VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)

Shamshabad - 501 218, Hyderabad

MASTER OF TECHNOLOGY
STRUCTURAL ENGINEERING

ACADEMIC REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR
M.TECH - STRUCTURAL ENGINEERING
UNDER AUTONOMOUS STATUS
FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2013 - 14

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already undergoing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- "Autonomous Institute / College" means an institute / college designated as autonomous institute / college by the Jawaharlal Nehru Technological University, Hyderabad (JNTUH), as per the JNTUH Autonomous College Statutes, 2011.

- "Academic Autonomy" means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.

- "Commission" means University Grants Commission.

- "AICTE" means All India Council for Technical Education.

- "University" the Jawaharlal Nehru Technological University, Hyderabad.

- "College" means Vardhaman College of Engineering, Hyderabad unless indicated otherwise by the context.

- "Program" means:

  Bachelor of Technology (B.Tech) degree program

  UG Degree Program: B.Tech

  PG degree Program: M.Tech

- "Branch" means specialization in a program like M.Tech degree program in Power Electronics and Electrical Drives.

- "Course" or "Subject" means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester. For example, B1801: Advanced Engineering Mathematics, B1802: Theory of Elasticity and Plasticity, etc.

- T – Tutorial, P – Practical, D – Drawing, L - Theory, C - Credits

FOREWORD

The autonomy is conferred on **Vardhaman College of Engineering** by J N T University, Hyderabad based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system** and **monitoring mechanism**, independent of the affiliating University but under its observance.

Vardhaman College of Engineering is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improving upon the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, in accordance with the vision and mission of the college to order to produce a quality engineering graduate to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications needed are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

PRINCIPAL

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

(Permanent Affiliation with JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)

ACADEMIC REGULATIONS

M. Tech. - Regular Two Year Post-Graduate Programme

(For the batches admitted from the academic year 2011–12)

For pursuing Two year degree program of study in Master of Technology (M.Tech.) offered by Vardhaman College of Engineering under Autonomous status and herein after referred to as VCE:

1. APPLICABILITY

All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2011-2012 onwards. Any reference to "College" in these rules and regulations stands for Vardhaman College of Engineering.

2. EXTENT

All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies Principal, Vardhaman College of Engineering shall be the Chairman, Academic Council.

3. PROGRAMS OFFERED

Vardhaman College of Engineering, an autonomous college affiliated to JNTUH, offers the following M.Tech programmes of study leading to the award of M.Tech degree under the autonomous scheme.

S. No	M.Tech Courses	Intake
1	Computer Science and Engineering	36
2	Software Engineering	18
3	Digital Electronics and Communication Systems	36
4	Wireless and Mobile Communications	18
5	Power Electronics and Electrical Drives	18

4. ADMISSION

Admission into first year of Two Year M.Tech Program shall be made subject to the eligibility, qualifications and specialization as per the guidelines prescribed by the APSCHE and AICTE from time to time.

5. DURATION OF THE PROGRAMS

5.1 Normal Duration

M.Tech degree program extends over a period of two academic years leading to the Degree of Master of Technology (M.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

5.2 Maximum Duration

5.2.1 The maximum period within which a student must complete a full-time academic program is 4 years for M.Tech. If a student fails to complete the academic program

within the maximum duration as specified above, he / she will be required to withdraw from the program.

5.2.2 The period is reckoned from the academic year in which the student is admitted first time into the degree programme.

6. SEMESTER STRUCTURE

The College shall follow semester pattern. An academic year shall consist of a first semester and a second semester and the summer term. Each semester shall be of 23 weeks duration and this period includes time for course work, examination preparation, and conduct of examinations. Each semester shall have a minimum of 90 working days. The academic calendar is shown in Table 1 is declared at the start of the semester. The duration for each semester shall be a minimum of 17 weeks of instruction.

Table 1: Academic Calendar

FIRST SEMESTER (23 weeks)	I Spell Instruction Period	: 9 weeks	19 weeks
	I Mid Examinations	: 1 week	
	II Spell Instruction Period	: 8 weeks	
	II Mid Examinations	: 1 Week	
	Preparation & Practical Examinations		2 weeks
	External Examinations		2 weeks
Semester Break			2 weeks
SECOND SEMESTER (23 weeks)	I Spell Instruction Period	: 9 weeks	19 weeks
	I Mid Examinations	: 1 week	
	II Spell Instruction Period	: 8 weeks	
	II Mid Examinations	: 1 Week	
	Preparation & Practical Examinations		2 weeks
	External Examinations		2 weeks
Summer Vacation			4 weeks
THIRD SEMESTER	Project Work Phase – I		18 Weeks
FOURTH SEMESTER	Project Work Phase – II		18 Weeks

7. CREDIT BASED SYSTEM

All the academic programs under autonomy are based on credit system. Credits are assigned based on the following norms:

7.1. The duration of each semester will normally be 23 weeks with 5 days a week. A working day shall have 6 periods each of 60 minutes duration.

- 1 credit per lecture period per week
- 2 credits for three (or more) period hours of practical's
- 2 credits for technical seminar
- 4 credits for comprehensive viva examination
- 18 credits for project work phase – I
- 22 credits for project work phase – II

7.2. The two year curriculum of any M.Tech programme of study shall have total of 88 credits. The exact requirements of credits for each course will be as recommended by the Board of Studies concerned and approved by the Academic Council.

7.3. For courses like technical seminar / comprehensive viva / Project Work Phases – I and II, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

8. METHOD OF EVALUATION

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

8.1 Theory

For all lecture based theory courses, the evaluation shall be for 40 marks through internal evaluation and 60 marks through external end semester examination of three hours duration.

8.1.1. Internal evaluation

For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of subjective test. The subjective test is for 40 marks, with duration of 2 hours. The Mid-Term Examination question paper shall be set with **six** questions out of which **four** are to be answered. All questions carry equal marks.

First midterm examination shall be conducted for I – IV units of syllabus and second midterm examination shall be conducted for the remaining portion.

The internal marks shall be computed as the average of the two internal evaluations, of two subjective tests.

8.1.2. External Evaluation

The question paper shall be set externally and valued both internally and externally. The external end semester examination question paper in theory subjects will be for a maximum of 60 marks to be answered in three hours duration. For End-Semester examination, the candidate has to answer any five out of eight questions. Each question carries 12 marks. Each theory course shall consist of eight units of syllabus.

8.2. Practicals

Practicals shall be evaluated for 100 marks, out of which 60 marks are for external examination and 40 marks are for internal evaluation. The 40 internal marks are distributed as 25 marks for day-to-day work and 15 marks for internal examination. The external end - examination shall be conducted by the teacher concerned and an external examiner from outside the college.

8.3. Technical Seminar

The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

8.4. Comprehensive Viva

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. This is aimed at assessing the student's understanding of various subjects studied during the entire program. The comprehensive viva shall be evaluated for 50 marks at the end of III semester. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

8.5. Project Work

The project work shall be evaluated for 200 marks out of which 50 marks for phase – I internal evaluation, 50 marks for phase – II internal evaluation and 100 marks for end semester evaluation. A minimum of 50% of marks on the aggregate in the internal evaluation and external end-evaluation taken together shall be obtained to earn the corresponding credits.

Every candidate is required to submit dissertation after taking up a topic approved by the Departmental Committee. The project work shall be spread over in III semester and in IV semester. The project work shall be somewhat innovative in nature, exploring the research bent of mind of the student.

The Departmental Committee (DC) consists of HOD, Supervisor and two senior experts in the department. The committee monitors the progress of Project Work. The DC is constituted by the Principal on the recommendations of the department Head.

Student shall register for the Project work with the approval of Departmental Committee in the III Semester and continue the work in the IV Semester too. The Departmental Committee (DC) shall monitor the progress of the project work. In III Semester, Phase – I of the Project Work is to be completed. A Student has to identify the topic of work, collect relevant Literature, preliminary data, implementation tools / methodologies etc., and perform a critical study and analysis of the problem identified. He shall submit status report in two different phases in addition to oral presentation before the Departmental Committee for evaluation and award of 50 internal marks at the end of Phase – I.

A candidate shall continue the Project Work in IV Semester (Phase – II) and submit a Project report at the end of Phase – II after approval of the Departmental Committee. During Phase -II, the student shall submit status report in two different phases, in addition to oral presentation before the DC. The DC shall evaluate the project for 50 internal marks based on the progress, presentations and quality of work.

A candidate shall be allowed to submit the dissertation only after passing all the courses of I and II semesters with the approval of Departmental Committee not earlier than **40 weeks** from the date of registration of the project work and then take viva-voce examination. The viva-voce examination may be conducted once in three months for all the eligible candidates.

Three copies of the dissertation certified in the prescribed form by the supervisor and HOD shall be presented to the Department and one copy is to be submitted to the Controller of Examinations, VCE and one copy to be sent to the examiner.

The department shall submit a panel of three experts for a maximum of 5 students at a time. However, the examiners for conducting viva-voce examination shall be nominated by the Controller of Examinations, VCE. 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 dissertation. The board shall jointly evaluate the project work for 100 marks. The candidates who fail in viva-voce examinations shall have to re-appear the viva-voce examination after three months. If he fails again in the second viva-voce examination, the candidate has to re-register for the Project Work.

If a candidate desires to change the topic of the project already chosen during Phase – I, he has to re-register for Project work with the approval of the DC and repeat Phases – I and II. Marks already earned in Phase – I stand cancelled.

9. ATTENDANCE REQUIREMENTS TO APPEAR FOR THE SEMESTER-END EXAMINATION

9.1. A student shall be eligible to appear for semester-end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

9.2. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

9.3. Shortage of attendance below 65% in aggregate shall in no case be condoned.

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

9.5. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current semester. The student may seek readmission for the semester when offered next. He will not be allowed to register for the subjects of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

9.6. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

9.7. Attendance may also be condoned as per the recommendations of academic council for those who participate in prestigious sports, co-curricular and extra-curricular activities provided as per the Govt. of AP norms in vogue.

10. ACADEMIC REQUIREMENTS FOR PROMOTION / COMPLETION OF REGULAR M.TECH PROGRAMME OF STUDY

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion / completion of regular M.Tech programme of study.

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, and practical, if he secures not less than 40% of marks in the semester-end examination and a minimum of 50% of marks in the sum of the internal evaluation and semester - end examination taken together.

ii. In case of technical seminar and comprehensive viva a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if he/she secures not less than 50% of marks.

iii. In case of project work, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted if he/she secures not less than 50% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.

iv. A student shall register for all the 88 credits and earn all the 88 credits. Marks obtained in all the 88 credits shall be considered for the award of the class based on aggregate of marks.

v. A student who fails to earn 88 credits as indicated in the course structure within **FOUR** academic years from the year of their admission shall forfeit their seat in M.Tech programme and their admission stands cancelled.

vi. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

11. EVALUATION

Following procedure governs the evaluation

11.1. Marks for components evaluated internally by the faculty should be submitted to the Controller of Examinations one week before the commencement of the semester-end examinations. The marks for the internal evaluation components will be added to the

external evaluation marks secured in the semester-end examinations, to arrive at total marks for any subject in that semester.

11.2. Performance in all the courses is tabulated course-wise and will be scrutinized by the Examination Committee and moderation is applied if needed, based on the recommendations of moderation committee and course-wise marks lists are finalized.

11.3. Student-wise tabulation is done and student-wise memorandum of marks is generated which is issued to the student.

12. SUPPLEMENTARY EXAMINATION

Supplementary examinations for the odd semester shall be conducted with the regular examinations of even semester and vice versa, for those who appeared and failed in regular examinations. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

13. RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL

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

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

13.2. A candidate shall be given one chance for a maximum of Three Theory subjects for Improvement of Internal evaluation marks for which the candidate has to re-register for the chosen subjects and fulfill the academic requirements.

13.3. 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 Principal, Vardhaman College of Engineering payable at Hyderabad along with the requisition through the concerned Head of the Department.

13.4. 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 re-registered subjects stand cancelled.

14. PERSONAL VERIFICATION

Students shall be permitted for personal verification of the semester-end examination answer scripts within a stipulated period after payment of prescribed fee.

15. TRANSITORY REGULATIONS

Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of four years for the award of M.Tech Degree.

16. TRANSCRIPTS

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued upto any point of study to a student on request, after payment of requisite fee.

17. AWARD OF DEGREE

The degree will be conferred and awarded by Jawaharlal Nehru Technological University, Hyderabad on the recommendations of the Chairman, Academic Council.

17.1. Eligibility

A student shall be eligible for the award of M.Tech. Degree, if he fulfills all the following conditions:

i. Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.

ii. Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.

iii. Obtained not less than 50% of marks (minimum requirement for declaring as passed).

iv. Has no dues to the college, hostel, and library etc. and to any other amenities provided by the College.

v. No disciplinary action is pending against him.

17.2. Award of Class

Declaration of Class is based on percentage of marks to be secured

After a student has satisfied the requirement prescribed for the completion of the programme and is eligible for the award of M.Tech. Degree he shall be placed in one of the following four classes Shown in Table 4:

Table 4: Declaration of Class is based on percentage of marks to be secured

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for the 88 Credits.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Fail	Below 50%	

Sometimes, it is necessary to provide equivalence of percentages and/or *Class* awarded with *Grade Point Average (GPA).* This shall be done by prescribing certain specific thresholds in averages for *Distinction, First Class and Second Class,* as in Table 5.

Table 5: Percentage Equivalence of *Grade Points* (For a 10-Point Scale)

Grade Point	Percentage of Marks / Class
5.75	50 (Second Class)
6.25	55
6.75	60 *(First Class)*
7.25	65
7.75	70 *(First Class with Distinction)*
8.25	75

18. REGISTRATION

Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the Academic Calendar. It is absolutely compulsory for the student to register for courses in time.

19. TERMINATION FROM THE PROGRAM

The admission of a student to the program may be terminated and the student is asked to leave the college in the following circumstances:

i. The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.

ii. The student fails to satisfy the norms of discipline specified by the institute from time to time.

20. CURRICULUM

20.1. For each program being offered by the Institute, a Board of Studies (BOS) is constituted in accordance with AICTE / UGC / JNTUH statutes.

20.2. The BOS for a program is completely responsible for designing the curriculum once in three years for that program.

21. WITH-HOLDING OF RESULTS

If the candidate has not paid any dues to the college / if any case of indiscipline / malpractice is pending against him, the results of the candidate will be withheld. The issue of the degree is liable to be withheld in such cases.

22. GRIEVANCES REDRESSAL COMMITTEE

"Grievance and Redressal Committee" (General) constituted by the principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters. The composition of the complaints cum redressal committee shall be:

Headed by Senior Faculty member
Heads of all departments
A senior lady staff member from each department (if available)

The committee constituted shall submit a report to the principal of the college, the penalty to be imposed. The Principal upon receipt of the report from the committee shall, after giving an opportunity of being heard to the person complained against, submit the case with the committee's recommendation to the Governing Body of the college. The Governing Body shall confirm with or without modification the penalty recommended after duly following the prescribed procedure.

23. MALPRACTICE PREVENTION COMMITTEE

A malpractice prevention committee shall be constituted to examine and punish the students who does malpractice / behaves indiscipline in examinations. The committee shall consist of:

Principal
Subject expert of which the subject belongs to
Head of the department of which the student belongs to
The invigilator concerned
In-charge Examination branch of the college

The committee constituted shall conduct the meeting on the same day of examination or latest by next working day to the incidence and punish the student as per the guidelines prescribed by the J N T University, Hyderabad from time to time.

Any action on the part of candidate at the examination like trying to get undue advantage in the performance at examinations or trying to help another, or derive the same through unfair means is punishable according to the provisions contained hereunder. The involvement of the Staff, who are in charge of conducting examinations, valuing examination papers and preparing / keeping records of documents relating to the examinations in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examination shall be viewed seriously and recommended for award of appropriate punishment after thorough enquiry.

24. AMENDMENTS TO REGULATIONS

The Academic Council of Vardhaman College of Engineering reserves the right to revise, amend, or change the regulations, scheme of examinations, and / or syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

25. STUDENTS' FEEDBACK

It is necessary for the Colleges to obtain feedback from students on their course work and various academic activities conducted. For this purpose, suitable feedback forms shall be devised by the College and the feedback obtained from the students regularly in confidence, by administering the feedback form in print or on-line in electronic form.

The feedback received from the students shall be discussed at various levels of decision making at the College and the changes/ improvements, if any, suggested shall be given due consideration for implementation.

26. GRADUATION DAY

The College shall have its own annual *Graduation Day* for the award of Degrees to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute.

The College shall institute Prizes and Awards to meritorious students, for being given away annually at the *Graduation Day.* This will greatly encourage the students to strive for excellence in their academic work.

27. AWARD OF A RANK UNDER AUTONOMOUS SCHEME

27.1. One (1) Merit Rank will be declared only for those students who have been directly admitted in VCE under Autonomous Regulations and complete the entire course in VCE only within the minimum possible prescribed time limit, i.e., 2 years for M.Tech.

27.2. A student shall be eligible for a merit rank at the time of award of degree in each branch of Master of Technology, provided the student has passed all subjects prescribed for the particular degree program in first attempt only.

27.3. Award of prizes, scholarships, or any other Honours shall be based on the rank secured by a candidate, consistent with the guidelines of the Donor, wherever applicable.

28. CONDUCT AND DISCIPLINE

28.1 Each student shall conduct himself / herself in a manner befitting his / her association with VCE.

28.2 He / she is expected not to indulge in any activity, which is likely to bring disrepute to the college.

28.3 He / she should show due respect and courtesy to the teachers, administrators, officers and employees of the college and maintain cordial relationships with fellow students.

28.4 Lack of courtesy and decorum unbecoming of a student (both inside and outside the college), wilful damage or removal of Institute's property or belongings of fellow students, disturbing others in their studies, adoption of unfair means during examinations, breach of rules and regulations of the Institute, noisy and unruly behaviour and similar other undesirable activities shall constitute violation of code of conduct for the student.

28.5 **Ragging in any form is strictly prohibited and is considered a serious offence. It will lead to the expulsion of the offender from the college.**

28.6 Violation of code of conduct shall invite disciplinary action which may include punishment such as reprimand, disciplinary probation, debarring from the examination, withdrawal of placement services, withholding of grades / degrees, cancellation of registration, etc., and even expulsion from the college.

28.7 Principal, based on the reports of the warden of Institute hostel, can reprimand, impose fine or take any other suitable measures against an inmate who violates either the code of conduct or rules and regulations pertaining to college hostel.

28.8 A student may be denied the award of degree / certificate even though he / she have satisfactorily completed all the academic requirements if the student is found guilty of offences warranting such an action.

28.9 Attendance is not given to the student during the suspension period.

29. OTHER ISSUES

The quality and standard of engineering professionals are closely linked with the level of the technical education system. As it is now recognized that these features are essential to develop the intellectual skills and knowledge of these professionals for being able to contribute to the society through productive and satisfying careers as *innovators, decision makers and/or leaders* in the global economy of the 21st century, it becomes necessary that certain improvements are introduced at different stages of their education system. These include:

i. Selective admission of students to a programme, so that merit and aptitude for the chosen technical branch or specialization are given due consideration.

ii. Faculty recruitment and orientation, so that qualified teachers trained in good teaching methods, technical leadership and students' motivation are available.

iii. Instructional/Laboratory facilities and related physical infrastructure, so that they are adequate and are at the contemporary level.

iv. Access to good library resources and Information & Communication Technology **(ICT)** facilities, to develop the student's *mind* effectively.

These requirements make it necessary for the College to introduce improvements like:

i. Teaching-learning process on modern lines, to provide *Add-On* Courses for *audit*/credit in a number of peripheral areas useful for students' self development.

ii. Life-long learning opportunities for faculty, students and alumni, to facilitate their dynamic interaction with the society, industries and the world of work.

iii. Generous use of ICT and other modern technologies in everyday activities.

30. GENERAL

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

Note: Failure to read and understand the regulations is not an excuse.

COURSE STRUCTURE

M. TECH - STRUCTURAL ENGINEERING

REGULATIONS: VCE - R11

I SEMESTER							
Code	Subject	Periods per Week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1801	Advanced Engineering Mathematics	3	-	3	40	60	100
B1802	Theory of Elasticity and Plasticity	3	-	3	40	60	100
B1803	Finite Element Analysis	3	-	3	40	60	100
B1804	Advanced Structural Analysis	3	-	3	40	60	100
PROFESSIONAL ELECTIVE - I		3	-	3	40	60	100
PROFESSIONAL ELECTIVE - II		3	-	3	40	60	100
B1811	Advanced Concrete Laboratory	-	3	2	40	60	100
B1812	Technical Seminar	-	-	2	50	-	50
TOTAL		**18**	**03**	**22**	**330**	**420**	**750**
II SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1813	Analysis and Design of Shells and Folded Plates	3	-	3	40	60	100
B1814	Structural Dynamics	3	-	3	40	60	100
B1815	Advanced Steel Structures Design	3	-	3	40	60	100
B1816	Advanced Reinforced Concrete Design	3	-	3	40	60	100
PROFESSIONAL ELECTIVE - III		3	-	3	40	60	100
PROFESSIONAL ELECTIVE - IV		3	-	3	40	60	100
B1823	Computer Applications in Structural Engineering Laboratory	-	3	2	40	60	100
B1824	Technical Seminar	-	-	2	50	-	50
TOTAL		**18**	**03**	**22**	**330**	**420**	**750**
III SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1825	Comprehensive Viva	-	-	4	-	50	50
B1826	Project Work Phase - I	-	-	18	50	-	50
TOTAL		**-**	**-**	**22**	**50**	**50**	**100**
IV SEMESTER							
Code	Subject	Periods per week		Credits	Scheme of Examination Maximum Marks		
		L	P		Internal	External	Total
B1827	Project Work Phase - II	-	-	22	50	100	150
TOTAL		**-**	**-**	**22**	**50**	**100**	**150**

M. TECH - STRUCTURAL ENGINEERING

REGULATIONS: VCE - R11

ELECTIVES	
PROFESSIONAL ELECTIVE - I	
Code	**Subject**
B1805	Advanced Concrete Technology
B1806	Optimization Techniques in Structural Engineering
B1807	Construction Project Management
PROFESSIONAL ELECTIVE - II	
B1808	Earth Quake Resistant Design of Buildings
B1809	Theory and Applications of Cement Composites
B1810	Experimental Stress Analysis
PROFESSIONAL ELECTIVE - III	
B1817	Low Cost Housing Techniques
B1818	Advanced Pre Stressed Concrete Design
B1819	Bridge Engineering
PROFESSIONAL ELECTIVE - IV	
B1820	Plastic Analysis
B1821	Stability of Structures
B1822	Rehabilitation and Retrofitting of Concrete Structures

SYLLABI FOR I SEMESTER

M. Tech. ST I SEMESTER

ADVANCED ENGINEERING MATHEMATICS

Course Code: B1801

L	P	C
3	-	3

UNIT - I

SOLUTIONS OF LINEAR EQUATIONS: direct method, Cramer's rule, Guass, Elimination method, Guass¸ Jordan elimination, Triangulation (LU decomposition) method, Iterative methods Jacobi – Iteration method, Gauss, Siedel iteration Successive over, relaxation method.

UUNIT - II

EIGEN VALUES AND EIGEN VECTORS: Jacobi method for symmetric matrices, given's method for symmetric matrices, Householder's method for symmetric matrices, Rutishauser method of arbitrary matrices, power method.

UNIT - III

INTERPOLATION: Linear interpolation, higher order interaction, Lagrange interpolation, interpolating polynomials using finites differences, Hermite interpolation, piece, wise and spline interpolation.

UNIT - IV

FINITE DIFFERENCE AND THEIR APPLICATIONS: introduction, differentiation formulas by interpolating parabolas backward and forward and central differences, derivation of differentiation formulas using Taylor series, Boundary conditions, Beam deflection, solution of characteristic value problems, Richardson's extrapolation, Use of unevenly spaced pivotal points, integration formulas by interpolating parabolas, Numerical solution to spatial differential equations.

UNIT - VI

NUMERICAL DIFFERENTIATION: Difference methods based on undetermined coefficients optimum choice of step length, partial differentiation.

UNIT - VII

NUMERICAL INTEGRATION: Methods based on interpolation, method based on undetermined coefficient, Gauss, Lagrange method, Radaua integration method, composite integration method, Double integration using Trapezoidal and Simpson's method.

UNIT - VIII

ORDINARY DIFFERENTIAL EQUATION: Euler's method, Backward Euler method, Midpoint method, single step method, Taylor series method, Boundary value problems.

TEXT BOOKS:

1. M.K. Jain, S.R.K. lyengar, R.K. Jain (1996), *Numerical Methods for Scientific and Engineering Computations,* Willey Eastern Limited, New Delhi, India.
2. S.S. Shastry (2005), *Numerical Methods,* PHI learning Pvt. Ltd., India.

REFERENCE BOOKS:

1. Curtis l. Gerald and Patrick O. Wheatly (2003), *Applied Numerical Analysis,* Addission Wasley – Published campus, US.
2. Steven c. Chopra Raymond P. Canal (2001), *Numerical Methods for Engineers,* 6th edition, Mc. Graw Hill book Company, New York.
3. C. Xavier (2007), *C Language and Numerical Methods*, New Age International, India.

M. Tech. ST I SEMESTER

THEORY OF ELASTICITY AND PLASTICITY

Course Code: B1802

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Elasticity, notation for forces and stress, components of stresses, components of strain, Hooks law. Plane stress and plane strain analysis, plane stress, plane strain, differential equations of equilibrium, boundary conditions, compatibility equations, stress function, boundary condition.

UNIT - II

TWO DIMENSIONAL PROBLEMS IN RECTANGULAR COORDINATES: Two dimensional problems in solution by polynomials, Saint-Venant's principle, determination of displacements, bending of simple beams, application of corier series for two dimensional problems, gravity loading.

UNIT - III

TWO DIMENSIONAL PROBLEMS IN POLAR COORDINATES: 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 coordinates, application of general solution in polar coordinates.

UNIT - IV

ANALYSIS OF STRESS AND STRAIN IN THREE DIMENSIONS: Principal stress, stress ellipsoid, director surface, determinations of principal stresses, maximum shear stresses, homogeneous deformation, principal axes of strain rotation.

UNIT - V

GENERAL THEOREMS: Differential equations of equilibrium, conditions of compatibility, determination of displacement, equations of equilibrium in terms of displacements, principle of super position, uniqueness of solution, the reciprocal theorem.

UNIT - VI

TORSION OF PRISMATIC BARS: Torsion of prismatic bars, bars with elliptical cross section, other elementary solution, membrane analogy, torsion of rectangular bars, solution of torsional problems by energy method, use of soap films in solving torsion problems, hydro dynamical analogies, torsion of shafts, tubes, bars etc.

UNIT - VII

BENDING OF PRISMATIC BARS: Stress function, bending of cantilever, circular cross section, elliptical cross section, rectangular cross section, bending problems by soap film method, displacements.

UNIT - VIII

THEORY OF PLASTICITY: Introduction, Concepts and assumption, yield criterions.

TEXT BOOKS:

1. Timoshenko (2009*), Theory of Elasticity*, 3rd Edition, McGraw Hill Publications, New Delhi, India.
2. Sadhu Singh (2003), *Theory of Elasticity*, Khanna Publishers, New Delhi, India.

REFERENCE BOOKS:

1. Y. C. Fung J.Chakrabarthy (2006), *Theory of Plasticity*, McGraw Hill Publications, New Delhi, India.
2. Kazimi S.M.A. (2001), *Solid Mechanics,* Tata McGraw Hill Publications, New Delhi, India.

M. Tech. ST I SEMESTER

FINITE ELEMENT ANALYSIS

Course Code: B1803

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Concepts of FEM, Steps involved, Merits and demerits, Energy principles, Discretization, Rayleigh, Ritz method of functional approximation.

UNIT - II

PRINCIPLES OF ELASTICITY: 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 1-D elements, Static condensation of global stiffness matrix, Solution, Initial strain and temperature effects.

UNIT - IV

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 - V

ISOPARAMETRIC FORMULATION: Concept, Different isoparametric elements for 2-D analysis, Formulation of 4-noded and 8-noded isoparametric quadrilateral elements, Lagrangian elements, Serendipity elements.

UNIT - VI

AXI SYMMETRIC ANALYSIS: Bodies of revolution, Axi symmetric modeling, Strain displacement relationship, Formulation of axi symmetric elements.

UNIT - VII

THREE DIMENSIONAL FEM: Different 3-D elements, 3-D strain, displacement relationship, Formation of hexahedral and isoparametric solid element.

UNIT - VIII

FINITE ELEMENT ANALYSIS OF PLATES: Basic theory of plate bending, thin plate theory, Stress resultants, Mindlin's approximations, Formulation of 4-noded isoparametric quadrilateral plate element.

TEXT BOOKS:

1. Robert D. Cook, David S. Malcus and Micheal E. Plesha (2002), *Concepts and Applications of Finite Element Analysis,* John Wiley and Sons, India.
2. Tirupathi Chandra Patila and Belugunudu (2002), *Introduction to Finite Element Methods*, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:

1. O. C. Zienkiewicz, RL Taylor (2005), *Finite Element Methods*, 6th Edition, Butterworth-Heinemann & McGraw Hill, India.
2. J. N. Reddy (2006), *Introduction to Finite Element Methods*, 3rd Edition, Tata McGraw Hill, India
3. Gallagher R.H. & Wilson (1975), *Finite Element Analysis Fundamentals*, Prentice Hall Inc., India.

M. Tech. ST I SEMESTER

ADVANCED STRUCTURAL ANALYSIS

Course Code: B1804

L	P	C
3	-	3

UNIT - I

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

ANALYSIS OF CONTINUOUS BEAMS: Stiffness method and flexibility method of analysis, Continuous beams of two and three spans with different end conditions.

UNIT - IV

ANALYSIS OF TWO - DIMENSIONAL PIN JOINTED TRUSSES: Stiffness and flexibility methods, Computation of joint displacement and member forces.

UNIT - V

ANALYSIS OF TWO - DIMENSIONAL PORTAL FRAMES: Stiffness and flexibility method of analysis of 2-D portal frames with different end conditions, plotting of bending moment diagrams.

UNIT - VI

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 - VII

EQUATION SOLUTION TECHNIQUES: Solution of system of linear algebraic equations, Direct inversion method, Gauss elimination method, Cholesky method, Banded equation solvers, Frontal solution technique.

UNIT - VIII

PLASTIC ANALYSIS: Introduction, Idealized stress, Strain diagram, shape factors for various sections. Moment curvature relationship, ultimate moment, Plastic hinge, lower and upper bound theorems, ultimate strength of fixed and continuous beams.

TEXT BOOKS:

1. C. S. Reddy (2011), *Structural Analysis*, 3rd Edition, Tata McGraw Hill, India.
2. Pandit and Gupta (2007), *Structural Analysis - A Matrix Approach*, Tata McGraw Hill, India.

REFERENCE BOOKS:

1. C. K. Wang (1983), *Intermediate Structural Analysis*, McGraw Hill Ryerson, New York.
2. R. C. Hibbeler (2008), *Structural Analysis,* 6th Edition, Pearson Education, India.
3. J. Meek (1971), *Matrix Methods of Structural Analysis*, McGraw Hill, India.

M. Tech. ST I SEMESTER

ADVANCED CONCRETE TECHNOLOGY
(Professional Elective - I)

Course Code: B1805

L	P	C
3	-	3

UNIT - I

CEMENT: Chemical composition, Bogues compounds, heat of hydration, influence of compound composition on properties of cement, admixtures, minal and chemical admixtures, dosage, admixtures of RMC and HCC, latest generation admixtures.

UNIT - II

ADMIXTURES: Classification of aggregate, particle shape and texture, gradation, fineness modules, grading curves, gap graded aggregates, combined grading, alkali aggregate reaction, soundness of aggregate.

UNIT - III

FRESH CONCRETE: Workability, factors affecting workability, measurement of workability, effect of time and temperature on work, segregation and bleeding, mixing of setting times of concrete, steps in manufacture of concrete, curing of concrete, Abram's law, gel/space ratio, maturity concept, effective water in mix.

UNIT - IV

HARDENED CONCRETE: Strength in compression and tension, testing of hardness of concrete, modulus of elastics, shrinkage and creep of concrete, rehology of creep, non-destructive and semi-destructive testing of concrete, and durability of concrete.

UNIT - V

QUALITY CONTROL OF CONCRETE: Quality assurance, quality management and quality audit, statistical quality control, acceptance criteria, codal provisions.

UNIT - VI

CONCRETE MIX-DESIGN: Design of mixes by BIS method, ACI method, Entroy and Shaklok method.

UNIT - VII

SPECIAL CONCRETE: Light weight concrete mix design, fiber reinforced concrete, SCC, SFRC and GFRC.

UNIT - VIII

SMART CONCRETE: Use of sensors, building instrumentation.

TEXT BOOKS:

1. M. S. Shetty (2005), *Concrete Technology,* S. Chand and Co., India.
2. A. K. Santha kumar (2012), *Concrete Technology,* Oxford Press, India.

REFERENCE BOOKS:

1. A. M. Neville (1987), *Properties of Concrete*, ELBS Publications, East Sussex.
2. N. Krishna Raju (1983), *Design of Concrete Mixes*, CBS Publications, India.
3. M. L. Gambhir (2006), *Concrete Technology,* 3rd Edition, Tata McGraw Hill, India
4. P. Mehata and Monterio (2005), *Concrete: Microstructure*, *Properties and Materials*, 4th Edition, McGraw Hill Publications, India.

M. Tech. ST I SEMESTER

OPTIMIZATION TECHNIQUES IN STRUCTURAL ENGINEERING

(Professional Elective - I)

Course Code: : B1806

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO OPTIMIZATION: Introduction, Historical developments, engineering application of Optimization, Statement of an optimization problem, Classification of Optimization problems, Optimization Techniques.

UNIT - II

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 in equality constraints, The generalized Newton-Raphson method.

UNIT - III

LINEAR PROGRAMMING: Introduction, Applications to 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 - IV

NON-LINEAR PROGRAMMING: Introduction, Unimodal function, Unrestricted search, Exhaustive search, Dichotomous search, Interval Halving method, Fibonacci method, Golden section method, Comparison of elimination methods.

UNIT - V

UNCONSTRAINED OPTIMIZATION TECHNIQUES: Direct search methods, Random search methods-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 - VI

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 problem, Additional applications.

UNIT - VII

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.

UNIT - VIII

APPLICATION OF OPTIMIZATION TECHNIQUES: Trusses, Beams and Frames.

TEXT BOOKS:

1. S. S. Rao (1984), *Optimization: Theory and Applications,* John Willey & Sons, India.
2. UriKirsch (1981), *Optimum Structural Design*, McGraw-Hill Inc., USA.

REFERENCE BOOKS:

1. R. T. Haftka and Z. Gurdal (1992), *Elements of Structural Optimization*, 3rd Edition, Kluwer Academic Publishers, India.
2. G. N. Vanderplaats (1984), *Numerical Optimization Techniques for Engineering Design with applications,* McGraw-Hill Ryerson, India.
3. J. S. Arora (2004), *Introduction to Optimum Design*, 2nd Edition, Elsevier Academic Press, India.
4. Leoynord Spunt (1971), *Optimum Structural Design*, *Civil Engineering and Engineering Mechanics*, PHI, India.
5. Richard Bronson and Govindasami Naadimuthu (1997), *Operations Research*, 2nd Edition, McGraw Hill Ltd., New York.

M. Tech. ST I SEMESTER

CONSTRUCTION PROJECT MANAGEMENT

(Professional Elective - I)

Course Code: : B1807

L	P	C
3	-	3

UNIT - I

CONCEPT OF A PROJECT: Characteristic features, Project life cycle, Phases, Project Management, Effects of project risks on organization, Organization of project participants, Traditional designer, Construction sequence, Professional construction management, Owner -builder Operation, Turnkey operation.

UNIT - II

LEADERSHIP AND MOTIVATION FOR THE PROJECT TEAM: Interpersonal behaviour in project organizations, Perceptions of owners and contractors.

UNIT - III

QUALITY AND SAFETY CONCERNS IN CONSTRUCTION: Organizing for quality and safety, Work and material specifications, Total quality control, Quality control by statistical methods, Statistical quality control with sampling by attributes, Statistical quality control with sampling by variables, Safety.

UNIT - IV

NETWORK TECHNIQUES: Bar charts, Critical path method, Programme evaluation and review technique, Time estimates, Uncertainties of time, Time computations, Monitoring of projects, Updating, Crashing and time, Cost tradeoff.

UNIT - V

OPTIMIZATION TECHNIQUES: Resource allocation, Heuristic approach, Linear programming, Graphical and simplex methods, Optimality analysis, Material transportation and Work assignment problems, Materials management , Planning and budgeting, Inventory control, Management of surplus materials, Equipment control, Process control, Work study, Crew size, Job layout, Process operation.

UNIT - VI

COST CONTROL PROBLEM: Project budget, Forecasting for activity cost control, Financial accounting systems and cost accounts, Control of project cash flows, Schedule control, Schedule and budget updates, Relating cost and schedule information.

UNIT - VII

COSTS ASSOCIATED WITH CONSTRUCTION FACILITIES: Approaches to cost estimation, Type of construction cost estimates, Effects of scale on construction cost, Unit cost method of estimation, Methods for allocation of Joint costs, Historical cost data.

UNIT - VIII

COST INDICES: Applications of cost indices to estimating, Estimate based on engineer's list of quantities, Allocation of construction costs over time, Computer aided cost estimation, Estimation of operating costs.

TEXT BOOKS:

1. Prasanna Chandra (2009), *Project Planning Analysis, Selection, Implementation and Review,* 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, India.
2. Peurifoy (2010), C*onstruction Planning, Equipment and Methods,* Tata McGraw Hill, India.

REFERENCE BOOKS:

1. Feigenbaum. L. (2001), *Construction Scheduling with Primavera Project Planner*, 2nd Edition, PHI, India
2. Halpin, D. W. (2009), *Financial and Cost Concepts for Construction Management*, John Wiley & Sons, New York.
3. Choudhury. S. (1989), *Project Management*, Tata McGraw Hill Publishing Company, New Delhi, India.
4. A. K. Datta (2006), *Materials Management*, 2nd Edition, Prentice Hall, India.
5. Arnold. J. R. Tony (2010), *Introduction to Materials Management*, 6th Edition, Prentice Hall of India.

M. Tech. ST I SEMESTER

EARTH QUAKE RESISTANT DESIGN OF BUILDINGS

(Professional Elective - II)

Course Code: : B1808

L	P	C
3	-	3

UNIT - I

ENGINEERING SEISMOLOGY: Earthquake phenomenon, causes of earthquakes, faults-plate tectonics, seismic waves, Terms associated with earthquakes, magnitude/intensity of an earthquake, scales, Energy released, Earthquake measuring instruments, Sesimoscope, Sesimograph, accelerograph, Characteristics of strong ground motions, seismic zones of India.

UNIT - II

CONCEPTUAL DESIGN: Introduction, functional planning, Continuous load path, overall form, simplicity and symmetric, elongated shapes, stiffness and strength, Horizontal and vertical members, Twisting of buildings, Ductility definition, ductility relationships, flexible buildings, framing systems, choice of construction materials, unconfined concrete, confined concrete, masonry-reinforcing steel.

UNIT - III

INTRODUCTION TO EARTHQUAKE RESISTANT DESIGN: Seismic design requirements, regular and irregular configurations, basic assumptions, design earthquake loads, basic load combinations, permissible stresses, seismic methods of analysis, factors in seismic analysis, equivalent lateral force method, dynamic analysis, response spectrum method, time history method.

UNIT - IV

REINFORCED CONCRETE BUILDING: Principles of earth quake resistant design of RC members, structural models for frame buildings, seismic method of analysis, seismic design methods, IS codes based methods for seismic design, seismic evaluation and retrofitting, vertical irregularities, plan configuration problems, lateral load resisting systems, determination of design lateral forces, equivalent lateral force procedure, lateral distribution of base shear.

UNIT - V

MASONRY BUILDINGS: Introduction, elastic properties of masonry assemblage, categories of masonry buildings, behavior of unreinforced and reinforced masonry walls, behavior of walls, box action and bands, behavior of infill walls, improving seismic behavior of masonry buildings, load combinations and permissible stresses, seismic design requirements, lateral load analysis of masonry buildings.

UNIT - VI

STRUCTURAL WALLS AND NON-STRUCTURAL ELEMENTS: Strategies in the location of structural walls, sectional shapes, variations in elevation, cantilever walls without openings, failure mechanism of non-structures, effects of non-structural elements on structural system, analysis of non-structural elements, prevention of non-structural damage, isolation of non-structures.

UNIT - VII

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 earthquakes.

UNIT - VIII

CAPACITY BASED DESIGN: Introduction to capacity design, capacity design for beams and columns, case studies.

TEXT BOOKS:

1. Pankaj Agarwal and Manish Shrikhande (2006), *Earthquake Resistant Design of Structures,* Prentice Hall Of India.
2. S. K. Duggal (2007), *Earthquake Resistant Design of Structures,* Oxford University Press, India.

REFERENCE BOOKS:

1. T. Paulay and M.J.N. Priestly (1992), *Seismic Design of Reinforced Concrete and Masonry Building*, 1st Edition, John Willey & sons, India.
2. Anand S. Arya (1978), *Masonry and Timber Structures Including Earthquake Resistant Design*, Nem Chand and Bros, Roorkey, India.
3. Meha Tomazevic (1999)*, Earthquake Resistant Design of Masonry Building,* Imperial College Press, London.
4. C.V.R.Murthy (2005), *Earthquake Tips- Learning Earthquake Design and Construction*, National Information Centre of Earthquake Engineering, IITK.

M. Tech. ST I SEMESTER

THEORY AND APPLICATIONS OF CEMENT COMPOSITES

(Professional Elective - II)

Course Code: : B1809

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Classification and characteristics of composite materials, Basic terminology, Advantages.

UNIT - II

STRESS-STRAIN RELATIONS: Orthotropic and anisotropic materials, Engineering constants for Orthotropic materials, Restrictions on elastic constants, Plane stress problem, Biaxial strength, Theories for an orthotropic lamina.

UNIT - III

MECHANICAL BEHAVIOUR: Mechanics of materials approach to stiffness, Determination of relations between elastic constants, Elasticity approach to stiffness.

UNIT - IV

TECHNIQUES FOR ELASTIC SOLUTIONS: Bounding techniques of elasticity, Exact solutions, Elasticity solutions with continuity, Halpin - Tsai equations, comparison of approaches to stiffness.

UNIT - V

CEMENT COMPOSITES: Types of cement composites, Terminology, Constituent materials and their properties , Construction techniques for fibre reinforced concrete.

UNIT - VI

TYPES OF CEMENT CONCRETES: Ferro cement, SIFCON, Polymer concretes, Preparation of reinforcement, Casting and curing.

UNIT - VII

MECHANICAL PROPERTIES OF CEMENT COMPOSITES: Behaviour of ferro cement, Fibre reinforced concrete in tension, compression, flexure, shear, fatigue and impact, Durability and corrosion.

UNIT - VIII

APPLICATION OF CEMENT COMPOSITES: FRC and Ferro cement, Housing, Water storage, Boats and miscellaneous structures.

TEXT BOOKS:

1. Robert M. Jonesb (1999), *Mechanics of Composite Materials*, 2nd Edition, McGraw Hill Co., New York.
2. R. N. Swamy (1983), *New Concrete Materials*, Survey University Press.

REFERENCE BOOKS:

1. Bruce Bingham (2004), *Ferro Cement: Design, Techniques and Applications,* Cornell Maritime Press.
2. R. P. Pama (1998), *Ferro Cement – Theory and Applications*, IFIC, Asian Institute of Technology.

M. Tech. ST I SEMESTER

EXPERIMENTAL STRESS ANALYSIS
(Professional Elective - II)

Course Code: : B1810

L	P	C
3	-	3

UNIT - I

BASIC EQUATIONS AND PLANE ELASTICITY THEORY: Introduction, Strain Equations of Transformation, Compatibility, Stress - Strain Relation, Two Dimensional State Of Stress. Elastic Problem, The Plane Strain Approach, Plane Stress, Airy's Stress Function, Cartesian Two Dimensional Problems In Polar Co-Ordinates,

UNIT - II

PRINCIPLES OF EXPERIMENTAL APPROACH: Introduction, Advantages of Experimental Stress Analysis, Different Methods.

UNIT - III

STRAIN MEASUREMENT USING STRAIN GAUGES: Definition of Strain and Its Relation to Experimental Determination, Properties of Strain gauge, Systems. Types of Strain gauges Mechanical and Optical Strain Gauges. Electrical Strain Gauges .Introduction to Lvdt, Resistance Strain Gauge, Gauge Factor, Materials for Adhesion Base, Etc.

UNIT - IV

STRAIN ROSETTES: Introduction, Three Element Rectangular Rosette, Delta Rosette.

UNIT - V

BRITTLE COATING METHOD: Introduction, Coating Stresses, Failure Theories Brittle Coating Crack Pattern, Crack Detection, Types Of Brittle Coating, Test Procedures For Brittle Coating.

UNIT - VI

THEORY OF PHOTO ELASTICITY: Introduction, Stress Optic Law, Effects of Stressed Model in a Polaris scope For Various arrangements.

UNIT - VII

TWO DIMENSIONAL PHOTO ELASTICITY: Introduction, Isochromatic Fringe Patterns, Isoclinic Fringe Patterns, Passage of Light through Plane Polari scope and Circular scope.

UNIT - VIII

COMPENSATION TECHNIQUES: Calibration Methods, Scaling Model To Proto Type Stress, Materials For Photo, Elasticity Properties of photo elastic Materials.

TEXT BOOKS:

1. J. W. W. dally Andw. F. Riley (1978)*, Experimental Stress Analysis,* McGraw Hill publications, New York.

2. Dr. Sadhu Singh (1982), *Experimental Stress Analysis*, Khanna Publishers, India.

REFERENCE BOOKS:

1. Dove and Adams (1964), *Experimental Stress Analysis and Motion Measurement,* Charles E. Merrill.
2. L. S. Srinath (1984), *Experimental Stress Analysis*, McGraw Hill publications, New York.

M. Tech. ST I SEMESTER

ADVANCED CONCRETE LABORATORY

Course Code: : B1811

L	P	C
-	3	2

LIST OF EXPERIMENTS:

1. To study the effect of water/cement ratio on workability and strength for different grades (M20 & M30) of concrete.
2. To study the effect aggregate/cement ratio on strength of concrete for different sizes (20 mm & 16 mm) aggregates.
3. To study the effect of fine aggregate/coarse aggregate ratio on strength and permeability of concrete using natural river sand and artificial sand.
4. To develop a Mix design for two grades of concrete using (a) I.S. Code method (b) ACI Code method.
5. To study the behavior of concrete member by developing stress-strain curve for two grades of concrete.
6. To study the correlation between cube strength, cylinder strength, split tensile strength and modulus of rupture for a given grade of concrete
7. To study the behavior of concrete member by developing stress-strain curve for Fe - 415 and High Tension steel.
8. To study the permeable nature of concrete.
9. To study the effect of super plasticizer on workability of concrete.
10. To study the strength of concrete using non destructive testing equipment.

SYLLABI FOR II SEMESTER

M. Tech. ST II SEMESTER

ANALYSIS AND DESIGN OF SHELLS AND FOLDED PLATES

Course Code: B1813

L	P	C
3	-	3

UNIT - I

INTRODUCTION TO SHELLS: Functional behavior, examples, structural behavior of shells, classification of shells, definitions, various methods of analysis of shells, merits and demerits of each method, 2D. Membrane equation.

UNIT - II

EQUATIONS OF EQUILIBRIUM: Derivation of stress resultants, cylindrical shells, Flugges simulations equations.

UNIT - III

GOVERNING THEORIES OF SHELLS: Derivation of governing DKJ equation for bending theory, Schorer's theory, Application to the analysis and design of short and long shells.

UNIT - IV

BEAM THEORY OF CYLINDRICAL SHELLS: Beam action and arch action, Analysis of shells using beam theory.

UNIT - V

INTRODUCTION TO DOUBLE CURVATURE SHELLS: Geometry, analysis and design of elliptic paraboloid, conoid and hyperbolic parabolic shapes, inverted umbrella types.

UNIT - VI

AXI - SYMMETRICAL SHELLS: General equation. Analysis of axi- Symmetrical shells by membrane theory. Application to spherical shells and hyperboloid of revolution cooling towers.

UNIT - VII

FOLDED PLATES: Introduction, Types of folded plates, structural behavior of folded plates, advantages, Assumptions, Whitney method of analysis, Edge shear equation, Analysis of folded plates of Whitney's method, Simpsons method of Analysis of folded plates, Moment and stress distribution, Rotation and no rotation solutions.

UNIT - VIII

PRESTRESSED FOLDED PLATES: Continuous folded plates, pre stress in continuous folded plates.

TEXT BOOKS:

1. G. S. Ramaswami (2005), D*esign and Construction of Concrete Shell Roofs,* CBS Publishers, India.
2. Dr. N. Krishna Raju (2004), *Advanced R.C Design*, 2nd Edition, University Press, India.

REFERENCE BOOKS:

1. N. K. Bairagi (1990), *Shell Analysis*, Khanna Publishers. India.
2. Billington (1982), *Design of Concrete Shell Roofs,* McGraw Hill, India.

M. Tech. ST II SEMESTER

STRUCTURAL DYNAMICS

Course Code: B1814

L	P	C
3	-	3

UNIT – I

INTRODUCTION: **E**lements of vibratory system, degree of freedom, continuous system, lumped mass idealization, oscillatory motion, simple harmonic motion, vectorial representation of S.H.M.

UNIT - II

THEORIES OF VIBRATIONS: Free vibrations of single degree of freedom system, un-damped and damped vibration, critical damping, logarithmic decrement, forced vibrations of SDOF systems, harmonic excitation, dynamic magnification factor, phase angle, Band width.

UNIT - III

INTRODUCTION TO STRUCTURAL DYNAMICS: Fundamental objectives of dynamic analysis, types of prescribed loading, methods of discretization, formulation of equations of motion by different methods, direct equilibration using Newton's law of motions/ D'Alembert's principle, principle of virtual work and Hamilton principle.

UNIT - IV

SINGLE DEGREE OF FREEDOM SYSTEM: Formulation and solution of the equation of motion, free vibration response, response to harmonic, periodic, impulsive and general dynamic loadings, Duhamel integral.

UNIT - V

MULTI-DEGREE OF FREEDOM SYSTEM: Selection of the degree of freedom- evaluation of structural property, Matrices- formulation of the MDOF equation of motion, un-damped free vibrations, solution of Eigen value problem for natural frequencies and mode shapes, analysis of dynamic response, normal co-ordinates, uncoupled equations of motion, orthogonal properties of normal modes, mode superposition procedure.

UNIT - VI

PRACTICAL VIBRATIONAL ANALYSIS: Introduction, stodola method, fundamental mode analysis, analysis of second and higher modes, holzer method, basic procedure

UNIT - VII

CONTINUOUS SYSTEM: Introduction, flexural vibrations of beams, elementary case, derivation of governing differential equation of motion, analysis of un-damped free vibrations of beams in flexure, natural frequencies and mode-shapes of simple beam with different end conditions, principles of applications to continuous beams.

UNIT - VIII

INTRODUCTION TO EARTHQUAKE ANALYSIS: Introduction, excitation by rigid base translation, lumped mass approach, SDOF and MDOF systems, IS code methods of analysis for obtaining response of multi-storied buildings.

TEXT BOOKS:

1. Mario Paz (1980), *Structural Dynamics*, C.B.S publishers, New Delhi, India.
2. Anil K. Chopra (2011), *Dynamics of Structures*, 4th Edition, Pearson Education (Singapore), New Delhi, India.

REFERENCE BOOKS:

1. Clough & Penzien *(1983), Dynamic of Structures*, McGraw Hill, New York.
2. Walter C. Hurty, Rubinstein (1964), *Dynamic Structures*, Prentice Hall of India, New Delhi, india.

M. Tech. ST II SEMESTER

ADVANCED STEEL STRUCTURES DESIGN

Course Code B1815

L	P	C
3	-	3

UNIT - I

ANALYSIS OF INDUSTRIAL BUILDINGS: Dead loads, live loads and wind loads on roofs. Design wind speed and wind pressure, wind pressure on roofs.

UNIT - II

DESIGN OF INDUSTRIAL BUILDINGS: Design of purlins, Design of struts, Design of tension members of roof truss, Design of connections.

UNIT - III

ANALYSIS OF MULTI-STOREY FRAMES: Analysis of Multi-storey frames for wind loads using Cantilever method and Portal method.

UNIT - IV

SPACE FRAMES: Types of space structures, material used in space frames, advantages and disadvantages, practical difficulties, analysis and design of towers.

UNIT - V

DESIGN OF STEEL TRUSS GIRDER BRIDGES: Types of truss bridges, component parts of a truss bridge, economic portions of trusses, self weight of truss girders, design of bridge compression members, tension members.

UNIT - VI

PLASTIC ANALYSIS: Introduction, fundamental static methods of analysis and mechanism method of analysis,

UNIT - VII

ULTIMATE LOAD METHOD: Virtual work method, beam mechanism, column mechanism and sway mechanism, application to continuous beams and portal frames with constant moment of inertia and varying moment of inertia.

UNIT - VIII

ULTIMATE DEFLECTIONS: Deflections at ultimate load, calculation of deflections to the beams and frames, moment curvature relationship, Ductility.

TEXT BOOKS:

1. N. Ramachandra (2005), *Design of Steel Structures* Vol I & II, Standard Book House, New Delhi, India.
2. N. Krishna Raju (2000), *Structural Design and Drawing*, 2nd Edition, University Press, India.

REFERENCE BOOKS:

1. P. Dayaratnam (2008), *Design of Steel Structures,* S. Chand Publications, India
2. B. C. Punmia (1998), *Design of Steel Structures,* Lakshmi Publications, India.
3. Gaylord and Gaylord (2010), *Design Steel Structures*, 3rd Edition, Tata McGraw Hill, India.
4. Vazirani and Ratwani (1987), *Design of Steel Structures,* Based on ISI 800, Khanna Publishers, India.
5. B. G. Neal (1977), *Plastic Methods of Structural Analysis*, 3rd Edition (SI), Science Paperbacks.

M. Tech. ST II SEMESTER

ADVANCED REINFORCED CONCRETE DESIGN

Course Code: B1816

L	P	C
3	-	3

UNIT - I

LIMIT ANALYSIS OF R.C. STRUCTURES: Rotation of a plastic hinge, Redistribution of moments, moment rotation characteristics of RC member, I.S. code provisions, and applications for fixed beams.

UNIT - II

YIELD LINE ANALYSIS FOR SLABS: Upper bound and lower bound theorems, Yield line criterion, Virtual work and equilibrium methods of analysis for square and rectangular slabs with simple and continuous end conditions.

UNIT - III

DESIGN OF RIBBED SLABS: Analysis of the Slabs for moment and shears. Ultimate moment of Resistance. Design for shear, deflection, Arrangement of Reinforcements.

UNIT - IV

FLAT SLABS: Direct design method, Distribution of moments in column strip and middle strip, moment and shear transfer from slabs to columns, shear in Flat slabs, Check for one way and two way shears.

UNIT - V

DESIGN OF REINFORCED CONCRETE DEEP BEAMS: Design of deep Beams, Design by IS 456, Checking for Local failures. Detailing of Deep Beams,

UNIT - VI

DESIGN AND ANALYSIS OF CORBELS: Analysis of Forces in Corbels, Design of procedure of Corbels. Design of Nibs.

UNIT - VII

DESIGN OF SHEAR WALLS: Classification according to Behaviour, Loads in Shear walls. Design of Rectangular and Flanged shear walls, Derivation of Formula for moment of Resistance of Rectangular shear walls.

UNIT - VIII

LIMIT STATE OF SERVICEABILITY: Deflections of Reinforced concrete beams and slabs short term deflections and long term deflection estimation of crack width in RCC members, calculations of crack widths, Shrinkage and thermal cracking.

TEXT BOOKS:

1. S. Unnikrishna Pillai & Menon, (2004), *Reinforced Concrete Design,* 2nd Edition Tata McGraw Hill, New Delhi, India.
2. P. C. Varghese (2008), *Advanced Reinforced Concrete Design*, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:

1. B. C. Punmia. Ashok kumar Jain and Arun Kumar Jain (2004), *Reinforced Concrete Structures* Vol.1, Laxmi Publications, India.
2. P. Purusthotham (1994), *Reinforced Concrete Structural Elements - Behavior, Analysis and Designs*, Tata McGraw Hill, India.
3. Kennath Leet (1991), *Reinforced Concrete Design,* 2nd Edition, Tata McGraw Hill, India.
4. Dr. S. R. Karve and Dr. V. L. Shah (1994), *Limit State Theory and Design of Reinforced Concrete*, 3rd Edition, Standard publishers, Pune, India.

M. Tech. ST II SEMESTER

LOW COST HOUSING TECHNIQUES
(Professional Elective - III)

Course Code: B1817

L	P	C
3	-	3

UNIT- I

HOUSING SCENARIO: Introduction, Status of urban housing, Status of rural housing.

HOUSING FINANCE: Introduction, Existing finance system in India, Government role as facilitator, Status at rural housing finance, Impediments in housing finance and related issues.

UNIT - II

LAND USE AND PHYSICAL PLANNING FOR HOUSING: Introduction, Planning of urban land, Urban land ceiling and regulation act, Effectiveness of building bye laws, Residential densities.

UNIT - III

HOUSING THE URBAN POOR: Introduction, Living condition in slums, Approaches and strategies for housing urban poor.

UNIT - IV

DEVELOPMENT AND ADOPTION OF LOW COST HOUSING TECHNOLOGY: Introduction, Adoption of innovative cost effective construction techniques, Adoption of precast elements in partial prefabrication, Adoption of total prefabrication of mass housing in India, General remarks on pre cast roofing/ flooring systems, Economical wall system, Single brick thick load bearing wall, 19 cm thick load bearing masonry walls, Half brick thick load bearing wall, Fly ash, gypsum brick for masonry, Stone block masonry, Adoption of precast R.C. plank and join system for roof/floor in the building.

UNIT - V

ALTERNATIVE BUILDING MATERIALS FOR LOW COST HOUSING: Introduction, Substitute for scarce materials, Ferro cement, Gypsum boards, Timber substitutions, Industrial wastes, Agricultural wastes.

UNIT - VI

LOW COST INFRASTRUCTURE SERVICES: Introducing, Present status, Technological options, Low cost sanitations, Domestic wall, Water supply, energy.

UNIT - VII

RURAL HOUSING: Introduction, Traditional practice of rural housing, Mud housing technology, Mud roofs, Characteristics of mud, Fire resistant treatment for thatched roof, Soil stabilization, rural housing programmes.

UNIT - VIII

HOUSING IN DISASTER PRONE AREAS: Introduction, Earthquake, Damages to houses, Traditional houses in disaster prone areas, Type of damages in non-engineered buildings, Repair and restore action of earthquake damaged non-engineered buildings, Recommendations for future constructions, Requirements of structural safety of thin pre- cast roofing units against earthquake forces, Status of R&D in earthquake strengthening measures, Floods, cyclones and future safety.

TEXT BOOKS:

1. A. K. Lal (1995), *Hand Book of Low Cost Housing*, New Age International Publishers, India.
2. A. G. Madhava Rao, D. S. Ramachandra Murthy and G. Annamalai (1984), *Modern Trends in Housing in Developing Countries*, E. & F. N. Spon.

REFERENCE BOOKS:

1. Neville A.M. (2012), *Properties of Concrete*, 5th Edition, Pitman Publishing Limited, London.
2. Kiado, Rudhai. G (1985), *Light Weight Concrete Academic*, Publishing Home of Hungarian Academy of Sciences.

M. Tech. ST II SEMESTER

ADVANCED PRE STRESSED CONCRETE DESIGN

(Professional Elective - III)

Course Code: B1818

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Development of prestressed concrete, Advantages and disadvantages of PSC over RCC, General principles of prestressing, Pretensioning 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 stress in steel, Slip in anchorage , friction etc.

UNIT - III

FLEXURE: Elastic analysis of concrete beams prestressed with straight, eccentric, bent and parabolic tedons, Kern lines, Cable profile, Design criteria as per I.S. code of practice, Elastic design of Beams (rectangular, I, and T-sections) for flexure.

UNIT - IV

SHEAR AND BOND: Shear in PSC beams, Principal stresses, Conventional elastic design for shear, Transfer of prestress in pretensioned members, Transmission length, Bond stresses.

UNIT - V

BEARING AND ANCHORAGE: Bearing at anchorage, Anchorage zone stresses in post tensioned members, Analysis and design of end blocks by Guyon, Magnel and approximate methods, Anchorage zone reinforcement**.**

UNIT - VI

DEFLECTIONS: Introduction, Factors influencing deflections, Short term and long term deflections of un-cracked and cracked members.

UNIT - VII

CIRCULAR PRESTRESSING: Introduction, Circumferential prestressing, Design of prestressed concrete tanks, Dome prestressing.

UNIT - VIII

STATICALLY INDETERMINATE STRUCTURES: Introduction, Advantages and disadvantages of continuity, Layout for continuous beams, Primary and secondary moments, Elastic analysis of continuous beams, concordant cable profile.

TEXT BOOKS:

1. Krishna Raju (2006), *Prestressed Concrete*, Tata McGraw Hill, New Delhi, India.
2. T. Y. Lin and Burn (1981), *Design of Prestress Concrete Structures*, John Wiley, New York.

REFERENCE BOOKS:

1. Y. Guyon (1998), *Prestressed Concrete, Vol. & II*, Wiley and Sons, India.
2. C. E. Reynold, J.C. Steedman and A. J. Threlfal (2007), *Reinforced Concrete Designers Hand Book*, 11th Edition, CRC Press, UK.

M. Tech. ST II SEMESTER

BRIDGE ENGINEERING
(Professional Elective - III)

Course Code: B1819

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Classification, Investigations and planning, choice of type, Economic span length, IRC specifications for road bridges, Standard live loads, other forces acting on bridges, General design considerations.

UNIT - II

DESIGN OF BOX CULVERTS: General aspects, Design loads, Design moment, shear and thrust, Design of critical section.

UNIT - III

DESIGN OF DECK SLAB BRIDGES: Effective width analysis, Working stress design and detailing of deck slab bridges for IRC loading.

UNIT - IV

DESIGN OF T-BEAM BRIDGES: Introduction, Wheel load analysis, Bending moments in slab, Pigaud's theory, Analysis of longitudinal girders by courbon's theory, Working stress design and detailing of reinforced concrete T- beam bridges for IRC loading.

UNIT - V

PRESTRESSED CONCRETE BRIDGES: General features, Advantages of prestressd concrete bridges, Pretensioned prestressed concrete bridges, Post tensioned prestressed concrete bridge decks, Design of post tensioned prestressed concrete slab bridge deck.

UNIT - VI

BRIDGE BEARINGS: General features, Types of bearings, Forces on bearings, Basis for selection of bearings, Design principles of steel rocker and roller bearings and its design, Design and detailing of elastomeric pad bearing.

UNIT - VII

PIERS: General features, Bed block, Materials for piers and abutments, Types of piers, Forces acting on piers, Design of pier, Stability analysis of piers.

UNIT - VIII

ABUTMENTS: General features of abutments, Forces acting on abutments, Stability analysis of abutments.

TEXT BOOKS:

1. D. Johnson Victor (1999), *Essentials of Bridge Engineering*, 6th Edition, Oxford & IBH Publishers Co. Pvt. Ltd, New Delhi.
2. N. Krishna Raju (2010), *Design of Bridges, 4th Edition,* Oxford & IBH, New Delhi.

REFERENCE BOOKS:

1. V. K. Raina (2010), *Concrete Bridge Design and Practice*, 3rd Edition, Shroff Publishers, India.
2. Rowe, R. E. (2002), *Concrete Bridge Design*, C.R. Books Ltd. London.
3. S. Ponnuswamy (2007), *Bridge Engineering*, 2nd Edition, Tata McGraw Hill Publications, New Delhi, India.
4. Mc Aswanin, VN Vazarani and MM Ratwani (2004), *Design of Concrete Bridges*, 2nd Edition, Khanna Publishers, New Delhi, India.
5. FR Jagadeesh, M.A. Jay Ram (2009), *Design of Bridge Structures*, 2nd Edition, Eastern Economy Edition, New Delhi, India.

M. Tech. ST II SEMESTER

PLASTIC ANALYSIS
(Professional Elective - IV)

Course Code: B1820

L	P	C
3	-	3

UNIT - I

PLASTIC ANALYSIS: Introduction, Idealized stress-strain diagram, shape factor for various sections. Moment curvature relationship, ultimate moment, Plastic hinge, lower and upper bound theorems, ultimate strength of fixed and continuous beams.

UNIT - II

ANALYSIS OF STRUCTURES FOR ULTIMATE LOAD: Fundamental principles, statical method of analysis, mechanism method of analysis, moment checks, carry over factor, moment balancing method.

UNIT - III

DESIGN OF CONTINUOUS BEAMS: Ultimate strength of continuous beams of uniform section throughout and continuous beams with different cross sections.

UNIT - IV

SECONDARY DESIGN PROBLEMS: Introduction, influence of axial force on the plastic moment.

UNIT - V

LATERAL BUCKLING: Influence of shear force, local buckling of flanges and webs, lateral buckling, column stability.

UNIT - VI

DESIGN OF CONNECTIONS: introduction, requirement for connections, straight corner connections, haunched connections, interior beam, column connections.

UNIT - VII

DESIGN OF STEEL FRAMES: introduction, Single span frames, simplified procedures for design of single span frames.

UNIT - VIII

ULTIMATE DEFLECTIONS: Introduction, deflection at ultimate load deflection at working load, deflection of beams.

TEXT BOOKS:

1. Ramachandra (1978), *Design of Steel Structures - Vol.II*., Standard Book House, New Delhi, India.
2. L. S. Beedle (1958), *Plastic Design of Steel Frames,* John Wiley & Sons Inc., India.

REFERENCE BOOKS:

1. B. G. Neal (1985), *The Plastic Methods of Structural Analysis, 3rd Edition, Science Paperbacks.*
2. N. Subramanian (2011), *Design of Steel Structures*, Oxford University Press, New Delhi, India
3. Arya and Ajmani (1974), *Design of Steel Structures*, Nem Chand, India.

M. Tech. ST II SEMESTER

STABILITY OF STRUCTURES
(Professional Elective - IV)

Course Code: B1821

L	P	C
3	-	3

UNIT - I

BEAM COLUMNS: 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.

UNIT - II

ELASTIC BUCKLING OF COLUMNS: Elastic buckling of straight columns, Effect of shear stress on buckling, eccentrically and laterally loaded columns, Energy methods.

UNIT - III

ELASTIC BUCKLING OF BARS: Buckling of a bar on elastic foundation, Buckling of 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

MATHEMATICAL TREATMENT OF STABILITY PROBLEMS: Buckling problem, Orthogonality relation, Ritz method, Timoshenko method and Galerkin method.

UNIT - VI

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 by Torsion and Flexure.

UNIT - VII

LATERAL BUCKLING OF SIMPLY SUPPORTED BEAMS: Beams of rectangular cross section subjected to pure bending.

UNIT - VIII

BUCKLING OF SIMPLY SUPPORTED RECTANGULAR PLATES: Derivation of equation for a plate subjected to constant compression in two directions and in one direction.

TEXT BOOKS:

1. Timoshenko and Gere (1981), *Theory of Elastic Stability*, McGraw Hill Book Company, New York.
2. Iyenger, N.G.R. (1990), *Structural Stability of Columns and Plates*, Affiliated East west press Pvt Ltd.

REFERENCE BOOKS:

1. Alexandar Chajes (1980), *Principles of Structural Stability Theory*, Prentice Hall, New Jersey.
2. Bleich F. (1991), *Buckling Strength of Metal Structures*, Tata McGraw Hill, India.
3. Ashwini Kumar (2006), *Stability Theory of Structures*, Tata McGraw Hill Publishing Company Ltd, India.
4. Smitses (1976), *Elastic Stability of Structures*, Prentice hall, India.

M. Tech. ST II SEMESTER

REHABILITATION AND RETROFITTING OF CONCRETE STRUCTURES

(Professional Elective - IV)

Course Code: B1822

L	P	C
3	-	3

UNIT - I

INTRODUCTION: Deterioration of Structures, Distress in Structures, Causes and Prevention.

UNIT - II

DAMAGE MECHANISM IN CONCRETE STRUCTURES: Mechanism of Damage, Types of Damage.

UNIT - III

CORROSION: Corrosion of Steel Reinforcement, Causes, Mechanism and Prevention.

UNIT - IV

FIRE DAMAGE: Damage of Structures due to Fire, Fire Rating of Structures, phenomena of Desication.

UNIT - V

DAMAGE ASSESSMENT: Inspection and Testing, Symptoms and Diagnosis of Distress, Damage assessment, Non Destructive Testing.

UNIT - VI

REHABILITATION OF STRUCTURES: Repair of Structures, Common Types of Repairs, Repairs in Concrete Structures, Repairs in Under water Structures, Guniting, Shot Create, Underpinning.

UNIT - VII

RETROFITTING: Strengthening of Structures, Strengthening Methods, Retrofitting, Jacketing.

UNIT - VIII

INSTRUMENTATION: Health Monitoring of Structures, Use of Sensors, Building Instrumentation.

TEXT BOOKS:

1. Peter H. Emmans (1992), *Concrete Repair and Maintenance,* Illustrated, RS Means Company Inc.
2. W. H. Ranso (1987), *Building Failures: Diagnosis and Avoidance*, 2nd Edition, EF & N Spon, London.

REFERENCE BOOKS:

1. A. R. Shantakumar (2006), *Concrete Technology*, Oxford University press, India.
2. E. F. and N Spon (2001), *Defects and Deterioration in Buildings*, 2nd Edition, London.
3. Allen R. T., and Edwards S.C (1993), *Repairs of Concrete Structures,* 2nd Edition, CRC Press.
4. G. Coulouris, J. Dollimore and Tim Kindbirg (2005), *Distributed Systems Concepts and Design*, 4th Edition, Wiley & sons, New Jersy, USA.
5. Raikar, R.N. (1987), *Learning from Failures – Deficiencies in Design, Construction and Service*, R&D Centre (SDCPL), Raikar Bhavan, India.

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M. Tech. ST II SEMESTER

COMPUTER APPLICATIONS IN STRUCTURAL ENGINEERING LABORATORY

Course Code: B1823

L	P	C
-	3	2

LIST OF EXPERIMENTS:

1. Introduction to develop a program in C language using arrays and functions for matrix manipulation up to 4x4 matrices.
2. To develop a program to draw bending moment diagram and shear force diagram for beams subjected to different loads using fundamental principles of graphics in C.
3. To develop a program for designing Reinforced Cement Concrete slabs using Excel Sheets.
4. To develop a program for designing Reinforced Cement Concrete beams using Excel Sheets.
5. To develop a program for designing Reinforced Cement Concrete Columns and Footings using Excel Sheets.
6. To develop a program for the analysis of Pin Jointed Plane Truss using STAAD pro.
7. To develop a program for the analysis of Multi-storey space frame using STAAD Pro.
8. To develop a program for the analysis and design of a Multi-storey Reinforced Cement Concrete building using STAAD Pro.

M. Tech. ST I / II SEMESTER

TECHNICAL SEMINAR

L	T	P	C
-	-	-	2

1. OBJECTIVE:

Seminar is an important component of learning in an Engineering College, where the student gets acquainted with preparing a report and presentation on a topic.

2. **PERIODICITY / FREQUENCY OF EVALUATION:** **Twice**

3. PARAMETERS OF EVALUATION:

1. The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work.
2. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score.
3. The students shall be required to submit the rough drafts of the seminar outputs within one week of the commencement of the class work.
4. Supervisor shall make suggestions for modification in the rough draft. The final draft shall be presented by the student within a week thereafter.
5. Presentation schedules will be prepared by different Departments in line with the academic calendar.

The Seminars shall be evaluated in two stages as follows:

A. Rough draft

In this stage, the student should collect information from various sources on the topic and collate them in a systematic manner. He/ She may take the help of the concerned supervisor.

The report should be typed in “MS-Word” file with “calibri” font, with font size of 16 for main heading, 14 for sub-headings and 11 for the body text. The contents should also be arranged in Power Point Presentation with relevant diagrams, pictures and illustrations. It should normally contain 18 to 25 slides, consisting of the followings:

1.	Topic, name of the student & guide	1 Slide
2.	List of contents	1 Slide
3.	Introduction	1 - 2 Slides
4.	Descriptions of the topic (point-wise)	7 - 10 Slides
5.	Images, circuits etc.	6 - 8 Slides
6.	Conclusion	1 - 2 Slides
7.	References/Bibliography	1 Slide

The soft copy of the rough draft of the seminar presentation in MS Power Point format along with the draft Report should be submitted to the concerned supervisor, with a copy to the concerned HOD within 30 days of the commencement of class work.

The evaluation of the Rough draft shall generally be based upon the following.

1.	Punctuality in submission of rough draft and discussion	2 Marks
2.	Resources from which the seminar have been based	2 Marks
3.	Report	3 Marks
4.	Lay out, and content of Presentation	3 Marks
5.	Depth of the students knowledge in the subject	5 Marks
Total		15 Marks

After evaluation of the first draft the supervisor shall suggest further reading, additional work and fine tuning, to improve the quality of the seminar work.

Within 7 days of the submission of the rough draft, the students are to submit the final draft incorporating the suggestions made by the supervisor.

B. Presentation:

After finalization of the final draft, the students shall be allotted dates for presentation (in the designated seminar classes) and they shall then present it in presence students, supervisor, faculties of the department and at least one faculty from some department / other department.

The student shall submit 3 copies of the Report neatly bound along with 2 soft copies of the PPT in DVD medium. The students shall also distribute the title and abstract of the seminar in hard copy to the audience. The final presentation has to be delivered with 18-25 slides.

The evaluation of the Presentation shall generally be based upon the following.

1.	Contents	10 Marks
2.	Delivery	10 Marks
3.	Relevance and interest the topic creates	5 Marks
4.	Ability to involve the spectators	5 Marks
5.	Question answer session	5 Marks
Total		35 Marks

4. WHO WILL EVALUATE?

The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department / other department.

M. Tech. ST III SEMESTER

COMPREHENSIVE VIVA

Course Code: B1825

L	T	P	C
-	-	-	4

1. OBJECTIVE:

- To enable the examiners to assess the candidate's knowledge in his or her particular field of learning.
- To test the student's awareness of the latest developments and relate them to the knowledge acquired during the classroom teaching.

2. PARAMETERS OF EVALUATION:

Subject Knowledge	Current Awareness	Career Orientation	Communication Skills	Total
20	10	10	10	50

3. WHO WILL EVALUATE?

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. The comprehensive viva shall be evaluated for 50 marks at the end of III semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

4. PERIODICITY / FREQUENCY OF EVALUATION: **Once**

5. PEDAGOGY:

- The viva will be held on a face to face basis.
- The students will be expected to answer the questions related to latest developments and all courses taken till date.
- Viva voce will be conducted within week before the beginning of midterm examinations. However, in exceptional circumstances it can be scheduled immediately after the end of midterm examinations.
- Students will have to make themselves available on the date of the viva voce.

M. Tech. ST III / IV SEMESTER

PROJECT WORK PHASE - I & II

Course Code: B1826 / B1827

L	T	P	C
-	-	-	18/22

1. OBJECTIVE:

The main objective of the Project Work is for the students to learn and experience all the major phases and processes involved in solving "real life engineering problems".

2. EXPECTED OUTCOME:

The major outcome of the M. Tech project must be well-trained students. More specifically students must have acquired:

- System integration skills
- Documentation skills
- Project management skills
- Problem solving skills

3. PROJECT SELECTION:

Projects are suggested by the faculty, with or without collaboration with an industry. All faculty are to suggest projects. Students are also encouraged to give project proposals after identifying a faculty who would be willing to supervisor the work. A Project brief is to be given by the faculty to the group defining the project comprehensively.

All M. Tech major projects are to be done in the Institute. For industry specified projects, students will be permitted to spend 1-2 weeks in the industry on recommendation by the supervisor. The number of students per batch should be 1.

4. WHO WILL EVALUATE?

The end semester examination shall be based on the report submitted and a viva-voce exam for 100 marks by committee comprising of the Head of the Department, project supervisor and an external examiner.

5. EVALUATION:

The basic purpose is to assess the student competencies with regard to his project work. More specifically to assess the student's individual contribution to the project, to establish the level of understanding of basic theoretical knowledge relevant to the project and to ensure that the student has good understanding and appreciation of design and development decisions taken in the course of the project. It is desirable that all faculty members are present for the evaluations as this is a platform to get to know the student projects and to motivate the students to do good projects. The faculty should adopt a clear and consistent pattern of asking questions from general to specific aspects of the project. The presentation and evaluation is open to other students of the department.

The project work shall be evaluated for 150 marks out of which 50 marks for internal evaluation and 100 marks for end-semester evaluation. The evaluation shall be done on the following basis

Semester III	Semester IV
Preliminary Evaluation - 50 marks	Design Evaluation I - 25 marks
	Design Evaluation II - 25 marks
	Final Evaluation – 100 marks

6. GUIDELINES FOR THE PREPARATION OF M. TECH PROJECT REPORTS

1.1. Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm). The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".

1.2. The total number of reports to be prepared are:

- One copy to the department
- One copy to the concerned guide(s)
- One copy to the candidate.

1.3. Before taking the final printout, the approval of the concerned guide(s) is mandatory and suggested corrections, if any, must be incorporated.

1.4. For making copies dry tone Xerox is suggested.

1.5. Every copy of the report must contain

- Inner title page (White)
- Outer title page with a plastic cover
- Certificate in the format enclosed both from the college and the organization where the project is carried out.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.

6.6. The organization of the report should be as follows:

1. 2. 3. 4. 5.	Inner title page Abstract or Synopsis Acknowledgments Table of Contents List of table & figures (optional)	Usually numbered in roman

6.7 Chapters (to be numbered) containing Introduction, which usually specifies the scope of work and its importance and relation to previous work and the present developments, Main body of the report divided appropriately into chapters, sections and subsections.

- The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc., and subsections as 2.2.3, 2.5.1 etc.
- The report should be typed in "MS-Word" file with "calibri" font. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 11.
- The figures and tables must be numbered chapter wise for e.g.: Fig. 2.1 Block diagram of a serial binary adder, Table 3.1 Primitive flow table, etc.
- The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.

6.8. Reference OR Bibliography: The references should be **numbered serially** in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [3]. The section on references should list them in serial order in the following format.

1. For textbooks - A.V. Oppenheim and R.W. Schafer, Digital Signal Processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975.
2. For papers - Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.

6.9. Only SI units are to be used in the report. Important equations must be numbered in decimal form for e.g. **V = IZ** ..... **(3.2)**

6.10. All equation numbers should be right justified.

6.11. The project report should be brief and include descriptions of work carried out by others only to the minimum extent necessary. Verbatim reproduction of material available elsewhere should be strictly avoided. Where short excerpts from published work are desired to be included, they should be within quotation marks appropriately referenced.

6.12. Proper attention is to be paid not only to the technical contents but also to the organization of the report and clarity of the expression. Due care should be taken to avoid spelling and typing errors. The student should note that report-write-up forms the important component in the overall evaluation of the project

6.13. Hardware projects must include: the component layout, complete circuit with the component list containing the name of the component, numbers used, etc. and the main component data sheets as Appendix. At the time of report submissions, the students must hand over a copy of these details to the project coordinator and see that they are entered in proper registers maintained in the department.

6.14. Software projects must include a virus free disc, containing the software developed by them along with the read me file. Read me file should contain the details of the variables used, salient features of the software and procedure of using them: compiling procedure, details of the computer hardware/software requirements to run the same, etc. If the developed software uses any public domain software downloaded from some site, then the address of the site along with the module name etc. must be included on a separate sheet. It must be properly acknowledged in the acknowledgments.

6.15. Sponsored Projects must also satisfy the above requirements along with statement of accounts, bills for the same dully attested by the concerned guides to process further, They must also produce NOC from the concerned guide before taking the internal viva examination.

6.16. The reports submitted to the department/guide(s) must be hard bounded, with a plastic covering.

6.17. Separator sheets, used if any, between chapters, should be of thin paper

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

Shamshabad – 501 218, Hyderabad

Department of ……..

CERTIFICATE

Certified that the project work entitled …….. carried out by Mr./Ms. ……., Roll Number ……., a bonafide student of ……in partial fulfillment for the award of **Master of Technology** in …… of the Jawaharlal Nehru Technological University, Hyderabad during the year …….. It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Name & Signature of the Guide **Name Signature of the HOD** **Signature of the Principal**

External Viva

Name of the examiners Signature with date

1.

2.

Certificate issued at the Organization where the project was carried out

(On a separate sheet, If applicable)

NAME OF THE INDUSTRY / ORGANIZATION, Address with pin code

CERTIFICATE

Certified that the project work entitled …….. carried out by Mr./Ms . ……., Roll Number……., a bonafide student of ……in partial fulfillment for the award of **Master of Technology** in …… of the Jawaharlal Nehru Technological University, Hyderabad during the year …….. It is certified that, he/she has completed the project satisfactorily

Name & Signature of the Guide **Name & Signature of the Head of Organization**

7. DISTRIBUTION OF MARKS FOR M.TECH DISSERTATION EVALUATION

S No.	Particulars	Max. Marks
1	Relevance of the subject in the present context	**10**
2	Literature Survey	**10**
3	Problem formulation	**10**
4	Experimental observation / theoretical modeling	**10**
5	Results – Presentation & Discussion	**20**
6	Conclusions and scope for future work	**10**
7	Overall presentation of the Thesis / Oral presentation	**20**
8	Project Report Writing	**10**
Total Marks		**100**

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	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

	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.	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.	

Frequently asked Questions and Answers about Autonomy

1. Who grants Autonomy? UGC, Govt., AICTE or University

In case of Colleges affiliated to a university and where statutes for grant of autonomy are ready, it is the respective University that finally grants autonomy.

2. Shall VCE award its own Degrees?

No. Degree will be awarded by Jawaharlal Nehru Technological University, Hyderabad with a mention of the name Vardhaman College of Engineering on the Degree Certificate.

3. What is the difference between a Deemed University and an Autonomy College?

A Deemed University is fully autonomous to the extent of awarding its own Degree. A Deemed University is usually a Non-Affiliating version of a University and has similar responsibilities like any University. An Autonomous College enjoys Academic Autonomy alone. The University to which an autonomous college is affiliated will have checks on the performance of the autonomous college.

4. How will the Foreign Universities or other stake – holders know that we are an Autonomous College?

Autonomous status, once declared, shall be accepted by all the stake holders. Foreign Universities and Indian Industries will know our status through our college website.

5. What is the change of Status for Students and Teachers if we become Autonomous?

An autonomous college carries a prestigious image. Autonomy is actually earned out of continued past efforts on academic performances, capability of self-governance and the kind of quality education we offer.

6. Who will check whether the academic standard is maintained / improved after Autonomy? How will it be checked?

There is a built in mechanism in the autonomous working for this purpose. An Internal Committee called Academic Programme Evaluation Committee is a Non – Statutory body, which will keep a watch on the academics and keep its reports and recommendations every year. In addition to Academic Council, the highest academic body also supervises the academic matters. At the end of three years, there is an external inspection by the University for this purpose. The standards of our question papers, the regularity of academic calendar, attendance of students, speed and transparency of result declaration and such other parameters are involved in this process.

7. Will the students of VCE as an Autonomous College qualify for University Medals and Prizes for academic excellence?

No. VCE has instituted its own awards, medals, etc. for the academic performance of the students. However for all other events like sports, cultural and co-curricular organized by the University the students shall qualify.

8. Can VCE have its own Convocation?

No, since the University awards the Degree the Convocation will be that of the University.

9. Can VCE give a provisional degree certificate?

Since the examinations are conducted by VCE and the results are also declared by VCE, the college sends a list of successful candidates with their final percentage of marks to the University. Therefore with the prior permission of the University the college will be entitled to give the provisional certificate.

10. Will Academic Autonomy make a positive impact on the Placements or Employability?

Certainly. The number of students qualifying for placement interviews is expected to improve, due to rigorous and repetitive classroom teaching and continuous assessment, besides the autonomous status is more responsive to the needs of the industry. As a result,

there will be a lot of scope for industry oriented skill development built-in into the system. The graduates from an autonomous college will therefore represent better employability.

11. What is the proportion of Internal and External Assessment as an Autonomous College?

Presently, it is 25 % for internal assessment and 75 % for external assessment. As the autonomy matures the internal assessment component shall be increased at the cost of external assessment.

12. Will there be any Revaluation or Re-Examination System?

No. There will not be any Revaluation system or Re-examination. But, there is a personal verification of the answer scripts.

13. How fast Syllabi can be and should be changed?

Autonomy allows us the freedom to change the syllabi as often as we need.

14. Will the Degree be awarded on the basis of only final year performance?

No. The percentage of marks will reflect the average performance of all the semesters put together.

15. Who takes Decisions on Academic matters?

The Academic Council of College is the top academic body and is responsible for all the academic decisions. Many decisions are also taken at the lower level like the BOS which are like Boards of Studies of the University.

16. What is the role of Examination committee?

The Exam Committee is responsible for the smooth conduct of inter and external examinations. All matters involving the conduct of examinations, spot valuations, tabulations, preparation of Memorandum of Marks etc fall within the duties of the Examination Committee.

17. Is there any mechanism for Grievance Redressal?

Yes, the college has grievance redressal committee, headed by a senior faculty member of the college.

18. How many attempts are permitted for obtaining a Degree?

All such matters are defined in Rules & Regulations.

19. Who declares the result?

The result declaration process is also defined. After tabulation work the entire result is reviewed by the Moderation Committee. Any unusual deviations or gross level discrepancies are deliberated and removed. The entire result is discussed in the College Academic Council for its approval. The result is then declared on the college notice boards as well put on the web site of the college. It is eventually sent to the University.

20. What is our relationship with the Jawaharlal Nehru Technological University, Hyderabad?

We remain an affiliated college of the Jawaharlal Nehru Technological University, Hyderabad. The University has the right to nominate its members on the academic bodies of the college.

21. Shall we require University approval if we want to start any New Courses?

Yes, It is expected that approvals or such other matters from an autonomous college will receive priority.

22. Shall we get autonomy for PG and Doctoral Programmes also?

Yes, presently our PG programmes are also enjoying autonomous status.

23. How many exams will be there as an autonomous college?

This is defined in the Rules & Regulations.