

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Modern Structural Material and System Design Theory					
Subject Code	MCECT20S101					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objectives:

1. To understand the concept of limit state design of steel components.
2. To understand the design methodologies of connections.
3. To get exposure on industrial structures.

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** To bring about an exposure to design concepts structures.
CO2: The loads- systems- structural materials- design procedures.
CO3: Repair and rehabilitation of systems.
CO4: Achieve Knowledge of design and development of problem solving skills.
CO5: Design and develop analytical skills.

Unit	Syllabus	Periods
UNIT-I	Modern: Structural Material: Essential requirements- properties-classification. Masonry: Concrete masonry units, advantages and disadvantages, sub divisions, requirements, types of units, construction system, types of structural wall, structure, characteristics, construction type, behavior, failure in flexure and shear. Concrete: Characteristics, behavior, compression, tension. Steel: Types, grades behavior, tension. Reinforced concrete: Types of section, behavior, cyclic loading. Fiber reinforced concrete: Properties, requirements, factors, benefits, applications. Composite materials: SCS construction, failure modes, concept, behavior, applications.	8
UNIT-II	Loads: Static monotonic and cyclic dynamic loads, Dead loads: Materials, components. Imposed loads: General provisions, categories, Reduction factors, and example. Wind loads: Basics, pressure, static and dynamic approach, along wind, Gust factor method. Earthquake load: General provisions, assumptions, base shear, distribution. Blast loads: Drag & diffraction type, scaling law, general recommendation, and special loads.	9

	(Indian standard codal provisions).	
UNIT-III	Structural Systems: Structural systems: Functions, understanding, load transfer mechanism, floor system, types, and aspects. Vertical load transfer system: Wall bearings, column / post. Horizontal load transfer system: Cost of system, basics of system, functions, classifications, rigid frames, advantages, behavior due to external shear and moments, analysis methods, braced frames, types, behavior, methods of analysis.	11
UNIT-IV	Design Concepts: Objectives, basic requirements, phases of construction projects, process of design, conceptual design, and steps involved. High rise structures: Need, benefits, drawbacks, common requirements for structures, other requirements, design parameters, stages of design, elements of structural system, economy in design.	13
UNIT-V	Repair and Rehabilitation: Introduction, defects, repair cost, distress in structures, types, deterioration of structures, causes for deterioration. Techniques of repair, cracks, spalling, disintegration, materials for repair, strengthening techniques of structural distress, damage evaluation, assessment procedure, flow chart. Quality monitoring: Maintenance, importance, routine maintenance.	14
Text book: 1. Salvadori and Levy- “Structural Design in Architecture”- Prentice Hall Inc.- New Jersey USA, 2003.		
Reference: 1. Enjel Heinrich - “Structures Systems”- Iliffe - London-2007. 2. Cowan HJ- “Architecture Systems- An Introduction to structural mechanics”-American Elsevier- New York, 2001.		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	I/I	3	0	0	3
Subject Name	Project Formulation and Appraisal				
Subject Code	MCECT20S102				
Paper	English	English			
	Hindi				
Max. Marks	100				

Course Objectives:

This Subject will enable students to

1. Understand the various management techniques
2. Understand the successful completion of construction projects.
3. Understand the effect of management for project organization,

Course Outcomes:

At the end of the Subject, students will be able to:

CO1: Introduce and study formulation- costing- appraisal.

CO2: Finance of construction projects.

CO3: Allocate the funds for each work and execute the same.

CO4: Calculate the total time required to complete the job without delay and delay in the project.

CO5: Estimate the amount of additional funds may require completing the job.

Unit	Syllabus	Periods
UNIT-I	Project Initiation: Project Initiation: Capital investments- Capital budgeting – feasibility study–preliminary analysis – market- technical-financial- economic and ecological – Market and Demand analysis- Detailed technical analysis.	8
UNIT-II	Time Value Of Money: Time Value of Money, time lines and notations- Future value of single amount- Present value of single amount- Future value of an annuity- Present value of an annuity-Simple interest, Compound interest, project cash Flows, principles of cash flow estimation.	9
UNIT-III	Costing: Investment Criteria, Discounting criteria, Net present value (NPV), Benefit cost ratio (BCR), internal rate of return (IRR), Non-Discounting criteria, Pay Back Period, Accounting rate of return (ARR), Urgency, Investment analysis in practice.	11

UNIT-IV	Financial Aspects: Financial aspects: Financing of projects, means of finance, Equity and Debt, financial institutions – cost of Capital, Risk Analysis, Sources and Measures of risk, Methods of risk analysis, Analysis of standalone risk, Analysis of contextual risk, special schemes.	13
UNIT-V	Different Infrastructure Projects: Private sector participation in Infrastructure Development Projects –Build operate own transfer(BOOT), Build operate transfer(BOT) , Build operate lease transfer (BOLT), Design Build operate transfer (DBOT) , Technology Transfer and Foreign Collaboration, Case Study.	14
<p>Text book:</p> <ol style="list-style-type: none"> 1. Chitkara, K.K. “Construction Project Management: Planning, Scheduling and Control”, Tata McGraw-Hill Publishing Company, New Delhi, 1998. 2. Choudhury S, “Project Management”, McGraw-Hill Publishing Company, New Delhi, 1988. 3. Chris Hendrickson and Tung Au, “Project Management for Construction – Fundamental Concepts for Owners, Engineers, Architects and Builders”, Prentice Hall, Pittsburgh, 2000. 		
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Prasanna Chandra- “Projects -Planning Analysis Selection Implementation & Review”- Fourth Edition-. Tata McGraw Hill Publishing Company Ltd.- New Delhi, 2005. 2. Joy P.K. “Total Project Management - The Indian Context (Chapters 3 7)”- New Delhi- Macmillan India Ltd., 2002. 3. “United Nations Industrial Development Organization (UNIDO) Manual for the preparation of Industrial Feasibility Studies”- (IDSI Reproduction) Bombay, 2007. 4. Barcus. S.W and Wilkinson. J. V. “Hand Book of Management Consulting Services “McGraw Hill- New York, 2006. 		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Quantitative Techniques in Construction Management					
Subject Code	MCECT20S103					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objectives:

This Subject will enable students

1. Prepare the BOQ of a given project.
2. Understand the qualities of materials used in the construction work.
3. Understand the Estimation of building.

Course Outcomes:

At the end of the Subject, students will be able to:

- CO1:** To bring about an exposure to quantitative techniques applied to construction industry.
CO2: To prepare the quantities of work for a multistoried building.
CO3: To certify the valuation report on existing structures.
CO4: To prepare the detailed bills for the on-going project.
CO5: To prepare Estimation of building services.

Unit	Syllabus	Periods
UNIT-I	Introduction To Operations Research: Introduction to Operations research, Linear programming, Graphical and Simplex Methods, Duality and Post, Optimality Analysis, Dynamic programming, Capital Budgeting problem, Reliability improvement problem, Shortest path method.	8
UNIT-II	Optimization Techniques: Integer Programming, Branch and bound techniques, Transportation Problems ,Least cost method, North west corner cell method, vogel's approximation method, U,V method, Work Assignment Problems.	9
UNIT-III	Inventory Management: Application to Production Scheduling, Single machine scheduling, Flow Shop Scheduling, Job shop Scheduling ,Inventory control, Economic order quantity (EOQ), Quantity Discounts, Safety Stock.	11

UNIT-IV	Optimization Theory: Replacement Theory , Decision Theory, Decision Rules, Decision making under conditions of certainty, risk and uncertainty , Decision trees, Utility Theory, Bayes theory.	13
UNIT-V	Cost Concepts: Cost concepts, Break, even, Analysis, Pricing techniques, Simulation Models, Game Theory applications.	14

Text book:

1. Estimating and Costing by B.N. Dutta, UBS Publications.
2. Estimating and Costing by G.S. Birdie, Dhanpat Rai Publishing Company.
3. Estimating and Costing by Chakaraborty, 24th edition, M.K.Publishing House.

References Books:

1. Vohra, N.D. "Quantitative Techniques in Management ", Tata McGraw Hill Co., Ltd, New Delhi, 2000.
2. Seehroeder, R.G., "Operations Management ", McGraw Hill, USA, 2002.
3. Levin, R.I, Rubin, D.S., and Stinsonm J., " Quantitative Approaches to Management" McGraw Hill Book Co., 2008.
4. Frank Harrison, E., "The Managerial Decision Making Process ", Houghton Mifflin Co. Boston, 2005.
5. Varshney, R.L. and Maheswari, K.L., "Managerial Economics ", S. Chand Publication, 2005.

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CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Statistical Methods and Queuing Theory					
Subject Code	MCECT20S104					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objectives:

1. To familiarize the students in the field of differential and elliptic equations to solve boundary value problems associated with engineering applications.
2. To expose the students to variation formulation and numerical integration techniques.
3. Their applications to obtain solutions for buckling, dynamic response, heat and flow problems of one and two dimensional conditions.

Course outcomes:

At the end of the Subject, students will be able to:

CO1: Develop analytical capability and to understand knowledge in statistical methods.

CO2: Queuing theory and their applications in Engineering and Technology.

CO3: Apply these concepts in engineering problems they would come across.

CO4: Apply the acquired knowledge in Eigen value problems and numerical integration techniques in the field of engineering.

CO5: Get familiarized with the wave, heat and elliptic equations and to solve problems associated with engineering applications.

Unit	Syllabus	Periods
UNIT-I	Theoretical Distributions: Binomial, Poisson and Normal distributions, Definitions, Simple problems only (Derivations not included).	8
UNIT-II	Regression Methods: Principle of Least Squares, Fitting of straight line and parabola, Correlation, Karl Pearson's coefficient of correlation and Spearman's rank correlation, Linear regression.	9
UNIT-III	Testing of Hypothesis: Sampling Distributions, Tests based on Normal, t, Chi-square and F-Distributions.	11
UNIT-IV	Anova and Design of Experiments: One way and two way classification of ANOVA, Completely Randomized Design, Randomised Block Design, Latin square Design.	13

UNIT-V	Queuing Theory: Single and multiple server Markovian queuing models, M/M/1 and M/M/c queuing models and Applications (Derivations not included)	14
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Sankara Rao. K, "Introduction to Partial Differential Equations", Prentice Hall of India Pvt. Ltd., New Delhi, 2011. 2. Rajasekaran. S, "Numerical Methods in Science and Engineering A Practical Approach", S. Chand & Company Ltd., 2010. 3. Gupta. A. S, "Calculus of Variations with Applications", Prentice Hall of India Pvt. Ltd., New Delhi, 2004. 		
<p>References Books:</p> <ol style="list-style-type: none"> 1. Gupta, S.C., and Kapoor, V.K., Fundamentals of mathematical statistics, Sultan Chand and sons, Reprint,2003. 2. Gupta, S.C., and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand and sons, 2003. 3. Veerarajan. T, Probability Statistics and Random processes, TMH, First reprint, 2004. 		

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CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Low Cost Build Materials & Construction Technology					
Subject Code	MCECT20S105					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objective:

1. To understand cost-effective and alternative construction technologies.
2. To reduce construction cost by the reduction of quantity of building materials.
3. To play a great role in providing better housing methods and protecting the environment.

Course Outcomes:

At the end of the Subject, students will be able to:

CO1: Study the concepts underlying building acoustics.

CO2: Apply the same for real time structures.

CO3: Adopt cost effective, innovative and environment-friendly housing technologies for the construction.

CO4: Use low cost housing technologies in comparison with the traditional construction methods.

CO5: Apply low cost construction techniques and equipments.

Unit	Syllabus	Periods
UNIT-I	Concept of Low Cost Materials: Soil, Fly ash, Ferrocement, Lime, Fibers, Stone Dust, Boulders and oversize metal, Bitumen etc.	8
UNIT-II	Low Cost Building Materials Product: (a) Walls - Stabilized and sun dried, soil blocks & bricks, Hollow concrete blocks, stone masonry blocks, Ferro-cement partitions. (b) Roofs - Precast R.C. Plank & Joists roof, precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferrocement shells, Filler Slab, Seasal Fibre roof, improved country tiles, Thatch roof.	9
UNIT-III	Low Cost Construction Techniques And Equipment: (a) Techniques: - Rat trap bond construction, Precast R.C. and Ferrocement technique, Mud Technology. (b) Equipments: - Brick moulding machine, Stabilized soil block making machine and plants for the manufacturing of concrete blocks. (c) Low-Cost Roads.	11
UNIT-IV	Low-Cost Sanitation: (a) Waste water disposal system (b) Low-cost sanitation for rural and urban areas (c) Ferrocement Drains.	13

UNIT-V	Cost Analysis And Comparison: (a) Low cost materials (b) Low cost techniques.	14
<p>Text book:</p> <ol style="list-style-type: none"> 1. Central Building Research Institute, “Building Dreams in Mud for Village Wardha (India) Your own House” Manual, Roorkee, India 2. Central Building Research Institute, “Living better with mud and Thatch” Manual, Roorkee, India. 3. Central Building Research Institute, “Advances in Building materials & construction” Manual, Roorkee, India. 		
<p>References:</p> <ol style="list-style-type: none"> 1. Indian Society of Earthquake Technology (2001), “A manual of Earthquake Resistant Non-Engineered Construction”, Roorkee, India. 2. Maharashtra Emergency Earthquake Rehabilitation Programme (1995), “Reconstruction and disaster management plan”, Maharashtra, India. 3. Civil Engineering Portal (2008). Cuore concrete - nano silica, Civil Engineering Portal. 4. Kumar A (1999). Sustainable building technology for mass application, Development Alternatives Newsletter. 9(11). 5. Miles ME (2000). Real estate development, principles and processes, Washington D.C., Urban Land Institute. 		

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CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Construction Equipment and Management					
Subject Code	MCECT20S106					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objective:

1. To describe the concept of human Resources Management.
2. To explain concept of equipment Management.
3. To summarize concept of material management.

Course Outcomes:

At the end of the Subject, students will be able to:

- CO1:** Introduce various construction equipment.
CO2: Study the efficient utilization of the same using scientific principles.
CO3: Carry out human Resources Management.
CO4: Execute equipment Management.
CO5: Apply materials management technique in construction.

Unit	Syllabus	Periods
UNIT-I	Equipment Management: Identification – Planning, Equipment Management in Projects, Maintenance Management – Replacement, Cost Control of Equipment – Depreciation Analysis, Methods of calculation of depreciation, Safety Management.	8
UNIT-II	Earth work Equipment: Fundamentals of Earth Work Operations, Earth Moving operations, Types of Earthwork Equipment, Tractors, Motor Graders, Scrapers, Front end Loaders, Earth Movers – capacity calculations.	9
UNIT-III	Pumps Used In Construction: Equipment for Dredging, Trenching, Tunneling, Drilling and Blasting. Equipment for compaction, Types of pumps used in Construction, Equipment for Grouting, Pile Driving Equipment, Equipment of Erection and demolition.	11

UNIT-IV	Forklifts Equipments: Forklifts and related equipment, Portable Material Conveyors, equipment used in demolition – Chain Pulley Blocks.	13
UNIT-V	Screening Equipment: Crushers – Feeders, Screening Equipment, Batching and Mixing Equipment – Hauling equipment, pouring and Pumping Equipment – Ready mixed concrete carriers.	14

Text Books:

1. Varma Mahesh (1975), “Construction Equipment, Its Planning & Application”, Metropolitan & Co.
2. Gopal krishnan (1977), “Materials Management: An Integrated Approach” PHI Learning Pvt. Ltd.
3. Nunnally (2000); “Managing Construction Equipment”, Prentice Hall Publications.

References

1. Peurifoy, R.L., Ledbetter, W.B. and Schexnayder. C, “Construction Planning Equipment and Methods”, McGraw Hill, Singapore 2005.
2. Sharma S.C. “Construction Equipment and Management”, Khanna Publishers, Delhi, 2008.
3. Deodhar, S.V. “Construction Equipment and Job Planning”, Khanna Publishers Delhi, 2008.
4. Mahesh Varma, “Construction Equipment and its planning and application”, Metropolitan Book Company, New Delhi, 2003.

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CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	Building Acoustics and Noise Control					
Subject Code	MCECT20S107					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course Objective:

1. The acoustical design issues for buildings involve the principal issues like site noise considerations,
2. Particularly if they are residential, establishing noise standards for each use space
3. Including limitation of excessive ventilation noise, room acoustics considerations,.

Course Outcomes:

At the end of the Subject, students will be able to:

CO1: To study the concepts underlying building acoustics.

CO2: apply the same for real time structures.

CO3: The reduction of sound energy from one building area to another by absorbing it or reflecting it.

CO4: Another way to increase the transmission loss of a panel or construction.

CO5: Reduce noise pollution or to reduce impact, whether outdoors or indoors.

Unit	Syllabus	Periods
UNIT-I	Introduction: Sound waves, Frequency, Intensity, Wave length, Measurement of sound, Decibel scale speech and music frequencies, human ear characteristics-Tone structure.	8
UNIT-II	Different Building Material: Outdoor noise levels - acceptable indoor noise levels-IS codes –sono meter, determinate of density of a given building material, absorption co-efficient and measurements, choice of absorption material, resonance, reverberation, echo, exercises involving reverberation time and absorption co-efficient.	9
UNIT-III	Noise Control: Types of noises, transmission of noise, transmission loss, noise control and sound insulation, remedial measures and legislation.	11

UNIT-IV	Insulation of Machinery: Walls/partitions, floors/ceilings, windows/doors, insulating fittings and gadgets machine mounting and insulation of machinery.	13
UNIT-V	Basic Principles In Acoustics Design: Site selection, shape, volume, treatment for interior surfaces-basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls and theatres for acoustics.	14
<p>Text books:</p> <ol style="list-style-type: none"> 1. Dr. Narasimhan. V., “An introduction to Building Physics”, Kabeer printing works, chennai-5, 2004. 2. Groomet. D. J, “Noise, Building and People”, Pergumon Press, 2007. 		
<p>References</p> <ol style="list-style-type: none"> 1. Thomas D. North wood, “Architecture acoustics”, Dowden, Hutchinson and Ross Inc., 2007. 2. Smith .B.J, R. J. Peters, Stephanie Owen, “Acoustics and Noise Control”, Longman Group Ltd- New York, USA, 2002. 		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		3	0	0	3
Subject Name	GIS in Construction Engineering and Management					
Subject Code	MCECT20S108					
Paper	English		English			
	Hindi					
Max. Marks	100					

Course Objectives: This Subject will enable students to:

1. Study the various types of data, data analysis methods and data quality requirements.
2. Study the means of getting suitable data output.
3. Study and use the data output for construction management using GIS tools.

Course Outcomes:

At the end of the Subject, students will be able to:

CO1: Introduce the elements of GIS as applied to construction management.

CO2: Achieve awareness on application techniques.

CO3: Know the different methods used to extract the storage data.

CO4: Use appropriate method to interpret the image.

CO5: Know the conceptual modeling.

Unit	Syllabus	Periods
UNIT-I	Introduction To GIS: GIS – Definition, Components of GIS -Maps, Definition, Types of Maps, Characteristics of Maps, Map Projections — Hardware, Software and Organizational Context, GIS software.	8
UNIT-II	Types Of Data: Data Types, Spatial and Non-Spatial, Spatial Data, Points, Lines and areas– Non- spatial data, Nominal, Ordinal, Interval and Ratio, Digitizer, Scanner, Editing and Cleaning, Geo reference data.	9
UNIT-III	Data Structure: Raster and Vector Data Structure, Raster data storage, Run length, Chain and Block Coding, Vector Data Storage, Topology, Topological Models, Arc Node Structure, Surface Data, DEM, Grid DEM and TIN structure-Applications of DEM.	11

UNIT-IV	Data Quality: Reclassification, Measurement, Buffering, Overlaying, SQL for Queries, Neighborhood and zonal operations, Data Quality, Components of data quality - Sources of errors in GIS, Meta data.	13
UNIT-V	Different Types Of Output: Output, Maps, Graphs, Charts, Plots, Reports, Printers, Plotters, Fields of application, Natural Resource Management, construction management-Parcel based, AM/FM applications examples, Case study.	14
<p>Text book:</p> <ol style="list-style-type: none"> 1. Burrough. P.A., “Principles of GIS for Land Resources Assessment”, Oxford Publication, 2008. 2. Robert Laurini and Derek Thompson, “Fundamentals of Spatial Information Systems”, Academic Press, 2006. 3. Anji Reddy, “Remote Sensing and Geographical Information Systems”, BS Publications, 2001, 		
<p>References:</p> <ol style="list-style-type: none"> 1. Burrough. P.A., “Principles of GIS for Land Resources Assessment”, Oxford Publication, 2008. 2. Robert Laurini and Derek Thompson, “Fundamentals of Spatial Information Systems”, Academic Press, 2006. 3. Anji Reddy, “Remote Sensing and Geographical Information Systems”, BS Publications, 2001 4. Srinivas M.G. (Edited by), “Remote Sensing Applications”, Narosa Publishing House, 2001. 5. Rhind. D, “Understanding of GIS, the ARC/INFO Method”, ESRI Press, 2000. 		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		0	0	4	2
Subject Name	Computer Workshop					
Subject Code	MCECT20S109					
Paper	English		English			
	Hindi					
Max. Marks	50					

Course Objectives: This Subject will enable students to

1. The objective of this Subject is to make students to learn principles and design of structures.

Course Outcomes: At the end of the Subject, students will be able to:

- CO1:** Create 2D and 3D computer drawings and models for manufacturing and prototyping using Auto CAD.
- CO2:** Evaluate computer aided design models and assemblies based on critical thinking and problem solving skills. Develop a solution through group work.
- CO3:** Achieve Knowledge of Design and development of soft skills.
- CO4:** Understand the principles of design of structures using the standard packages.

List of experiments	Periods
<ol style="list-style-type: none"> 1. Create, analyze and produce 2D drawings in AUTO CAD environment. 2. Study and understand civil engineering drawings. 3. Draw the plan, section and elevation of a building. 4. Detailing building plans in CAD environment. 	8
<p>References Books:</p> <ol style="list-style-type: none"> 1. "Software Manuals" 2. Harry G Harris and Gajanan M Sabnis, "Structural Modeling and Experimental Techniques", CRC Press. 	

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CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	I/I		0	0	4	2
Subject Name	Advance Construction Lab-I					
Subject Code	MCECT20S110					
Paper	English	English				
	Hindi					
Max. Marks	50					

Course Objectives:

This Subject will enable students to:

1. The objective of this Subject is to make students to learn principles and design of experiments.
2. To investigate the performance of various Concrete.

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** Function on multi-disciplinary teams in the area of materials testing.
CO2: Use the techniques, skills and modern engineering tools necessary for engineering.
CO3: Understand professional and ethical responsibility in the areas of material testing.
CO4: Communicate effectively the mechanical properties of materials.

List of Practical's

Periods

1. Test on Bricks
2. Test on Cement
3. Test on Aggregate
4. Tension Test
5. Deflection test on Cantilever beam and simply supported beam Continuous beam
6. Torsion Test
7. Spring Test
8. Impact Test
9. Shear Test
10. Verification of Maxwell's reciprocal theorem on beams
11. Use of electrical resistance strain gauge
12. Deflection test on Continuous beam

8

Text Books:

1. J K Ray, "Experimental analysis of stress and strain", S Chand & Co.
2. J K Bungey, "Testing of concrete in structures", Surrey University Press.

References Books:

1. Metha P.K and Monteiro. P. J. M. "CONCRETE", Microstructure, Properties and Materials, Third Edition, Tata McGraw- Hill Publishing company Limited, New Delhi, 2006.
2. Shetty. M. S., "Concrete Technology, Theory and Practice", Revised Edition, S. Chand & company Ltd., New Delhi, 2006.
3. Neville. A.M., "Properties of Concrete", 4th Edition Longman, 1995.
4. Mindass and Young, "Concrete", Prentice Hall, 1998.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	I/I	2	0	0	2
Subject Name	Research Methodology and IPR				
Subject Code	MMAT20S111				
Paper	English	English			
	Hindi				
Max. Marks	100				

Course Objectives:

1. This Subject is designed to familiarize the student with the research process, problem.
2. Identification strategies and formulation of a research plan by doing case studies.

Course Outcomes:

At the end of this Subject, students will be able to:

CO1: Understand research problem formulation.

CO2: Analyze research related information.

CO3: Follow research ethics.

CO4: Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

CO5: Understand that when IPR would take such important place in growth of individuals & nation, it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

Unit	Syllabus	Periods
UNIT-I	Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations.	8
UNIT-II	Effective literature studies approaches, analysis Plagiarism, and Research ethics.	9

UNIT-III	Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee.	11
UNIT-IV	Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.	13
UNIT-V	Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.	14

Text books:

1. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd, 2007.
2. Mayall, "Industrial Design", McGraw Hill, 1992.
3. Niebel, "Product Design", McGraw Hill, 1974.

References books:

1. Asimov, "Introduction to Design", Prentice Hall, 1962.
2. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.
3. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	I/I	2	0	0	0
Subject Name	English for Research Paper Writing				
Subject Code	MCECT20S112				
Paper	English	English			
	Hindi				
Max. Marks	00				

Course Objectives:

Students will be able to:

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

Course Outcomes:

- CO1:** Students write a 13-page original research paper using both secondary and primary sources.
CO2: They synthesize these sources to support a central thesis statement on Native American topics.
CO3: They locate these sources themselves using tools learned from workshops with UM librarians and the professor.
CO4: Through a variety of smaller assignments, individual meetings with the professor, and the submission of drafts.
CO5: The students receive feedback that helps them develop their research and writing skills.

	Syllabus	Periods
Unit-I	Planning and preparation, word order, breaking up long sentences, structuring paragraphs and sentences, being concise and removing redundancy, avoiding ambiguity and vagueness.	8
Unit-II	Clarifying who did what, highlighting your findings, hedging and criticizing, paraphrasing and plagiarism.	10

Unit-III	Sections of a paper, abstracts. Introduction, review of the literature, methods, results, discussion, conclusions, the final check.	8
Unit-IV	Key skills needed when writing a title, key skills needed when writing an abstract, key skills needed when writing an introduction, skills needed when writing a review of the literature, skills needed when writing the methods, skills needed when writing the results, skills needed when writing the discussion, skills are needed when writing the conclusions.	12
Unit-V	Useful phrases, how to ensure paper is as good as it could possibly be the first- time submission.	8

Text books:

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.

References:

1. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman's book.
2. Adrian Wallwork, English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011.

SEMESTER - II

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	III/I		3	0	0	3
Subject Name	Construction Planning Scheduling and Control					
Subject Code	MCECT20S201					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course objective:

1. At the end of this Subject the student is expected to have learnt how to plan construction projects.
2. Schedule the activities using network diagrams.
3. Determine the cost of the project, control the cost of the project by creating cash flows and budgeting and how to use the project information as information and decision making tool.

Course outcomes:

At the end of the Subject, students will be able to:

CO1: Study the finer aspects of planning.

CO2: Scheduling and controlling of construction projects.

CO3: Allocate the funds for each work and execute the same.

CO4: Calculate the total time required to complete the job without delay and delay in the project.

CO5: Estimate the amount of additional funds may require completing the job.

Unit	Syllabus	Periods
UNIT-I	Basic Concepts In Construction Plans: Basic Concepts In the Development of Construction Plans - Choice of Technology and Construction Method - Defining Work Tasks - Defining Precedence Relationships Among Activities -Estimating Activity Duration. Estimating Resource Requirements for Work Activities -Coding Systems.	8
UNIT-II	Construction Schedules: Relevance of Construction Schedules - The Critical Path Method - Calculations for Critical Path Scheduling -Activity Float and Schedules -Presenting Project Schedules Critical Path Scheduling for Activity-on-Node and with Leads. Lags and Windows. Calculations for Scheduling with Leads, Lags and Windows, Resource Oriented Scheduling,	14

	Scheduling with Resource Constraints and Precedence, Use of Advanced Scheduling Techniques, Scheduling with Uncertain Duration, Calculations for Monte Carlo Schedule Simulation, Crashing and Time/Cost Tradeoffs, Scheduling In Poorly Structured Problems, Improving the Scheduling Process.	
UNIT-III	Introduction To Project Budget: The Cost Control Problem, The Project Budget, Forecasting for Activity Cost Control, Financial Accounting Systems and Cost Accounts, Control of Project Cash Flows, Schedule Control, Schedule and Budget Updates, Relating Cost and Schedule Information.	11
UNIT-IV	Quality And Safety Management: Quality and Safety Concerns in Construction, Organizing for Quality and Safety, Work and Material Specifications, Total Quality Control, Quality Control by Statistical Methods, Statistical Quality Control with Sampling by attributes, Statistical Quality Control with Sampling by Variables, Safety.	13
UNIT-V	Project Information: Types of Project Information, Accuracy and Use of Information, Computerized Organization and Use of Information, Organizing Information in Databases, Relational Mode of Databases, Other Conceptual Models of Databases, Centralized, Database Management Systems, Databases and Applications Programs, Information, Transfer and Flow.	9
Text books:		
<ol style="list-style-type: none"> 1. PERT and CPM – BC Punmia and KK Khandelwal, Laxmi Publications. 2. PERT and CPM – LS Srinath, East-West Press (Pvt.) Ltd. 3. A management guide to PERT/CPM by Wiest Levy, PHI Publications. 		
References:		
<ol style="list-style-type: none"> 1. Chitkara. K.K. “Construction Project Management: Planning Scheduling and Control”, Tata McGraw Hill Publishing Company, New Delhi, 2008. 2. Calin M. Popescu, Chotchal Charoengam, “Project Planning, Scheduling and Control in Construction: An Encyclopedia of terms and Applications”, Wiley, New York, 2005. 		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	II/I		3	0	0	3
Subject Name	Advanced Construction Techniques					
Subject Code	MCECT20S202					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course objectives:

1. Study the properties of concrete making materials, tests, mix design,
2. Special concretes and various methods for making concrete.
3. To understand the quality control of concrete

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** Bring about a complete understanding of advanced construction techniques in sub structure super structure and repair construction.
- CO2:** Supervise the heavy construction sites.
- CO3:** Understand the working principle and use of various equipments.
- CO4:** Know the various tests on fresh, hardened concrete, special concrete and the methods of manufacturing of concrete.
- CO5:** Check the quality of hardened concrete by using Various NDT Test.

Unit	Syllabus	Periods
UNIT-I	Sub Structure Construction: Box Jacking: Need, elements, concept, precautions, advantages. Pipe, jacking: Technique, factors, applications, advantages. Diaphragm walls, methods, sheet piles, applications, advantages. Piling techniques: Classifications, factors. Well and caisson: Types, sinking method, precautions. Cofferdam: Purpose, types, techniques. Cable anchoring, screw anchor, necessity- applications. Grouting: Need, materials, techniques, applications, grouting and shotcreting. Well points - dewatering, techniques.	8

UNIT-II	Tall Structures Construction: Concrete in tall buildings, types of concrete pumps, factors, blockage, causes - clearing, safety. Slip form techniques: Vertical - chimney, horizontal, concrete paving methods. Suspended form work: Purpose, methods, advantages - erection techniques. Prestressing techniques, insitu prestressing in high rise structures.	9
UNIT-III	Large Span Structures Construction: Tunneling: Purpose, aspects, shafts, mucking, construction techniques, advantages, trenchless technology. Bow string bridges: Systems, arrangements, advantages. Suspension and cable stayed bridges: Parallel, radial patterns, concept. Domes: Types, structural framing, erection methods. Aerial transportations, components, advantages, applications.	11
UNIT-IV	Special Structure Construction: Lattice tower: Definition, techniques. Rigging of transmission line structures: Definition, precaution, stages involved. Advanced construction techniques in offshore construction practice: Various operations, under water concrete - vacuum dewatering of concrete flooring. Articulated structure, definition, mechanism.	13
UNIT-V	Repair and Strengthening Techniques: Mud Jacking: Techniques, behavior of slab, advantages. Micro piles: Uses, stages, applications-benefits. Shallow profile pipeline laying, procedure, specifications, sub aqueous pipe lines, laying methods. Sheet piles protection techniques. Water proofing: need, above and below ground. Under pinning: Need, methods. Demolition and dismantling: Principles methods, modern demolition techniques, controlled demolition, mechanical method, hydro demolition, advantages, sequence of demolition, beams, columns, walls, general sequence.	14

Text book:

1. Gambhir. M.L., "Concrete Technology", McGraw Hill Education, 2006.
2. Gupta. B.L., Amit Gupta, "Concrete Technology", Jain Book Agency, 2010.
3. Neville, A.M., "Properties of Concrete", Prentice Hall, 1995, London.

References:

1. Sankar, S.K. And Saraswati, S., Construction Technology, Oxford University Press, New Delhi, 2008.
2. Gahlot .P.S & Sanjay Sharma, 'Building repair and maintenance management' CBS Publications, 2006.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	II/I		3	0	0	3
Subject Name	Construction Economics and Financial Management					
Subject Code	MCECT20S203					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course objectives:

This Subject will enable students to:

1. Understand concept of financial management.
2. Know the time value money factor.
3. Know the importance of bidding and awards.

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** Bring about an exposure to quantitative techniques applied to construction industry.
- CO2:** Design estimates of construction costs and schedules presented by contemporary construction companies.
- CO3:** Design of a construction cost overrun is the possible loss of the economic justification for the project.
- CO4:** Prepare the balance sheet.
- CO5:** Prepare the cash flow statement.

Unit	Syllabus	Periods
UNIT-I	Introduction to operations research: Introduction to Operations research- Linear programming-Graphical and Simplex Methods- Duality and Post-Optimality Analysis- Dynamic programming- Capital Budgeting problem, Reliability improvement problem, Shortest path method.	8

UNIT-II	Optimization techniques: Integer Programming- Branch and bound techniques-Transportation Problems -Least cost method, North west corner cell method, Vogel's approximation method, U-V method- Work Assignment Problems.	9
UNIT-III	Inventory management: Application to Production Scheduling-Single machine scheduling, Flow Shop Scheduling, Job shop Scheduling - Inventory control, Economic order quantity (EOQ), Quantity Discounts, Safety Stock.	11
UNIT-IV	Optimization theory: Replacement Theory, Decision Theory-Decision Rules-Decision making under conditions of certainty, risk and uncertainty, Decision trees-Utility Theory- Bayes theory.	13
UNIT-V	Cost concepts: Cost concepts-Break-even -Analysis-Pricing techniques- Simulation Models-Game Theory applications.	14

Text books:

1. Peterson, H.C., Lewis, W.C. "Managerial Economics", Prentice Hall of India Pvt. Ltd., 2001.
2. Parkin, M. & Bade R., "Modern Macroeconomics" 4th Edition, Prentice Hall, 1996.
3. Werther & Davis, "Human Resources & Personnel Management", McGraw Hill, 1996.

References:

1. Vohra, N.D. "Quantitative Techniques in Management ", Tata McGraw Hill Co., Ltd, New Delhi, 2000.
2. Seehroeder, R.G., "Operations Management ", McGraw Hill, USA, 2002.
3. Levin, R.I, Rubin, D.S., and Stinsonm J., " Quantitative Approaches to Management" McGraw Hill Book Co., 2008.
4. Frank Harrison, E., "The Managerial Decision Making Process ", Houghton Mifflin Co. Boston, 2005.
5. Varshney, R.L. and Maheswari, K.L., "Managerial Economics ", Sultan Chand, 2005.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	II/I	3	0	0	3
Subject Name	Quality Control and Safety Management				
Subject Code	MCECT20S204				
Paper	English	English			
	Hindi				
Max. Marks	100				

Course objectives:

This Subject will enable students to:

1. Understand the elements of quality planning and the implication.
2. Become aware of objectives and advantage of quality assurance.
3. Study the relationship between quality and safety management.

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** Create a complete understanding on quality planning,
CO2: Quality assurance, quality control and safety management.
CO3: Ensure quality control.
CO4: To take safety measures in construction.
CO5: Gain knowledge on Personal & Structural safety - Safety consideration during construction.

Unit	Syllabus	Periods
UNIT-I	Quality Management Systems: types of organizations, inspection. control and enforcement, quality management systems and method ,responsibilities and authorities in quality assurances and quality control, architects, engineers, contractors, and special consultants, quality circle.	8
UNIT-II	Quality policy: quality policy ,objectives and methods in construction industry ,consumers satisfaction, economics, time of completion, statistical tolerance, taguchi's concept of quality ,codes and standards, documents	9

	,contract and construction programming ,inspection procedures, processes and products ,total qa i qc programme and cost implication.	
UNIT-III	Objectives: objectives, regularity agent, owner, design, contract and construction oriented objectives, methods, techniques and needs of qa/qc, different aspects of quality, appraisals, factors influencing construction quality.	11
UNIT-IV	Failure Aspects: critical, major failure aspects and failure mode analysis, stability methods and tools, optimum design –reliability testing, reliability coefficient and reliability prediction, selection of new materials ,influence of drawings detailing, specification, standardization ,bid preparation, reliability based design.	13
UNIT-V	Construction Activity: construction activity, environmental safety. social and environmental factors, natural causes and speed of construction, life cycle costing, reliability and probabilistic methods, value engineering and value analysis.	14

Text books:

1. N. Logothetis, “Management for Total Quality”, Prentice Hall.
2. David Gold Smith, “Safety Management in construction and Industry”, McGraw Hill.
3. K N Vaid, “Construction Safety Management”, NICMAR, Bombay.

References

1. James, J.O Brian, “Construction Inspection Handbook -Quality Assurance and: Quality Control”, Van Nostrand, New York, 2009.
2. Kwaku, A., Tenah, Jose. M. Guevara, “Fundamentals of Construction Management and Organization”, Reston Publishing Co., Inc., Virginia, 2005.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	II/I	3	0	0	3
Subject Name	Construction Project Management				
Subject Code	MCECT20S205				
Paper	English	English			
	Hindi				
Max. Marks	100				

Course objective:

1. Recognize business requirements.
2. Define necessary costs, schedule, list of deliverables, and delivery dates.
3. Establish resources needed.

Course outcomes:

At the end of the Subject, students will be able to:

CO1: Study the elements of construction project management consisting of owners' perspective, organization, design and construction procedures, resource utilization and cost estimation.

CO2: Create a construction project safety plan.

CO3: Create construction project cost estimates.

CO4: Understand different methods of project delivery and the roles and Responsibilities of all constituencies involved in the design and construction process.

CO5: Understand construction risk management.

Unit	Syllabus	Periods
UNIT-I	Introduction to project: Concept of a Project, Characteristic features, Project Life cycle, Phases, Project Management, tools and techniques for project management, role of project managers.	8
UNIT-II	Role of project management: Development of project plan and objectives, programming, scheduling, project organization, organization and project team, role of communication in project management, controlling systems.	9

UNIT-III	Working systems: Working systems, Characteristics, class of systems, design of systems, work break down system (WBS), project execution plan, project procedure manual, sub systems of project management- monitoring of projects- networks, monitoring contracts.	11
UNIT-IV	Project direction: Project direction , direction during production stage , value engineering review , stages ,directives , project coordination , procedure , interface management , project control ,scope for progress control , overall project progress control , stages, methods.	13
UNIT-V	Resource management: Basic concept, Labour requirements , Labour productivity , site productivity , Equipment Management , Material management- procurement organization , procurement planning , functions of material management , inventory control.	14
Text books: 1. Srinath L.S, “PERT and CPM”, East West Press Pvt Ltd New Delhi. 2. S. M. Levy, Project management in construction, 5th ed., McGraw Hill, New York, 2007. 3. PMI, A guide to the project management body of knowledge, 3rd ed., Project Management Institute Pennsylvania, 1996.		
References: 1. Prasanna Chandra, “Project Planning, Analysis, Selection, Implementation and review”, Tata Mcgraw Hill, 2009. 2. Chitkara, K.K “Construction Project Management: Planning Scheduling and control”, Tata McGraw - Hill Publishing Company, New Delhi - 2008. 3. Frederick E. Gould, “Construction Project Management”, Went worth Institute of Technology, Vary E. Joyce, Massachusetts Institute of Technology, 2000. 4. Choudhury, S “Project Management”, Tata McGraw-Hill Publishing Company New Delhi 2008.		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	II/I	3	0	0	3
Subject Name	Advanced Concrete Technology				
Subject Code	MCECT20S206				
Paper	English	English			
	Hindi				
Max. Marks	100				

Course objectives:

This Subject will enable students to:

1. Study the properties of concrete and special types of concrete, Identify Quality Control tests on concrete making materials.
2. Study the properties of concrete making materials, tests, mix design, special concretes and various methods for making concrete.
3. Understand the quality control of concrete.

Course outcomes:

On completion of this Subject, students are able to:

CO1: Achieve Knowledge of design and development of problem solving skills.

CO2: Understand the industrial building and the components.

CO3: Design and develop analytical skills.

CO4: Summarize the principles of Structural Design and detailing.

CO5: Understands the concept of Pre- engineered buildings.

Unit	Syllabus	Periods
UNIT-I	Composition Cement: Composition of OPC, Manufacture, Modified Portland Cements, Hydration process of Portland Cements, Structure of Hydrated Cement Pastes.	8
UNIT-II	Mechanical IP Properties: Particle characteristics and Mechanical Properties, Absorption and Physical Durability, Chemical Stability, Packing Characteristics.	9

UNIT-III	Mineral Admixtures: Mineral Admixtures , Slag , Pozzolanas and Fillers , Chemical Admixtures – Solutes, Retarders , Air Entraining Agents , Water Proofing Compounds , Plasticizers and Super Plasticizers.	11
UNIT-IV	Performance Of Concrete: Workability , Mix Proportioning , Mixes incorporating Fly Ash , Mixes for High Performance Concrete , Interfacial Transition Zone , Fracture Strength , Mechanical Properties, Fresh concrete and Hardened concrete , High Strength Concrete , Shrinkage , Creep . Durability of Concrete , Basic Consideration , Stability of Constituents , Chemical Attack , Corrosion of Reinforcing Steel, Use of inhibitors and types of inhibitors.	13
UNIT-V	Properties And Applications Of Concrete: introduction to treatment on properties and applications, fiber reinforced concrete, polymer concrete , self-compacting concrete ,reactive powder concrete , roller compacted concrete , geo polymer concrete , bio concrete, recycled aggregate concrete , high volume fly ash concrete , ready mixed concrete ,sulphur infiltrated impregnated concrete, extreme weather concreting, special concreting methods, materials used in highway pavements.	14

Text books:

1. P.C.Varghese, "Advanced Reinforced Concrete Design"- Prentice-Hall of India, New Delhi, 2005.
2. Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Comprehensive RCC Design" Laxmi publication.
3. Advanced Reinforced Concrete Design - N. Krishnaraju, CBS Publishers.

References:

1. Metha P.K and Monteiro.P.J.M, "Concrete, Microstructure, Properties and Materials", Third Edition, Tata McGraw- Hill Publishing company Limited, New Delhi, 2006.
2. Shetty .M.S., "Concrete Technology, Theory and Practice", Revised Edition, S. Chand & company Ltd., New Delhi, 2006.
3. Neville. A.M., "Properties of Concrete", 4th Edition Longman, 2005.
4. Mindass and Young, "Concrete", Prentice Hall, 1998.
5. Aitcin – "High performance concrete", McGraw Hill, 2009.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.				L	T	P	C
Semester/Year	II/I				3	0	0	3
Subject Name	Management Information System							
Subject Code	MCECT20S207							
Paper	English				English			
	Hindi							
Max. Marks	100							

Course objective:

1. The goals of an MIS are to implement the organizational structure.
2. Dynamics of the enterprise for the purpose of managing the organization in a better way.
3. Capturing the potential of the information system for competitive advantage.

Course outcomes:

At the end of the Subject, students will be able to:

CO1: Design the various models of management information systems.

CO2: Implement their application to project management.

CO3: Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.

CO4: Understand effective communication strategy alternatives to facilitate decision making.

CO5: Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.

Unit	Syllabus	Periods
UNIT-I	Information Systems: Information Systems, Establishing the Framework, Business Models, Information System Architecture, Evolution of formation Systems	8
UNIT-II	Modern Information System: Modern Information System, Systems Development, life Cycle. Structured Methodologies, Designing Computer Based methods, Procedures Control, Designing Structured Programs.	9
UNIT-III	Integrated Construction Management: Integrated Construction Management, Information System, Project Management, Information System, Functional Areas finance, Marketing Production, Personnel, levels, DSS, EIS, ES, Comparison Concepts and Knowledge representation, Managing Inter, national Information System	11
UNIT-IV	Coding Techniques: Control, Testing Security, Coding Techniques, Defection of Error, Validating, Cost Benefit Analysis, Assessing the value and risk of Information System.	13

UNIT-V	Software Engineering: Software engineering qualities- Design, Production, Service, Software specification- Software Metrics, Software quality assurance ,Systems Methodology ,Objectives- Time and Logic, Knowledge and Human Dimension -Software life cycle models- Verification and Validation.	14
<p>Text books:</p> <ol style="list-style-type: none"> 1. Kenneth C Laudon and Jane Price Laudon, “Management Information Systems Organization and Technology”, Prentice Hall, 2006. 2. Gordon B. Davis, “Management Information System: Conceptual Foundations Structure and Development”, McGraw Hill, 2004. 		
<p>References:</p> <ol style="list-style-type: none"> 1. Joyce J Elam, “Case series for Management Information Systems Simon and Schuster”, Custom Publishing, 2006. 2. Ralph H Sprague and Huge J Watson, “Decision Support for Managers”, Prentice Hall, 2006. 3. Michael W. Evans and John J Marciniak, “Software Quality assurance and Management”, John Wiley and Sons, 2007. 4. Card and Glass, “Measuring Software Design quality”, Prentice Hall, 2000. 		

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	II/I		3	0	0	3
Subject Name	Building services					
Subject Code	MCECT20S208					
Paper	English	English				
	Hindi					
Max. Marks	100					

Course objective:		
<ol style="list-style-type: none"> 1. Building maintenance is work undertaken to keep. 2. Restore or improve every part of a building. 3. Services to a currently acceptable standard and to sustain the utility and value of the facility. 		
Course outcomes:		
At the end of the Subject, students will be able to:		
CO1: To study the elements of building services like water supply Sanitation.		
CO2: Electrical installations air conditioning and fire safety.		
CO3: Impart the knowledge about the characteristics, sources and defects in various materials used for construction purposes.		
CO4: Design and test the materials either in the laboratory or in the field before their actual use at the site.		
CO5: Attain the knowledge of different components of building, their classification, materials and methods of construction and causes of their failures.		
Unit	Syllabus	Periods
UNIT-I	Water Supply Systems: Water quality, Purification and treatment, water supply systems, distribution systems in small towns ,types of pipes used, laying jointing ,testing, testing for water tightness plumbing system for building, internal supply in buildings, municipal bye laws and regulations , Rain Water Harvesting , Sanitation in buildings, arrangement of sewerage systems in housing ,pipe systems, storm water drainage from buildings , septic and sewage treatment plant , collection, conveyance and disposal of town refuse systems	8
UNIT-II	Wiring Systems: Types of wires , wiring systems and their choice ,planning electrical wiring for building ,main and distribution boards ,transformers and switch gears ,modern theory of light and colour ,synthesis of light ,luminous flux ,candela, lanes of illumination, lighting design, design for modern lighting.	9

UNIT-III	Ventilation And Its Importance: Ventilation and its importance, natural and artificial systems, Window type and packaged air conditioners, chilled water plant ,fan coil systems, water piping ,cooling load ,air conditioning systems for different types of buildings ,protection against fire to be caused by A.C. Systems.	11
UNIT-IV	Safety Regulations: Causes of fire in buildings, safety regulations, NBC, planning considerations in buildings like Non, combustible materials, construction, staircases and A.C. systems, special features required for physically handicapped and elderly in building types, heat and smoke detectors, dry and wet risers, Automatic sprinklers.	13
UNIT-V	Intelligent Buildings: Intelligent buildings, Building automation, Smart buildings, Building services in high rise buildings, Green buildings, Energy efficient buildings for various zones, Case studies of residence, office buildings and other buildings in each zones.	14

Text books:

1. Fair G.M., Geyer J.C. and Okun .D, “Water and waste engineering“, Vol. II, John Wiley & sons, Inc., New York. 2008.
2. Hopkinson .R.G and Kay .J .D, “The Lighting of buildings”, Faber and Faber, London, 2009.

Reference Books:

1. “Hand book for Building Engineers in Metric systems”, NBC, New Delhi, 2008.
2. “Philips Lighting in Architecture Designs”, McGraw Hill, New York, 2004.
3. “Time saver Standards for Architecture Design Data”, Callendar JH, McGraw Hill, 2004.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	II/I	0	0	4	2
Subject Name	Construction Computational Laboratory				
Subject Code	MCECT20S209				
Paper	English	English			
	Hindi				
Max. Marks	50				

Course objectives:

This Subject will enable students to:

1. The objective of this Subject is to make students to learn principles and design of structures.
2. Build architectural plan and material take-off.

Course outcomes:

At the end of the Subject, students will be able to:

- CO1:** Prepare work break down plan and estimate resources required in a construction project.
CO2: Prepare precedence diagram and network diagrams.
CO3: Implement resource allocation and levelling using MSP.
CO4: Assemblies based on critical thinking and problem solving skills.
CO5: Model construction processes.

List of Experiments	Periods
<ol style="list-style-type: none"> 1. Introduction to different software available for Construction Technology and Management. 2. Introduction to network methods (CPM, PERT). 3. Implementation in MSP Introduction to Primavera software, case study. 4. Introduction to REVET architecture. 5. Introduction to SPSS. 6. Introduction to Stroboscope, EZ Strobe and CYCLONE. 	8

References:

1. "Software Manuals".
2. Harry G Harris and Gajanan M Sabnis, "Structural Modeling and Experimental Techniques", CRC Press.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.				
Semester/Year	II/I				
Subject Name	Advance Construction – II Lab				
Subject Code	MCECT20S210				
Paper	English	English			
	Hindi				
Max. Marks	50				

Course objectives:

This Subject will enable students to:

1. Study the properties of concrete making materials, tests, mix design, special concretes and various methods for making concrete.
2. To understand the quality control of concrete.

Course outcomes:

At the end of the Subject, students will be able to:

CO1: Function on multi-disciplinary teams in the area of materials testing.

CO2: Use the techniques, skills and modern engineering tools necessary for engineering.

CO3: Understand of professional and ethical responsibility in the areas of material testing.

CO4: Communicate effectively the mechanical properties of materials.

List of Experiments	Periods
<ol style="list-style-type: none"> 1. Specific gravity test for bitumen 2. Penetration test 3. Ductility test 4. Softening point of bitumen 5. Flash and fire point test 6. Viscosity test 7. Bituminous mix design by marshall method 8. Direct shear test 9. Unconfined compression test 10. Undrained triaxial test 11. Consolidated test 12. California bearing ratio test 13. Determination of moisture content 	8

Text books:

1. Gambhir. M. L., “Concrete Technology”, McGraw Hill Education, 2006.
2. Gupta. B. L., Amit Gupta, “Concrete Technology”, Jain Book Agency, 2010.
3. Neville, A.M., “Properties of Concrete”, Prentice Hall, 1995, London.

References:

1. Santha kumar. A. R.; “Concrete Technology”, Oxford University Press, 2007.
2. Shetty M.S., “Concrete Technology”, S. Chand and Company Ltd. Delhi, 2003.
3. Mehta .P.K., and Paulo J.M. Monteiro, “Concrete- Microstructure, Properties and Materials.

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.		L	T	P	C
Semester/Year	II/I		0	0	4	2
Subject Name	Mini Project					
Subject Code	MCECT20S211					
Paper	English	English				
	Hindi					
Max. Marks	50					

Course Objective:

1. The aim of the mini project is that the student has to understand the structural engineering problems.
2. The student should gain a thorough knowledge in the problem, he/she has selected and to analyze complex structural systems.

Course Outcomes:

At the end of the Subject, the student will be able to:

CO1: Identify structural engineering problems reviewing available literature.

CO2: Study different techniques used to analyze complex structural systems.

CO3: Work on the solutions given and present solution by using his/her technique applying engineering principles.

Contents	Periods
<ol style="list-style-type: none"> 1. Mini Project will have mid semester presentation and end semester presentation. Mid semester presentation will include identification of the problem based on the literature review on the topic referring to latest literature available. 2. End semester presentation should be done along with the report on identification of topic for the work and the methodology adopted involving scientific research, collection and analysis of data, determining solutions highlighting individuals 'contribution. 3. Continuous assessment of Mini Project at Mid Sem and End-Sem will be monitored by the departmental committee. 	8

SYLLABUS

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Class	M.TECH.	L	T	P	C
Semester/Year	II/I	2	0	0	0
Subject Name	Stress Management by Yoga				
Subject Code	MCECT20S212				
Paper	English	English			
	Hindi				
Max. Marks	00				

Course Objectives 1. To achieve overall health of body and mind. 2. To overcome stress.	
Course Outcomes: Students will be able to: CO1: Develop healthy mind in a healthy body thus improving social health. CO2: Improve efficiency.	
Contents	Periods
1. Definitions of Eight parts of yog. (Ashtanga). 2. Yam and Niyam. Do`s and Don`ts`s in life. 3. Ahinsa, satya, astheya, bramhacharya and aparigraha, Shaucha, santosh, tapa, swadhyay, ishwarpranidhan. 4. Asana and Pranayama. 5. Various yoga poses and their benefits for mind &body, Regularization of breathing techniques and its effects-Types of pranayama.	8
References: 1. ‘Yogic Asanas for Group Training-Part’:Janardan Swami Yogabhyasi Mandal, Nagpur. 2. “Rajayoga or conquering the Internal Nature” by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata.	