or type question from each unit.

v) Final mid semester marks shall be arrived at by considering the marks secured by the student in both the mid examinations with 80% weightage given to the better mid exam and 20% to the other.

For Example:

Marks obtained in first mid: 25
Marks obtained in second mid: 20
Final mid semester Marks: (25x0.8) + (20x0.2) = 24

If the student is absent for any one midterm examination, the final mid semester marks shall be arrived at by considering 80% weightage to the marks secured by the student in the appeared examination and zero to the other. For Example:

Marks obtained in first mid: Absent
Marks obtained in second mid: 25
Final mid semester Marks: (25x0.8) + (0x0.2) =20

b) End Examination Evaluation:

End examination of theory subjects shall have the following pattern:

i) There shall be 6 questions and all questions are compulsory.
ii) Question I shall contain 10 compulsory short answer questions for a total of 20marks such that each question carries 2 marks.
iii) There shall be 2 short answer questions from each unit.
a) In each of the questions from 2 to 6, there shall be either/or type questions of 10 marks each. Student shall answer any one of them.
iv) The questions from 2 to 6 shall be set by covering one unit of the syllabus for each question.

End examination of theory subjects consisting of two parts of different subjects, for Example: Basic Electrical &Electronics Engineering shall have the following pattern:

i) Question paper shall be in two parts viz., Part A and Part B with equal weightage of 35 marks each.
ii) In each part, question 1 shall contain 5 compulsory short answer questions for a total of 5 marks such that each question carries 1mark.
iii) In each part, questions from 2 to 4, there shall be either/or type questions of 10 marks each. Student shall answer any one of them.
iv) The questions from 2 to 4 shall be set by covering one unit of the syllabus for each question.

PRACTICAL COURSES

Assessment Method	Marks
Continuous Internal Assessment	30
Semester End Examination	70
Total	100

b) For practical courses, there shall be a continuous evaluation during the semester for 30 sessional marks and end examination shall be for 70 marks.

c) Day-to-day work in the laboratory shall be evaluated for 15 marks by the concerned laboratory teacher based on the regularity/record/viva and 15 marks for the internal test.

d) The end examination shall be evaluated for 70 marks, conducted by the concerned laboratory teacher and a senior expert in the subject from the same department.
- Procedure: 20 marks
- Experimental work & Results: 30 marks
- Viva voce: 20 marks.

In a practical subject consisting of two parts (Eg: Basic Electrical &Electronics Engineering Lab), the end examination shall be conducted for 70 marks as a single laboratory in 3 hours. Mid semester examination shall be evaluated 35 marks in each part. Mid semester examination shall be evaluated as above for 30 marks in each part and final mid semester marks shall be arrived by considering the average of marks obtained in two parts.

e) For the subject having design and/or drawing, such as Engineering Drawing, the distribution of marks shall be 30 for mid semester evaluation and 70 for end examination.

Assessment Method	Marks
Continuous Internal Assessment	30
Semester End Examination	70
Total	100

Day-to-day work shall be evaluated for 15 marks by the concerned subject teacher based on the reports/submissions prepared in the class. And there shall be two midterm examinations in a semester for duration of 2 hours each for 15 marks with weightage of 80% to better mid marks and 20% for the other. The subjective paper shall contain 3 either or type questions of equal weightage of 5 marks. There shall be no objective paper in mid semester examination. The sum of day-to-day evaluation and the mid semester marks will be the final sessional marks for the subject.

The end examination pattern for Engineering Graphics, shall consists of 5 questions, either/or type, of 14 marks each. There shall be no objective type questions in the end examination. However, the end examination pattern for other subjects related to design/drawing, multiple branches, etc. is mentioned along with the syllabus.

f) There shall be no external examination for mandatory courses with zero credits. However, attendance shall be considered while calculating aggregate attendance and student shall be declared to have passed the mandatory course only when he/she secures 40% or more in the internal examinations. In case, the student fails, a re-examination shall be conducted for failed candidates for 30 marks satisfying the conditions mentioned in item 1 & 2 of the regulations.

g) The laboratory records and mid semester test papers shall be preserved for a minimum of 3 years in the respective institutions as per the University norms and

shall be produced to the Committees of the University as and when the same are asked for.

10. Skill oriented Courses

i) There shall be five skill-oriented courses offered during III to VII semesters.

ii) Out of the five skill courses two shall be skill-oriented courses from the same domain. Of the remaining three skill courses, one shall be a soft skill course and the remaining two shall be skill-advanced courses from the same domain/Interdisciplinary/Job oriented.

h) The course shall carry 100 marks and shall be evaluated through continuous assessments during the semester for 30 sessional marks and end examination shall be for 70 marks. Day-to-day work in the class / laboratory shall be evaluated for 30 marks by the concerned teacher based on the regularity/assignments/viva/mid semester test. The end examination similar to practical examination pattern shall be conducted by the concerned teacher and an expert in the subject nominated by the principal.

iii) The Head of the Department shall identify a faculty member as coordinator for the course. A committee consisting of the Head of the Department, coordinator and a senior Faculty member nominated by the Head of the Department shall monitor the evaluation process. The marks/grades shall be assigned to the students by the above committee based on their performance.

iv) The student shall be given an option to choose either the skill courses being offered by the college or to choose a certificate course being offered by industries/Professional bodies or any other accredited bodies. If a student chooses to take a Certificate Course offered by external agencies, the credits shall be awarded to the student upon producing the Course Completion Certificate from the agency. A committee shall be formed at the level of the college to evaluate the grades/marks given for a course by external agencies and convert to the equivalent marks/grades.

v) The recommended courses offered by external agencies, conversions and appropriate grades/marks are to be approved by the University at the beginning of the semester. The principal of the respective college shall forward such proposals to the University for approval.

vi) If a student prefers to take a certificate course offered by external agency, the department shall mark attendance of the student for the remaining courses in that semester excluding the skill course in all the calculations of mandatory attendance requirements upon producing a valid certificate as approved by the University.

11. Massive Open Online Courses (MOOCs):

A Student has to pursue and complete one course compulsorily through MOOCs approved by the University. A student can pursue courses other than core through MOOCs and it is mandatory to complete one course successfully through MOOCs for awarding the degree. A student is not permitted to register and pursue core courses through MOOCs.

A student shall register for the course (Minimum of either 8 weeks or 12 weeks) offered through MOOCs with the approval of Head of the Department. The Head of the Department shall appoint one mentor to monitor the student's progression. The student needs to earn a certificate by passing the exam. The student shall be awarded the credits assigned in the curriculum only by submission of the certificate. Examination fee, if any, will be borne by the student.

Students who have qualified in the proctored examinations conducted through MOOCs platform can apply for credit transfer as specified and are exempted from appearing internal as well as external examination (for the specified equivalent credit course only) conducted by the university.

Necessary amendments in rules and regulations regarding adoption of MOOC courses would be proposed from time to time.

12. **Credit Transfer Policy**

Adoption of MOOCs is mandatory, to enable Blended model of teaching-learning as also envisaged in the NEP 2020. As per University Grants Commission (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016, the University shall allow up to a maximum of 20% of the total courses being offered in a particular programme i.e., maximum of 32 credits through MOOCs platform.

i) The University shall offer credit mobility for MOOCs and give the equivalent credit weightage to the students for the credits earned through online learning courses.
ii) Student registration for the MOOCs shall be only through the respective department of the institution, it is mandatory for the student to share necessary information with the department.
iii) Credit transfer policy will be applicable to the Professional & Open Elective courses only.
iv) The concerned department shall identify the courses permitted for credit transfer.
v) The University/institution shall notify at the beginning of semester the list of the online learning courses eligible for credit transfer.
vi) The institution shall designate a faculty member as a Mentor for each course to guide the students from registration till completion of the credit course.
vii) The university shall ensure no overlap of MOOC exams with that of the university examination schedule. In case of delay in results, the university will re-issue the marks sheet for such students.
viii) Student pursuing courses under MOOCs shall acquire the required credits only after successful completion of the course and submitting a certificate issued by the competent authority along with the percentage of marks and grades.
ix) The institution shall submit the following to the examination section of the university:
    a) List of students who have passed MOOC courses in the current semester along with the certificate of completion.
    b) Undertaking form filled by the students for credit transfer.
x) The universities shall resolve any issues that may arise in the implementation of this policy from time to time and shall review its credit transfer policy in the light of periodic changes brought by UGC, SWAYAM, NPTEL and state government.

Note: Students shall be permitted to register for MOOCs offered through online platforms approved by the University from time to time.

13. Academic Bank of Credits (ABC)

The University has implemented Academic Bank of Credits (ABC) to promote flexibility in curriculum as per NEP 2020 to

i. provide option of mobility for learners across the universities of their choice
ii. provide option to gain the credits through MOOCs from approved digital platforms.
iii. facilitate award of certificate/diploma/degree in line with the accumulated credits in ABC
iv. execute Multiple Entry and Exit system with credit count, credit transfer and credit acceptance from students' account.

14. Mandatory Internships

Summer Internships

Two summer internships either onsite or virtual each with a minimum of 08 weeks duration, done at the end of second and third years, respectively are mandatory. It shall be completed in collaboration with local industries, Govt. Organizations, construction agencies, Power projects, software MNCs or any industries in the areas of concerned specialization of the Undergraduate program. One of the two summer internships at the end of second year (Community Service Project) shall be society oriented and shall be completed in collaboration with government organizations/NGOs & others. The other internship at the end of third year is Industry Internship and shall be completed in collaboration with Industries. The student shall register for the internship as per course structure after commencement of academic year. The guidelines issued by the APSCHE / University shall be followed for carrying out and evaluation of Community Service Project and Industry Internship.

Evaluation of the summer internships shall be through the departmental committee. A student will be required to submit a summer internship report to the concerned department and appear for an oral presentation before the departmental committee comprising of Head of the Department, supervisor of the internship and a senior faculty member of the department. A certificate of successful completion from industry shall be included in the report. The report and the oral presentation shall carry 50% weightage each. It shall be evaluated for 50 external marks. There shall be no internal marks for Summer Internship. A student shall secure minimum 40% of marks for successful completion. In case, if a student fails, he/she shall reappear as and when semester supplementary examinations are conducted by the University.

Full Semester Internship and Project work:

In the final semester, the student should mandatorily register and undergo internship (onsite/virtual) and in parallel he/she should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work carried out during the internship.

The project report shall be evaluated with an external examiner. The total marks for project work 200 marks and distribution shall be 60 marks for internal and 140 marks for external evaluation. The supervisor assesses the student for 30 marks (Report: 15 marks, Seminar: 15 marks). At the end of the semester, all projects shall be showcased at the department for the benefit of all students and staff and the same is to be evaluated by the departmental Project Review Committee consisting of supervisor, a senior

faculty and HOD for 30 marks. The external evaluation of Project Work is a Viva-Voce Examination conducted in the presence of internal examiner and external examiner appointed by the University and is evaluated for 140 marks.

The college shall facilitate and monitor the student internship programs. Completion of internships is mandatory, if any student fails to complete internship, he/she will not be eligible for the award of degree. In such cases, the student shall repeat and complete the internship.

15. Guidelines for offering a Minor

To promote interdisciplinary knowledge among the students, the students admitted into B.Tech. in a major stream/branch are eligible to obtain degree in Minor in another stream.

i) The Minor program requires the completion of 12 credits in Minor stream chosen.
ii) Two courses for 06 credits related to a Minor are to be pursued compulsorily for the minor degree, but maybe waived for students who have done similar/equivalent courses. If waived for a student, then the student must take an extra elective course in its place. It is recommended that students should complete the compulsory courses (or equivalents) before registering for the electives.
iii) Electives (minimum of 2 courses) to complete a total of 12 credits.

Note: A total of 04 Open Electives are offered in the curriculum. A student can complete the requirement for Minor within the 160 credits by opting for the courses offered through various verticals/tracks under Open Electives.

16. Guidelines for offering Honors

The objective of introducing B.Tech. (Hons.) is to facilitate the students to choose additionally the specialized courses of their choice and build their competence in a specialized area in the UG level. The programme is a best choice for academically excellent students having good academic record and interest towards higher studies and research.

i) Honors is introduced in the curriculum of all B. Tech. programs offering a major degree and is applicable to all B. Tech (Regular and Lateral Entry) students admitted in Engineering & Technology.
ii) A student shall earn additional 15 credits for award of B.Tech. (Honors) degree from same branch/department/discipline registered for major degree. This is in addition to the credits essential for obtaining the Undergraduate degree in Major Discipline (i.e., 160 credits).
iii) A student is permitted to register for Honors in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to the Honors from V Semester onwards.
iv) The concerned Principal of the college shall arrange separate class work and timetable of the courses offered under Honors program.
v) Courses that are used to fulfil the student's primary major may not be double counted towards the Honors. Courses with content substantially equivalent to courses in the student's primary Major may not be counted towards the Honors.
vi) Students can complete the courses offered under Honors either in the college or in online platforms like SWAYAM with a minimum duration of 12 weeks for a 3-credit course and 8 weeks duration for a 2-credit course satisfying the criteria for credit mobility. If the courses under Honors are offered in conventional

mode, then the teaching and evaluation procedure shall be similar to regular B. Tech courses.

vii) The attendance for the registered courses under Honors and regular courses offered for Major degree in a semester are to be considered separately.

viii) A student shall maintain an attendance of 75% in all registered courses under Honors to be eligible for attending semester end examinations.

ix) A student registered for Honors shall pass in all subjects that constitute the requirement for the Honors degree program. No class/division (i.e., second class, first class and distinction, etc.) shall be awarded for Honors degree programme.

x) If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into open or core electives; they will remain extra. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xi) The Honors will be mentioned in the degree certificate as Bachelor of Technology (Honors) in XYZ. For example, B.Tech. (Honors) in Mechanical Engineering

Enrolment into Honors:

i) Students of a Department/Discipline are eligible to opt for Honors program offered by the same Department/Discipline

ii) The enrolment of student into Honors is based on the CGPA obtained in the major degree program. CGPA shall be taken up to III semester in case of regular entry students and only III semester in case of lateral entry students. Students having 7 CGPA without any backlog subjects will be permitted to register for Honors.

iii) If a student is detained due to lack of attendance either in Major or in Honors, registration shall be cancelled.

iv) Transfer of credits from Honors to regular B. Tech degree and vice-versa shall not be permitted.

v) Honors is to be completed simultaneously with a Major degree program.

Registration for Honors:

i) The eligible and interested students shall apply through the HOD of his/her parent department. The whole process should be completed within one week before the start of every semester. Selected students shall be permitted to register the courses under Honors.

ii) The selected students shall submit their willingness to the principal through his/her parent department offering Honors. The parent department shall maintain the record of student pursuing the Honors.

iii) The students enrolled in the Honors courses will be monitored continuously. An advisor/mentor from parent department shall be assigned to a group of students to monitor the progress.

iv) There is no fee for registration of subjects for Honors program offered in offline at the respective institutions.

17. Attendance Requirements:

i) A student shall be eligible to appear for the University external examinations if he/she acquires a minimum of 40% attendance in each subject and 75% of attendance in aggregate of all the subjects. b) Condonation of shortage of

attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

ii) Shortage of Attendance below 65% in aggregate shall in NO CASE be condoned.

iii) A stipulated fee shall be payable towards condonation of shortage of attendance to the University.

iv) Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.

v) A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester. They may seek readmission for that semester from the date of commencement of class work.

vi) If any candidate fulfils the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.

vii) If the learning is carried out in blended mode (both offline & online), then the total attendance of the student shall be calculated considering the offline and online attendance of the student.

viii) For induction programme attendance shall be maintained as per AICTE norms.

18. **Promotion Rules:**

The following academic requirements must be satisfied in addition to the attendance requirements mentioned in section 16.

i) A student shall be promoted from first year to second year if he/she fulfils the minimum attendance requirement as per university norms.

ii) A student will be promoted from II to III year if he/she fulfils the academic requirement of securing 40% of the credits (any ***decimal*** fraction should be ***rounded off*** to ***lower*** digit) up to in the subjects that have been studied up to III semester.

iii) A student shall be promoted from III year to IV year if he/she fulfils the academic requirements of securing 40% of the credits (any ***decimal*** fraction should be ***rounded off*** to ***lower*** digit) in the subjects that have been studied up to V semester.

And in case a student is detained for want of credits for a particular academic year by ii) & iii) above, the student may make up the credits through supplementary examinations and only after securing the required credits he/she shall be permitted to join in the V semester or VII semester respectively as the case may be.

iv) When a student is detained due to lack of credits/shortage of attendance he/she may be re-admitted when the semester is offered after fulfilment of academic regulations. In such case, he/she shall be in the academic regulations into which he/she is readmitted.

19. Grading:

As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades and corresponding percentage of marks shall be followed:

After each course is evaluated for 100 marks, the marks obtained in each course will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Structure of Grading of Academic Performance

Range in which the marks in the subject fall	Grade	Grade points Assigned
90 & above	S (Superior)	10
80 - 89	A (Excellent)	9
70 - 79	B (Very Good)	8
60 - 69	C (Good)	7
50 - 59	D (Average)	6
40 - 49	E (Pass)	5
< 40	F (Fail)	0
Absent	Ab (Absent)	0

i) A student obtaining Grade 'F' or Grade 'Ab' in a subject shall be considered failed and will be required to reappear for that subject when it is offered the next supplementary examination.

ii) For non-credit audit courses, "Satisfactory" or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA/Percentage.

Computation of Semester Grade Point Average (SGPA) and Cumulative GradePoint Average (CGPA):

The Semester Grade Point Average (SGPA) is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.,

$$SGPA = \Sigma (C_i \times G_i)/\Sigma C_i$$

where, C_i is the number of credits of the i^{th} subject and G_i is the grade point scored by the student in the i^{th} course.

The Cumulative Grade Point Average (CGPA) will be computed in the same manner considering all the courses undergone by a student over all the semesters of a program, i.e.,

$$CGPA = \Sigma (C_i \times S_i)/\Sigma C_i$$

where "S_i" is the SGPA of the i^{th} semester and C_i is the total numberof credits up to that semester.

Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

While computing the SGPA the subjects in which the student is awarded Zero grade points will also be included.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.
Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by the letters S, A, B, C, D and F.

Award of Class:

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

Class Awarded	CGPA Secured
First Class with Distinction	≥ 7.5 (Without any supplementary appearance)
First Class	≥ 6.5 < 7.5
Second Class	≥ 5.5 < 6.5
Pass Class	≥ 5.0 < 5.5

Note: * Students who have written supplementary examinations to fulfil the credit requirement will not be awarded First Class with Distinction. For such students the highest degree that is awarded will be First Class Only.

CGPA to Percentage conversion Formula – (CGPA – 0.5) x 10

20. With–holding of Results

If the candidate has any dues not paid to the university or if any case of indiscipline or malpractice is pending against him/her, the result of the candidate shall be withheld in such cases.

21. Multiple Entry / Exit Option

(a) Exit Policy:

The students can choose to exit the four-year programme at the end of first/second/third year.

i) **UG Certificate in (Field of study/discipline)** - Programme duration: First year (first two semesters) of the undergraduate programme, 40 credits followed by an additional exit 10-credit bridge course(s) lasting two months, including at least 6-credit job-specific internship/ apprenticeship that would help the candidates acquire job-ready competencies required to enter the workforce.

ii) **UG Diploma (in Field of study/discipline)** - Programme duration: First two years (first four semesters) of the undergraduate programme, 80 credits followed by an additional exit 10-credit bridge course(s) lasting two months, including at least 6-credit job-specific internship/ apprenticeship that would help the candidates acquire job-ready competencies required to enter the workforce.

iii) **Bachelor of Science (in Field of study/discipline)** i.e., **B.Sc. Engineering in (Field of study/discipline)**- Programme duration: First three years (first six semesters) of the undergraduate programme, 120 credits.

(b) Entry Policy:

Modalities on multiple entry by the student into the B.Tech. programme will be provided in due course of time.

Note: The Universities shall resolve any issues that may arise in the implementation of Multiple Entry and Exit policies from time to time and shall review the policies in the light of periodic changes brought by UGC, AICTE and State government.

22. Gap Year Concept:

Gap year concept for Student Entrepreneur in Residence is introduced and outstanding students who wish to pursue entrepreneurship / become entrepreneur are allowed to

take a break of one year at any time after II year to pursue full-time entrepreneurship Programme/to establish startups. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The principal of the respective college shall forward such proposals submitted by the students to the University. An evaluation committee constituted by the University shall evaluate the proposal submitted by the student and the committee shall decide whether to permit the student(s) to avail the Gap Year or not

23. Transitory Regulations

Discontinued, detained, or failed candidates are eligible for readmission as and when the semester is offered after fulfilment of academic regulations. Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to Section 2 and they will follow the academic regulations into which they are readmitted.

Candidates who are permitted to avail Gap Year shall be eligible for re-joining into the succeeding year of their B. Tech from the date of commencement of class work, subject to Section **2** and they will follow the academic regulations into which they are readmitted.

24. Minimum Instruction Days for a Semester:

The minimum instruction days including exams for each semester shall be 90 days.

25. Medium of Instruction:

The medium of instruction of the entire B. Tech undergraduate programme in Engineering &Technology (including examinations and project reports) will be in English only.

26. Student Transfers:

Student transfers shall be as per the guidelines issued by the Government of Andhra Pradesh and the Universities from time to time.

27. General Instructions:

a. The academic regulations should be read as a whole for purpose of any interpretation.
b. Malpractices rules-nature and punishments are appended.
c. Where the words “he”, “him”, “his”, occur in the regulations, they also include “she”, “her”, “hers”, respectively.
d. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.
e. The Universities may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the Universities.
f. In the case of any doubt or ambiguity in the interpretation of the guidelines given, the decision of the Vice-Chancellor / Head of the institution is final.

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ACADEMIC REGULATIONS (DR24)
FOR B.TECH. (LATERAL ENTRY SCHEME)

*(Effective for the students getting admitted into II year through Lateral Entry Scheme from the Academic Year **2024-2025** onwards)*

1. **Award of the Degree**
   (a) Award of the B.Tech. Degree / B.Tech. Degree with a Minor if he/she fulfils th following:
      (i) Pursues a course of study for not less than three academic years and not more than six academic years. However, for the students availing Gap year facility this period shall be extended by two years at the most and these two years would in addition to the maximum period permitted for graduation (Six years).
      (ii) Registers for 120 credits and secures all 120 credits.

   (c) Award of B.Tech. degree with Honors
   A student will be declared eligible for the award of the B.Tech. with Honors if he/she fulfils the following:
      (i) Student secures additional 15 credits fulfilling all the requisites of a B.Tech. programme. i.e., 120 credits.
      (ii) Registering for Honors is optional.
      (iii) Honors is to be completed simultaneously with B.Tech. programme.

2. Students, who fail to fulfil the requirement for the award of the degree within six consecutive academic years from the year of admission, shall forfeit their seat.

3. **Minimum Academic Requirements**
   The following academic requirements have to be satisfied in addition to the requirements mentioned in item no.**2**
   i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, 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 mid semester evaluation and end examination taken together.

   ii. A student shall be promoted from III year to IV year if he/she fulfils the academic requirements of securing 40% of the credits (any decimal fraction should be rounded off to lower digit) in the subjects that have been studied up to V semester.

   And in case if student is already detained for want of credits for particular academic year, the student may make up the credits through supplementary exams of the above exams before the commencement of IV year I semester class work of next year.

4. Course Pattern

i) The entire course of study is three academic 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 next supplementary examination offered.

iii) When a student is detained due to lack of credits/shortage of attendance the student may be re-admitted when the semester is offered after fulfilment of academic regulations, the student shall be in the academic regulations into which he/she is readmitted.

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

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Balusumudi, Bhimavaram-2

DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - IV

(Pages: 1 & 2)

ANNEXURE - IV

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Ph: 08816-221238 Email: dnrcet@gmail.com website: https://dnrcet.org

Guidelines for offering B.Tech with Minors and B.Tech with Honors

1. Guidelines for offering a Minors

To promote interdisciplinary knowledge among the students, the students admitted into B.Tech. in a major stream/branch are eligible to obtain degree in Minor in another stream.

i) The Minor program requires the completion of 12 credits in Minor stream chosen.
ii) Two courses for 06 credits related to a Minor are to be pursued compulsorily for the minor degree, but maybe waived for students who have done similar/equivalent courses. If waived for a student, then the student must take an extra elective course in its place. It is recommended that students should complete the compulsory courses (or equivalents) before registering for the electives.
iii) Electives (minimum of 2 courses) to complete a total of 12 credits.

Note: A total of 04 Open Electives are offered in the curriculum. A student can complete the requirement for Minor within the 160 credits by opting for the courses offered through various verticals/tracks under Open Electives.

2. Guidelines for offering Honors

The objective of introducing B.Tech. (Hons.) is to facilitate the students to choose additionally the specialized courses of their choice and build their competence in a specialized area in the UG level. The programme is a best choice for academically excellent students having good academic record and interest towards higher studies and research.

i) Honors is introduced in the curriculum of all B. Tech. programs offering a major degree and is applicable to all B. Tech (Regular and Lateral Entry) students admitted in Engineering & Technology.
ii) A student shall earn additional 15 credits for award of B.Tech. (Honors) degree from same branch/department/discipline registered for major degree. This is in addition to the credits essential for obtaining the Undergraduate degree in Major Discipline (i.e., 160 credits).
iii) A student is permitted to register for Honors in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to the Honors from V Semester onwards.
iv) The concerned Principal of the college shall arrange separate class work and timetable of the courses offered under Honors program.
v) Courses that are used to fulfil the student's primary major may not be double counted towards the Honors. Courses with content substantially equivalent to courses in the student's primary Major may not be counted towards the Honors.
vi) Students can complete the courses offered under Honors either in the college or in online platforms like SWAYAM with a minimum duration of 12 weeks for a 3-credit course and 8 weeks duration for a 2-credit course satisfying the criteria for credit mobility. If the courses under Honors are offered in conventional

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mode, then the teaching and evaluation procedure shall be similar to regular B. Tech courses.

vii) The attendance for the registered courses under Honors and regular courses offered for Major degree in a semester are to be considered separately.

viii) A student shall maintain an attendance of 75% in all registered courses under Honors to be eligible for attending semester end examinations.

ix) A student registered for Honors shall pass in all subjects that constitute the requirement for the Honors degree program. No class/division (i.e., second class, first class and distinction, etc.) shall be awarded for Honors degree programme.

x) If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into open or core electives; they will remain extra. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xi) The Honors will be mentioned in the degree certificate as Bachelor of Technology (Honors) in XYZ. For example, B.Tech. (Honors) in Mechanical Engineering

Enrolment into Honors:

i) Students of a Department/Discipline are eligible to opt for Honors program offered by the same Department/Discipline

ii) The enrolment of student into Honors is based on the CGPA obtained in the major degree program. CGPA shall be taken up to III semester in case of regular entry students and only III semester in case of lateral entry students. Students having 7 CGPA without any backlog subjects will be permitted to register for Honors.

iii) If a student is detained due to lack of attendance either in Major or in Honors, registration shall be cancelled.

iv) Transfer of credits from Honors to regular B. Tech degree and vice-versa shall not be permitted.

v) Honors is to be completed simultaneously with a Major degree program.

Registration for Honors:

i) The eligible and interested students shall apply through the HOD of his/her parent department. The whole process should be completed within one week before the start of every semester. Selected students shall be permitted to register the courses under Honors.

ii) The selected students shall submit their willingness to the principal through his/her parent department offering Honors. The parent department shall maintain the record of student pursuing the Honors.

iii) The students enrolled in the Honors courses will be monitored continuously. An advisor/mentor from parent department shall be assigned to a group of students to monitor the progress.

iv) There is no fee for registration of subjects for Honors program offered in offline at the respective institutions.

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DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - V

(Pages: 1-19)

ANNEXURE-V

DR24 REGULATIONS

M.Tech CURRICULUM

(Applicable for the batches admitted from 2024-25)

DEPARTMENT OF CIVIL ENGINEERING
M.Tech. (Structural Engineering) Program

D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY
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ANNEXURE-V

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M.Tech II year I – Semester **Structural Engineering**

S.No.	Course Name	Category	Subject Code	L	T	P	C	Marks
1	Elective 5: Program Elective /MOOCS**	Elective		3	0	--	3	100
	a) Design of Pre-stressed Concrete structures		MT24SE2101A					
	b) Structural Health Monitoring		MT24SE2101B					
	c) Industrial Structures		MT24SE2101C					
2	Open Elective / MOOCS**	Elective		3	0	--	3	100
	a) Operations Research		MT24SE2102A					
	b) Construction Management		MT24SE2102B					
	c) Green Technology		MT24SE2102C					
3	Dissertation Phase-I / Industrial Project (To be continued and Evaluated next Semester)*	Academic coursework	MT24SEPDW	--	--	20	10	
	Total Credits / Marks						**16**	**200**

* Evaluated and displayed in 4th Semester marks list
** Students Going for Industrial Project / Thesis will complete these courses through MOOCS.
Students can also choose SWAYAM or **NPTEL with a 12 weeks course** duration in PG level with 3 credits, but the chosen subject should not be covered in their M. Tech Course.

M.Tech II year II - Semester

Sl No	Course Name	Category	Subject Code	L	T	P	C	Marks
1	Project / Dissertation Phase II (Continued from II Yr. I Semester)	Academic coursework	MT24SEPDW	0	0	32	16	100
	Total Credits / Marks						**16**	**100**

Audit course 1 & 2

1. English for Research Paper Writing
2. Disaster Management
3. Sanskrit for Technical Knowledge
4. Value Education
5. Constitution of India
6. Pedagogy Studies
7. Stress Management by Yoga
8. Personality Development through Life Enlightenment Skills.

II Year - I Semester	L	T	P	C
	3	0	0	3
Program Elective 5- DESIGN OF PRE-STRESSED CONCRETE STRUCTURES (MT24SE2101A)				

Course Outcomes: At the end of the course, the student will be able to

CO1	Explain the principle, types and systems of prestressing and analyze the deflections.
CO2	Determine the flexural strength and design the flexural members, end blocks.
CO3	Analyze the statically indeterminate structures and design the continuous beam.
CO4	Design the tension and compression members and apply it for design of piles.
CO5	Analyze the stress, deflections, flexural and shear strength and apply it for the design of bridges.
CO6	Analyze the Composite construction of Pre-stressed and in-situ concrete.

Mapping of Course Outcomes with Program Outcomes:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	1	2	1	--	2	1
CO2	1	1	2	2	--	2	1
CO3	1	2	2	2	--	2	1
CO4	--	1	2	3	--	2	1
CO5	1	2	2	3	--	2	1
CO6	1	2	2	2	--	2	1

1. Slightly 2. Moderately 3. Substantially Detailed Syllabus

UNIT I:
Introduction – Prestressing Systems – Pretensioning Systems – Postensioning Systems – High Strength Steel and Concrete - Analysis of Prestress - Resultant Stresses at a Section – Pressure Line or Thrust Line – Concept of Load Balancing - Losses of Prestress – Loss Due to Elastic Deformation of Concrete – Shrinkage of Concrete – Creep – Relaxation of Stress in Steel – Friction – Anchorage Slip.

UNIT II:
DEFLECTIONS OF PRESTRESSED CONCRETE MEMBERS: Importance of Control of Deflections – Factors Influencing Deflection – Short-term Deflections of Uncracked Members – Prediction of Long-time Deflections – Deflections of Cracked Members – Requirements of IS 1343-2012.
Ultimate Flexural Strength of Beams: Introduction, Flexural theory using first principles – Simplified Methods – Ultimate Moment of Resistance of untensioned Steel.

UNIT III:
COMPOSITE CONSTRUCTIONS: Introduction, Advantages, Types of Composite Construction, Analysis of Composite beams- Differential shrinkage- Ultimate Flexural and shear strength of composite sections- Deflection of Composite Beams. Design of Composite sections.

UNIT IV:
PRESTRESSED CONCRETE SLABS: Types Of Prestressed Concrete Floor Slabs- Design of Prestressed Concrete One Way and Two Way Slabs.
Prestressed Concrete Pipes and Poles : Circular prestressing- Types of Prestressed Concrete Pipes- Design of Prestressed Concrete Pipes - Prestressed Concrete Poles.

UNIT V:

CONTINUOUS BEAMS: Advantage of Continuous Members – Effect of Prestressing Indeterminate Structures – Methods of Achieving Continuity – Methods of Analysis of Secondary Moments – Concordant Cable Profile – Guyon's Theorem. Redistribution of moments in a continuous beam.

Anchorage Zone Stresses in Beams : Introduction, Stress distribution in End Block – Anchorage zone stresses –Magnel's method- Guyon's Method - Anchorage zone Reinforcement.

TEXT BOOKS

1. Prestressed Concrete, 6e by N. Krishna Raju, Mc Graw Hill Publishers
2. Prestressed Concrete by K. U.Muthu, PHI Learning Pvt Limited

REFERENCES:

1. Prestressed Concrete Analysis and Design, Antone E. Naaman 2e, Techno Press 3000
2. Design of Prestressed Concrete- T. Y. Lin, Ned H. Burns 3e, Wiley Publications
3. Design of prestressed Concrete by E.G. Nawy
4. Prestressed Concrete by N. Rajagopalan, Narosa Publishing
5. IS1343 2012 Prestressed concrete Code of Practice

II Year - I Semester	L	T	P	C
	3	0	0	3
Program Elective 5 - STRUCTURAL HEALTH MONITORING (MT24SE2101B)				

Course Outcomes: At the end of the course, the student will be able to

CO1	Diagnose the distress in the structure by understanding the causes and factors
CO2	Assess the health of structure using static field methods.
CO3	Assess the health of structure using dynamic field tests
CO4	Carryout repairs and rehabilitation measures of the structure

Mapping of Course Outcomes with Program Outcomes:

Course Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	1	2	1	--	2	1
CO2	1	1	2	2	--	2	1
CO3	1	2	2	2	--	2	1
CO4	--	1	2	3	--	2	1

1. Slightly 2. Moderately 3. Substantially

UNIT-I
Structural Health: Factors affecting Health of Structures, Causes of Distress, Regular Maintenance
Structural Audit: Assessment of Health of Structure, Collapse and Investigation, Investigation Management, SHM Procedures

UNIT-II
Structural Health Monitoring: Concept, Various Measures, Structural Safety in Alteration Structural Audit: Assessment of Health of Structure, Collapse and Investigation, Investigation Management, SHM Procedures

UNIT-III
Dynamic Field Testing: Types of Dynamic Field Test, Stress History Data, Dynamic Response Methods, Hardware for Remote Data Acquisition Systems, Remote Structural Health Monitoring.

UNIT-IV
Introduction to Repairs and Rehabilitation of Structures: Case Studies (Site Visits), Piezo– electric materials and other smart materials, electro–mechanical impedance (EMI) technique, adaptations of EMI technique.

TEXT BOOKS
1. Structural Health Monitoring, Daniel Balageas, Claus Peter Fritzen, Alfredo Güemes, John Wiley and Sons, 2006.
2. Health Monitoring of Structural Materials and Components Methods with Applications, Douglas E Adams, John Wiley and Sons, 2007.

REFERENCES
1. Structural Health Monitoring and Intelligent Infrastructure, Vol1, J. P. Ou, H. Li and Z. D. Duan, Taylor and Francis Group, London, UK, 2006.
2. Structural Health Monitoring with Wafer Active Sensors, Victor Giurglutiu, Academic Press Inc, 2007.

II Year - I Semester	L	T	P	C
	3	0	0	3
Program Elective 5 – INDUSTRIAL STRUCTURES (MT24SE2101C)				

Course Outcomes: At the end of the course, the student will be able to

CO1	Plan the functional requirements of structural systems for various industries.
CO2	Get an idea about the materials used and design of industrial structural elements.
CO3	Realize the basic concepts and design of power plant structures.
CO4	Design power transmission structures.
CO5	Possess the ability to understand the design concepts of Chimneys, bunkers and silos

Mapping of Course Outcomes with Program Outcomes:

Course Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	--	--	1	--	--	--	1
CO2	--	--	1	--	--	--	1
CO3	--	--	1	--	--	--	1
CO4	--	--	--	3	--	3	
CO5	--	--	2	3	--	3	2

1. Slightly 2. Moderately 3. Substantially

Detailed Syllabus:

UNIT: I

Planning and functional requirements- classification of industries and industrial structures- planning for layout- requirements regarding lighting ventilation and fire safety- protection against noise and vibrations

UNIT: II

Industrial buildings- design of gantry girder- design of corbels and nibs- machine foundations

UNIT: III

Design of Pre Engineered Buildings- **Design of Roof Systems for Industrial Buildings** (Steel)

UNIT: IV

Power plant structures- Bunkers and silos- chimney and cooling towers-Nuclear containment structures

UNIT: V

Power transmission structures- transmission line towers- tower foundations- testing towers

TEXT BOOKS

1. Handbook on Machine Foundations by P. Srinivasulu and C. V. Vaidyanathan, Structural Engineering Research Center
2. Tall Chimneys- Design and Construction by S. N. Manohar Tata Mc Grawhill Publishing Company

REFERENCES:

1. Transmission Line Structures by S. S. Murthy and A. R. Santakumar McGraw Hill
2. SP 32: 1986, Handbook on functional requirements of Industrial buildings
3. Design of steel structures by N. Subramanian

II Year - I Semester	L	T	P	C
	3	0	0	3

Open Elective: a). OPERATIONS RESEARCH (MT24SE2102A)
(Common to M. Tech - Structural Engineering & Structural Design, Soil Mechanics & Foundation Engineering, Highway Engineering, and Transportation Engineering)

OUTCOMES:
At the end of the course, the student will be able to
1. Formulate a linear programming problem for given problem and solve this problem by using Simplex techniques
2. Apply the dynamic programming to solve problems of discreet and continuous variables
3. Apply the concept of non-linear programming for solving the problems involving non- linear constraints
4. Carry out sensitivity analysis
5. Model the real world problem and simulate it

UNIT-I
Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models.

UNIT-II
Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming.

UNIT-III
Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem - CPM/PERT.

UNIT-IV
Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.

UNIT-V
Competitive Models, Single and Multi-Channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation.

REFERENCE:
1. Kanthi Swarup, P.K. Gupta and Man Mohan, Operations Research, 14 th Edition, Sultan Chand and Sons, New Delhi, 2008.
2. S. D. Sharma, Operations Research, Kedar Nath and Ram Nath, Meerut,2008.
3. H.A. Taha, Operations Research, An Introduction, PHI, 2008
4. H.M. Wagner, Principles of Operations Research, PHI, Delhi, 1982.
5. J.C. Pant, Introduction to Optimization: Operations Research, Jain Brothers, Delhi, 2008
6. Hitler Libermann Operations Research: McGraw Hill Pub. 2009
7. Pannerselvam, Operations Research: Prentice Hall of India 2010
8. Harvey M Wagner, Principles of Operations Research: Prentice Hall of India 2010

II Year - I Semester	L	T	P	C
	3	0	0	3

Open Elective: b) CONSTRUCTION MANAGEMENT (MT24SE2102B)
(Common to M. Tech - Structural Engineering, Structural Engineering & Structural Design, Computer Aided Structural Analysis & Design, and Soil Mechanics & Foundation Engineering)

COURSE OUTCOME:

1. Able to plan, coordination, and control of a project from beginning to completion.
2. Adopting the most effect method for meeting the requirement in order to produce a functionally and financially viable project.

UNIT -I

Management process- Roles. Management theories. Social responsibilities. Planning and strategic management. Strategy implementation. Decision making: tools and techniques – Organizational structure. Human resource management- motivation performance- leadership.

UNIT-II

Classification of Construction projects, Construction stages, Resources- Functions of Construction Management and its Applications. Preliminary Planning- Collection of Data- Contract Planning – Scientific Methods of Management: Network Techniques in construction management - Bar chart, Gant chart, CPM, PERT- Cost & Time optimization.

UNIT-III

Resource planning - planning for manpower, materials, costs, equipment. Labour -Scheduling - Forms of scheduling - Resource allocation. budget and budgetary control methods

UNIT-IV

Contract - types of contract, contract document, and specification, important conditions of contract – tender and tender document - Deposits by the contractor - Arbitration. negotiation - M.Book - Muster roll -stores.

UNIT-V

Management Information System - Labour Regulations: Social Security - welfare Legislation - Laws relating to Wages, Bonus and Industrial disputes, Labour Administration - Insurance and Safety Regulations - Workmen's Compensation Act -other labour Laws - Safety in construction: legal and financial aspects of accidents in construction. occupational and safety hazard assessment- **Role of Management in Fire Safety- Planning for Fire Safety- Management by Objectives and its Role in Safety, Health, and Environment (SHE) - Coordination of the Three Components of SHE.**

REFERENCE:

1. Ghalot, P.S., Dhir, D.M., Construction Planning and Management, Wiley Eastern Limited,1992.
2. Chitkara,K.K., Construction Project Management¸ Tata McGraw Hill Publishing Co, Ltd., New Delhi,998.
3. Punmia,B,C., Project Planning and Control with PERT and CPM, Laxmi Publications, New Delhi,1987.
4. Sengupta, B. &Guha, H, Construction Management and Planning by: Tata McGraw-hill publications.

II Year - I Semester	L	T	P	C
	3	0	0	3

Open Elective: c) GREEN TECHNOLOGY (MT24SE2102C)
(Common to M. Tech - Structural Engineering, Structural Engineering & Structural Design, and Computer Aided Structural Analysis & Design)

COURSE OUTCOMES:

Upon successful completion of this course, the students will be able to:
1. Enlist different concepts of green technologies in a project
2. Understand the principles of Energy efficient technologies
3. Estimate the carbon credits of various activities
4. Recognize the benefits of green fuels with respect to sustainable development.

UNIT- I
Introduction: Green Technology – definition- Importance – Historical evolution – advantages and disadvantages of green technologies-factors affecting green technologies- Role of Industry, Government and Institutions – Industrial Ecology – role of industrial ecology in green technology.
Cleaner Production (CP): Definition – Importance – Historical evolution - Principles of Cleaner Production– Benefits–Promotion – Barriers – Role of Industry.

UNIT- II
Cleaner Production Project Development and Implementation:
Government and Institutions – clean development mechanism, reuse, recovery, recycle, raw material substitution-Wealth from waste, case studies. Overview of CP Assessment Steps and Skills, Process Flow Diagram, Material Balance, CP Option Generation – Technical and Environmental Feasibility analysis – Economic valuation of alternatives - Total Cost Analysis – CP Financing – Preparing a Program Plan – Measuring Progress- ISO 14000.

UNIT- III
Pollution Prevention and Cleaner Production Awareness Plan – Waste audit – Environmental Statement, carbon credit, carbon sequestration, carbon trading, Life Cycle Assessment - Elements of LCA – Life Cycle Costing – Eco Labelling.

UNIT –IV
Availability and need of conventional energy resources, major environmental problems related to the conventional energy resources, future possibilities of energy need and availability. Non- conventional energy sources: Solar Energy-solar energy conversion technologies and devices, their principles, working and application.

UNIT- V
Green Fuels – Definition-benefits and challenges – comparison of green fuels with conventional fossil fuels with reference to environmental, economic and social impacts- public policies and market-driven initiatives.
Biomass energy: Concept of biomass energy utilization, types of biomass energy, conversion processes, Wind Energy, energy conversion technologies, their principles, equipment and suitability in Indian context; tidal and geothermal energy.

REFERENCES:

1. 'Pollution Prevention: Fundamentals and Practice' by Paul L Bishop (2000), McGraw Hill International.
2. 'Cleaner Production Audit' by Prasad Modak, C.Visvanathan and MandarParasnis (1995), Environmental System Reviews, No.38, Asian Institute of Technology, Bangkok
3. 'Non-conventional Energy Sources' by Rai G.D.
4. 'Energy, The Solar Hydrogen Alternative' by Bokris J.O.
5. Waste Energy Utilization Technology' by Kiang Y. H.
6. 'Solar Energy' by Sukhatme S.P.
7. 'Pollution Prevention and Abatement Handbook – Towards Cleaner Production' by World Bank Group (1998), World Bank and UNEP, Washington D.C.
8. 'Handbook of Organic Waste Conversion' by Bewik M.W.M.

II Year - I Semester	L	T	P	C
	0	0	20	10
Dissertation Phase-I (MT24SEPDW)				

Course Outcomes: At the end of the course, the student will be able to

CO1	Identifying the topic after thorough review of literature on chosen topic and Can able to do the Project either Experimental Work or analytical Work.

Mapping of Course Outcomes with Program Outcomes:;

Course Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	--	2	2	3	3	3

1. Slightly 2. Moderately 3. Substantially

II Year - II Semester
Dissertation (Phase-II)

Sl No.	Course Name	Category	L	T	P	C	Marks
1	Project / Dissertation Phase II (Continued from II Yr. I Semester)	Academic coursework	0	0	32	16	100
	Total Credits / Marks					**16**	**100**

Mapping of Course Outcomes with Program Outcomes:;

Course Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	--	2	2	3	3	3

1. Slightly 2. Moderately 3. Substantially

AUDIT 1 and 2: ENGLISH FOR RESEARCH PAPER WRITING

Course objectives:

Students will be able to:

1. Understand that how to improve your writing skills and level of readability Learn about what to write in each section
2. Understand the skills needed when writing a Title Ensure the good quality of paper at very first-time submission.

Syllabus		
Units	**CONTENTS**	**Hours**
1	Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness	4
2	Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction	4
3	Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.	4
4	Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature,	4
5	Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions	4
6	Useful phrases, how to ensure paper is as good as it could possibly be the first-time submission	4

Suggested Studies:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N(1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book.
4. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

AUDIT 1 and 2: DISASTER MANAGEMENT

Course Objectives: -

Students will be able to:

1. Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
2. Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
4. Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

Syllabus		
Units	**CONTENTS**	**Hours**
1	Introduction Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.	4
2	Repercussions of Disasters And Hazards: Economic Damage, Loss Of Human And Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man- made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.	4
3	Disaster Prone Areas In India Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics	4
4	Disaster Preparedness And Management Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.	4
5	Risk Assessment Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co- Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.	4
6	Disaster Mitigation Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs of Disaster Mitigation In India.	4

Suggested Readings:

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies "'New Royal book Company.
2. Sahni, Pardeep Et.Al. (Eds.)," Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.
3. Goel S. L. , Disaster Administration And Management Text And Case Studies" ,Deep &Deep Publication Pvt. Ltd., New Delhi.

AUDIT 1 and 2: SANSKRIT FOR TECHNICAL KNOWLEDGE

Course Objectives

1. To get a working knowledge in illustrious Sanskrit, the scientific language in the world\
2. Learning of Sanskrit to improve brain functioning
3. Learning of Sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power
4. The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature

Syllabus

Unit	Content	Hours
1	Alphabets in Sanskrit, Past/Present/Future Tense, Simple Sentences	4
2	Order, Introduction of roots, Technical information about Sanskrit Literature	4
3	Technical concepts of Engineering-Electrical,	4
4	Technical concepts of Engineering - Mechanical.	4
5	Technical concepts of Engineering - Architecture.	4
6	Technical concepts of Engineering – Mathematics.	4

Suggested reading

1. "Abhyaspustakam" – Dr.Vishwas, Samskrita-Bharti Publication, New Delhi
2. "Teach Yourself Sanskrit" Prathama Deeksha-Vempati Kutumbshastri, Rashtriya Sanskrit Sansthanam, New Delhi Publication
3. "India's Glorious Scientific Tradition" Suresh Soni, Ocean books (P) Ltd., New Delhi.

Course Output

Students will be able to

1. Understanding basic Sanskrit language
2. Ancient Sanskrit literature about science & technology can be understood
3. Being a logical language will help to develop logic in students

AUDIT 1 and 2: VALUE EDUCATION

Course Objectives

Students will be able to

1. Understand value of education and self- development
2. Imbibe good values in students
3. Let the should know about the importance of character

Syllabus

Unit	Content	Hours
1	Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism. Moral and non- moral valuation. Standards and principles. Value judgements	4
2	Importance of cultivation of values. Sense of duty. Devotion, Self-reliance. Confidence, Concentration. Truthfulness, Cleanliness. Honesty, Humanity. Power of faith, National Unity. Patriotism.Love for nature ,Discipline	4
3	Personality and Behavior Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline. Punctuality, Love and Kindness. Avoid fault Thinking.	4
4	Free from anger, Dignity of labour. Universal brotherhood and religious tolerance. True friendship. Happiness Vs suffering, love for truth. Aware of self-destructive habits. Association and Cooperation. Doing best for saving nature	4
5	Character and Competence –Holy books vs Blind faith. Self-management and Good health. Science of reincarnation. Equality, Nonviolence ,Humility, Role of Women.	4
6	All religions and same message. Mind your Mind, Self-control. Honesty, Studying effectively	4

Suggested reading

1. Chakroborty, S.K. “Values and Ethics for organizations Theory and practice”, Oxford University Press, New Delhi

Course outcomes

Students will be able to 1.Knowledge of self-development
2. Learn the importance of Human values 3.Developing the overall personality

AUDIT 1 and 2: CONSTITUTION OF INDIA

Course Objectives:
Students will be able to:
1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

Syllabus		
Units	**Content**	**Hours**
1	**History of Making of the Indian Constitution:** History Drafting Committee, (Composition & Working)	4
2	**Philosophy of the Indian Constitution: Preamble Salient Features**	4
3	**Contours of Constitutional Rights & Duties:** Fundamental Rights Right to Equality Right to Freedom Right against Exploitation Right to Freedom of Religion Cultural and Educational Rights Right to Constitutional Remedies Directive Principles of State Policy Fundamental Duties.	4
4	**Organs of Governance:** Parliament Composition Qualifications and Disqualifications Powers and Functions Executive President Governor Council of Ministers Judiciary, Appointment and Transfer of Judges, Qualifications Powers and Functions	4
5	**Local Administration:** District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CE of Municipal Corporation. Pachayati raj: Introduction, PRI: ZilaPachayat. Elected officials and their roles, CEO ZilaPachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy	4
6	**Election Commission:** Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.	4

Suggested reading
1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Course Outcomes: Students will be able to:
1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2. Discuss the intellectual origins of the framework of argument that informed the ceptualization of social reforms leading to revolution in India.
3. Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
4. Discuss the passage of the Hindu Code Bill of 1956.

AUDIT 1 and 2: PEDAGOGY STUDIES

Course Objectives: Students will be able to:

1. Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers.
2. Identify critical evidence gaps to guide the development.

Syllabus		
Units	**Content**	**Hours**
1	Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of methodology and Searching.	4
2	Thematic overview: Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher education.	4
3	Evidence on the effectiveness of pedagogical practices Methodology for the in depth stage: quality assessment of included studies. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?	4
4	Theory of change. Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' attitudes and beliefs and Pedagogic strategies.	4
5	Professional development: alignment with classroom practices and follow-up support Peer support Support from the head teacher and the community. Curriculum and assessment Barriers to learning: limited resources and large class sizes	4
6	Research gaps and future directions Research design Contexts Pedagogy Teacher education Curriculum and assessment Dissemination and research impact.	4

Suggested reading

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, Compare, 31 (2): 245-261.
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, Journal of Curriculum Studies, 36 (3): 361-379.
3. kyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER) country report 1. London: DFID.
4. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? International Journal Educational Development, 33 (3): 272–282.
5. Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education. Oxford and Boston: Blackwell.

Course Outcomes: Students will be able to understand:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

AUDIT 1 and 2: STRESS MANAGEMENT BY YOGA

Course Objectives

1. To achieve overall health of body and mind
2. To overcome stress

Syllabus

Unit	Content	Hours
1	Definitions of Eight parts of yoga. (Ashtanga)	5
2	Yam and Niyam. Do`s and Don't's in life. Ahinsa, satya, astheya, bramhacharya and aparigraha	5
3	Yam and Niyam. Do`s and Don't's in life. Shaucha, santosh, tapa, swadhyay, ishwarpranidhan	5
4	Asan and Pranayam Various yog poses and their benefits for mind & body	5
5	Regularization of breathingtechniques and its effects-Types of pranayam	4

Suggested reading

1. 'Yogic Asanas for Group Tarining-Part-I" : Janardan Swami YogabhyasiMandal, Nagpur
2. "Rajayoga or conquering the Internal Nature" by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata

Course Outcomes:

Students will be able to:

1. Develop healthy mind in a healthy body thus improving social health also Improve efficiency

AUDIT 1 and 2: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

Course Objectives

1. To learn to achieve the highest goal happily
2. To become a person with stable mind, pleasing personality and determination
3. To awaken wisdom in students

Syllabus

Unit	Content	Hours
1	Neetisatakam-Holistic development of personality Verses- 19,20,21,22 (wisdom) Verses-29,31,32 (pride & heroism) Verses- 26,28,63,65 (virtue)	4
2	Neetisatakam-Holistic development of personality Verses- 52,53,59 (dont's) Verses- 71,73,75,78 (do's)	4
3	Approach to day to day work and duties. Shrimad Bhagwad Geeta : Chapter 2-Verses 41,47,48	4
4	Chapter 3-Verses 13, 21, 27, 35, Chapter 6-Verses 5,13,17, 23, 35, Chapter 18-Verses 45,46, 48.	4
5	Statements of basic knowledge. Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68 Chapter 12 -Verses 13, 14, 15, 16,17, 18	4
6	Personality of Role model. Shrimad Bhagwad Geeta: Chapter2-Verses 17, Chapter 3-Verses 36,37,42, Chapter 4-Verses 18, 38,39 Chapter18 – Verses 37,38,63	4

Suggested reading

1. "Srimad Bhagavad Gita" by Swami Swarupananda Advaita Ashram (Publication Department), Kolkata
2. Bhartrihari's Three Satakam (Ni ti-sringar-vairagya) by P.Gopinath, Rashtriya Sanskrit Sansthanam, New Delhi.

Course Outcomes

Students will be able to

1. Study of Shri mad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity
3. The Study of Neetishatakam will help in developing versatile personality of students

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Balusumudi, Bhimavaram-2

DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - VI

(Pages: 1-30)

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ACADEMIC REGULATIONS DR24 FOR M. Tech (REGULAR) DEGREE COURSE (Applicable for the batches admitted from 2024-25)

Applicable for the students of M. Tech (Regular) Course from the Academic Year 2024-25 onwards. The M. Tech Degree of D.N.R. COLLEGE OF ENGINEERING & TECHNOLOGY, Bhimavaram affiliated to Jawaharlal Nehru Technological University Kakinada shall be conferred on candidates who are admitted to the program and who fulfil all the requirements for the award of the Degree.

1.0 ELIGIBILITY FOR ADMISSIONS

Admission to the above program shall be made subject to eligibility, qualification and specialization as prescribed by the JNTUK, University and Andhra Pradesh State Council of Higher Education (APSCHE) from time to time.

2.0 AWARD OF M. Tech DEGREE

1. A student shall be declared eligible for the award of the M. Tech Degree, if he pursues a course of study in not less than two and not more than four academic years.
2. **The student shall register for all 68 credits and secure all the 68 credits.**
3. The minimum instruction days in each semester are 90.

3.0 A. PROGRAMME OF STUDY

The following specializations are offered at present for the M. Tech Programme of study.

M.Tech

1. M.Tech- Structural Engineering
2. M.Tech- Machine Design
3. M.Tech- Digital Electronics and Communication Systems
4. M.Tech- Computer Science & Engineering

and any other course as approved by AICTE/ University from time to time.

3.0 B. Departments offering M. Tech Programmes with specializations are noted below:

CE	M.Tech. - Structural Engineering (87)
ME	M.Tech- Machine Design (15)
ECE	M.Tech- Digital Electronics and Communication Systems (38)
CSE	M.Tech- Computer Science & Engineering (58)

4.0 ATTENDANCE

1. A student shall be eligible to write University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects/courses, and with

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minimum 50% in each and every course including practicals.

2. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester shall be granted by the College Academic Committee.
3. Shortage of Attendance **below** 65% in aggregate shall not be condoned and not eligible to write their end semester examination of that class.
4. Students whose shortage of attendance is not condoned in any semester are not eligible to write their end semester examination of that class.
5. A prescribed fee shall be payable towards the condonation of shortage of attendance.
6. A student shall not be promoted to the next semester unless, he satisfies the attendance requirement of the present semester, as applicable. They may seek re-admission into that semester when offered next. If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for re-admission into the same class.

5.0 EVALUATION

The performance of the candidate in each semester shall be evaluated subject-wise, with a maximum of 100 marks for theory and 100 marks for practical, on the basis of Internal Evaluation and End Semester Examination.

5.1 For the theory subjects 75 marks shall be awarded based on the performance in the End Semester Examination and 25 marks shall be awarded based on the Internal Evaluation. The internal evaluation shall be made based on the **average** of the marks secured in the two Mid Term-Examinations conducted-one in the middle of the Semester and the other immediately after the completion of instruction. Each midterm examination shall be conducted for a total duration of 120 minutes with 4 questions (without choice) each question for 10 marks, and it will be reduced to 25 marks. End semester examination is conducted for 75 marks for all FIVE (5) questions (one question from one unit) to be answered (either or).

5.2 For practical subjects, 75 marks shall be awarded based on the performance in the End Semester Examinations and 25 marks shall be awarded based on the day-to-day performance as Internal Marks. The internal evaluation based on the day to day work-5 marks, record- 5 marks and the remaining 15 marks to be awarded by conducting an internal laboratory test. The end examination shall be conducted by the examiners, with a breakup marks of Procedure-20, Experimentation-30, Results-10, Viva-voce-15.

5.3 For Mini Project with Seminar, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the department in a report form and shall make an oral presentation before the Project Review Committee consisting of Head of the Department,

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Supervisor/mentor and two other senior faculty members of the department. For Mini Project with Seminar, there will be only internal evaluation of 100 marks. A candidate has to secure a minimum of 50% of marks to be declared successful.

5.4 A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End semester Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

5.5 In case the candidate does not secure the minimum academic requirement in any subject (as specified in 5.4) he has to re-appear for the End semester Examination in that subject. A candidate shall be given **one** chance to re-register for each subject provided the internal marks secured by a candidate **are less than 50% and has failed in the end examination.** In such a case, the candidate must re-register for the subject(s) and secure the required minimum attendance. The candidate's attendance in the re-registered subject(s) shall be calculated separately to decide upon his eligibility for writing the end examination in those subject(s). In the event of the student taking another chance, his internal marks and end examination marks obtained in the previous attempt shall stands cancelled. For re- registration the candidates have to apply to the Institution by paying the requisite fees and get approval from the Institution before the start of the semester in which re-registration is required.

5.6 In case the candidate secures less than the required attendance in any re-registered subject(s), he shall not be permitted to write the End Examination in that subject. He shall again re-register the subject when next offered.

5.7 Laboratory examination for M. Tech. courses must be conducted with two Examiners, one of them being the Laboratory Class Teacher or teacher of the respective college and the second examiner shall be appointed by the Institution from the panel of examiners submitted by the respective college.

6.0 EVALUATION OF PROJECT/DISSERTATION WORK

Every candidate shall be required to submit a thesis or dissertation on a topic approved by the Project Review Committee.

6.1 A Project Review Committee (PRC) shall be constituted with Head of the Department and two other senior faculty members in the department.

6.2 Registration of Dissertation/Project Work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the subjects, both theory and practical.

6.3 After satisfying 6.2, a candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work for approval. The student can initiate the Project work, only after obtaining the approval from the Project Review Committee (PRC).

6.4 If a candidate wishes to change his supervisor or topic of the project, he can do so

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with the approval of the Project Review Committee (PRC). However, the PRC shall examine whether or not the change of topic/supervisor leads to a major change of his initial plans of project proposal. If yes, his date of registration for the project work starts from the date of change of Supervisor or topic as the case may be.

6.5 Continuous assessment of Dissertation-I and Dissertation-II during the Semester(s) will be monitored by the PRC.

6.6 A candidate shall submit his status report in two stages to the PRC, at least with a gap of 3 months between them.

6.7 The work on the project shall be initiated at the beginning of the II year and the duration of the project is two semesters. A candidate is permitted to submit Project Thesis only after successful completion of theory and practical course with the approval of PRC not earlier than 40 weeks from the date of registration of the project work. The candidate has to pass all the theory and practical subjects before submission of the Thesis.

6.8 Three copies of the Project Thesis certified by the supervisor shall be submitted to the College/School/Institute.

6.9 The thesis shall be adjudicated by one examiner selected by the Institution. For this, the HoD of the concerned Dept shall submit a panel of 5 examiners, eminent in that field, with the help of the guide concerned.

6.10 If the report of the examiner is not favorable, the candidate shall revise and resubmit the Thesis, in the time frame as decided by the PRC. If the report of the examiner is unfavorable again, the thesis shall be summarily rejected. The candidate has to re- register for the project and complete the project within the stipulated time after taking the approval from the Institution.

6.11 The Head of the Department shall coordinate and make arrangements for the conduct of Viva-Voce examination.

6.12 If the report of the examiner is favorable, Viva - Voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the Examiner who adjudicated the Thesis. The Board shall jointly report the candidate's work for a maximum of 100 marks.

6.13 If the report of the Viva -Voce is unsatisfactory (i.e., <50 % of marks), the candidate shall retake the Viva-Voce examination, only after three months. If he fails to get a satisfactory report at the second Viva-Voce examination, the candidate has to re-register for the project and complete the project within the stipulated time after taking the approval from the Institution.

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7.0 Cumulative Grade Point Average (CGPA)

Marks Range Theory/ Laboratory (Max – 100)	Marks Range Mini Project/ Project Work or Dissertation (Max – 100)	Letter Grade	Level	Grade Point
≥ 90	≥ 90	O	Excellent	10
≥80 to <90	≥80 to <90	S	Very Good	9
≥70 to <80	≥70 to <80	A	Good	8
≥60 to <70	≥60 to <70	B	Fair	7
≥50 to <60	≥50 to <60	C	Satisfactory	6
<50	<50	F	Fail	0
		AB	Absent	0

Computation of SGPA

- The following procedure is to be adopted to compute the Semester Grade Point Average(SGPA) and Cumulative Grade Point Average(CGPA):

- The **SGPA** is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

  - **SGPA (Si) = $\sum$ (Ci X Gi) / $\sum$ Ci**

- Where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Computation of CGPA

- The **CGPA** is also calculated in the same manner taking into account all the courses undergone by a student over all the semester of a Programme, i.e.
- **CGPA = $\sum$ (Ci X Si) / $\sum$ Ci**
- Where Si is the SGPA of the i^{th} semester and Ci is the total number of credits in that semester.

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- The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.
- Equivalent Percentage = (CGPA – 0.75) x 10

8.0 AWARD OF DEGREE AND CLASS

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

Class Awarded	CGPA to be secured	
First Class with Distinction	≥ 7.75 (Without anysupplementary appearance)	**From the CGPA secured from 68 Credits.**
First Class	≥ 7.75 (With any supplementary appearance) ≥ 6.75 and < 7.75 (Without any supplementary appearance)	
Second Class	≥ 6.75 and < 7.75 (With any supplementary appearance) ≥ 6.0 to < 6.75 (Without any supplementary appearance)	
Pass Class	≥ 6.0 to < 6.75 (With any supplementary appearance)	

The Grades secured, Grade points and Credits obtained will be shown separately in the memorandum of marks

9.0 WITHHOLDING OF RESULTS

If the student is involved in indiscipline/malpractices/court cases, the result of the student will be withheld.

10.0 TRANSITORY REGULATIONS (for R19)

10.1 Discontinued or detained candidates are eligible for readmission (within the duration as mentioned in item 2.1) as and when next offered.

10.2 The readmitted students will be governed by the regulations under which the candidate has been admitted.

11.0 GENERAL

11.1. Wherever the words “he”, “him”, “his”, occur in the regulations, they include “she”,

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"her", "hers".

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

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

11.4 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 Institution.

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

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

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2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects ofthat semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course bythe candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police

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		and a case is registered against him.
4.	Smuggles in the Answer book o additional sheet or takes out o arranges to send out the question pape during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practica examinations and project work and shal no be permitted for the remaining examinations of the subjects of tha semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course bythe candidate is subject to the

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		academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Controller of Examinations/ any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walkout or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer- in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects
7.	Leaves the exam hall taking away answer script or intentionally tears o the script or any part thereof inside o outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subjec and all the other subjects the candidate has already appeared including practica examinations and project work and shall no be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and

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		all University examinations. The continuation of the course bythe candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college's expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Institution for	

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DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - VII

(Pages: 1&2)

DR24

H.T.No: | | | | | | | | | | |

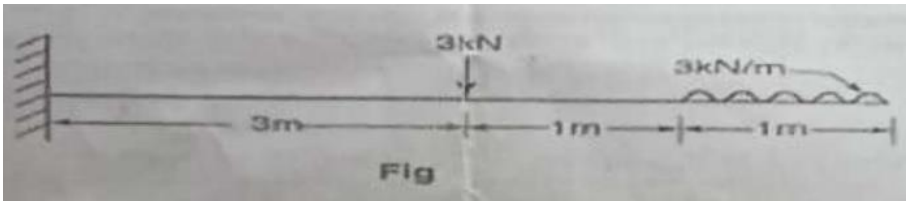
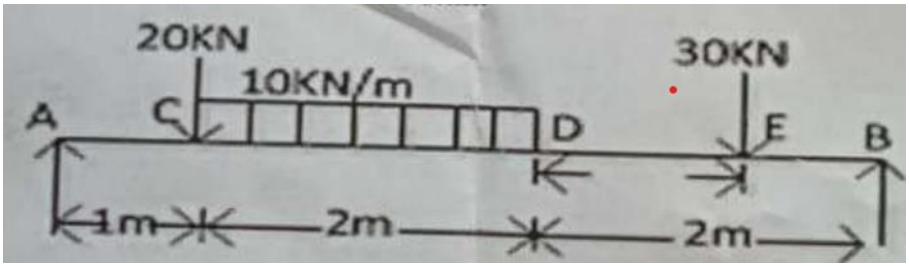
Course Code:
BT24CE2102

D.N.R. COLLEGE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)
B. Tech. II-II Semester End Examinations (DR24)
STRENGTH OF MATERIALS
Civil Engineering

Time: 3 Hours **Max.Marks:70**

1. Answer all the questions form PART– A. Each question carries 2 Marks.
2. Answer one question from each unit in PART– B. Each question carries 10 Marks.

S.No		PART – A (Answer All Questions)	20 Marks		
			BTL	CO	M
1	a	Define Stress.	1	1	2
	b	Define Strain.	1	1	2
	c	Draw Bending Moment Diagram for Simply Supported Beam with Full UDL.	2	2	2
	d	What Causes the Deflection of Beam?	1	4	2
	e	Write the Theory of Simple Bending Equation.	1	3	2
	f	What are the Assumptions made in Torsion Equation.	1	3	2
	g	What are the Types of Columns.	1	5	2
	h	What are the Important End Conditions of Columns?	1	4	2
	i	Write Lames Formula.	1	5	2
	j	How do you Control Beam Deflection.	1	5	2
		PART – B (All questions carry equal marks)	**50 Marks**		
		UNIT – I	**10 Marks**		
1		A Circular rod of diameter 20 mm & 500 mm long is subjected to a Tensile Force of 45 kN, the Modulus of Elasticity for the Material is 2.1 x 10^5 N/mm^2. Find the stress, strain & the Elongation of Circular rod.	3	1	10
		OR			
2		A Mild Steel Bar is subjected to a Tension Test. The Diameter of the bar is 36mm & its gauge length is 200mm. When it is subjected to an Axial Tensile Force of 150kN the extension of the bar is 0.14mm and the decrease in the diameter is 0.006mm. Calculate the Young's Modulus, Poisson Ratio, and Modulus of Rigidity & Bulk Modulus of Material of the bar.	3	1	10
		UNIT – II	**10 Marks**		
3		A Simply Supported beam of Length 5m Carries a UDL of 800 N/m run at one end to 1600 N/m run at other end. Draw the Shear Force & Bending moment diagrams for the Beam.	4	2	10

		OR			
4		Draw the SFD & BMD for a Simply Supported beam AB of span 9 mts carry a UDL of 18kN/m for a distance of 4m from the left support A.	4	2	10
		UNIT – III	**10 Marks**		
5		Derive the equation for Theory of Simple Bending. Also Mention the Assumption made for the Derivation.	5	3	10
		OR			
6		Sketch the Bending Stress distribution across the cross-section of a Rectangular beam section 230mm x 400 mm subjected to 60 kN.m moment.	4	3	10
		UNIT – IV	**10 Marks**		
7	a	Find the Slope & Deflection at the Free end of the Cantilever shown in Figure. Take EI= 1x 10^{10} kN-mm^2. 	4	4	10
		OR			
8		Determine the Deflections at Points C,D & E in the beam shown in figure. Take E = 200 kN/mm^2 & I = 60 x 10^6 mm^4. 	4	4	10
		UNIT – V	**10 Marks**		
9		A hollow short column of external and internal diameters of 460 mm and 220 mm respectively carries an eccentric load of 100 kN. If the eccentricity of the load is 40 mm, find: (a) the maximum and minimum stress intensities, and (b) Eccentricity up-to which there will be no tension in the column.	3	5	10
		OR			
10		A Cylindrical Vessel whose ends are closed by means of Rigid Flange Plates is made of Steel Plate 3 mm Thick. The Length & Internal Diameter of the Vessel are 50 cm & 25 cm respectively. Determine the Longitudinal & Hoop Stresses in the Cylindrical Shell due to an Internal Fluid Pressure of 3 N/mm^2. Also Calculate the increase in the length.	4	5	10

Note: In **Part – B,** a long answer question may be **split into two or three sub questions** totaling ten marks **or** given as **a single question** worth of ten marks.

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DEPARTMENT OF CIVIL ENGINEERING

SECOND BOARD OF STUDIES (BOS) MEETING

ANNEXURE - VIII

(Pages: 1-7)

ANNEXURE-VIII

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DEPARTMENT OF CIVIL ENGINEERING

PROPOSED PAPER SETTERS FOR B.Tech (Civil Engineering) AND M.Tech (Structural Engineering) PROGRAMMES

(A.Y: 2025-26)

S.No	Name of Faculty
1	Dr.K.Rajasekhar Professor Department of Civil Engineering Andhra University College of Engineering (AUCE), Andhra University Visakhapatnam-530003, Andhra Pradesh. E mail: dr.krajasekhar@andhrauniversity.edu.in Mobile: 9703335288
2.	Dr.S.Adiseshu Professor Department of Civil Engineering Andhra University College of Engineering (AUCE), Andhra University Visakhapatnam-530003, Andhra Pradesh. E mail: prof.siragamadiseshu@andhrauniversity.edu.in Mobile: 9440713480
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ANNEXURE-VIII

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DEPARTMENT OF CIVIL ENGINEERING

S.No	Name of Faculty
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5	Dr. Elluri Venkata Prasad Assistant Professor Department of Civil Engineering GITAM School of Technology GITAM Deemed to be University, Rudraram, Hyderabad-502329 Telangana E mail: velluri@gitam.edu Mobile: 9583574684
6	Dr G.Radhakrishnan Professor Department of Civil Engineering Sri Vasavi Engineering College(A Tadepalligudem,West Godavari, Andhra Pradesh Email: radhakrishnan.gunupudi@gmail.com Mobile: 6303154996
7	Dr Koniki Srikanth, Assistant Professor Department of Civil Engineering Chaitanya Bharathi Institute of Technology Hyderabad – 500075 Email: ksrikanth_civil@cbit.ac.in sri.sri001@gmail.com Mobile: (+91) 9966663323

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11	Dr. M.M.Rao Assistant Professor Department of Civil Engineering IARE(Institute of Aeronautical Engineering) Dundigal, Hyderabad-500043, Telangana, India E mail: M.maheswararao@iare.ac.in Mobile:+91 7725033189
12	Dr. C.V. Siva Rama Prasad Assoc. Professor Malla Reddy Engineering College (A), Main Campus, Maisammaguda(H), Gundlapochampally Village, Medchal Mandal, Telangana State – 500100 E mail :cvsrprasad@mrec.ac.in Mobile:+91 8008707104

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14	Dr. P. Markandeya Raju Professor Department of Civil Engineering M.V.G.R College of Engineering (A) Vijayaram Nagar campus, Chintalavalasa Vizianagaram Andhra Pradesh – 535005 Email: markandeyaraju@mvgrce.edu.in Mobile: 9440528403/9177749097
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19	Dr. Sunil Nandipati Assistant Professor Dept. of Civil Engineering GITAM School of Technology GITAM Deemed to be University, Gandhi Nagar, Rushikonda, Visakhapatnam-530045, Andhra Pradesh. Email: snandipa@gitam.edu Mobile: 9985313733

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22	Dr.S.Kanaka Durga Associate Professor Department of Civil Engineering GITAM School of Technology GITAM (Deemed to be University), Visakhapatnam-520045. E mail: ksambhan@gitam.edu Mobile: 9989014047
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25	Dr. Ashok Kumar Suluguru Associate Professor Department of Civil Engineering Malla Reddy Engineering College (Autonomous), Main Campus, College code- J4 Maisammaguda(H), Gundlapochampally Village, Medchal Mandal, Medchal-Malkajgiri District, Telangana State - 500100 E mail: ashokkumarce@mrec.ac.in Mobile: 9908506216 / 9676599312

HoD

Gmail DNR CIVIL <dnrcet.civil@gmail.com>

Submission of BOS 2 (Civil Engineering-DNRCET) Meeting Minutes and Resolutions

9 messages

DNR CIVIL <dnrcet.civil@gmail.com> Thu, Apr 24, 2025 at 11:28 AM
To: Bhadradri Raghuram Kadali <brkadali@nitw.ac.in>, "Dr P V Surya Prakash Principal, PYCE , Kakinada" <princengg@pydah.edu.in>, M Pavan Kumar <pavanidea@gmail.com>
Cc: srpalivela@jntucek.ac.in, vijayakumarpeeram@gmail.com

Dear Sir,

We are submitting the minutes of the BOS 2 (Civil Engineering) meeting along with the corresponding resolutions for your kind perusal.

We kindly request your approval to proceed with the further necessary actions.

Enclosures:1.BOS2-MoM Copy

2. Annexures

Thank you for your support and guidance.

With Regards
Dr.B.V.Ramana Murthy
Head of the Department
Civil Engineering
DNRCET(A), Bhimavaram, West Godavari, Andhra Pradesh
Contact No: 9381949823

2 attachments

BoS 2_CIVIL_MoM_04-04-2025-Final copy.pdf
672K

Annexures-BOS2-Civil-DNRCET(A).rar
3416K

M Pavan Kumar <pavanidea@gmail.com> Thu, Apr 24, 2025 at 4:15 PM
To: DNR CIVIL <dnrcet.civil@gmail.com>

Dear Sir,

Thank you for submitting the minutes of the BOS 2 (Civil Engineering) meeting along with the corresponding resolutions and annexures.

The submitted documents have been reviewed and are hereby approved. You may proceed with the necessary further actions as required.

Thank you for your efforts.

Best regards
M. Pavan Kumar
9291634473
[Quoted text hidden]

DNR CIVIL <dnrcet.civil@gmail.com> Thu, Apr 24, 2025 at 10:16 PM
To: M Pavan Kumar <pavanidea@gmail.com>

Dear Sir , Thank you for your prompt response
[Quoted text hidden]

Bhadradri Raghuram Kadali <brkadali@nitw.ac.in> Fri, Apr 25, 2025 at 9:23 PM
To: DNR CIVIL <dnrcet.civil@gmail.com>
Cc: "Dr P V Surya Prakash Principal, PYCE , Kakinada" <princengg@pydah.edu.in>, M Pavan Kumar <pavanidea@gmail.com>, srpalivela@jntucek.ac.in, vijayakumarpeeram@gmail.com

Dear Sir
Greetings

I have approved minutes for further process.

Thanks and Regards
Raghuram
[Quoted text hidden]

Dr. B Raghuram Kadali
Assistant Professor
Department of Civil Engineering
NIT Warangal
Warangal - 506004, India.
Phone: +91-991-224-5124
Email: brkadali@nitw.ac.in
Web page: WSDC | NIT Warangal; Google Scholar; Welcome to my home page (google.com)

Vijayakumar Peeram <vijayakumarpeeram@gmail.com> Sat, Apr 26, 2025 at 9:27 AM
To: DNR CIVIL <dnrcet.civil@gmail.com>
Cc: Bhadradri Raghuram Kadali <brkadali@nitw.ac.in>, "Dr P V Surya Prakash Principal, PYCE , Kakinada" <princengg@pydah.edu.in>, M Pavan Kumar <pavanidea@gmail.com>, srpalivela@jntucek.ac.in

Dear DR.B.V.R Murthy garu,

Noted sir,

...for further process.

Chartered Engineer
Corporate Chief Engineer (Technical Director)
Ramoji Film City.
Hyderabad.

Mobile : 9502294974, 9281147399
Mail : cce@ramojifilcity.com

On Thu, Apr 24, 2025 at 11:29 AM DNR CIVIL <dnrcet.civil@gmail.com> wrote:
[Quoted text hidden]

--
Best Regards
in name of Amma

P.VijayaKumar
DCE.,B.Tech.,MTech(Structural Engineering).,MBA.,MISTE.,MIE.,MASTM.,PG. Dip in Concrete Tech.,(PhD).
Chartered Engineer (India)

HEAD - PROJECTS
Amrita University
Mail : amrita.headprojects@gmail.com
Mobile: 9502294974
9705487686

DNR CIVIL <dnrcet.civil@gmail.com> Sun, Apr 27, 2025 at 5:09 PM
To: Bhadradri Raghuram Kadali <brkadali@nitw.ac.in>

Thank you, sir, for your reply and support.

With Regards
Dr.B.V.Ramana Murthy
Head of the Department
Civil Engineering
DNRCET(A), Bhimavaram, West Godavari, Andhra Pradesh
Contact No: 9381949823
[Quoted text hidden]

DNR CIVIL <dnrcet.civil@gmail.com> Sun, Apr 27, 2025 at 5:10 PM
To: Vijayakumar Peeram <vijayakumarpeeram@gmail.com>

Thank you, sir, for your response and support.

With Regards
Dr.B.V.Ramana Murthy
Head of the Department
Civil Engineering
DNRCET(A), Bhimavaram, West Godavari, Andhra Pradesh
Contact No: 9381949823
[Quoted text hidden]

DNR CIVIL <dnrcet.civil@gmail.com> Sun, Apr 27, 2025 at 5:11 PM
To: Vijayakumar Peeram <vijayakumarpeeram@gmail.com>

Thank You sir.

On Sat, Apr 26, 2025 at 9:28 AM Vijayakumar Peeram <vijayakumarpeeram@gmail.com> wrote:
[Quoted text hidden]

Dr P V Surya Prakash Principal, PYCE , Kakinada <princengg@pydah.edu.in> Mon, Apr 28, 2025 at 10:11 AM
To: DNR CIVIL <dnrcet.civil@gmail.com>

Approved for the further process.

Principal

Dr P. V. Surya Prakash,
B.E., M.Tech (IITM), Ph.D (IITM), MIE,MISTE, MIGS
Principal
Pydah College of Engineering,
Patavala, Kakinada-533 461

Off: 0884-2315234 : Mobile: 8332891841
Mobile: 9493289321
Email Id: princengg@pydah.edu.in

On Thu, Apr 24, 2025 at 11:29 AM DNR CIVIL <dnrcet.civil@gmail.com> wrote:
[Quoted text hidden]