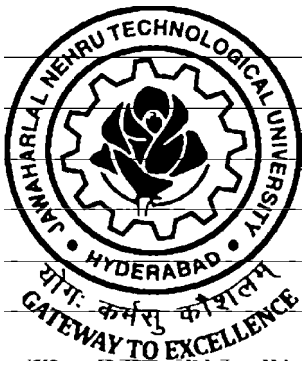
ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

M.TECH
CONSTRUCTION MANAGEMENT

(Applicable for the batches admitted from 2013-14)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
KUKATPALLY, HYDERABAD – 500 085.

ACADEMIC REGULATIONS R13 FOR M. TECH. (REGULAR) DEGREE COURSE

Applicable for the students of M. Tech. (Regular) Course from the Academic Year 2013-14 and onwards

The M. Tech. Degree of Jawaharlal Nehru Technological University Hyderabad 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 University from time to time.

Admissions shall be made on the basis of merit/rank obtained by the candidates at the qualifying Entrance Test conducted by the University or on the basis of any other order of merit as approved by the University, subject to reservations as laid down by the Govt. from time to time.

2.0 AWARD OF M. TECH. DEGREE

2.1 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. However, he is permitted to write the examinations for two more years after four academic years of course work.

2.2 A student, who fails to fulfill all the academic requirements for the award of the degree within four academic years from the year of his admission, shall forfeit his seat in M. Tech. course.

2.3 The student shall register for all 88 credits and secure all the 88 credits.

2.4 The minimum instruction days in each semester are 90.

3.0 A. COURSES OF STUDY

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

1. Advanced Manufacturing Systems
2. Aerospace Engineering/ Aeronautical Engineering
3. Automation
4. Biomedical Signal Processing and Instrumentation
5. Bio-Technology
6. CAD/CAM
7. Chemical Engineering
8. Communication Systems
9. Computer Networks
10. Computer Networks and Information Security
11. Computer Science
12. Computer Science and Engineering
13. Computers and Communication Engineering.
14. Construction Management
15. Control Engineering
16. Control Systems
17. Cyber Forensic / Cyber Security & Information Technology
18. Design for Manufacturing/ Design and Manufacturing
19. Digital Electronics and Communication Engineering.
20. Digital Electronics and Communication Systems
21. Digital Systems and Computer Electronics
22. Electrical Power Engineering
23. Electrical Power Systems
24. Electronics & Instrumentation

25. Electronics and Communication Engineering
26. Embedded Systems
27. Embedded Systems and VLSI Design
28. Energy Systems
29. Engineering Design
30. Environmental Engineering
31. Geoinformatics and Surveying Technology
32. Geotechnical Engineering.
33. Heating Ventilation & Air Conditioning.
34. Highway Engineering
35. Image Processing
36. Industrial Engineering and Management
37. Information Technology
38. Infrastructure Engineering
39. Machine Design
40. Mechatronics.
41. Microwave & Radar Engineering
42. Nano Technology
43. Neural Networks
44. Parallel Computing
45. Power and Industrial Drives
46. Power Electronics
47. Power Electronics and Electrical Drives
48. Power Engineering and Energy Systems
49. Power Plant Engineering & Energy Management
50. Power System Control and Automation
51. Power System with Emphasis H.V. Engineering / H.V. Engineering
52. Production Engineering.
53. Real Time Systems
54. Software Engineering
55. Structural Engineering
56. Systems & Signal Processing
57. Thermal Engineering.
58. Transportation Engineering
59. VLSI
60. VLSI and Embedded System/ Electronics Design Technology
61. VLSI Design
62. VLSI System Design
63. Web Technologies
64. Wireless and Mobile Communication

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

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

Civil Engg.	Construction Management Environmental Engineering Geoinformatics and Surveying Technology Geotechnical Engineering Highway Engineering Infrastructure Engineering Structural Engineering Transportation Engineering
EEE	Control Engineering Control Systems Electrical Power Engineering Electrical Power Systems Power and Industrial Drives Power Electronics Power Electronics and Electrical Drives Power Engineering and Energy Systems Power Plant Engineering & Energy Management Power System Control and Automation Power System with Emphasis H.V. Engineering / H.V. Engineering
ME	Advanced Manufacturing Systems Automation CAD/CAM Design for Manufacturing/ Design and Manufacturing Energy Systems Engineering Design Heating Ventilation & Air Conditioning Industrial Engineering and Management Machine Design Mechatronics. Power Plant Engineering & Energy Management Production Engineering Thermal Engineering.
ECE	Biomedical Signal Processing and Instrumentation Communication Systems Computers and Communication Engineering. Digital Electronics and Communication Engineering. Digital Electronics and Communication Systems Digital Systems and Computer Electronics Electronics & Instrumentation Electronics and Communication Engineering Embedded Systems Embedded Systems and VLSI Design

	Microwave & Radar Engineering Systems & Signal Processing VLSI VLSI and Embedded System/ Electronics Design Technology VLSI Design VLSI System Design Wireless and Mobile Communication
CSE	Computer Networks Computer Networks and Information Security Computer Science Computer Science and Engineering Cyber Forensic / Cyber Security & Information Technology Image Processing Information Technology Neural Networks Parallel Computing Real Time Systems Software Engineering Web Technologies
Aeronautical Engg.	Aerospace Engineering / Aeronautical Engineering
Bio-technology	Bio-Technology
Chemical Engg.	Chemical Engineering
Nano Technology	Nano Technology

4.0 ATTENDANCE

The programs are offered on a unit basis with each subject being considered a unit.

4.1 A student shall be eligible to write University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

4.2 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.

4.3 Shortage of Attendance below 65% in aggregate shall not be condoned.

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

4.5 A prescribed fee shall be payable towards condonation of shortage of attendance.

4.6 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 readmission into that semester when offered next. If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.

4.7 A candidate shall put in a minimum required attendance at least in three (3) theory subjects in the present semester to get promoted to the next semester. In order to qualify for the award of the M. Tech. Degree, the candidate shall complete all the academic requirements of the subjects, as per the course structure.

4.8 A student shall not be promoted to the next semester unless he satisfies the attendance requirements of the previous semester including the days of attendance in sports, games, NCC and NSS activities.

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 practicals, on the basis of Internal Evaluation and End Semester Examination.

5.1 For the theory subjects 60 marks shall be awarded based on the performance in the End Semester Examination and 40 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 mid term examination shall be conducted for a total duration of 120 minutes with Part A as compulsory question (16 marks) which consists of four sub-questions and carries 4 marks each and Part B with 3 questions to be answered out of 5 questions each question for 8 marks. If any candidate is absent from any subject of a mid-term examination, an on-line test will be conducted for him by the University. The details of the Question Paper pattern for End Examination (Theory) is given below:

- The End semesters Examination will be conducted for 60 marks which consists of two parts viz. i).Part-A for 20 marks, ii). Part –B for 40 marks.
- Part-A is compulsory question where it consists of five questions one from each unit and carries four marks each. This will be treated as Question 1.
- Part-B consists of five Questions (numbered from 2 to 6) carries 8 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice (that means there will be two questions from each unit and the student should answer only one question)

5.2 For practical subjects, 60 marks shall be awarded based on the performance in the End Semester Examinations and 40 marks shall be awarded based on the day-to-day performance as Internal Marks.

5.3 There shall be two seminar presentations during I year I semester and II semester. For 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 Departmental Academic Committee consisting of Head of the Department, Supervisor and two other senior faculty members of the department. For each Seminar there will be only internal evaluation of 50 marks. A candidate has to secure a minimum of 50% of marks to be declared successful.

5.4 There shall be a Comprehensive Viva-Voce in II year I Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is intended to assess the students' understanding of various subjects he has studied during the M. Tech. course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

5.5 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.

5.6 In case the candidate does not secure the minimum academic requirement in any subject (as specified in 5.5) he has to reappear 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 so 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 stand cancelled.

5.7 In case the candidate secures less than the required attendance in any subject, he shall not be permitted to write the End Examination in that subject. He shall re-register the subject when next

offered.

5.8 Laboratory examination for M. Tech. courses must be conducted with two Examiners, one of them being the Laboratory Class Teacher and the second examiner shall be another Laboratory Teacher.

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 Principal as Chairperson, Heads of all the Departments offering the M. Tech. programs and two other senior faculty members.

6.2 Registration of 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 to the Departmental Academic Committee for approval. Only after obtaining the approval of the Departmental Academic Committee can the student initiate the Project work.

6.4 If a candidate wishes to change his supervisor or topic of the project, he can do so with the approval of the Departmental Academic Committee. However, the Departmental Academic Committee 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 A candidate shall submit his status report in a bound-form in two stages at least with a gap of 3 months between them.

6.6 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. For the approval of PRC the candidate shall submit the draft copy of thesis to the Principal through Head of the Department and make an oral presentation before the PRC.

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

6.8 The thesis shall be adjudicated by one examiner selected by the University. For this, the Principal of the College shall submit a panel of 5 examiners, eminent in that field, with the help of the guide concerned and head of the department.

6.9 If the report of the examiner is not favourable, the candidate shall revise and resubmit the Thesis, in the time frame as decided by the PRC. If the report of the examiner is unfavourable again, the thesis shall be summarily rejected.

6.10 If the report of the examiner is favourable, 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 as one of the following:

A. Excellent

B. Good

C. Satisfactory

D. Unsatisfactory

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

If the report of the Viva-Voce is unsatisfactory, 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, he will not be eligible for the award of the degree.

7.0 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	% of marks to be secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%
Pass Class	Below 50% but not less than 40%

The marks in internal evaluation and end examination shall be shown separately in the memorandum of marks.

8.0 WITHHOLDING OF RESULTS

If the student has not paid the dues, if any, to the university or if any case of indiscipline is pending against him, the result of the student will be withheld and he will not be allowed into the next semester. His degree will be withheld in such cases.

9.0 TRANSITORY REGULATIONS

9.1 Discontinued, detained, or failed candidates are eligible for admission to two earlier or equivalent subjects at a time as and when offered.

9.2 The candidate who fails in any subject will be given two chances to pass the same subject; otherwise, he has to identify an equivalent subject as per R13 academic regulations.

10. GENERAL

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

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

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

10.4 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 University.

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	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 and sent to the University.
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 of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.

4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	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/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on 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 of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

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 colleges 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 University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

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

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.TECH - CONSTRUCTION MANAGEMENT

COURSE STRUCTURE AND SYLLABUS

I Year I Semester

Code	Group	Subject	L	P	Credits
		Construction Project Planning and Administration	3	-	3
		Quantitative Methods in Construction Management	3	-	3
		Management of Quality and Safety in Construction	3	-	3
		Construction Engineering Practices	3	-	3
		Elective - I	3	-	3
		Elective- II	3	-	3
	Lab	Construction Engineering Lab	-	3	2
		Seminar	-	-	2
		Total Credits	18	3	22

I Year II Semester

Code	Group	Subject	L	P	Credits
		Construction Methods and Equipment	3	-	3
		Construction and Contract Management	3	-	3
		Construction Economics and Finance	3	-	3
		Civil Engineering Materials and Recent Advances	3	-	3
		Elective – III	3	-	3
		Elective – IV	3	-	3
	Lab	Advanced Construction Engineering Lab	-	3	2
		Seminar	-	-	2
		Total Credits	18	3	22

II Year - I Semester

Code	Group	Subject	L	P	Credits
		Comprehensive Viva	-	-	2
		Project Seminar	-	3	2
		Project work	-	-	18
		Total Credits	-	3	22

II Year - II Semester

Code	Group	Subject	L	P	Credits
		Project work and Seminar	-	-	22
		Total Credits	-	-	22

Elective-I & II

1. Infrastructure Valuation.
2. Human Resources Development for Construction.
3. Formwork and Scaffolding Design.
4. Remote Sensing and GIS for Urban Planning and Management.
5. Optimization Techniques.
6. Earthquake Resistant Design of Structures.
7. Rehabilitation and Retrofitting of Structures.

Elective-III & IV

1. Under Water Construction.
2. Critical Chain Management.
3. Strategic Management in Construction.
4. Building Services.
5. Geo-Environmental Engineering.
6. Advanced concrete Technology.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

CONSTRUCTION PROJECT PLANNING AND ADMINISTRATION

UNIT-I

Construction administration, control of quality in construction, organizational structure, responsibility for co-ordiantion of the trade-Introduction to Project planning and Scheduling-Processes of project planning-Project scheduling- Progress control.

UNIT-II

Project planning and scheduling techniques- Network scheduling techniques. Project planning using computer based models- Principles of project management.

UNIT-III

Certainty, risk and uncertainity, risk management, identification and nature of construction risks, contractual allocation of risk, types of risks, minimizing risks and mitigating losses, use of expected values, utility in investment decisions, decision trees, sensitivity analysis.

UNIT-IV

Resource management and inventory-Implementation of project planning management.

UNIT-V

Analysis and design of planning and control system- Disputes and claims management-Use of computer based project management tools.

Text books:

1. Callahan,M.T., Quackenbush,D.G.,and rowing,J.E., Construction project scheduling,McGraw-Hill ,New York,1992.
2. Cleland,D.I.and Ireland, L.R., project management:Strategic design and implementation,4th Edition, McGraw-Hill, New York,2002.
3. Fisk,D.R.2000 Construction Project Administration, Prentice hall International, London.
4. K Wakye,A.A 1997, Construction Project Administration: Adisson Wesley Longman, London.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

QUANTITATIVE METHODS IN CONSTRUCTION MANAGEMENT

UNIT-I

Introduction and concepts of probability and statistics-Probability theory-Statistical tools.

UNIT-II

Linear programming Transportation and assignment problems.

UNIT-III

Dynamic programming, Queuing theory, Decision theory, Games theory.

UNIT-IV

Simulations applied to construction, Study of various effects.

UNIT-V

Modifications and improvement on CPM/PERT techniques.

Text Books:

1. Freund,J.E.and Miller,I.R., Probability and statictics for engineers,5th edition,prentice hall of india, New delhi,1994.
2. Goel B.S and mittal.S.K., Operation Research,pragati Prakashan,Meerut,2000.
3. Gupta,S.C.and Kapur,V.K., Fundamentals of mathematical statistics,sultan chand and sons new delhi,1999.
4. Taha,H.A., Operations research: An introduction,8th edition,prentice hall india,new delhi,2010.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

MANAGEMENT OF QUALITY AND SAFETY IN CONSTRUCTION

UNIT-I

Quality policy in construction industry-Consumer satisfaction- Ergonomics-Time of completion-Statistical tolerance.

UNIT-II

Taguchi's concept of quality-contract and construction programming-inspection procedures.

UNIT-III

Quality assurance/Quality control programme and cost implication.

UNIT-IV

Different aspects of quality-appraisals-failure mode analysis-stability methods and tools-Influence of drawings-detailing.

UNIT-V

Specifications-standardization-Bid preparation-construction activity-Environmental safety-social and environmental factors.

Text Books:

1. Clarkson H.Oglesby,productivity improvement in construction, Mcgraw Hill,2000.
2. James,J.O Brain, construction inspection handbook-quality assurance and quality control,Van Nostrand, newyork,1989.
3. Juran frank, J.M.and gryana,F.M.quality planning and analysis ,tata McGraw Hill,1982.
4. Kwaku A., Tenah and jose M.Guevera, fundamental of cinstruction management and organization PHI 1995.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

CONSTRUCTION ENGINEERING PRACTICES

UNIT-I

Reinforced and prestressed concrete construction-Prefabricated structures.

UNIT-II

Production of ready mixed concrete-productivity analysis-Economics of formwork-Design of farmwork and their reusability.

UNIT-III

Modular construction practices-fibonacci series, its handling and other reliable proportioning concepts.

UNIT-IV

Modular coordination-standardization-system building-advantages.

UNIT-V

Lamination and advantages of modular construction-concepts implementation procedures.

Text Books:

1. Allen E, Iano,J,funadamentals of building construction material and method, john wiely and sons,2011.
2. Cameron K.andres.ronald C.Smith,principals and practices of commercial construction,8th edition, prentice hall,2009.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

INFRASTRUCTURE VALUATION

(Elective-I & II)

UNIT-I

Function analysis; FAST diagramming; brain storming; criteria scoring matrices.

UNIT-II

An introduction to value theory; an introduction to value management.

UNIT-III

Value Engineering-Definition and concepts of the creative and structured phases of value engineering.

UNIT-IV

The workshop approach to achieve value- procedures- merits and demerits-detailed analysis.

UNIT-V

Teambuilding theory; target setting; time management.

Text Books:

1. Lawrence D. Miles, Techniques of Value Analysis and Engineering, McGraw-Hill Book Company, 2009.
2. M.R.S. Murthy, Cost Analysis for Management Decisions, Tata McGraw-Hill Publishing Company Ltd.,1988.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

HUMAN RESOURCES DEVELOPMENT FOR CONSTRUCTION

(Elective-I & II)

UNIT-I

Challenges of managing people in construction, organization.

UNIT-II

Management theory- Human resources management theory- strategic human resources management approaches.

UNIT-III

Operational approaches of Human resources management- employee relations.

UNIT-IV

Employee empowerment-salient features-diversity and worklife balance.

UNIT-V

Employee welfare-strategic Human resource development- employment legislation-legal aspects.

Text Books:

1. Langfor D.A. Human Resource management in construction, Longman,1995.
2. Martin Loosemore, Andrew Dainty,Helen Lingard, Human Resource Management in construction projects: strategic and operational approaches, Taylor and Francis, 2010.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

FORMWORK AND SCAFFOLDING DESIGN

(Elective-I & II)

UNIT-I

Formwork and false work - Temporary work systems, construction planning and site constraints.

UNIT-II

Materials and construction of the common formwork and false work systems; Special, and proprietary forms.

UNIT-III

Concrete pressure on forms. Design of timber and steel forms; Loading and moment of formwork.

UNIT-IV

Types of beams, decking and column formwork; Design of decking; False work design; Effects of wind load.

UNIT-V

Foundation and soil on false work design; The use and applications of special forms; Sequence of construction; Safety use of formwork and false work.

Text Books:

1. Austin, C.K., Formwork for Concrete, Cleaver, Hume Press Ltd., London, 1996.
2. Michael P. Hurst, Construction Press, London and NewYork, 2003.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

REMOTE SENSING AND GIS FOR URBAN PLANNING AND MANAGEMENT

(Elective-I & II)

UNIT-I

Remote sensing for detection of urban features-Scale and resolution-Scope and limitations-interpretation from Aerial and satellite images-digital image processing techniques-image fusion.

UNIT-II

Classification and settlement-settlement structure-segmentation of built-up areas-classification algorithms-land use/land cover mapping-change detection-high resolution remote sensing.

UNIT-III

Urban morphology-housing typology-population estimation from remote sensing-infrastructure demand analysis-urban renewal land suitability analysis-plan formulation-regional, master and detailed development-Use of remote sensing and GIS in plan preparation-urban information system-web GIS.

UNIT-IV

Mapping transportation network-classification-optimum route/shortest route-alignment planning-traffic and parking studies-accident analysis

UNIT-V

Urban growth modeling-Expert systems in planning-3D city models-ALTM-Land use transportation interaction models-intelligent transportation systems.

Text Books:

1. Juliana Maantay,john Ziegler,john pickles,GIS for the Urban environment, Esri press 2006.
2. Allan Brimicombe, GIS Environmental modeling and Engineering,CRC;1 edition 2003.
3. Paul Longley,Michael Batty,spatial Analysis: Modeling in a GIS Eniveronment Wiley,1997.
4. Michael F. Goodchild,Louis T.Steyaert,Bardely O.Parks,Carol Johnston,David Maidment, Michael crane,Sandi Glendinning,GIS and Environmental modeling: Progess and Research issues(Handover) by, Publisher; Wiely; 1 edition, 1996.
5. Roland Fletcher, The limits of settlement Growth: A Theoretical Outline(New.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

OPTIMIZATION TECHNIQUES

(Elective– I & II)

UNIT-I

Introduction to Optimization: Introduction - Historical developments - Engineering applications of Optimization - Statement of an Optimization problem - Classification of Optimization problems - Optimization Techniques. Optimization by calculus: Introduction - Unconstrained functions of a single variable - Problems involving simple constraints - Unconstrained functions of several variables – treatment of equality constraints - Extension to multiple equality constraints – Optimization with inequality constraints - The generalized Newton-Raphson method.

UNIT- II

Linear Programming: Introduction - Applications of linear programming - standard form of a linear programming problem - Geometry of linear programming problems - Definitions and theorems - Solution of a system of Linear simultaneous equations - Pivotal reduction of a general system of equations - Motivation of the Simplex Method - Simplex Algorithm - Two phases of the simplex method.

UNIT- III

Non-Linear Programming: Introduction - Unimodal Function - Unrestricted search - Exhaustive search - Dichotomous search - Interval Halving method - Fibonacci method - Golden section method - Comparison of elimination methods - Unconstrained optimization techniques - Direct search methods - Random search methos - grid search method - Univariate method - Powell's method - Simplex method - Indirect search methods - Gradient of a function - Steepest descent method - Conjugate gradient - Newton's method.

UNIT-IV

Dynamic Programming: Introduction - Multistage decision processes - concept of sub-optimization and the principle of optimality - computational procedure in dynamic programming - example illustrating the Calculus method of solution - example illustrating the Tabular of solution - conversion of a final value problem into an initial value problem - continuous dynamic programming - Additional applications.

UNIT- V

Network Analysis: Introduction - Elementary graph theory - Network variables and problem types - Minimum-cost route - Network capacity problems - Modification of the directional sense of the network.,Application of Optimization Techniques

Text Books:

1. Optimization: Theory and Applications by S.S.Rao. New Age International (p) Ltd.
2. Numerical Optimization Techniques for Engineering Design with applications by G.N.Vanderplaats 2007.
3. Elements of Structural Optimization by R.T.Haftka and Z.Gurdal Kluwer academic publishers
4. Optimum Structural Design by U.Kirsch. Tata Mc Graw Hill
5. Optimum Design of Structures by K.I.Majid.
6. Introduction to Optimum Design by J.S.Arora. Academic press, 2012 ISBN : 978-0-12-381375-6.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

(Elective-I & II)

UNIT - I

Engineering Seismology: Earthquake phenomenon cause of earthquakes-Faults- Plate tectonics- Seismic waves- Terms associated with earthquakes-Magnitude/Intensity of an earthquake-scales-Energy released-Earthquake measuring instruments-Seismoscope, Seismograph, accelerograph-Characteristics of strong ground motions- Seismic zones of India.

Introduction-Functional planning-Continuous load path-Overall form-simplicity and symmetry-elongated shapes-stiffness and strength - Seismic design requirements-regular and irregular configurations-basic assumptions.

UNIT - II

Conceptual Design - Horizontal and Vertical Load Resisting Systems - System and Members for Lateral Loads and High Rise / Tall Structures.

Twisting of Buildings – Flexible Building and Rigid Building Systems.

Strength and Stiffness – Ductility – Definition – Ductility Relationships – Choice of construction Materials – Unconfined Concrete & Confined Concrete – Masonry, Steel Structures. Design Earthquake Loads – Basic Load Combinations – Permissible Stresses.

Seismic Methods of Analysis – Static Method – Equivalent Lateral Force Method. Dynamic Analysis – Response Spectrum Method – Modal Analysis Torsion.

UNIT - III

Introduction to Earthquake Resistant Design – Seismic Design Requirements and Methods.

RC Buildings – IS Code based Method.- Vertical Irregularities – Mass Irregularity Torsional Irregularity - Plan Configuration Problem - Design Lateral Force, Base Shear Evaluation – Lateral Distribution of Base Shear – Structural Walls Strategies and the Location of Structural Walls – Sectional Shapes – Behaviour of Unreinforced and Reinforced Masonry Walls – Behaviour of Walls Box Action and Bands – Behaviour of infill Walls - Non Structural Elements – Failure Mechanism of Nonstructural Elements – Effects of Nonstructural Elements on Structural System – Analysis – Prevention of Damage to Nonstructural Elements – Isolation of Non-Structures.

UNIT - IV

Design of Shear walls: Classification according to Behavior, Loads in Shear walls, Design of Rectangular and Flanged Shear walls, Derivation of Formula for Moment of Resistance of Rectangular Shear walls – Coupled Shear Walls.

UNIT - V

Ductility Considerations in Earthquake Resistant Design of RC Buildings: Introduction- Impact of Ductility-Requirements for Ductility- Assessment of Ductility- Factors affecting Ductility- Ductile detailing considerations as per IS 13920. Behavior of beams, columns and joints in RC buildings during earthquakes-Vulnerability of open ground storey and short columns during earthquake- Seismic Evaluation and Retrofitting.

Capacity Based Design: Introduction to Capacity Design, Capacity Design for Beams and Columns-Case studies.

References :

1. Earthquake Resistant Design of structures – S. K. Duggal, Oxford University Press
2. Earthquake Resistant Design of structures – Pankaj Agarwal and Manish Shrikhande, Prentice Hall of India Pvt. Ltd.
3. Seismic Design of Reinforced Concrete and Masonry Building – T. Paulay and M.J.N. Priestly, John Wiley & Sons
4. Masory and Timber structures including earthquake Resistant Design –Anand S.Arya, Nem chand & Bros
5. Earthquake –Resistant Design of Masonry Building –Miha Tomazevic, Imperial college Press.
6. Earthquake Tips – Learning Earthquake Design and Construction C.V.R. Murty

Reference Codes:

1. IS: 1893 (Part-1) -2002. “Criteria for Earthquake Resistant – Design of structures.” B.I.S., New Delhi.
2. IS:4326-1993, “ Earthquake Resistant Design and Construction of Building”, Code of Practice B.I.S., New Delhi.
3. IS:13920-1993, “ Ductile detailing of concrete structures subjected to seismic force” – Guidelines, B.I.S., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

REHABILITATION AND RETROFITING OF STRUCTURES

(Elective-I & II)

UNIT – I

Introduction – Deterioration of Structures – Distress in Structures – Causes and prevention. Mechanism of Damage – Types of Damage.

UNIT – II

Corrosion of Steel Reinforcement – Causes – Mechanism and Prevention. Damage of Structures due to Fire – Fire Rating of Structures – Phenomena of Desiccation.

UNIT – III

Inspection and Testing – Symptoms and Diagnosis of Distress - Damage assessment – NDT.

UNIT – IV

Repair of Structure – Common Types of Repairs – Repair in Concrete Structures – Repairs in Under Water Structures – Guniting – Shot Create – Underpinning. Strengthening of Structures – Strengthening Methods – Retrofitting – Jacketing.

UNIT – V

Health Monitoring of Structures – Use of Sensors – Building Instrumentation.

Text Books:

1. Concrete Technology by A.R. Santakumar, Oxford University press
2. Defects and Deterioration in Buildingts, E F & N Spon, London
3. Non-Destructive Evaluation of Concrete Structures by Bungey - Surrey University Press
4. Maintenance and Repair of Civil Structures, B.L. Gupta and Amit Gupta, Standard Publications.
5. Concrete Repair and Maintenance Illustrated, RS Means Company Inc W. H. Ranso, (1981)
6. Building Failures : Diagnosis and Avoidance, EF & N Spon, London, B. A. Richardson, (1991).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year I Sem. (Construction Management)

CONSTRUCTION ENGINEERING LAB

1. Evaluation of properties of content, fine aggregates and coarse aggregates.
2. Evaluation of properties of reinforcing steel, timber, building block and tile.
3. Variation of workability with time for different grades of concrete experimental observations.
4. Experimental observation on influence of following parameters on strength characteristics of concrete (Some of these parameters may be considered depending up on time)
   - i. Size, shape and grade of course aggregate.
   - ii. Grading of fine aggregate.
   - iii. Hand Mixing/ Machine Mixing.
   - iv. Aggregate- Cement Ratio.
   - v. Coarse aggregate- Fine aggregate Ratio.
   - vi. Size and shape of Test specimen.
   - vii. Admixtures.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

CONSTRUCTION METHODS AND EQUIPMENT

UNIT-I

Selection of equipment-factors effecting-relative advantages and disadvantages-technical and economic aspects.

UNIT-II

Construction engineering fundamentals-analysis of production outputs and costs

UNIT-III

Characteristics and performance of equipment for earth moving.

UNIT-IV

Erection and material transport equipments- their performance advantages-pile driving-dewatering.

UNIT-V

Study of performance of equipment used for concrete construction including batching and mixing units-equipment used for tunneling.

Text Books:

1. Peurifoy,R.L., Ledbetter.W.B and schexnayder,C,construction planning and equipment methods, 5th Edition, McGraw Hill, Singapore,1995.
2. Sharma S.C.. Construction equipment and management, khanna publishers,newdelhi, 2011.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

CONSTRUCTION AND CONTRACT MANAGEMENT

UNIT-I

Introduction and concepts of Construction law-public law-government departments and local authorities.

UNIT-II

Private law-contracts-torts-property law and building law-concepts-salient features-sections.

UNIT-III

Construction contracts-contracts specifications-types of contract documents used for construction.

UNIT-IV

Contract procurement- selection of contractor-contract procedure-salient features.

UNIT-V

Arbitration and litigation procedure-preparation, settlement, evidence, price adjustment-need for the formulae-civil engineering and building formulae- practical implications.

Text books:

1. Gajaria G.T., laws relating to building and engineering contracts in india, M.M Tripathi private Ltd., Bombay, 1982.
2. Jimmie Hinze, construction contracts, 2nd edition., McGraw hill,2001.
3. Joseph T.Bockrath, contracts and the legal environment for engineers and architects,6 th edition, McGraw hill,2000.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

CONSTRUCTION ECONOMICS AND FINANCE

UNIT-I

Construction accounting-income statement-depreciation and amortization.

UNIT-II

Engineering economics-benefit-cost analysis-replacement analysis-break even analysis- assessment of time for arriving break even.

UNIT-III

Risks and uncertainties and management decision in capital budgeting-Uncertainties due to improper planning.

UNIT-IV

Taxation and inflation-work pricing-contract bidding and award-revision-escalation.

UNIT-V

Turnkey activities-project appraisal and yield-Working capital management-international finance-budgeting and budgetary-performance-appraisal.

Text Books:

1. Danny myers,construction economics: A new approach,Taylor and francis publisher,2004.
2. Ofori,G, the construction industry aspects of its economics and management, Singapore university press,1990.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

CIVIL ENGINEERING MATERIALS AND RECENT ADVANCES

UNIT-I

Light weight aggregate concrete - fiber reinforced concrete - High strength concrete.

UNIT-II

Changes in concrete with time, Corrosion of rebars in concrete- control measures.

UNIT-III

Different Industrial waste materials – their usage in concrete –study of properties.

UNIT-IV

Effects of temperature on Concrete- high temperature - Ferro-cement – advantages and properties and strength.

UNIT-V

Polymers - Fibre reinforced plastic in sandwich panels - Adhesives and sealants.Structural elastomeric bearings, Moisture barriers.

Text books:

1. Adam M. Neville, Properties of Concrete, 5th Edition, Longman Sc and Tech Publishers, 2011.
2. Kumar Mehta. P. and Paulo J.M. Monteiro, Concrete Microstructure, Properties and Materials, McGraw Hill, 2006.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

UNDER WATER CONSTRUCTION

(Elective-III & IV)

UNIT-I

Under Water construction - Site preparation, temporary roads, site drainage.

UNIT-II

Deep trench and deep basement excavations. Bulk excavation. Stability of slopes to open excavations.

UNIT-III

Support of excavation by timbering and sheet piling. Retaining walls and sheet pile design - requirements for shorting and underpinning.

UNIT-IV

Methods of shoring of Underpinning - Tunneling in touch, medium-tough and soft rocks.

UNIT-V

Tunneling by borls shield tunneling - Culverts and conduits - Design of piles, pile load tests. Foundation design for dynamic conditions.

Text Books:

1. Ben C. Gerwick Jr., Construction of Marine and Offshore Structures, 3rd Edition, CRC Press, 2007.
2. Patrick Powers. J, Construction Dewatering: New Methods and Applications, John Wiley & Sons, 1992.

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M. Tech – I year II Sem. (Construction Management)

CRITICAL CHAIN MANAGEMENT

(Elective-III & IV)

UNIT-I

Overview of Theory of Constraints (TOC), Concept of critical chain in projects.

UNIT-II

Developing single-project critical chain plan- Advantages and dis advantages-procedures.

UNIT-III

Developing multi-project critical chain plan. Measurement and control.

UNIT-IV

Study of Project risk management.

UNIT-V

TOC's thinking process applied to project management.

Text Books:

1. Dettmer HW, The Logical Thinking Process: A Systems Approach to Complex Problem Solving, ASQ Quality Press, 2007.
2. Leach LP, Critical Chain Project Management, Artech House, 2004.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

STRATEGIC MANAGEMENT IN CONSTRUCTION

(Elective- III & IV)

Unit-I

Introduction to Strategic Management Concepts-necessity and significance of strategic management.

Unit-II

Different approaches of Strategy Formation and Implementation-procedures- problems encountered.

Unit-III

External and Internal Environment Analysis.

Unit-IV

Financial Strategies-budget allocation for different tasks -Decision and Analytical Tools.

Unit-V

Corporate Strategic Events, Leadership and Decision-making, Corporate Social Responsibility.

Text Books:

1. David Langford, Steven Male, Strategic Management in Construction, 2nd Edition, John Wiley and Sons, 2008.
2. Richard Fellows, Construction Management in Practice, 2nd Edition, Blackwell Science, 2001.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

BUILDING SERVICES

(Elective-III & IV)

UNIT-I

Orientation and Planning - Grouping and circulation - lighting and ventilation .

UNIT-II

Termite proofing of buildings- Lightning protection of buildings - Fire protection of buildings .

UNIT-III

Vertical transportation – Prefabrication systems in residential buildings: Planning and modules and sizes of components in prefabrication.

UNIT-IV

Shell structures - Domes - Folded plate structures - Skeletal and space frame structures- Grain storage structures

UNIT-V

Earthquake resistant structures - Air-conditioning and heating - Acoustics and Sound insulation – Plumbing services

Text Books:

1. Arora and Bindra, Building Construction, Dhanpat Rai, 2012.
2. Hand Book of Housing Statistics, NBO, 2003.
3. National Building Code of India, Bureau of Indian Standards, 2005.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

GEO-ENVIRONMENTAL ENGINEERING

(Elective-III & IV)

UNIT-I

Sources and Site Characterization**:** Scope of Geoenvironmental Engineering, Various Sources of Contaminations, Need for contaminated site characterization; and Characterisation methods.

UNIT-II

Solid and Hazardous Waste Management: Classification of waste, Characterisation solid wastes, Environmental Concerns with waste, waste management strategies.

UNIT-III

contaminant Transport**:** Transport process, Mass-transfer process, Modeling, NAPL.

UNIT-IV

Remediation Techniques**:** Objectives of site remediation, various active and passive methods, Bioremediation, Phytoremediation, Remediation of NAPL sites.

UNIT-V

Landfills**:** Types of landfills, Site Selection, Waste Containment Liners, Leachate collection system, Cover system, Gas collection system.

Text Books:

1. Phillip B. Bedient, Refai, H. S. & Newell C. J. - Ground Water Contamination - Prentice Hall Publications, 4th Edition, 2008.
2. Sharma, H. D. and Reddy, K. R. - Geoenvironmental Engineering, John Wiley & Sons (2004).

References:

1. Rowe, R. K. - Geotechnical & Geoenvironmental Engineering Handbook, Kluwer Academic, 2001.
2. Reddi, L. N. and Inyang, H. I. - Geoenvironmental Engineering Principles and Applications, Marcel. Dekker, Inc., New York (2000).
3. LaGrega, M. D., Buckingham, P. L. and Evans, J. C. - Hazardous Waste Management, New York: McGraw-Hill, 2001.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

ADVANCED CONCRETE TECHNOLOGY

(Elective-III & IV)

UNIT – I

Concrete Making Materials : Cement – Bogus Compounds – Hydration Process – Types of Cement – Aggregates – Gradation Charts – Combined Aggregate – Alakali Silica Reaction – Admixtures – Chemical and Mineral Admixtures.

UNIT – II

Fresh And Hardened Concrete: Fresh Concrete – workability tests on Concrete – Setting Times of Fresh Concrete – Segregation and bleeding.

Hardened Concrete : Abrams Law, Gel space ratios, Maturity concept – Stress strain Behaviour – Creep and Shrinkage – Durability Tests on Concrete – Non Destructive Testing of Concrete.

UNIT – III

High Strength Concrete – Microstructure – Manufacturing and Properties – Design of HSC Using Erintroy Shaklok method – Ultra High Strength Concrete.

High Performance Concrete – Requirements and Properties of High Performance Concrete – Design Considerations

UNIT – IV

Special Concretes : Self Compacting concrete, Polymer Concrete, Fibre Reinforced Concrete – Reactive Powder Concrete – Requirements and Guidelines – Advantages and Applications.

Concrete Mix Design: Quality Control – Quality Assurance – Quality Audit - Mix Design Method – BIS Method – DOE Method – Light Weight Concrete, Self Compacting Concrete.

UNIT – V

Form work – materials – structural requests – form work systems – connections – specifications – design of form work – shores – removal for forms - shores – reshoring – failure of form work.

Text Books:

1. Special Structural concretes by Rafat Siddique, Galgotia Publications 2000.
2. Design of Concrete Mixes by N.Krishna Raju, CBS Publications, 2000.
3. Concrete: Micro Structure by P.K.Mehta, ICI, Chennai.
4. Properties of Concrete by A.M.Neville, ELBS publications Oct 1996.
5. Concrete Technology by A.R. Santhakumar, Oxford University Press 2006 Oct.
6. Concrete Technology by M.S.Shetty, S.Chand & Co 2009.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech – I year II Sem. (Construction Management)

ADVANCED CONSTRUCTION ENGINEERING LAB

1. Concrete mix design by BIS, ACI and BS method-proportioning, batching, mixing, modeling of specimens for compression, modulus of elasticity and modulus of rupture-testing of specimens as per relevant codes of practice (Comparative study).
2. Development of correlation between Non-Destructive and Destructive tests using Rebound Hammer & UPV instruments.
3. Influence of following parameters on NDT reading-experimental observations.
   - i. Aggregate Cement Ratio.
   - ii. Water Cement Ration.
   - iii. Excess/Deficient Cement.
   - iv. Excess/Deficient Water.
   - v. Aggregate type.

   (Some of the above parameters may be considered depending upon time)
4. Strain and deflection measurement for a structural member under single point/ two point loading-crack propagation observation. Measurement and plotting.