JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR ANANTHAPURAMU-515002 (A.P) INDIA

ACADEMIC REGULATIONS COURSE STRUCTURE
AND
DETAILED SYLLABI
OF
MASTER OF TECHNOLOGY
IN
COMPUTER AIDED STRUCTURAL ENGINEERING

Regular Two Year P.G. Degree Course
(Applicable for the batches admitted from 2013-14)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
Academic Regulations For The Award Of Full Time M.Tech. P.G. Degree
(WITH EFFECT FROM THE ACADEMIC YEAR 2013-14)

The Jawaharlal Nehru Technological University Anantapur shall confer M.Tech. Post Graduate degree to candidates who are admitted to the Master of Technology Programs and fulfill all the requirements for the award of the degree.

1.0 ELIGIBILITY FOR ADMISSIONS:

Admission to the above programme shall be made subject to the eligibility, qualifications and specialization prescribed by the University for each programme, from time to time.

Admissions shall be made either on the basis of merit rank obtained by the qualified candidates at an Entrance Test conducted by the University or on the basis of GATE / PGECET score, subject to reservations prescribed by the University or Government policies from time to time.

2.0 **COURSE WORK:**

2.1 A Candidate after securing admission must pursue the M.Tech. course of study for Four semesters duration.

2.2 Each semester shall be of 20 weeks duration including all examinations.

2.3 A candidate admitted to a programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

3.0 ATTENDANCE:

3.1 A candidate shall be deemed to have eligibility to write end semester examinations if he has put in atleast 75% of attendance on cumulative basis of all subjects/courses in the semester.

3.2 Condonation of shortage of attendance up to 10% i.e., from 65% and above and less than 75% may be given by the college on the recommendation of the Principal.

3.3 Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representation by the candidate with supporting evidence.

3.4 If the candidate does not satisfy the attendance requirement he is detained for want of attendance and shall reregister for that semester. He / she shall not be promoted to the next semester.

4.0. 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.

4.1 For the theory subjects 60% of the marks will be for the External End Examination. While 40% of the marks will be for Internal Evaluation, based on the better of the marks secured in the two Mid Term-Examinations held, one in the middle of the Semester (I-IV units) and another immediately after the completion of instruction (V-VIII) units with Three questions to be answered out of four in 2hours, evaluated* for 40 marks.

*****Note: All the Questions shall be of equal weightage of 10 marks and the marks obtained for 3questions shall be extrapolated to 40 marks, any fraction rounded off to the next higher mark

4.2 For practical subjects, 60 marks shall be for the End Semester Examinations and 40 marks will be for internal evaluation based on the day to day performance.

4.3 For Seminar there will be an internal evaluation of 50 marks. A candidate has to secure a minimum of 50% to be declared successful. The assessment will be made by a board consisting of HOD and two internal experts at the end of IV semester instruction.

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

4.5 In case the candidate does not secure the minimum academic requirement in any of the subjects (as specified in 4.4.) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the course when next offered or do any other specified subject as may be required.

5.0 RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL EVALUATION MARKS:

Following are the conditions to avail the benefit of improvement of internal evaluation marks.

5.1 The candidate should have completed the course work and obtained examinations results for I & II semesters.

5.2 He should have passed all the subjects for which the Internal evaluation marks secured are more than 50%.

5.3 Out of the subjects the candidate has failed in the examination due to Internal evaluation marks secured being less than 50%, the candidate shall be given one chance for each Theory subject and for a maximum of **three** Theory subjects for Improvement of Internal evaluation marks.

5.4 The candidate has to re-register for the chosen subjects and fulfill the academic requirements.

5.5 For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the

Registrar, JNTUA payable at Anantapur along with the requisition through the Principal of the respective college.

5.6 In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

6.0 EVALUATION OF PROJECT WORK:

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the college/ institute.

6.1 Registration of Project work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and practical courses of I & II Sem)

6.2 An Internal Departmental Committee (I.D.C) consisting of HOD, Supervisor and one internal senior expert shall monitor the progress of the project work.

6.3 The work on the project shall be initiated in the penultimate semester and continued in the final semester. The duration of the project is for two semesters. The candidate can submit Project thesis with the approval of I.D.C. after 36 weeks from the date of registration at the earliest and one calendar year from the date of registration for the project work. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

6.4 The student must submit status report at least in three different phases during the project work period. These reports must be approved by the I.D.C before submission of the Project Report.

6.5 A candidate shall be allowed to submit the thesis / dissertation only after passing in all the prescribed subjects (both theory and practical) and then take viva voce examination of the project. The viva-voce examination may be conducted once in two months for all the candidates submitted during that period.

6.6 Three copies of the Thesis / Dissertation certified in the prescribed from by the supervisor & HOD shall be presented to the HOD One copy is to be forwarded to the University and one copy to be sent to the examiner.

6.7 The college shall submit a panel of three experts for a maximum of 5 students at a time. However, the thesis / dissertation will be adjudicated by one examiner nominated by the University.

6.8 If the report of the examiner is favorable viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the examiner who adjudicated the thesis / dissertation. The board shall jointly report candidates work as:

1.	Very Good	Grade A
2.	Good	Grade B
3.	Satisfactory	Grade C
4.	Not satisfactory	Grade D

If the report of the viva-voce is not satisfactory (Grade D) the candidate will retake the viva-voce examination 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 unless the candidate is permitted to revise and resubmit the thesis.

7.0 AWARD OF DEGREE AND CLASS:

A candidate shall be eligible for the award of respective degree if he satisfies the minimum academic requirements in every subject and secures 'satisfactory' or higher grade report on his thesis/dissertation and viva-voce. Based on overall percentage of marks obtained, the following class is awarded.

First class with Distinction:	70% or more
First class	below 70% but not less than 60%
Second class	below 60% but not less than 50%

8.0 WITH – HOLDING OF RESULTS:

If the candidate has not paid dues to the university or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed/ promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

9.0 TRANSITORY REGULATIONS:

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to 4.5 and 2.3 sections. Whereas they continue to be in the academic regulations they were first admitted.

10.0 GENERAL:

i. **The academic regulations should be read as a whole for purpose of any interpretation**.
ii. **Disciplinary action for Malpractice / improper conduct in examinations is appended**.
iii. **There shall be no places transfer within the constituent colleges and affiliated colleges of Jawaharlal Nehru Technological University Anantapur.**
iv. **Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".**
v. **In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.**
vi. **The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the University.**

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APPROVED REVISION OF RULES FOR DISCIPLINARY ACTION FOR MALPRACTICES / 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 for four 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.** **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 four consecutive semesters from class work and all University examinations, if his involvement is established. Otherwise, The candidate is 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 only.
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	**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. If the candidate physically assaults the invigilator/ officer-in-charge of the Examinations, then the candidate is also debarred and forfeits his/her seat. In case of outsiders, they will be handed over to the police and a police case is registered against**

	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.	**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 only or in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations, depending on the recommendation of the committee.**
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.

<u>Note:</u> Whenever the performance of a student is cancelled in any subject/subjects due to Malpractice, he has to register for End Examinations in that subject/subjects consequently and has to fulfill all the norms required for the award of Degree.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
Course Structure and syllabi for
M.Tech- Computer Aided Structural Engineering
Offered by Department of Civil Engineering
for affiliated Engineering Colleges 2013-14

I YEAR I Semester

S. No	Course code	Subject	Theory	Lab.	Credits
1.	13D35101	Computer Aided Numerical Methods	4		4
2.	13D35102	Matrix Methods of Structural Analysis	4		4
3.	13D35103	Theory of Elasticity	4		4
4.	13D35104	C++ and Data Structures	4		4
5.	 13D35105 13D35106 13D35107	Elective – I 1. Experimental Stress Analysis 2. Optimization in Structural Design 3. Structural Health Monitoring	4		4
6.	 13D35108 13D35109 13D35110	Elective – II 1. Modelling, Simulation & Computer Applications 2. Prestressed Concrete structures 3. Structural Stability	4		4
7.	13D35111	CAD Laboratory – I		3	2
		Total Credits			26

I YEAR II Semester

S. No	Course code	Subject	Theory	Lab.	Credits
1.	13D35201	Structural Dynamics	4		4
2.	13D35202	Finite Element Analysis	4		4
3.	13D35203	Artificial Neural Networks	4		4
4.	13D35204	CAD & Computer applications in Structural Engineering	4		4
5.	13D35205 13D35206 13D35207	Elective – III 1. Analysis of Shells and Folded Plates 2. Reliability Based Engineering Design 3. Earthquake Resistant Structures	4		4
6.	13D35208 13D35209 13D35210	Elective – IV 1. Management Information Systems 2. Fracture Mechanics 3. Advanced Concrete Technology	4		4
7.	13D35211	CAD Laboratory – II		3	2
	Total Credits				26

II YEAR (III & IV Semesters)

S. No	Course code	Subject		credits
1	13D35401	Seminar		2
2	13D35402	Project work		16

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M.Tech I semester (CASE)

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(13D35101) COMPUTER AIDED NUMERICAL METHODS

UNIT-I

Solution of Non-linear Equations: Newton-Raphson method, Von-mises formula, Chord's method, bisection method- Comparative study-solution of cubic equation and quartic equation.

UNIT-II

Numerical integration: Newton-Cotes integration formulas- Trapezoidal rule-Romberg Integration – Simpson's rule – Gaussian quadrature – Errors in integration formulas – Multiple integration with variable limits.

UNIT-III

Solution of system of equations: Gauss elimination method- gauss-Jordan method- L-U decomposition – Errors in the solution- iterative methods – solution of sets of non linear equations.

UNIT-IV

Boundary Value Problems and Characteristics – Value problems: Shooting method-solution through a set of equations – Derivative boundary conditions – characteristic value problems – Eigen values of matrix by iteration.

UNIT-V

Numerical Solution of Elliptical partial differential Equations: Equilibrium temperatures in a heated slab-Equation of steady state heat flow.

UNIT-VI

Laplace equation on rectangular region – Poisson equation –Derivative boundary conditions.

UNIT-VII

Numerical Solution of parabolic partial Differential equations: Explicit Method- simple implicit method Crank- Nicolson method- Derivative boundary conditions – stability and convergence criteria - Equations in two dimensions.

UNIT-VIII

Finite Element method: General approach – Finite Element application in one dimension and 2-D problems.

REFERENCE BOOKS:

1. Numerical Methods for Engineers by Steven c.chapra and Raymond P.canal –Mc Graw Hill book company.
2. Applied Numerical Analysis by Curtis .F.Gerald-Addition-wesley Publishing company.
3. C. Language and Numerical Methods by C.Xavier-New age international Publishers

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(13D35102) MATRIX METHODS OF STRUCTURAL ANALYSIS

UNIT-I

INTRODUCTION:
Indeterminacy-Determination of static and kinematic indeterminacies of two-dimensional and three-dimensional portal frames, pin jointed trusses and hybrid frames-coordinate systems –structural idealization.

UNIT-II
Introduction to Matrix Methods of Analysis-Flexibility and stiffness matrices-Force displacement relationships for axial force, couple, torsional moments – stiffness method of analysis and flexibility method of analysis.

UNIT-III & IV
ANALYSIS OF CONTINUOUS BEAMS
stiffness method and flexibility method of analysis – continuous beams of two and three spans with different end conditions-internal hinges.

UNIT- V
ANALYSIS OF TWO DIMENSIONAL PORTAL FRAMES & PINJOINTED TRUSSES

a) stiffness and flexibility method of analysis of 2D portal frames with different end conditions-plotting of bending moment diagrams.

UNIT -VI

b) Computation of joint displacement and member forces for pinjointed trusses.

UNIT - VII
TRANSFORMATION OF CO-ORDINATES
Local and Global co-ordinate systems-transformation of matrices from local to global coordinates of element stiffness matrix-direct stiffness method of analysis-assembly of global stiffness matrix from element stiffness matrices –static condensation-sub-structuring.

UNIT- VIII

EQUATION SOLVERS-solution of system of linear algebraic equations-direct inversion method-gauss elimination method-Cholesky method-banded equation solvers-frontal solution technique.

REFERENCE BOOKS :

1. Structural Analysis by Pundit & Gupta, Tata MC Graw Hill Book company.
2. Structural Analysis by C.S.Reddy, Tata MC Graw Hill Book company
3. Cotes, R.C., Couties, M.G., and Kong, F.K., Structural Analysis, ELBS.
4. MC.Guire, W.,and Gallagher, R.H., Matrix Structural analysis, John Wiley and sons.
5. John L.Meek., Matrix Structural Analysis, MC Graw Hill Book company.
6. Structural Analysis – R.C.Hibbeler, Pearson Education

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M.Tech I semester (CASE) **Th 4** **C 4**

(13D35103) THEORY OF ELASTICITY

UNIT-I

INTRODUCTION TO PLANE STRESS AND PLANE STRAIN ANALYSIS: Elasticity –Notation for forces and stresses-Components of stresses –components of strain –Hooke's law.

UNIT-II

PLANE STRESS AND PLANE STRAIN ANALYSIS: Plane stress-plane strain-Differential equations of equilibrium- Boundary conditions- Compatibility equations-stress function-Boundary conditions.

UNIT- III

TWO DIMENSIONAL PROBLEMS IN RECTANGULAR COORDINATES:

Solution by polynomials-Saint Venant's principle-Determination of displacements-bending of simple beams-application of Fourier series for two dimensional problems - gravity loading.

UNIT- IV & V:

TWO DIMENSIONAL PROBLEMS IN POLAR COORDINATES :

General Equation in polar co-ordinates - stress distribution symmetrical about an axis – Pure bending of curved bars- strain components in polar coordinates-Displacements for symmetrical stress distributions-simple symmetric and asymmetric problems-General solution of two dimensional problem in polar coordinates-Application of the general solution of two dimensional problem in polar coordinates-Application of the general solution in polar coordinates.

UNIT- VI

ANALYSIS OF STRESS AND STRAIN IN THREE DIMENSIONS:

Principle stress - ellipsoid and stress-director surface-Determination of principle stresses- Maximum shear stresses-Homogeneous deformation-principle axis of strain rotation.

UNIT – VII

GENERAL THEOREMS:

Balance laws - Differential equations of equilibrium- conditions of compatibility - Determination of displacement-Equations of equilibrium in terms of displacements-principle of superposition-Uniqueness of solution –the Reciprocal theorem.

UNIT-VIII

TORSION OF PRISMATICAL BARS:

Torsion of prismatic bars- Elliptical cross section-other elementary solutions-membrane anology-Torsion of rectangular bars-solution of torsional problems by energy method-use of soap films in solving torsionol problems-hydra dyanmical analogies-Torsion of shafts, tubes, bars etc.

REFERENCE BOOKS :

1. Theory of Elasticity and Plasticity by Timoshenko, S., MC Graw Hill Book company.
2. Advnced Strength of materials by Papoov, MC Graw Hill Book company.
3. Theory of Elasticity and Plasticity by Sadhu Singh. Khanna Publishers.
4. Chen, W.F. and Han, D.J.Plasticity for structural Engineers, Springer – Verlag, New York.
5. Lubliner, J., Plasticity theory, Mac Millan Publishing Co., New York.
6. Foundations of Solid Mechanics by Y.C.Fung, PHI Publications.
7. Advanced Mechanics of Solids by L.S. Srinath, Tata MC Graw Hill Book company.

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(13D35104) C++ AND DATA STRUCTURES

UNIT-I

Object oriented programming :- Procedure – oriented programming, object oriented programming paradigm, basic concepts of oop, benefits of opp. Basics of C++, key words, data types, operators, functions in C++, classes and objects.

UNIT-II

Concepts of C++:- Constructors, parameterized constructiors, copy constructor, destructors, Inheritance – single, multilevel, multiple, Hierarchical, Hybrid, parameter passing methods.

UNIT-III

Sorting: Bubble sort, selection sort, Insertion sort, Quick sort, Merge sort, Heap sort , Radix sort.

UNIT- IV

Searching: Binary Search, Linear Search.

UNIT- V

Linked Lists :- Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked, insertion in to and deletion from linked list.

UNIT-VI

Stacks:- Introduction, Implementation using arrays and linked lists, applications: Arithmetic Expression, Implementation of Recursion, Towers of Hanoi,.

UNIT-VII

Queues: Introduction, Implementation using arrays and linked lists, Types of queues, Applications

UNIT- VIII

Trees :- binary trees, representing binary trees in memory, Operations on Binary Trees, Types of trees.

TEXT BOOKS :

1. Object oriented programming with C++, “Balaguru Swamy”, Tata McGraw Hill.
2. Classic Data Structures, “D. Samantha”, PHI Learning Pvt. Ltd..
3. Data structures, Algorithms and Applications in C++, S. Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press.

REFERENCE BOOKS:

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
4. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
6. Data Structures using C++, D.S. Malik, Cengage Learning, India Edition.

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M.Tech I semester (CASE)

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(13D35105) EXPERIMENTAL STRESS ANALYSIS
(Elective-I)

UNIT-I
PRINCIPLES OF EXPERIMENTAL APPROACH :-
Merits of Experimental Analysis Introduction, uses of experimental stress analysis advantages of experimental stress analysis, Different methods –Simplification of problems.

UNIT-II
STRAIN MEASUREMENT USING STRAIN GAUGES :-
Definition of strain and its relation of experimental Determinations Properties of Strain-Gauge Systems-Types of Strain Gauges –Mechanical, Acoustic and Optical Strain Gauges.

UNIT-III
ELECTRICAL STRAIN GAUGES:-
Introduction to Electrical strain gauges - Inductance strain gauges – LVDT – Resistance strain gauges – various types –Gauge factor – Materials of adhesion base.

UNIT-IV
STRAIN ROSSETTES Introduction – the three elements Rectangular Rosette – The Delta Rosette Corrections for Transverse Strain Gauge.

UNIT-V
NON – DESTRUCTIVE TESTING OF CONCRETE:-
Ultrasonic Pulse Velocity method –Application to Concrete. Hammer Test – Application to Concrete.

UNIT-VI
THEORY OF PHOTOELASTICITY :-
Introduction –Temporary Double refraction – The stress Optic Law –Effects of stressed model in a polariscope for various arrangements – Fringe Sharpening. Brewster's Stress Optic law.

UNIT-VII

TWO DIMENSIONAL PHOTOELASTICITY :-

Introduction – Isochramic Fringe patterns- Isoclinic Fringe patterns passage of light through plane Polariscope and Circular polariscope Isoclinic Fringe patterns – Compensation techniques – Calibration methods – Separation methods – Scaling Model to prototype Stresses

UNIT-VIII

Materials for photo – Elasticity Properties of Photoelastic Materials.

REFERENCE BOOKS:

1. Experimental stress analysis by J.W.Dally and W.F.Riley, College House Enterprises
2. Experimental stress analysis by Dr.Sadhu Singh.khanna Publishers
3. Experimental Stress analysis by U.C.Jindal, Pearson Pubilications.
4. Experimental Stress Analysis by L.S.Srinath, MC.Graw Hill Company Publishers.

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(13D35106) OPTIMIZATION IN STRUCTURAL DESIGN
(Elective-I)

UNIT-I
System approach – Techniques of operation research – Decision making – Research models.

UNIT-II
Basic concepts of minimum weight, minimum cost design, variables, constrains, model and model building, objective function, classical methods.

UNIT-III
Concept of liner programming, Integer programming, Quadratic programming, Dynamic programming and geometric programming methods for optimal design of structural elements.

UNIT-IV
Linear programming: Standard form of linear programming problem, geometry of linear programming problem. Solution of system of linear simultaneous equations.

UNIT-V
Application of linear programming methods for plastic design of frames Computer search methods of univarite and multivariate minimsation.

UNIT-VI
Simplex method. – Revised simplex method, duality of linear programming sensitivity or post optimality analysis.

UNIT-VII
Optimization by structural theorems. Maxwell Mitchell and Heymans theorem for structures and frames.

UNIT-VIII
Optimization Techniques applied to fully stressed design with deflection constraints, optimality criterion methods.

REFERENCE BOOKS:

1. Spunt, Optimum Structural Design, Civil Engineering and Engineering mechanics Services, Prentice Hall New Jersey, 1971.
2. S.S.Rao, Optimization theory and applications, Wiley Eastern Limited, New Delhi, 1977.
3. Uri Krisch, Optimum Structural Design Mc Graw hill Book co., 1981.
4. Richard Bronson, Operations Research, Schaums, outline series, Mc Graw Hill book company, Singapore 1983.
5. J.S.Arora, introduction to optimum Design, Mc Graw Hill Book company, new your, 1989.
6. A.J. Morris (Editor) Foundations of Structural Optimization – a unified Approach, John Wiley and Sons, Chichester, 1982.

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(13D35107) STRUCTURAL HEALTH MONITERING
(Elective-I)

UNIT-I

Introduction to Structural Health Monitoring (SHM) :

a) Definition & motivation for SHM, SHM - a way for smart materials and structures, SHM and bio mimetic - analog between the nervous system of a man and a structure with SHM

UNIT-II

b) SHM as a part of system management, Passive and Active SHM, NDE, SHM and NDECS, basic components of SHM, materials for sensor design.

UNIT-III

Application of SHM in Civil Engineering: Introduction to capacitive methods, capacitive probe for cover concrete, SHM of a bridge, applications for external post tensioned cables, monitoring historical buildings.

UNIT-IV

Non Destructive Testing of Concrete Structures: Introduction to NDT - Situations and contexts, where NDT is needed, classification of NDT procedures, visual Inspection, half-Cell electrical potential methods, Schmidt Rebound Hammer Test, resistivity measurement, electromagnetic methods, radiographic Testing, ultrasonic testing, Infra Red thermography, ground penetrating radar, radio isotope gauges, other methods.

UNIT-V

Condition Survey & NDE of Concrete Structure:

a) Definition and objective of Condition survey, stages of condition survey (Preliminary, Planning, Inspection and Testing stages)

UNIT-VI

b) Possible defects in concrete structures, quality control of concrete structures - Definition and need,Quality control applications in concrete structures, NDT as an option for Non-Destructive Evaluation (NDE) of Concrete structures, case studies of a few NDT procedures on concrete structures.

UNIT-VII

Rehabilitation and Retrofitting of Concrete Structure :

a) Repair rehabilitation & retrofitting of structures, damage assessment of concrete structures, Materials and methods for repairs and rehabilitation.

UNIT-VIII

b) Modeling of repaired composite structure, structural analysis and design - Importance ofre-analysis, execution of rehabilitation strategy, Case studies.

REFERENCE BOOKS:

1. Daniel Balageas, Claus - Peter FritzenamI Alfredo Guemes, Structural Health Monitoring, Published by ISTE Ltd., U.K. 2006.

2. Guide Book on Non-destructive Testing of Concrete Structures,Training course series No.17,International Atomic Energy Agency,Vienna, 2002.

3. Hand book on "Repair and Rehabilitation of RCC Buildings", Published by Director General, CPWD, Govt. of India, 2002.

4. Hand Book on Seismic Retrofitting of Buildings, Published by CPWD & Indian Building Congress in Association with IIT, Madras, Narosa Publishing House, 2008

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(13D35108) MODELLING, SIMULATIONS AND COMPUTER APPLICATIONS
(Elective-II)

UNIT-I

System models: Concepts, continues and discrete systems, system modeling, types of models, subsystems, corporate model, and system study.

UNIT-II

System simulation: Techniques, comparison of simulation and analytical methods, types of simulation, Distributed log models, cobweb models.

UNIT-III

Continuous System Simulation: Nemeric solution of differential equations, Analog computers, Hybrid computers, continuous system simulation languages CSMP, system dynamic growth models, logistic curves.

UNIT-IV

Probability concepts in simulation: Monte Carlo techniques, stochastic variables, probability functions, Random Number generation algorithms.

UNIT-V

Queuing Theory: Arrival pattern distributions, servicing times, queuing disciplines, measure of queues, mathematical solutions to queuing problems.

UNIT-VI

Discrete System Simulation: Events, generation of arrival patterns, simulation programming tasks, analysis of simulation output.

UNIT-VII & VIII

GPSS & SIMSCRIPT, programming in GPSS: simulation programming Techniques: Data Structures, Implementation of activities, events and queues, Event scanning, simulation algorithms in GPSS and SIMSCRIPT.

TEXT/ REFERENCE BOOKS:

1. Geoffery Gordon: System Simulation, PHI.
2. Naylor, Thomas, H.Computer Simulation experiments with models of economic systems, John Wiley and sons, 1971.
3. Naylor Thomas, H and ET. AI. Computer simulation techniques, John wiley and Sons, 1966.
4. Louis Wdward Alfeld and Alan K.Graham, Introduction to Urban Dynamics, wright – Allen Press Inc., Massachusetts, 1976.
5. Richard J.Chorley and Peter haggett, Models in Geography, Methuen & Co.Ltd., 1977.
6. Hamdy A.Taha, Operations Research – An Introduction, Macmillan Company, New York, 1987.
7. Thirumurthy.A.m. Environmental Facilities and Urban development in India-A System Dynamic Model for developing countries, Academic foundations, India.

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(13D35109) PRESTRESSED CONCRETE STRUCTURES
(Elective-II)

UNIT-I

INTRODUCTION: Development of prestressed concrete –Advantages and Disadvantages of PSC over RCC –General principles of pre-stressing-pre tensioning and post tensioning –Materials used in PSC-high strength concrete –High tension steel-Different types /methods/systems of prestressing.

UNIT-II

Losses of prestress: Estimation of the loss of prestress due to various causes like elastic shortening of concrete ,creep of concrete, shrinkage of concrete, relaxation of steel, slip in anchorage, friction etc.

UNIT-III

Flexure: Analysis of sections for flexure in accordance with elastic theory-Allowable stresses-Design criteria as per I.S code of practice –Elastic design of Beams (rectangular, I and T sections) for Flexure –Introduction to partial prestressing.

UNIT-IV

Deflections: Introduction-Factors influencing deflections-short term and long term deflections of uncracked and cracked members.

UNIT-V

Shear, bond, Bearing and Anchorage:

a) shear in PSC beams –Principal stresses –Conventional elastic design for shear-transfer of prestress in pretensioned members-transmission length –Bond stresses-bearing at anchorage –Anchorage zone stresses in post-tensioned members.

UNIT-VI

b) Analysis and design of end blocks by Guyon, Magnel and approximate methods –Anchorage zone reinforcements.

UNIT-VII

Statistically indeterminate structures: Introduction –advantages and disadvantages of continuity –Layouts for continuous beams-primary and secondary moments –Elastic analysis of continuous beams-Linear transformation-Concordant cable profile-Design of continuous beams.

UNIT-VIII

Circular prestressing: Introduction –Circumferential prestressing Design of Prestressed concrete tanks –vertical prestressing in tanks-Dome prestressing.

REFERENCE BOOKS:

1. Prestressed Concrete by S. Krishna raju, TMH Pubilishers.
2. Prestressed Concrete by S. Ramamrutham, Dhanpati Rai Pubilicartions.
3. Prestressed concrete design by Praveen Nagarajan, Pearson Pubilications.
4. T.Y.Lin, Design of Prestressed Concrete Structures, Asian Publishing house, Bombay, 1953.
5. Y.Guyon, Prestressed Concrete, Vol.I&II, Wiley and Sons, 1960.
6. F.Leohhardt, Prestressed concrete Design and construction, Wilhelm Ernst and shon, Berlin, 1964.
7. C.E.Reynolds and J.C. Steedman, Reinforced concrete designers hand bood, A view point publication, 1989.
8. Edward P.Nawy, Prentise Hall – Prestressed Concrete.
9. Prestressed Concrete – by Raj Gopal, Narsoa Pubilications.

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(13D35110) STABILITY OF STRUCTURES
(Elective-II)

UNIT-I

Formulations related to beam columns : Concept of Stability, Differential equation for beam columns –Beam column with concentrated loads –continuous lateral load – couples -beam column with built in ends –continuous beams with axial load –application of Trignometric series –Determination of allowable stresses.

UNIT-II & III

Elastic Buckling of Bars: Elastic buckling of straight columns –Effect of shear stress on buckling-Eccentrically and laterally loaded columns –energy methods –Buckling of a bar on elastic foundation, Buckling of a bar with intermediate compressive forces and distributed axial loads –Buckling of bars with change in cross section –Effect of shear force on critical load –Built up columns

UNIT-IV

Inelastic Buckling: Buckling of straight bars-Double modulus theory –Tangent modulus theory.

UNIT-V

Torsional Buckling: Pure torsion of thin walled bar of open cross section-Non – Uniform torsion of thin walled bars of open cross section-Torsional buckling –Buckling under Torsion and Flexure.

UNIT-VI

Mathematical Treatment of Stability Problems: Buckling problem orthogonality realation –Ritz method-Timoshenko method, Galerkin method

UNIT-VII

Lateral Buckling of simply supported Beams: Beams of rectangular cross section subjected for pure bending.

UNIT-VIII

Buckling of simply rectangular plates : Derivation of equation of rectangular plate subjected to constant compression in two directions and one direction.

REFERENCE BOOKS:

1. Stability of metalic structure by Bleich –Mc Graw hill
2. Theory of Beam columns Vol I by chen & Atsuta Mc.Graw Hill
3. Smitses,Elastic stability of structures, Prentice Hall,1973.
4. Timoshenko, S., and Gere., theory of Elastic stability, Mc Graw Hill Book company, 1973.
5. Brush and Almorth., Buckling of bars plates and shells, Mc Graw Hill book company ,1975.
6. Chajes, A., Principles of Structural Stability Theory, Prentice Hall,1974
7. Ashwini Kumar, stability theory of structures, TATA Mc Graw Hill publishing company Ltd, New Delhi,1985.

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(13D35111) CAD LABORATORY – I

1. Simple Programs: Prime number, Factorial of a number, conversion of integers into words, swapping of two integers, addition and multiplication of matrices.
2. Functions : Inline functions, functions with parameters
3. Objects : Objects with arrays, counting of votes
4. Analysis of cantilever, simply supported beam, fixed beams, continuous beams for different loading conditions.
5. Design of R.C.C. beams, slabs, foundations.
6. Design of steel tension Members.

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(13D35201) STRUCTURAL DYNAMICS

UNIT-I

Theory of Vibrations: Introduction –Elements of a vibratory system – degrees of freedom-continuous systems –lumped mass idealization –Oscillatory motion –Simple harmonic motion –pictorial representation of S.H.M - free vibrations of single degree of Freedom (SDOF) systems –undamped and Damped –Critical damping – Logarithmic decrement –Forced vibrations of SDOF systems-Harmonic excitation – Dynamic magnification factor- Bandwidth.

UNIT-II

Fundamental objective of dynamic analysis-types of prescribed loading- Methods of discretization- Formulation of the equations of motion.

UNIT-III

Single degree of Freedom System: Formulation and solutions of the equation of motion - free Vibration response –response to harmonic, periodic, Impulsive and general Dynamic loading –Duhamel integral.

UNIT-IV & V

Multi Degree of Freedom System: selection of the degree of freedom –Evaluation of structural property matrices-Formulation of the MDOF equations of motion – Undamped free vibrations-Solution of Eigen value problem for natural frequencies and mode shapes- Analysis of dynamic response –Normal coordinates –Uncoupled equations of motion –Orthogonal properties of normal modes-mode superposition procedure

UNIT-VI

Practical vibration analysis: Stodola method- Fundamental mode analysis –analysis of second and higher modes –Holzer's method –basic procedure –transfer matrix procedure

UNIT-VII

Introduction to Earthquake analysis: Introduction –Excitation by rigid base translation –Lumped mass approach -SDOF and MDOF system- I.S code methods of analysis.

UNIT-VIII

Continuous system: Introduction –Flexural vibrations of beams- Elementary case- Equation of motion –Analysis of undamped free shapes of simple beams with different end conditions-principles of application to continuous beams.

REFERENCE BOOKS:

- A.K.Chopra, "Structural Dynamics for Earthquake Engineering",Pearson Pubilications
- Dynamics of structures by Clough & Penziem
- Structural dynamics by Mario Paz
- I.S:1893(latest)" code of practice for earthquakes resistant design of stuctures"
- Anderson R.A fundamentals of vibration, Amerind Pulblishing Co., 1972.

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(13D35202) FINITE ELEMENT ANALYSIS

UNIT-I

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

UNIT-II

Elastic formulations: Stress equations-strain displacement relationships in matrix form-plane stress, plane strain and Axi-symmetric bodies of revolution with axi symmetric loading

UNIT-III

One Dimensional FEM-Stiffness Matrix for Beam and bar elements shape functions for ID elements –static condensation of global stiffness matrix-solution –Initial strain and temperature effects.

UNIT-IV & V

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

UNIT-VI

Isoparametric formulation-Concept, Different isoparametric elements for 2d analysis-Formulation of 4-noded and 8-noded isoparametric quadrilateral elements – Lagrangian elements-serendipity elements.

UNIT-VII

Axi symmetric analysis –bodies of revolution-axi symmetric modelling –strain displacement relationship-formulation of axi symmetric elements.

UNIT-VIII

Three Dimensional FEM-Different 3-D elements, 3D strain –displacement relationship- formulation of hexahedral and isoparametric solid element.

REFERENCE BOOKS:

- Finite Elements Methods in Engineering by Tirupati. R. Chandrnpatla and Ashok D. Belegundu – Pearson Education Publications.
- Finite Element analysis – Theory & Programming by C.S.Krishna Murthy- Tata Mc.Graw Hill Publishers Finite Elements Methods in Engineering by Tirupati. R. Chandrnpatla, Universities Press India Ltd. Hyderabad.
- Finite element method and its application by Desai, 2012, Pearson Pubilications.
- Finite element methods by Darrel W.Pepper, Vikas Pubilishers
- Finite element analysis and procedures in engineering by H.V.Lakshminaryana, 3rd edition, universities press, Hyderabad.
- Finite element analysis in Engineering Design by S.Rajasekharan, S.Chand Publications, New Delhi.
- Finite element analysis by S.S. Bhavakatti-New age international publishers

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(13D35203) ARTIFICIAL NEURAL NETWORKS

UNIT I:

INTRODUCTION: History Of Neural Networks, Structure And Functions Of Biological And Artificial Neuron, Neural Network Architectures, And Characteristics of ANN.

UNIT-II

Applications, And Basic Learning Rules: Hibbing Learning, Competitive Learning, And Boltzmann Learning.

UNIT-III

SUPERVISED LEARNING-1: Single Layer Neural Network and architecture, McCulloch-Pitts Neuron Model, Perception Model, Perception Convergence Theorem, ADALINE, Delta Learning Rule.

UNIT IV:

SUPERVISED LEARNING-2: Multi Layer Neural Network and architecture, MADALINE, Back Propagation learning, Back Propagation Algorithm.

UNIT V:

UNSUPERVISED LEARNING-1: Kohenen Self Organization Networks, Hamming Network and MAXNET, Learning Vector Quantization, Mexican hat.

UNIT VI:

UNSUPERVISED LEARNING-2: Counter Propagation Network, Forward Only Counter Propagation Network, Adaptive Resonance Theory (ART) -Architecture, Algorithms.

UNIT VII:

ASSOCIATIVE MEMORY NETWORKS : Introduction, Auto Associative Memory ,Hetero Associative Memory, Bidirectional Associative Memory(BAM) -Theory And Architecture, BAM Training Algorithm-Storage.

UNIT VIII:

HOPFIELD NETWORK: Introduction, Architecture Of Hopfield Network, Discrete And Continuous Hopfield Network, Iterative Auto Associative Memory Network (Linear Auto Associative Memory, Brain-In-The-Box Network), Temporal Associative Memory Architecture .

TEXT BOOKS:

1. Jacek M. Zurada , " Introduction to Artificial Neural Systems " – Jaico Publishing, 2006.
2. S.N.Sivanandam , S.N.Deepa, " Introduction to Neural Networks using MATLAB 6.0 " , Tata McGraw- Hill Publications, 2006.

REFERENCE BOOKS:

1. B.Yegnanarayana " Artificial Neural Networks " PHI, NewDelhi, 2005.
2. S.Rajasekaran and G.A.Vijayalakshmi Pai " Neural Networks. Fuzzy Logic and Genetic Algorithms ", 2007.
3. James A Freeman and Davis Skapura" Neural Networks Algorithm, Applications and Programming Techniques ", Pearson Education, 2002.

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(13D35204) CAD & COMPUTER APPLICATIONS IN STRUCTURAL ENGINEERING

UNIT-I

Introduction to computer aided design – Reasons for implementing CAD – Design process – Applications of computers to design – Benefits of computer Aided design.

UNIT-II

Principles of computer graphics – Introduction, Graphic primitives, point plotting, drawing of lines, Bresenham's Algorithm, C program to draw a line, circle, ellipse using breasenham's algorithm.

UNIT-III

Transformation in Graphics – Coordinate system used lin graphics & windowing, view port, 2 – D transformations, clipping, 3-D transformation; C-graphics.

UNIT-IV & V

Stiffness Method : Microsoft Excel procedure for stiffness method of analysis step – by step procedure using Excel, examples using Excel.

UNIT-VI & VII

Analysis of beams using stiffness method : Long hand solution of single span beams, continuous beams solution of single span beams, continuous beams using Excel.

UNIT-VIII

Database : Introduction, concept of a database, objectives of databases, Design of data base, design consideration of data base.

REFERENCE BOOKS :

1. C.S.Krishna Murthy & Rajiv S. – Computer Aided Design, Software & Analytical tools – Narasha publishing house India.
2. Computer Aided design in rainforced concrete – Dr L.Shah-Structures Publishers Pune.\
3. IS – 456 -2000
4. Limit State Design – A.Jain.
5. Computer application – Boyd C.Panbou Mc Graw Hill 1997.
6. Raker D., and Rice H. Inside Aut CAD, BPD Publication, Delhi, 1986.
7. Nancy Andrews – Windows the Official guide to Microsoft Operation Environment, Micro Soft, 1986.
8. Moshi, f., Rubinstein, Matrix computer analysis of Structures, Prentice Hall 1986.

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(13D35205) ANALYSIS OF SHELLS AND FOLDED PLATES
(Elective-III)

UNIT-I

Equations of equilibrium : Introduction, classification, derivation of stress Resultants, Principles of membrane theory and bending theory.

UNIT-II & III

Cylindrical shells: Derivation of governing DKJ equation for bending theory, details of Schorer's theory, Applications to the analysis and design of short shells and long shells. Introduction of ASCE manual co-efficients for design.

UNIT-IV & V

Introduction to shells of double curvature: (other than shells of revolution:) Geometry and analysis of elliptic paraboloid, rotational paraboloid and hyperbolic paraboloid shapes by membrane theory.

UNIT-VI & VII

Folded Plates: Folded plate theory, plate and slab action, Whitney's theory, Simpson's theory for the analysis of different types of folded plates (Design is not included)

UNIT-VIII

Shells of double Curvature-Surfaces of revolution .Derivation of equilibrium equations by membrane theory, Applications to spherical shell and rotational Hyperboloid

REFERENCE BOOKS:

1. Design and construction of concrete shell roofs by G.S. Rama Swamy – CBS Publishers & Distributors, 485, Jain Bhawan Bhola Nath Nagar, shahotra, Delhi.
2. Fundamentals of the analysis and design of shell structures by Vasant S.kelkar Robert T.Swell – Prentice hall, Inc., Englewood cliffs, new Jersy -02632.
3. N.k.Bairagi, Shell analysis, Khanna Publishers, Delhi, 1990.
4. Billington, Ithin shell concrete structures, Mc Graw Hill Book company, New york, St. Louis, Sand Francisco, Toronto, London.
5. ASCE Manual of Engineering practice No.31, design of cylindrical concrete shell roofs ASC, Newyork.

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(13D35206) RELIABILITY BASED ENGINEERING DESIGN
(Elective-III)

UNIT-I

Basic statistics and probability – Concepts of structural safety.

UNIT-II

Resistance parameters and distributions. Probabilistic analysis of loads live load & wind load.

UNIT-III

Determination of reliability, Monte Carlo study of structural safety.

UNIT-IV

Levels of reliability methods and their suitable adoption in structural engineering elements.

UNIT-V & VI
Level 2 reliability methods including advanced level 2 method.

UNIT-VII
Reliability analysis of structural components – Reliability based design determination of partial safety factors, code calibration.

UNIT-VIII
Reliability of structural systems application to steel & concrete structures, off shore structures.

REFERENCE BOOKS :

1. PALLE THOFT CHRISTENSEN AND M.J.Baker – Structural Reliability Theory and its application springer – verlag, Berlon Haiderberg, newyork 1982.
2. R.E. Melchers, structural Reliability Analysis and prediction, Elles Harwood, Chisester, England, 1987.
3. A.H.S. Ang and W.H.Tang, Prbability concepts in Engineering planning and design volume II Jhon Wiley, Newyork 1984.
4. Palle Thoft Cristensen and Y.Murotsu applicantion of Structural systems, Reliability theory Springer – Verlog, Berlin 1986.

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(13D35207) EARTHQUAKE RESISTANT STRUCTURES
(Elective-III)

UNIT-I

Engineering seismology :
Earthquake – causes of earthquake – earthquakes and seismic waves – scale and intensity of earthquakes – seismic activity.

UNIT-II
Measurements of earth quakes – seismometer- strong motion accelerograph / field observation of ground motion – analysis of earthquakes waves – earth quake motion – amplification of characteristics of surface layers – earthquake motion on the ground surface.

UNIT-III
Vibration of structures under ground motion:
Elastic vibration of simple structures – modelling of structures and equations of motion – freevibrations of simple structures – steady state forced vibrations – Non steady state forced vibrations – response spectrum representations; Relation between the nature of the ground motion and structural damage.

UNIT-IV
Design approaches: Methods of analysis – selection of analysis – equivalent lateral force procedure seismic base shear – seismic design co-efficient - vertical distribution of seismic forces and horizontal shear – twisting moment - Over turning moment – vertical seismic load and orthogonal effects lateral deflection – P- Δ characteristics effect – soil structure Interaction

UNIT-V
Seismic – Graphs study, earthquake records for design – factors affecting Accelerogram characteristics - artificial Accelerogram – zoning map.

UNIT-VI
Dynamic – analysis procedure: Model analysis – Inelastic – time history analysis Evaluation of the results.

UNIT-VII

Earthquake – Resistant design of structural Components and systems:

Introduction – monolithic reinforced – concrete structures – precast concrete structures – Prestressed concrete structures – steel structures – composite – structures, masonry structures – Timber structures.

UNIT-VIII

Fundamentals of seismic planning: Selection of materials and types of construction form of superstructure – framing systems and seismic units – devices for reducing. Earthquake loads.

REFERENCE BOOKS:

- Design of earthquake resistant structures by Minoru Wakabayashi.
- A.K.Chopra, Strucutural Dynamics for Earthquake Engineering", Pearson Pubilications.
- R.W.Clough and 'Dynamics of structures'. Mc Graw – Hill, 2nd edition,1992.
- N.M Newmark and E.Rosenblueth, Fundamentals of Earthquake Engineering' prentice hall,1971.
- David Key, Earthquake design practice for buildings." Thomas telford,London,1988
- R.L. Wegel, Earthquake Engg; Prentice Hall 12nd edition 1989.
- J.A. Blume, N.M. Newmark, L.H. Corning., Design of Multi –storied Buildings for Earthquake ground motions', Portland Cement Association, Chicago,1961
- I.S.Codes No. 1893,4326,13920.
- Earthquake Resistant Design by Pankaj Agarwal.

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(13D35208) MANAGEMENT INFORMATION SYSTEMS
(Elective-IV)

UNIT-I

Introduction to MIS – Importance of information for management decisions – systems approach and information – System Development –

UNIT-II

Information System Architecture – Quantitative Techniques and Management Information Systems interfacing.

UNIT-III

Physical design of computer sub-systems, database design, file design, input-output and procedure design and system security.

UNIT-IV

MIS development – process – system development – system life cycle method.

UNIT-V

Structured development method, and prototype method – Software development.

UNIT-VI

Information systems – Computers in Management – MIS office automations decision support system – Expert system.

UNIT-VII

Implementation, Evaluation and maintenance of MIS – pitfalls in MIS development.

UNIT-VIII

System modeling for MIS system engineering methodology for MIS problem solving.

REFERENCE BOOKS :

1. Suresh K.Basandra – Computers To day, Glagotia Publishers.
2. R.G.Murdicks – Information systems for management.
3. Elias M.Award – System Analysis and Design
4. A.Senn – Analysis and design information systems.
5. Jerome Kanter – Managing with information, Prentice & Hall.
6. C.S.V.Murthy – Management information systems Text & application
7. Himalaya Publishing house – Mumbai.
8. Gordan Davis – Management Information Systems, Mc Graw – hill Publishers.

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(13D35209) FRACTURE MECHANICS
(Elective-IV)

UNIT-I

Summary of basic problems and concepts:
Introduction - A crack in a structure - The stress at a crack tip - The Griffith criterion The crack opening displacement criterion - Crack Propagation - Closure

UNIT-II

The elastic crack – tip stress field : The Airy stress function - Complex stress functions - Solution to crack problems - The effect of finite size - Special cases - Elliptical cracks - Some useful expressions.

UNIT-III
The crack tip plastic zone: The Irwin plastic zone correction - The Dugdale approach - The shape of the plastic zone - Plane stress versus plane strain - Plastic constraint factor - The thickness effect
UNIT-IV

The energy principle:
The energy release rate - The criterion for crack growth - The crack resistance (R curve) - Compliance , The J integral (Definitions only)
UNIT-V
Plane strain fracture toughness:
The standard test - Size requirements - Non-Linearity – Applicability

UNIT-VI
Plane stress and transitional behaviour:
Introduction - An engineering concept of plane stress - The R curve concept

UNIT-VII

The crack opening displacement criterion:
Fracture beyond general yield - The crack tip opening displacement - The possible use of the CTOD criterion.

UNIT-VIII

Determination of stress intensity factors:
Introduction - Analytical and numerical methods - Finite element methods, Experimental methods (An Ariel views only)

REFERENCE BOOKS:

1. Elementary engineering fracture mechanics - David Broek, Battelle, columbus laboratories, columbus, Ohieo, USA
2. Fracture and Fatigue Control in Structures - John M.Barsom, Senior consultant United states Steel corporation & Stanley T.Rolfe, Ross H.Forney Professor of Engineering University of Kansas. &Stanley T.Rolfe, Ross H.forney Professor of Engineering, University of Kansas

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(13D35210) ADVANCED CONCRETE TECHNOLOGY
(Elective-IV)

UNIT-I

Cements and Admixtures:

A) Portland cement – Chemical composition - Hydration, setting and finenesses of cement – structures of hydrated cement – mechanical strength of cement gel - water held in hydrate cement paste – Heat of hydration of cement –

UNIT-II

B) Influence of compound composition on properties of cement – tests on physical properties of cement – I.S. specifications – Different types of cements – Admixtures.

UNIT-III

Aggregates: Classification of aggregate – particle shape and texture – Bond strength and other mechanical properties of aggregate specific gravity, Bulk density, porosity, absorption and moisture in aggregate – soundness of aggregate – Alkali – aggregate reaction, Thermal properties – sieve analysis – Fineness modulus – grading curves – grading requirements – practical grading – Road note No.4 grading of fine and coarse aggregates gap graded aggregate – maximum aggregate size.

UNIT-IV

Fresh concrete: Workability – factors affecting workability – measurement of workability by different tests – Effect of time and temperature on workability – segregation and bleeding – mixing and vibration of concrete – quality of mixing water.

UNIT-V

Hardened Concrete: Water/cement ratio-Abram's law – Gel space ratio – effective water in mix – Nature of strength of concrete – strength in tension and compression-Griffith's hypothesis – factors affecting strength – autogeneous healing –Relation between

compression and tensile strength – curing and maturity of concrete Influence of temperature on strength – Steam curing – testing of Hardened concrete – compression tests – tension tests – factors affecting strength – flexure tests – splitting tests – Non destructive testing methods.

UNIT-VI

Elasticity, Shrinkage and Creep: Modulus of elasticity – dynamic modulus of elasticity – poisson's ratio – Early volume changes – swelling – Draying shrinkage - Mechanism of shrinkage – factors affecting shrinkage – Differential shrinkage – moisture movement carbonation shrinkage-creep of concrete – factors influencing creep – relation between creep and time – Nature of creep – Effect of creep.

UNIT-VII

Mix Design: Proportioning of concrete mixes by various methods – fineness modulus, trial and error, mix density, Road Note. No. 4, ACI and ISI code methods – factors in the choice of mix proportions – Durability of concrete – quality control of concrete – Statistical methods – High strength concrete mix design.

UNIT-VIII

Special concrete's: Light weight concretes –light weight aggregate concrete- Mix design – Cellular concrete - No fines concrete – High density concrete – Fiber reinforced concrete – Different types of fibers - factories affecting properties of FRC – Applications polymer concrete – types of polymer concrete properties of polymer concrete applications.

REFERENCE BOOKS:

1. Properties of Concrete by A.M.Neville – Pearson publication – 4th edition
2. Concrete Technology by M.S.Shetty. – S.Chand & Co. ; 2004
3. Design of Concrete Mix by Krishna Raju, CBS pubilishers.
4. Concrete: Micro structure, Properties and Materials – P.K.Mehta and J.M.Monteiro, Mc-Graw Hill Publishers
5. Concrete Technology by A.R. Santha Kumar, Oxford university Press, New Delhi
6. Concrete Technology by A.M.Neville – Pearson publication
7. Concrete Technology by M.L. Gambhir. – Tata Mc. Graw Hill Publishers, New Delhi
8. Non-Destructive Test and Evaluation of materials by J.Prasad & C.G.K. Nair , Tata Mcgraw hill Publishers, New Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
M.Tech II semester (CASE)

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(13D35211) CAD LABORATORY – II

1. To draw a line using Bresenhams line algorithm
2. To draw a circle, Ellipse using Bresenhams line algorithm,
3. Reinforcement detailing in beam using graphics.
4. Reinforcement detailing in slabs using graphics.
5. Reinforcement detailing in foundation using graphics.