

by NEP

Autonomy NEP
7th Sem

Priyadarshini J. L. College of Engineering
An Autonomous Institute, Affiliated to RTM Nagpur University, Nagpur
Department of Civil Engineering
Scheme of Teaching & Examination
Seventh Semester for B-Tech Programme (NEP)

Scheme :- BTECH/CE/NEP-24/RO

Seventh Semester

Sr. No.	Type of Course	Credits as per Category	Course Code	Course Title	Teaching Scheme (Clock Hours/Week)			Credits	Maximum Marks			Minimum Marks			End Semester Exam Duration (Hrs)
					L	T	P		Continuous Evaluation	End Semester Exam	Total Marks	Continuous Evaluation	End Semester Exam	Total Marks	
					1	PCC	4		CE701T	Estimating and Costing	3	0	0	3	
2			CE701P	Estimating and Costing Lab	0	0	2	1	25	25	50	---	25	25	---
3	PEC	2	CE702T	Program Elective-IV Refer Program Elective Basket	2	0	0	2	20	30	50	---	8	23	2
4	MDM	2	CSE / AI / ETC / EE / 703T	Branch wise Course (CSE / AI / ETC / EE)	2	0	0	2	20	30	50	---	8	23	2
5	OJT	12	CE704P	Internship Evaluation	0	0	24	12	200	200	400	---	---	200	---
Total =					7	0	26	20			650				

NOTE:- 1. Refer Annexure - I for MDM Courses - CSE / AI / ETC / EE / 703T

Abbreviations:-

L- Lecture, T- Tutorial, P- Practical

PCC - Programme Core Course, PEC- Programme Elective Course, MDM - Multidisciplinary Minor, OJT- On Job Training / Internship / Apprenticeship.

Multidisciplinary Minor			
Sr. No.	Category	Course Code	Course Name
1	MDM	CE703T	Advanced Building Material

Programme Elective Basket			
Sr. No.	Category	Course Code	Course Name
1	PEC-IV	CE702TA	Green Building
2		CE702TB	Air Pollution & Solid Waste Management
3		CE702TC	Advanced Traffic Engineering
4		CE702TD	Foundation Engineering
5		CE702TE	Town Planning

Dr. Mohd. Gulam Pathan
Chairman, BOS (Civil Engg.)
Priyadarshini J.L. College of Engg.,
740, New Nandanvan, Nagpur.

Chavale
Abbey Chavale

M.D. Pichaykar

P. D. Chaturvedi

R. H. Mohanwar

R. S. Bute

Mohd. R. M. Saldique

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Lokmanya Tilak Jankalyan Shikshan Sanstha's
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DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS OF FOURTH YEAR BACHELOR OF TECHNOLOGY,
SEMESTER VII

COURSE : ESTIMATING AND COSTING

COURSE CODE: CE701T

Hours/ Week	Credits	Duration of End Sem Exam	Continous Evaluation	End Sem Exam	Total Marks
3 Hrs	3	4 Hrs	40	60	100

Course Objectives:

1.	To differentiate the types of Estimation, adopt specification and Unit Rates
2.	To analyse rates for different items of works.
3.	To interpret the drawings and estimate the quantities of various items in civil engineering structures.
4.	To understand departmental procedures and Take measurement of completed work
5.	To understand different techniques of preliminary & detailed estimation of buildings & roads.

Course Outcomes:

After completion of the course, the student will be able to

CO1	Prepare the preliminary estimate of buildings, and write specifications
CO2	Prepare the detail estimate of buildings, roads and canals
CO3	Analyse the Rates of various items to estimating cost of material & manpower.
CO4	Understand the process of Tender and Contract.
CO5	Analyse the rent and Valuation of structures, Machineries etc.

Scheme :- BTECH/CE/NEP-24/RO

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SYLLABUS:

UNIT I	(7 Hours) (12 Marks)
INTRODUCTION Introduction: Importance and purpose of the subject, Units of measurement as per I.S.1200. Items of work and Description of items of work. Administrative approvals, technical sanction, preliminary estimates. Objectives, and its methods Specifications: IS 1200 Introduction, Purpose and principles of specifications writing, Types of specifications, writing and developing	
UNIT II	(8 Hours) (12 Marks)
DETAILED ESTIMATE Detailed estimates, objects, importance, accuracy. Methods of detailed estimates, Detailed estimates of load bearing and framed structures. Calculation of reinforcing steel with Bar bending Schedule. Earthwork: Calculation of Earthwork estimates in road, hill roads and canals, methods of consumptions of earthwork.	
UNIT III	(7 Hours) (12 Marks)
RATE ANALYSIS Introduction, Purpose and principles of CSR, Factors affecting analysis of rates, labour guidelines from National Building Organization, Task work. Market rates of materials and labour, Rate analysis of major items of Work.	
UNIT IV	(7 Hours) (12 Marks)
TENDERS AND CONTRACTS Method of carrying out works, tender notice, acceptance of tender, essentials of contract, type of contracts, contract documents, land acquisition act, Legal aspects of various contract provisions, Arbitration. Public work department procedure of work: Organisation of Engineering department, Methods of carrying out works, stores, Tools and plants, Mode of payment, Public work account, Power of sanctions	
UNIT V	(7 Hours) (12 Marks)
VALUATION Purpose of valuation, Factors affecting property price and cost, Types of Value. Real Estate, Tenure of land, Free hold and lease hold, sinking fund, Depreciation, and its methods, Capitalized value, Methods of valuation, Net & Gross income, Rent fixation.	

List of Books:**Text books:**

1. Estimating and Costing By B. N. Dutta
2. Estimating and Costing By Chakraborty
3. Valuation by Roshan Namavati

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SYLLABUS OF FOURTH YEAR BACHELOR OF TECHNOLOGY,
SEMESTER VII

COURSE :- ESTIMATING AND COSTING LAB

COURSE CODE: CE701P

Hours/ Week	Credits	Continous Evaluation	End Sem Exam	Total Marks
2 Hrs	1	25	25	50

- 1) The practicals are based on theory subject of design of steel structure and CO's.
- 2) Minimum 08 practicals, from the list given below shall be performed:
- 3) Any one practical may be performed using Software program.

List of Experiments

1. Preliminary estimate using Plinth area method.
2. Draft Detailed specification for 8 major items.
3. Detailed estimate of Load bearing structure.
4. Detailed estimate of Frame structure.
5. Calculation of steel with Bar bending Schedule.
6. Detailed estimate of earthwork of road for Approximate 1km length.
7. Analysis the unit rate of 8 major items of work contained.
8. Market survey for material and labour rates for various items.
9. Collection of four different types of Tenders.
10. Calculation of annual and total Depreciation and book value of the end of each year.
11. Fixation of standard rent of property.

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DEPARTMENT OF CIVIL ENGINEERING
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PROGRAM ELECTIVE COURSE-IV
SEMESTER VII

COURSE :-GREEN BUILDING

COURSE CODE: CE702TA

Hours/ Week	Credits	Duration of End Sem Exam	Continuous Evaluation	End Sem Exam	Total Marks
2 Hrs	2	2 Hrs	20	30	50

Course Objectives:

1.	Apply cost effective Technologies and Methods in Construction
2.	Understand the Problems due to Global Warming
3.	State the Concept of Green Building, Understand Green Buildings

Course Outcomes:

After completion of the course, the student will be able to

CO1	Analyze global warming due to different materials in construction
CO2	Analyse buildings for green rating
CO3	Use alternate source of energy and effective use water

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SYLLABUS:

UNIT I

(8 Hours) (10 Marks)

Global Warming

Definition - Causes and Effects - Contribution of Buildings towards Global Warming - Carbon Footprint - Global Efforts to reduce carbon Emissions

Green Buildings - Definition - Features- Necessity - Environmental benefit - Economical benefits - Health and Social benefits - Major Energy efficient areas for buildings - Embodied Energy in Materials

Green Materials - Comparison of Initial cost of Green V/s Conventional Building - Life cycle cost of Buildings.

UNIT II

(8 Hours) (10 Marks)

Green Building rating Systems

BREEAM - LEED - GREEN STAR -GRIHA (Green Rating for Integrated Habitat Assessment) for new buildings - Purpose - Key highlights - Point System with Differential weight age. Green Design - Definition - Principles of sustainable development in Building Design - Characteristics of Sustainable Buildings - Sustainably managed Materials - Integrated Lifecycle design of Materials and Structures (Concepts only)

UNIT III

(8 Hours) (10 Marks)

Utility of Solar Energy in Buildings, Green Composites for Buildings

Utility of Solar energy in buildings concepts of Solar Passive Cooling and Heating of Buildings. Low Energy Cooling. Case studies of Solar Passive Cooled and Heated Buildings.

Green Composites for Buildings

Concepts of Green Composites. Water Utilisation in Buildings, Low Energy Approaches to Water Management. Management of Solid Wastes. Management of Sullage Water and Sewage. Urban Environment and Green Buildings. Green Cover and Built Environment.

List of Books:

Text books:

1. Harharalyer G, Green Building Fundamentals, Notion Press.
2. Dr. Adv. Harshul Savla, Green Building: Principles & Practices.

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PROGRAM ELECTIVE COURSE-IV
SEMESTER VII

COURSE :-AIR POLLUTION & SOLID WASTE MANAGEMENT

COURSE CODE: CE702TB

Hours/ Week	Credits	Duration of End Sem Exam	Continuous Evaluation	End Sem Exam	Total Marks
2 Hrs	2	2 Hrs	20	30	50

Course Objectives:

1.	To get knowledge about different aspects of air pollutants, its sources and effects, meteorological parameters.
2.	To Provide the knowledge of design equipment for air pollution to reduce its impact on environment. Also students should get the knowledge about structure of solid waste.
3.	To introduce the students about problems arriving in handling large amount of solid waste generated, its collection, transportation, and processing, design safe collection and disposal methods.

Course Outcomes:

After completion of the course, the student will be able to

CO1	Understand the problem of different aspects of air pollutants, its sources and effects on man & materials and Meteorological parameters
CO2	Summarize the concept of design equipment for air pollution to reduce its impact on environment.
CO3	Analyze problems arriving in handling large amount of solid waste generated. Understand the problems arriving in its collection, transportation, and processing & to design safe collection and disposal methods.

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UNIT I**Introduction to air pollution****(8 Hours) (10 Marks)**

Definition, atmosphere & its zones, Classification and sources of air pollutants, Impacts of air pollution on human health, vegetation, animals, building materials, structures, and atmosphere, soil and water bodies, Global and regional environmental issues of air pollution: Ozone depletion, Climate change, Global warming, Acid rain.

Meteorological parameters: Primary and secondary parameters, atmospheric stability, plume behaviour. Wind rose diagram, Air Quality Index (AQI), Standards for air pollution (as per Indian Standards and CPHEEO).

UNIT II**(8 Hours) (10 Marks)**

Air pollution controls methods and equipment: Principles of control methods for particulates and gaseous pollutants, gravity settlers, electrostatic precipitators, bag filters, cyclones and wet scrubbers.

Introduction to solid waste management(SWM)

Structure , necessity and responsibility, Sources, Quantity and quality, Sources of solid waste, classification and components, physical and chemical characteristics, per capita contribution, sampling and analysis

UNIT III: :**(8 Hours) (10 Marks)**

Collection and transportation of solid waste: Method of collection, equipment used for collection and transportation, transfer stations, optimization of transport route

Methods of processing, merits and demerits of various methods, 3R concept

Disposal methods: Composting of waste, methods of composting, factors affecting composting Sanitary land filling: Site requirements, methods, leachate management.

List of Books:**Text Books:**

1. Air Pollution by M.N. Rao & H.V.N.Rao, Tata McGraw Hill Publishing Co. Ltd.
2. Environmental Pollution Control Engineering by C.S.Rao, Wiley Estern Ltd. New Delhi.

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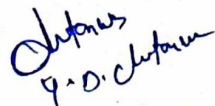
Reference Books:

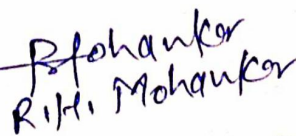
1. Air Pollution: Health and Environmental Impacts by Gurjar B.R., Molina, L., Ojha, C.S.P. (Eds.), CRC Press. 2010.
2. Solid Waste Management in developing countries by A. D. Bhide, & Sunderesan B.B., INSDOC, N. Delhi
3. Treatment and Disposal of Solid and Hazardous Wastes Kindle Edition by Debashish Sengupta, Brajesh K. Dubey, Sudha Goel
4. Solid and Hazardous Waste Management, Second Edition by M. N. Rao
5. Municipal Solid Waste Management by P Jayarama Reddy
6. Municipal solid waste management rules Handbook.

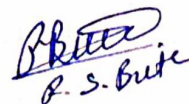

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DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS OF FOURTH YEAR BACHELOR OF TECHNOLOGY,
PROGRAM ELECTIVE COURSE-IV
SEMESTER VII

COURSE : ADVANCED TRAFFIC ENGINEERING

COURSE CODE: CE702TC

Hours/ Week	Credits	Duration of End Sem Exam	Continous Evaluation	End Sem Exam	Total Marks
2 Hrs	2	2 Hrs	20	30	50

Course Objectives:

1.	To introduce the students with the road and vehicle characteristics and to give knowledge of speed studies and statistical methods in traffic events.
2.	To enable the students to have a strong knowledge of types of road junctions and traffic control systems.
3.	To give the knowlege of parking systems and design as well as importance of traffic safety through enforcement and education.

Course Outcomes:

After completion of the course, the student will be able to

CO1	define and describe various traffic characteristics and traffic studies and to apply the knowledge of statistical tools in traffic engineering
CO2	understand the various aspects related to geometry of a road with respect to traffic movement and design traffic signals by various methods
CO3	design parking systems as required and to know the safety issues related to traffic movement

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SYLLABUS:

UNIT I	(8 Hours) (10 Marks)
General: Roads, Road user and Vehicle Characteristics Traffic Surveys: Traffic studies, methods of measurement of spot speed, factors affecting capacity, measurements of running and journey speeds. Level of service concept, Statistical method for interpretation of traffic data, application of Binomial, Normal and Poission distributions, Test of significance – Chi square test for finding out probabilities of traffic events.	
UNIT II	(8 Hours) (10 Marks)
Road Geometry: Types of road junctions, At grade and Grade separated intersections, Factors affecting Rotary intersection, design of rotary intersections. Traffic Control: Traffic signs, road markings, traffic signals, coordination of signals, design of signalized intersections and signaling systems, Queing Theory	
UNIT III	(8 Hours) (10 Marks)
Parking: On and Off street parking systems - Underground and multistoried parking, Parking demand, Design of off-street parking lot. Traffic Safety: Importance of Laws and enforcement, traffic accident conditions in India, Causes and prevention for accidents, Analysis of accidents, 3R and 5E's of traffic management. Education and Pollution: Education -Motor Vehicle act and rules, Air pollution and Noise pollution by traffic.	

List of Books:

Text books:

1. Highway Engineering, Khanna S.K. and Justo C.E.G., Nem Chand & Bros.
2. Traffic engineering and transportation planning, Kadiyali, Khanna Publications,
3. Transportation Engineering: An Introduction, C. JotinKhisty , B. Kent Lall
4. Transportation Engineering and Planning ,C.S. Papacostas, P.D. Prevedouros

Reference books:

1. Highway Engineering, Rangawala B.S. Charotar Publishing House, 2011
2. IRC Handbook and MOST Specifications, Indian Road Congress, 2012

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PROGRAM ELECTIVE COURSE-IV
SEMESTER VII

COURSE :- FOUNDATION ENGINEERING

COURSE CODE: CE702TD

Hours/ Week	Credits	Duration of End Sem Exam	Continous Evaluation	End Sem Exam	Total Marks
2 Hrs	2	2 Hrs	20	30	50

Course Objectives:

1.	To brief information about shallow foundation and effect of settlement of foundation
2.	To get information about pile foundation
3.	To understand the use of sheet pile and cofferdams

Course Outcomes:

After completion of the course, the student will be able to

CO1	Analyse the suitability of shallow foundation and its design and Find the settlement of foundation by using basic information
CO2	Implementing the knowledge of design and use of pile foundation for respective project
CO3	Choosing the sheet pile and cofferdams for projects

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SYLLABUS:

UNIT I

(8 Hours) (10 Marks)

SHALLOW FOUNDATION

Different types of shallow foundation and modes of failure. Bearing capacity of soil By Terzaghi's theory, Design criteria and codal provisions. Effect of water table on bearing capacity, correction factor for shape and depth of footing. Bearing capacity estimation on sand and clays from N-value, factor affecting bearing capacity.

SETTLEMENT OF FOUNDATION

elastic and consolidation settlement, differential settlement, control of excessive settlement. Proportioning the footing for equal settlement.

Plate load test: Procedure, interpretation for bearing capacity and settlement prediction, limitations, IS code method.

UNIT II

(8 Hours) (10 Marks)

PILE FOUNDATIONS

Classification of piles, constructional features of cast-in-situ & pre-cast concrete piles. Pile driving methods. Load transfer mechanism of axially loaded piles. Pile capacity by static formula & dynamic formulae. Pile load test and interpretation of data, group action in piles, spacing of piles, negative skin friction and its effect on pile capacity, general feature of under reamed piles. Settlement of pile group,

Introduction to IS 2911.

UNIT III

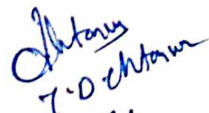
(8 Hours) (10 Marks)

SHEET PILE AND COFFERDAM

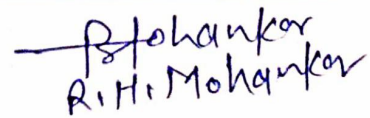
Type, material, method of construction, distribution of earth pressure and related approximation. distinction between sheet pile and retaining wall, Cantilever sheet piles and anchored bulkheads, Earth pressure diagram, determination of depth of embedment in sands and clays, timbering of trenches, Earth pressure diagrams, forces in struts.

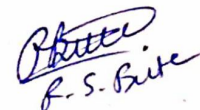

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List of Books:


Text Books:

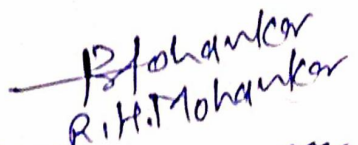
1. Soil Mechanics & Foundation Engg, B.C. Punmia
2. Soil Mechanics & Foundation Engg, K.R. Arora
3. Soil Mechanics & Foundation Engg, Dr. P.N. Modi
4. Soil Mechanics & Foundation Engg, V.N.S. Murthy


Reference Books:


1. Advanced Soil Mechanics by Das, B.M. (2008), Taylor and Francis Group, London, Second edition.
2. Soil Mechanics concepts and applications by Powrie W. (2002), Spon Press, Taylor and Francis Group, London, Second edition.
3. Soil Mechanics in Engineering Practice by Terzaghi K., Peck R.B. and Mesri G. (1996).


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PROGRAM ELECTIVE COURSE-IV
SEMESTER VII

COURSE :- TOWN PLANNING

COURSE CODE: CE702TE

Hours/ Week	Credits	Duration of End Sem Exam	Continous Evaluation	End Sem Exam	Total Marks
2 Hrs	2	2 Hrs	20	30	50

Course Objectives:

1.	To understand the improvement of transport economic efficiency for transport providers and business user and to generate alternatives for improving transportation system
2.	To describe the future demand and selecting the best alternative after proper evaluation and Improve mobility levels for the urban poor through promotion of affordable urban transport plans, programme and technologies
3.	To Increase the efficiency of existing transport operations through improved planning and management of all modes of transport

Course Outcomes:

After completion of the course, the student will be able to

CO1	Explain the characteristic of urban transportation, structure of urban transportation and classification of urban roads, objectives of transportation planning, data collection for planning and environmental impact analysis fro transportation system
CO2	Analysis the process of travel demand forecasting & need for interation in different modes of transportation and use of intelligent Transport System and need to accommodate non-motorized transports.
CO3	Preparing transportation system to get future demand through all modes of transportation

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Scheme: BTECH/CE/NEP-24/R0

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 T. D. Chaturvedi
 M. D. P. D. S. Brite
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SYLLABUS:

UNIT I

(8 Hours) (10 Marks)

Urbanization and Transportation

Importance of urban area, Structure of urban area, Urban design, Use of road space, Classification of urban roads

Urban Transportation Characteristics

Factors influencing transportation needs, Transportation demand, Type of trips, Mode of travel, urban transportation scene in India, Road congestion, Impact of transport on environment

UNIT II

(8 Hours) (10 Marks)

Transportation Planning Process

Urban transportation planning objectives, Urban transportation system, Urban transportation planning process, Data collection, Surveys for data collection, Environmental impact analysis

Travel Demand Forecasting

Trip generation and attraction analysis, Trip distribution models, Model split analysis, Route assignment analysis

UNIT III

(8 Hours) (10 Marks)

Public Transportation, Innovations in Urban Transportation

Bus transport characteristics, bus route planning, performance indicator, Integrated Transport System, Modes of Integrated transport systems, Need for innovative approaches, Track guided bus
BRT, GIS, ITS, Functional areas of ITS

List of Books:

Text Books:

1. Traffic Engineering and Transport Planning by L R Kadiyali, Khanna publication
2. Urban Transportation by D. J. Victor & S. Ponnuswamy, Tata McGraw -Hill publication
3. Transport Planning and Traffic engineering by C A O Flaherty, Butter Worth- Heinemann publication
4. Urban Development and Sustainable Transport by P. Anbalagan, Bookwell publication
5. Urban Transportation Planning by Michael Meyer & Eric Miller, Tata McGraw -Hill publication

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	Lokmanya Tilak Jankalyan Shikshan Sanstha's PRIYADARSHINI J. L. COLLEGE OF ENGINEERING, NAGPUR An Autonomous Institute Affiliated to RTM, Nagpur University, Nagpur Accredited with Grade "A" by NAAC 846, New Nandanvan Layout, Nagpur – 440 009 Tel: +91-712-2712490, 2711505; Fax: 91-712-2711505	
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DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS OF FOURTH YEAR BACHELOR OF TECHNOLOGY
SEMESTER VII

COURSE : INTERNSHIP

COURSE CODE: CE704P

Hours/ Week	Credits	Duration of End Sem Exam	Continuous Evaluation	End Sem Exam	Total Marks
24 Hrs	12	--	200	200	400

Course Outcomes: After completion of this course, student will able to

1.	Understand how to prepare a comprehensive report highlighting their learnings and takeaways during the internship period
2.	Apply the various techniques of design and development of actual product and manufacturing steps involved in construction process.
3.	Understand the Practical applications and relationships with concepts taught in the course

After completion of Internship, students has to prepare a comprehensive report highlighting their learnings and takeaways during the internship period. The report shall be signed by the Internship Supervisor, Faculty Mentor and HoD.

The students are mandated to give a seminar based on the internship undertaken before an expert committee constituted by the concerned department, as per Pro forma for Evaluation of Internship (Appendix I).

The internship shall be evaluated on the basis of performance, as reflected in the student log (Appendix II), Attendance record (Appendix III), supervisor evaluation form (Appendix IV).

The assessment of internship will be based on the following criteria:

- Quality and effectiveness of presentation, Depth of knowledge and demonstrated skills
- Attendance sheet, Student Diary log and supervisor evaluation of intern
- Internship Report

The weightage given to the Internship evaluation shall be as per the discretion of the concerned HOD and Internship teacher. The credits will be allocated on the basis of overall grade received by the students during the assessment.

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Scheme: BTECH/CE/NEP-24/R0

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