DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO. ACAD / NP / B.E.[T.Y.] /Syllabi/187/2013

It is hereby informed to all concerned that, the syllabus prepared by the Boards of Studies, Ad-hoc Board, Committees and recommended by the Faculty of Engineering and Technology, the Hon'ble Vice-Chancellor has accepted the following **"Revised Syllabi for all Braches of T.Y. [B.E.]"** on behalf of the **Academic Council Under Section-14(7) of the Maharashtra Universities Act, 1994** as appended herewith :-

Sr. No.	Revised Syllabi
[1]	**Third Year B.E. [CIVIL ENGINEERING],**
[2]	**Third Year B.E. [MECHANICAL ENGINEERING],**
[3]	**Third Year B.E. [ELECTRICAL ENGINEERING/ EEP/EE/EEE],**
[4]	**Third Year B.E. [COMPUTER SCIENCE & ENGINEERING],**
[5]	**Third Year B.E. [INFORMATION TECHNOLOGY],**
[6]	**Third Year B.E. [ECT/EC/E & C/ IE],**
[7]	**Third Year B.E. [INSTRUMENTATION],**
[8]	**Third Year B.E. [BIOTECHNOLOGY],**
[9]	**Third Year B.E. [CHEMICAL ENGINEERING].**

This is effective from the Academic Year 2013-2014 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO. ACAD/ NP/ T.Y.B.E/
SYLLABI / 2013/14140-69

V.C.14[7] A-07.

Date:- 15-06-2013.

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Director,
Board of College and
University Development.

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Copy forwarded with compliments to :-

1] The Principals, affiliated concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.

2] The Director, University Network & Information Centre, UNIC, with **a request to upload the above all syllabi on University Website [www.bamu.net].**

Copy to :-

1] The Controller of Examinations,

2] The Superintendent, [Engineering Unit],

3] The Programmer [Computer Unit-1] Examinations,

4] The Programmer [Computer Unit-2] Examinations,

5] The Superintendent, [Eligibility Unit] ,

6] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,

7] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

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S/150613/-*

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Syllabus of

T.E.

CIVIL

[Effective from the Academic Year 2013-14 & onwards]

THIRD YEAR DEGREE COURSE IN ENGINEERING (REVISED)

(Applicable from the Academic Year 2013- 2014)

1. All the Rules and Regulations, hereinafter specified shall be read as a whole for the purpose of interpretation.

ADMISSION

1. Admission to third year engineering shall be carried out as per the rules and regulations prescribed by the competent authority as appointed by the Government of Maharashtra and Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, from time to time.

DURATION AND COURSES OF STUDY

1. The duration of the course is four years. Each of the four academic years shall be divided into two semesters herein after referred to as the semester I and semester II in chronological order. Each semester shall comprise

   Instructions ..... 15 weeks
   Preparation holiday ..... 2 weeks or 15 days
   (Includes practical exams)

2. **Candidate who fails to fulfill all the requirements for the award of the degree as specified hereinafter within eight academic years from the time of admission, will forfeit his/her seat in the course and his/her admission will stand cancelled.**

RULES AND REGULATION OF ATTENDANCE

1. Candidates admitted to a particular course of study are required to pursue a "Regular course of study" as prescribed by the University before they are permitted to appear for the University Examination.
2. "A regular course of study" means putting in attendance not less than 75% for individual subject.
3. a) In special cases and for sufficient causes shown, the Principal of the institute may, on the specific recommendation the Head of the Department, condone the deficiency in attendance to the extent of 15 % on medical ground subject to submission of medical certificate.

   b) However, in respect of women candidates who seek condonation of attendance due to pregnancy, the Principal may condone the deficiency in attendance to the extent of 25 % (as against 15 % Condonation for other) on medical grounds subject to submission of medical certificate to this effect. Such condonation be availed twice during the entire course of study leading to degree in Engineering and Technology.

4. "Active Participation in N.C.C/N.S.S. Camps or Inter collegiate or Inter University or Inter State or International matches or debates of Educational Excursions or such other Inter University activities as approved by the authorities involving journeys outside the city in which the college is situated will not be counted as absence. However, such 'absence shall not exceed (4) weeks per semester of the total period of instructions. Such leave should not be availed more than twice during the entire course of study.

5. The attendance shall be calculated on individual papers/subjects from the date of commencement of the semester.

6. In case of the candidates who fail to put in the required attendance in a course of study, he/she shall be detained in the same class and will not be recommended to appear for the University examination.

7. A candidate detained in semester I should take readmission in next academic year as a regular student and shall have to complete all the theory and practicals as a regular student.

8. In case a candidate is detained in semester II, he/she should take admission to Semester II of next academic year and complete all the theory and practicals as a regular student of semester II

9. In case of change of syllabus the candidate even if detained in semester II should take readmission in next academic year for Semester I and II as a regular student and complete all the theory and practical's as a regular student.

SCHEME OF INSTRUCTIONS AND EXAMINATION

1. Instructions about the curriculum in the various subjects in each semester of all the four years shall be provided by the University.

2. The details of instruction period, examination schedule, vacations etc. shall be notified by the Principal of the College as per the University academic calendar

3. The medium of instruction and examination shall be English.

4. At the end of each semester, University examinations shall be held as prescribed in the respective schemes of examination.

5. The examinations prescribed may include written papers, practical and oral, tests, inspection of certified sessional work in Drawing and Laboratories and work done by students in each practical examination, along with other materials prepared or collected as part of Lab work/Project.

6. All the rules for examinations prescribed by the University from time to time shall be adhered to.

7. A candidate shall be deemed to have fully passed the Examination of a semester, if he/she secures not less than the minimum marks/grade as prescribed.

8. Institutions will be encouraged to adopt modern tools in classroom/labs to deliver the course contents.

9. Institutions will be encouraged to conduct online class tests.

O.874

The Third Year Examination in Engineering will be held in two parts T.E. semester-I and T. E. semester- II. No candidate will be admitted to T.E. semester-I examination unless he/she produce testimonials of having kept one term, for the subject under S.E. semester-I and II satisfactorily in a college of engineering affiliated to this University after passing the Second year examination of engineering other examination recognized as equivalent thereto as per the admission rules to Third year engineering prescribed by the Government of Maharashtra and Dr. B.A.M.University from time to time.

R.1861

i. In case a candidate fails in one or more heads of passing at the T.E. semester-I Examination after taking that examination at the end of first term as a regular student, he/she will be allowed to appear again for only those heads of passing in which he/she has failed at his/her immediately subsequent semester-I examination.

ii. That the marks obtained by the candidate at semester-I Examination shall be carried forward unless the candidate desires to appear for a paper in which he has failed and then gracing of marks should be done as a whole for semester-I and semester-II examination taken together.

R.1862

a) Candidates who secure 45% or more but less than 50% marks in the aggregate and pass the examination will be declared to have passed the examination in Pass Division.

b) Candidates who secure 50% or more but less than 60% marks in the aggregate and pass the examination will be declared to have passed the examination in Second Division.

c) Candidates who secure 60% or more but less than 66% marks in the aggregate and pass the examination will be declared to have passed the examination in first Division.

d) Candidates who secure 66% or more marks in the aggregate and pass the examination will be declared to have passed the examination in First Division with Distinction.

e) For calculating the percentage for the purpose of giving weightage while awarding division in Final Examination to the students admitted to first year engineering, the maximum marks prescribed and the

marks obtained by the examinee in the particular examinations shall be taken into consideration with the following weightages.

F.E. - 10%, S.E. - 10%,
T.E. – 40% , B. E. – 40%

This shall be applicable for the students admitted in first year from academic year 2011-2012 onwards.

f) In case of the students directly admitted to the second year, the weightage while awarding Division in Final Examination the maximum marks prescribed and the marks obtained by the Examinee in the particular examinations shall be taken in to consideration

S.E. - 20%, T.E. – 40%

B. E. – 40%

This shall be applicable for the students admitted in second year from academic year 2012-2013 onwards.

R.1863

In case a candidate fails in the examination but desires to appear again thereat.

a) He may, at his option, claim exemption from appearing in the head or heads of passing in which he has passed.
b) Such exemption, if claimed, shall cover all the heads of passing- in which it can be claimed.
c) Such exemption, if not availed of at the immediately subsequent appearance of the candidate at the examination, shall be deemed to have lapsed.
d) He /She may, at his option claim exemption from appearing in head or heads of passing of his choice and appear in the remaining head or head/s of passing to make-up the deficiency in the aggregate, if he has passed in all the heads of passing but has failed to secure a minimum of 45% of the aggregate marks.
e) The Marks obtained by a candidate for such term work as separately assessed will be carried over unless fresh term work is presented by him. A candidate whose marks are thus carried over shall be eligible for a division provided he/she does not avail himself of exemption in any head of passing excepting term work.
f) For the purpose of deciding whether a candidate claiming exemption in accordance with (a), (b), (c) above or (d) and (e) above has as required by R.260 secures 45% of the total marks obtainable in the whole examination the marks at his/ her previous examination/examination in the head or heads of passing in which he/she is exempted will be carried over. Candidates passing the examination in this manner shall not be eligible for a division or prizes or scholarships at the examination.

R.1864

RULE FOR COMBINED PASSING

1) To pass the examination a candidate must obtain minimum 40% of Marks in each Theory Paper &class test taken together however the candidate must obtain minimum 35% of Marks at the University theory Examination. The

candidate must obtain a minimum aggregate of 45% of the total Marks obtainable at the T.E. Semester -I & II Examination taken together.

To pass a subject where there is no provision of class test, the candidate must obtain 40% of Marks in the University Examination.

Gracing should be done for the performance at University Examination or University Examination and class test taken together.

Minimum two-class tests should be conducted in a semester for the theory subject if provided. The average performance of the Two-class tests should be forwarded to the University by the college along with the term work marks.

If candidate fails to secure 40% of marks at university theory examination and class test taken together at the regular semester examination, then he/she shall have to appear for university examination from subsequent examination onwards and secure 40% of marks at university examination and earlier obtained class test marks taken together. The improved performance at the university examination should not be considered for the Merit/Medal/Prize etc.

If the candidate remains absent for the class-test, his performance should be treated as 'Zero' Marks. Minimum marks required for passing in term work and practical shall be 40%. If a candidate secures less than 40% in any of the term work or fails to submit term work shall be detained in the same class.

RULE FOR A T K T

For securing ATKT at Third Year Engineering Course candidate should clear (pass) as per the provision of R.1864[A] in at least 13 heads of passing out of 17 heads of passing.

R.1865

GENERAL RULES OF EXAMINATION

1. Application for permission to appear at every examination shall be made in the prescribed format accompanied by one passport size full face photograph (not profile) along with the necessary certificates and the prescribed fee, should be submitted to the Principal of the institute on or before the date fixed for this purpose.

2. When a candidate's application is found in order and he/she is eligible to appear at an Examination, the Principal of the institute is empowered to furnish him/her with a Hall-Ticket with the photograph affixed to it,

enabling the candidate to appear in the Examination, and this Hall- Ticket shall have to be produced by the Candidate before he/she is admitted to the premises where the Examination is being held.

3. A Candidate who does not present himself/herself for the examination for any reason whatsoever, excepting shortage of attendance, shall not be entitled to claim refund of the whole or part of the examination fee, for subsequent Examination(s).
4. As engineering is a full time course, no candidate shall be allowed to put in attendance for a course or appear at examinations for different degrees and different faculties at one and the same time.
5. Students who have appeared once at any examination of the course need not put in fresh attendance, if they wish to reappear at the corresponding examination, notwithstanding the fact that the College may have introduced new subject. They will, however, have to appear at the examinations according to the scheme of examination and syllabi in force

R.1866

EQUIVALENCE OF THE SUBJECTS

Whenever a course or scheme of instruction is changed in a particular year, three more examinations immediately following thereafter shall be conducted according to the old syllabi/regulations. Also candidates not appearing at the examinations or failing in them shall take the examination subsequently according to the changed syllabi/ regulations as per the equivalence of the subjects as prescribed by the University.

Proposed Coding System of Subject/Paper

Six digit code for a subject (UG course)

Batch	Year	Subject no
CED	1. First Year UG	**Semester-I**
MED	2. Second Year UG	1-20 Theory
EEP	3. Third Year UG	21-30 practical
ECE	4. Fourth Year UG	31-40 Service Courses
EXE	5. Fifth Year UG	41-49 Electives
ETC		**Semester-II**
IEX		51-70 Theory
PED		71-80 Practical
CSE		81-90 Service Courses
CTD		91-99 Electives
COE		
ITD		
EED		
EEE		
ARH		
BSH		
BTD		

Structure of syllabus of subject Code No:

Title: Teaching Scheme

Examination Scheme Theory:

hours/week **Class Test: Marks**

Tutorial: hours/week **Theory examination: Maximum hours**
Practical/ Term Work: hours/week **Theory examination: Maximum Marks**
Practical/ Oral examination: Maximum Marks

Objectives: 1
2
3

Unit 1: Unit 2: Unit 3:
Unit 4: Unit 5:
Unit 6:

Text Books: 1
2

Reference Books: 1
2
3
4

Pattern of Question Paper:

The six units in the syllabus shall be divided in two equal parts i.e 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should have at least eight bits of two marks out of which five to be solved
4. Two questions from remaining questions from each section A and B be asked to solve having weightage of 15 marks

For 40 marks Paper:

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 5 from section B be made compulsory and should have at least five bits of two marks out of which three to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 7 marks.

0.95 G R A C E MARKS FOR PASSING IN EACH HEAD OF PASSING (THEROY / PRACTICAL / ORAL / SESSIONAL) (EXTERNAL / INTERNAL)

The examinee shall be given the benefit of grace marks only for passing in each head of passing (Theory/practical/Oral/ Sessional) in external or Internal examination as follows:- Head of passing

	Grace Marks up to
Up to 50	2
051 to 100	3
101 to 150	4
151 to 200	5
201 to 250	6
251 to 300	7
301 to 350	8
351 to 400	9
And 401 and above	10

Provided that the benefit of such gracing marks given in different heads of passing shall not exceed 01 (one) percent of the aggregate marks in that examination.

Provided, further that the benefit of gracing of marks under this ordinance shall be applicable only if the candidate passes the entire examination of semester/year.

Provided further that this gracing is concurrent with the rules and guidelines of professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, CCIH, NCTE, UGC etc.

0.96 GRACE MARKS FOR GETTING HIGHER CLASS

A candidate who passes in all the subjects and heads of passing in the examination without the benefit of either gracing is condonation rules and whose total number of marks falls short for securing Second Class/Higher Second class of First Class by marks not more than 01 percent of the aggregate marks of that examination or up to 10 marks, whichever is less, shall be given the required marks to get the next higher class or grade as the case may be.

Provided that benefit of the above mentioned grace marks shall not be given, if the candidate fails to secure necessary passing marks in the aggregate head of passing also, if prescribed in the examination concerned.

Provided further that this gracing is concurrent with the rules and guidelines of professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, CCIH, NCTE etc.

0.97 GRACE MARKS FOR GETTING DISTINCTION IN THE SUBJECT ONLY.

A candidate who passes in all the subject/heads of passing in the examination without benefit of either gracing or condonation rules and whose total number of marks in the subject/s falls short by not more than three marks for getting distinction in the subject/s shall be given necessary grace marks up to three in maximum two subjects, subject to maximum 01(one) percent of the total marks of that head of passing whichever is more, in a given examination.

Provided that benefit of the above mentioned grace marks shall be given to the candidate only for such examination/s of which provision for distinction in a subject has been prescribed.

Provided further that this gracing is concurrent with the rules and guidelines of professional statutory bodies at the All India level such as AICTE, MCI, Bar council, CCIM, CCIH, NCTE etc.

0.98 CONDONATION

If a candidate fails in only one head of passing, having passed in all other heads of passing, his/her deficiency of marks in such head of passing may be condoned by not more than 01 percent of the aggregate marks of the examination or 10 percent of the total number of marks of the head of passing in which he/she is failing, whichever is less. However, condonation, whether in one head of passing or aggregate head of passing be restricted to maximum upto 10 marks only.

Condonation of deficiency of marks be shown in the statement of marks in the form of asterisk and ordinance number.

Provided that this condonation of marks is concurrent with the rules and guidelines of

Professional statutory bodies at the all India level such as AICTE, MCI, Bar council, CCIM,CCIH,NCTE etc.

0.106 (A) UNFAIR MEANS COMMITTED BY THE STUDENT

1. The Board of Examinations shall be the competent authority to take disciplinary action against a student for his misconduct due to his unfair means committed by him at the examination conducted by the University.

2. The Principal, of the college or Head of the recognized Institution shall be the competent authority to take disciplinary action against a student for his misconduct due to his unfair means committed by him at the examination conducted by the University, recognized Institution of behalf of the University.

3. Definition- Unless the context otherwise requires

(a) Student means and includes a person who is enrolled as such by the University/college/Institution for receiving instruction qualifying for any degree, diploma or

certificate awarded by the University. It includes ex-student and student registered as candidate (examinee) for any of the Degree, Diploma or Certificate examinations.

(b) Unfair Means includes one or more of the following acts or omissions on the part of student/s during the examination period.

i. Possessing unfair means material and or copying there from.
ii. Transcribing any unauthorized material or any other use thereof.
iii. Intimidating or using obscene language or threatening or use of violence against invigilator or person on duty for the conduct of examination or man-handling him/her or leaving the examination hall without permission of the supervisor or causing disturbances in any manner in the examination proceedings.

iv. Unauthorized communicating with other examinees or any one else inside or out side the examination hall.

v. Mutual/Mass copying

vi. Smuggling out, either blank or written or smuggling in of answer books as copying material.

vii. Smuggling in blank or written answer book, forging and forging signature of the Jr. Supervisor therein.

viii. Interfering with or counterfeiting of University/College Institution seal or answer books or office stationary used in the examination.

ix. Impersonation at the University/college/Institution examination.

x. Revealing identity in any form in the answer written or in any other part of the answer book by the student at the University or College or Institution examination.

xi. Or any other similar act/s omission/s which may be considered as unfair means by the competent authority.

(c) "Unfair means relating to examination" means and includes directly or indirectly communicating or attempting to commit or threatening to commit any act or coercion, undue influence or fraud or malpractice with a view to obtaining wrongful gain to him or to any other person or causing wrongful loss to other person/s.

(d) "Unfair means material" means and includes any material whatsoever, related to the subject of the examination, printed, typed, handwritten or otherwise on the person or on clothes, or body of the student (examinee) or on wood or other material, in any manner or in the form of chart,
diagram, map or drawing or electronic aid etc. which is not allowed in the examination hall.

(e) "Possession of unfair means material by a student" means having any unauthorized material on his/her person or desk or chair or table or at any place within his/ her reach, in the examination centre and its environs or premises at any time from the commencement of the examination till its conclusion.

(f) " Student found in possession" means a student reported in writing as having been found in possession of unfair means material by Jr. Supervisor, Sr. Supervisor, member of the Vigilance committee or Examination squad or any other person authorized for this purpose in this behalf, even if the unfair means material is not produced as evidence because of its being reported as swallowed or destroyed or snatched away or otherwise taken away or spoiled by the student or by any other person acting on his behalf to such an extent that it has become illegible.

Provided that report to that effect is submitted by the Sr. Supervisor or chief Conductor or any other authorized person to the Controller of Examinations, Principal or Head of the Institutions concerned or any officer authorized in this behalf.

(g) Material related to the subject of Examination means and includes, if the material is produced as evidence any material certified as related to the subject of examination by a competent person and if the material is not produced as evidence or has become illegible for any of the reasons referred to in clause (f) above, the presumption shall be that the material did relate to the subject of the examination.

(h) "Chief Conductor", means and includes, Principal of the College concerned, or Head of the recognized institution concerned where concerned examination is being conducted and any other person duly authorized by him or person appointed as In charge of examination, by the authority competent to make appointment to such post.

4. Where the examination of the University courses are conducted by the constituent college/recognized Institute on behalf of the University, the Principal/Head of the concerned college/recognized Institution on receipt of a report regarding use of unfair means by any student at any such examination including breach of the rules laid down by the Management council or by the College/recognized institution for proper conduct of examination, shall have power at any time to institute inquiry and to punish such unfair means or breach of any of the rules by exclusion of such a student from any such examination or any University course in any college/Institution either permanently or for a specified period or by cancellation of the result of the student in the college/recognized Institution examination for which he/she appeared or by deprivation of any college/Institution scholarship or by cancellation of the award of any college/Institution prize or medal to him/her or by imposition of fine not exceeding Rs.300/- or in any two or more of the aforesaid ways.

5. During examination, examinees and other students shall be under disciplinary control of the Chief Conductors.

6. Chief Conductor/s of the examination centre shall in the case of unfair means, follow the procedure as under:-

(a) The student shall be called upon to surrender to the Chief Conductor, the unfair means material found in his or her possession, if any, and his/her answer-book.

(b) Signature of the concerned student shall be obtained on the relevant materials and list thereon. Concerned Senior Supervisor and the Chief Conductor shall also sign on all the relevant materials and documents.

(c) Statement of the student and his undertaking in the prescribed format and the statement of the concerned Jr. Supervisor and Sr. Supervisor shall be recorded in writing by the Chief Conductor (Appendix-III). If the student refuses to make statement or to give undertaking the concerned Sr. Supervisor and / or Chief Conductor shall record accordingly under their signature.

(d) Chief Conductor shall take one or more of the following decisions depending upon seriousness/gravity of the case:-

i) In the case of impersonation or violence, expel the concerned student from the examination and not allow him/her to appear for remaining examination.

ii) Obtain undertaking from the student to the effect that the decision of the concerned competent authority in his/her case shall be final and binding and allow him/ her to continue with his/ her examination.

iii) May report the case to the concerned Police Station as per the provision of Maharashtra Act No. XXXI 1982 – An act to provide for preventing Malpractice's at University Board and other specified examinations (Appendix-III) (Performa A& B).

iv) Confiscate his / her answer books, mark it as suspected unfair means case and issue him/her fresh answer books duly marked.

v) All the material and list of material mentioned in sub-clause (a) and the undertaking with the statement of the student and that of the Jr. Supervisor as mentioned in clause no. (b) & (c) and the answer-book/s shall be forwarded by the Chief conductor along with his report to the concerned Controller of Examinations/Principal/Head of the Institution, as the case may be, in a separate and confidential sealed envelope marked " suspected unfair means case"

vi) In case of unfair means of oral type, the Jr. Supervisor and the Sr. Supervisor or concerned authorized person shall record the facts in writing and shall report the same to the concerned Controller of Examinations/Principal/Head of the Institutions, as the case may be.

PUNISHMENT

The competent authority concerned i.e. the Board of Examinations in the case of University examination, the concerned Principal in the case of college examinations held by the recognized Institutions, after

taking into consideration the report of the committee shall pass such orders as it deem fit including granting the student benefit of doubt, issuing warning or exonerating him/her from the charges and shall impose any one or more of the following punishment on the student/s found guilty of using unfair means:-

(a) Annulment of performance of the student in full or in part in the examination he/she has appeared for.

(b) Debarring student from appearing for any examination of the University or college Institution for a stipulated period not exceeding five year.

(c) Debarring student from appearing for any examination of the University or college Institution for a stipulated period not exceeding five year.

(d) Cancellation of the University or College or Institution scholarship/s or award/s prize or medal etc. awarded to him/her in that examination.

(e) In addition to the above mentioned punishment, the competent authority may impose a fine not exceeding Rs.300/- on the student declared guilty. If the student concerned fails to pay the fine within a stipulated period, the competent authority may impose on such a student additional punishment/penalty as it may deem fit.

(f) The student concerned be informed of the punishment finally imposed on him/her in writing by the competent authority or by the officer authorized by it in this behalf, under intimation to the College/Institution he/ she belongs to.

(g) An appeal against the findings of the committee shall lie with the concerned competent authority whose decision shall be final and binding.

(h) An appeal made in writing within a period of 30 days from the date imposition of the punishment shall be considered by the competent authority on merit and shall be decided on the basis of the evidence available in the case and shall be heard in person in deserving cases, if the competent authority finds substance in the appeal, the competent authority shall supply a typed copy of the relevant extract of fact-finding report of the inquiry committee, as well as documents relied upon (if not strictly confidential). Decision in the appeal shall be informed to the student concerned accordingly.

(i) The court matters in respect of the unfair means cases should be dealt with by the respective competent authority.

(j) As far as possible the quantum of punishment should be as prescribed (Category-wise in Appendix- I

APPENDIX-I

THE BROAD CATEGORIES OF UNFAIR MEANS ADOPTED BY STUDENTS AT THE UNIVERSITY/ COLLEGE/ INSTITUTION EXAMIANTION AND THE QUANTUM OF PUNISHMEN T FOR EACH CATEGORY THEREOF.

Sr. No.	Nature of Malpractices	Quantum of Punishment
1.	Possession of copying material	(Note:- This quantum of punishment Shall apply also ot the following categories of malpractices at Sr. No. 2, to Sr. No.12 in addition to the Punishment prescribed thereat)
2.	Actual copying from the copying material	Exclusion of the student from university or College or Institution examination for one additional examination.
3.	Possession of another students Answer Book	Exclusion of the student from University or College or Intuition examination for one additional examination (Both the students)
4.	Possession of another students Answer book+ actual evidence of Copying	Exclusion of the student from University or College or Institution examination for two additional examination (Both the Students)

5.	Mutual / Mass copying.	Exclusion of the student from University or College or Institution examination for two additional examinations.
6 (a)	Smuggling out or smuggling in of Answer book as copying material.	Exclusion of the student from University or College or Institution examination for two additional examinations.
(b)	Smuggling in of written answer book based on the question paper set at the examination	Exclusion of the student from University or College or Institution examination for three additional examinations
(c)	(c) Smuggling in of written answer book and forging signature of Jt, Supervisor thereon	Exclusion of the student from University or College or Institution. Examination for four additional examinations.

7.	Attempt to forge the signature of the Jr. Supervisor on the answer book or Supplement.	Exclusion of the student from the University or College or Institution examination for four additional examinations.
8	Interfering with or counterfeiting of University / College/ Institution seal or Answer books or office stationary used in the examination	Exclusion of the student from University or College or Institution examination for four additional examinations.
9.	Answer book main or supplement written outside the examination hall or any other insertion in answer book.	Exclusion of the student from University or College or Institution examination for four additional examinations.
10.	Insertion of currency notes/to bribe or attempting to bribe any of the persons/s connected with the conduct of Examination	Exclusion of the student from University or College or Institution Examination for four additional examinations. (Note:- This money shall be created to the Vice-Chancellor's Fund)
11.	Using obscene language/violence/ threat at the examination centre by a student at the University/ College / Institution Examination to Jr./ Sr. Supervisor/ Chief Conductor or Examiners.	Exclusion of the student from University or College or Institution examination for four additional Examinations.

12.(a)	Impersonation at the University/ College / Institution examination	Exclusion of the Student from University or College or Institution examination for five additional examinations, (Both the students if impersonator is University or College or Institute student)
(b)	Impersonation by a University/ College/ Institute student at S.S.C./ H.S.C./ any other Examinations.	Exclusion of the Student from University or College or Institution examination for five additional examinations
13.	Revealing identity in any form in the answer written or in any other part of the Answer book by the student at the University or College or Institution Examination	Annulment of the performance of the student at the University or College or Institution Examination in full.
14.	Student found having written on palms or on the Body, or on the clothes while in the Examination	Annulment of the performance of the student at University or College or Institution Examination in full.
15.	All other mal-practices not covered in the aforesaid categories.	Annulment of the performance of the student at the University or college or Institution Examination in full and severe punishment depending upon the gravity or the offence.
16.	If on previous occasion a disciplinary action was taken against a student for malpractice used at examination and he/she is caught 'again for malpractices used at the examinations, in this event he/she shall be dealt with severely. Enhanced punishment can be imposed on such student. This enhanced punishment may extend to double the punishment provided for the offence when committed at the second or subsequent examination	
17.	**PRACTICAL/DISSERTATION/PROJECT REPORT EXAMS.**	
	Student involved in malpractices at practical/ dissertation/ project report examination shall be dealt with as per the punishment provided for the theory examination.	
18.	The competent authority in addition to the above mentioned punishments may impose a fine not exceeding Rs. 300/- on the student declared guilty.	
	Note:- The term annulment of performance in full' includes performance of the student of the theory as well as annual practical examination, but does not include performance at term work, project work and dissertation examination unless malpractice used thereat.	

FACULTY OF ENGINEERING AND TECHNOLOGY
Proposed Revised Structure of TE (Civil)

Semester-I

Subject Code	Subject	Contact hrs/Week			Examination				
		Th.	Pr.	Total	Th.	CT	TW	Pr. / Oral	Total
CED301	Theory of Structure - II	4	-	4	80	20	-	-	100
CED302	Design of Structure - I (Steel)	4	-	4	80	20	-	-	100
CED303	Building Planning and Design	4	-	4	80	20	-	-	100
CED304	Engineering Geology	4	-	4	80	20	-	-	100
CED305	Transportation Engineering I	4	-	4	80	20	-	-	100
CED306	Advanced Surveying	2	-	2	40	10	-	-	50
CED321	Lab I: Building Planning and Design	-	4	4	-	-	50	25	75
CED322	Lab II: Engineering Geology	-	2	2	-	-	25	25	50
CED323	Lab III: Advanced Surveying	-	2	2	-	-	25	-	25
BSH331	Lab IV: Communication Skill- II	-	2	2	-	-		50*	50
	TOTAL	**22**	**10**	**32**	**440**	**110**	**100**	**100**	**750**

* Online Exam

Semester-II

Subject Code	Subject	Contact Hrs/Week			Examination Scheme				
		Th.	Pr.	Total	Th.	CT	TW	Pr. / Oral	Total
CED351	Design of Structure-II (RCC)	4	-	4	80	20	-	-	100
CED352	Environmental Engineering - I	4	-	4	80	20	-	-	100
CED353	Geotechnical Engineering	4	-	4	80	20	-	-	100
CED354	Water Resource Engineering	4	-	4	80	20	-	-	100
CED355	Transportation Engineering - II	4	-	6	80	20	-	-	100
CED371	Lab V: Structural Design and Drawing-I (Steel)	-	4	4	-	-	50	50	100
CED372	Lab VI: Geotechnical Engineering	-	2	2	-	-	25	25	50
CED373	Lab VII: Transportation Engineering - II	-	2	2	-	-	25	25	50
CED374	Lab VII: Computer Lab- III	0	2	2	-	-	50		50
	TOTAL	**20**	**10**	**30**	**400**	**100**	**150**	**100**	**750**

Th. = Theory, Pr. = Practical, CT = Class Test, TW = Term Work

CED301: Theory of Structures- II

Teaching Schemes	Examination Schemes
Theory: 04 Hrs / Week	Theory: 80 Marks;
	Class Test: 20 Marks

Unit I: Plastic Analysis of Structures **(04)**

Introduction, Material behavior, Theory of Plastic bending and plastic hinge, Plastic Hinge Concept, Shape factor, Ultimate moment of resistance of RCC section, Plastic collapse load. (No numerical to be set)

Unit II:-Basic Concepts and Analysis of Indeterminate Beams, Frames and Trusses (11)

Concept of indeterminacy–Static and Kinematic Indeterminacy, Degree of Indeterminacy- Rigid Plane Frames and Pin-jointed Plane Trusses.

Analysis of continuous beams, rectangular portal frames and trusses (Indeterminacy up to second degree) by Castigliano's II theorem, lack of fit, temperature changes.

Slope deflection method

Nature of equilibrium methods, the slope deflection equation, Interpretation of the slope deflection equation, Analysis of continuous beam, fixed beam, & overhang beams by slope deflection method, Effect of sinking of supports.

Unit III: Column Analogy Method **(05)**

Introduction, Development of the method, Analysis of beams (simple and fixed), Analysis of single bay-single storey frames.

Unit IV:-Moment Distribution method **(08)**

Iterative methods, Physical interpretation of iterative solutions, Basic concept of Moment Distribution Method, Analysis of continuous beam, fixed beam, & overhang beams by Moment Distribution Method, analysis of portal frames (single bay single storey frames), sway and non-sway analysis..

Unit V: Kani's method **(06)**

Analysis of continuous beam, fixed beam, & overhang beams by Kani's Method, analysis of portal frames, sway and non-sway analysis (single bay single storey frames).

Unit VI: Two Hinged Arch **(06)**

Analysis of two hinged parabolic, semicircular and circular arches, yielding of supports of two hinged arches, Rib shortening effects, horizontal thrust due to temperature effects on two hinged arches, Influence lines for two hinged arches.

Recommended Books

1. Fundamentals of Structural Analysis – West & Geschwindner – Wiley India Edition
2. Strucutral Engineering (An Integrated Treatise) – V.V. Sastry – Dhanpat Rai and Co.
3. Basic Structural Analysis - C.S. Reddy – McGraw Hill
4. Theory of Structures - Timoshenko & Goodier - McGraw Hill
5. Advance Theory of Structures – Sinha & Gayen - Dhanpat Rai and Co.
6. Theory of Structures by S. Ramamrutham and R. Narayan, Dhanpat Rai Publication
7. Theory of Structures, Vol. 1 by Pandit and Gupta
8. Theory of Structures, Vol. 2 by Pandit and Gupta

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED302: Design of Structures-I (Steel)

Teaching Scheme
Theory: 04 Hrs / Week

Examination Scheme
Theory: 80 Marks,
Class Test: 20 Marks

Unit-I (04)

Types of steel structures, grades of structural steel, various rolled steel sections, relevant IS specifications such as IS: 800-2007, IS: 808-1989, IS: 875 part I to III, SP: 6(1), SP: 6(6), IS: 4000-1992, codes of welded connections, advantages of steel structures, Philosophy of limit state design for strength and serviceability, partial safety factor for load and resistance, various load combinations, classification of cross section such as plastic, compact, semi compact and slender.

Unit-II (06)

Tension member: Types, Limit state due to yielding, rupture and block shear, Design using single and double angle sections and its connections by bolts and welds.

Unit-III (10)

Compression member: Behavior of compression members, modes of failure, classification of cross section, Design of strut in trusses and its connections by bolts and welds. Design of axially loaded column using rolled steel section. Design of built up column, lacing and battening, connection of lacing / battening with main components by bolts and welds. Column base under axial load: design of slab base, gusseted base. Column base for axial load and uniaxial bending.

Unit-IV (07)

Flexural member: Laterally supported and unsupported beams using single rolled steel section with and without flange plate, strength in flexure, check for shear and deflection. Secondary and main beam arrangement for floor of a building, design of beam to beam and beam to column connections using bolt / weld.

Unit-V (05)

Design of welded plate girder: Design of cross section, curtailment of flange plate, stiffeners and connections.

Unit-VI (08)

Roof Trusses and Gantry Girder: Assessment of dead load, live load and wind load, design of gantry girder.

Recommended Books

Reference codes: IS 875-Part I to V, IS 800 – 2007.

1. Design of Steel Structures by N. Subramanian, Oxford University Press, New Delhi.
2. Design of steel structure by Limit State Method as per IS: 800-2007 by Bhavikatti S. S., I K International Publishing House, New Delhi.
3. Limit state design of Steel Structure by V. L. Shah and Gore, Structures Publication, Pune.
4. Teaching Resource Material by INSDAG

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED 303: Building Planning and Design

Teaching Scheme
Lectures: 4 Hrs / week

Examination Scheme:
Theory paper: 80 Marks
Class Test: 20 Marks

Unit- I: (07)

Principles of Architectural Composition: Unit, Contrast, Proportion, Scale, Balance, Rhythm, Character. Functional treatment of building: massing, Principles of Building planning, Climate & its influence on Building planning: Solar radiation, air temperature, wind, humidity, precipitation, climatic zones, climate & comfort, earth & its motion, directions & their characteristics. Orientation of buildings: factors affecting orientation, sun, wind, rain, C.B.R.I. – suggestions for obtaining optimum orientation, orientation criteria for Indian conditions.

Unit- II: (06)

Building rules & bye laws: objective of building bye-laws, terms commonly used, plot sizes, building frontages, road widths, open spaces, area limitations, height of buildings, plinth height, requirement of different types of rooms, parapet wall, boundary wall, provision for lighting & ventilation, provision for means of access, provision for drainage & sanitation, parking spaces, qualifications for registered architects, Engineers & Licensed supervisor, certificate of commencement, completion & occupancy.

Unit-III: (07)

a) Different types of buildings, different types of residential buildings, site selection for residential buildings, standard guidelines for building drawings, guidelines for drawing of residential building, drafting materials and their utilization,
b) Building services: water supply requirement of buildings, sanitary fittings, systems of plumbing, drainage of house, its principles, common terms, drainage plans of buildings, testing of drains, maintenance, pipe sizes and gradients. Septic tanks: domestic & public septic tank, design & commissioning of septic tank.

Unit- IV: (04)

Design of residential buildings: Planning of living area, sleeping area & service area, minimum standards specified by building bye- laws, requirement of different purpose rooms of a residential building and their grouping.

Unit- V: (10)

Design of Public buildings:

A) Educational Building: Site selection, design of Class rooms, Library, Assembly hall, administrative area, staff rooms, sanitary & water fittings requirements.
B) Health care buildings: its types, site selection, out- patient dept.(OPD), In- patient dept. (IPD), wards, Operation theatre, Radiology dept., Sanitary & water fitting requirements for IPD & OPD, Pathology dept.
C) Hostel Buildings: site selection, Employees hostel, Ladies & working women's hostel, open & closed type hostel, special requirements of ladies hostel, warden's office, residential area, dining area, kitchen, recreation room, store room, sanitary & water fitting requirements.
D) Hotel building: site selection, major components of hotel building - entrance foyer, public rooms, bedrooms, kitchen, food store, laundry, building services, sanitary units.
E) Office buildings: entrance, corridors, storage, sanitary units, canteen.
F) Industrial building: Factory building, godowns & warehouses, site selection, Factory shed, canteen, cloak room, drinking water, entrance, loading & unloading platform, medical aid, office, storage, sanitary block.

Unit VI: (06)

Perspective drawing: Necessity, principle of perspective projection, perspective elements, One-point & Two- point perspective. Landscaping: Its necessity, types & materials.

Recommended Books

1. Building Planning & Drawing - Dr. N. Kumara swamy, A. Kameshwara rao, 6th Edition, Charotar Publications.
2. Building Planning Designing & Scheduling - Gurcharan Singh, Jagdigh singh, Standard Publishers.
3. Planning & Designing of building - Y.S. Sane.
4. Principles of building drawing - M.G. Shah & C.M. Kale
5. Building construction illustrated- Francis D.K. Ching, 4th Edition, Wiley India Edition.
6. National Building Code of India: S.P - 7 (2005)

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED304: Engineering Geology

Teaching Scheme
Theory: 04 Hrs / Week

Examination Scheme
Theory: 80 Marks,
Class Test: 20 Marks

Unit I (04)

Physical Geology: Geological action of water ,river, valley development, normal cycle of regional erosion, ,water fall, meanders, and related features , transportation and deposition by river flood plane deposits, deltas, Rejuvenation and related features Earthquake , Interior of the Earth, Volcanism and its types, Types of Mountains.
Mineralogy: Minerals, Silicate and non silicate minerals, Rock forming minerals, Physical Properties of minerals , Moh's scale of hardness.

Unit II (07)
Petrology: Igneous rock and its sub-division- volcanic, hypabyssal and plutonic rocks. Hatch scheme of classification, Texture of rock and its types , study of common rock types, Extrusive rocks Dyke ,Bathyliths and intrusive igneous type sill, laccolith ,lopolith, phacylith, vein.
Secondary Rock: Rock weathering, decomposition and disintegration of rock, Classification of secondary rock, Texture of sedimentary rock , stratification and lamination , consolidation by welding and cementation . Characteristics of shallow water deposits, study of common rock types.
Metamorphic Rock: Metamorphism. agents of metamorphism, metamorphic minerals and structures, stress minerals and anti-stress minerals. Kind of metamorphism – contact, dynomathermal, cataclastic and plutonic metamorphism. Study of common types of rock.

Unit III (09)

Structural Geology: Structural elements of rock – dip and strike. Unconformity and overlap. Faults, folds, joints, in rock and their effects on outcrops. Inliers and outliers.
Stratigraphy: General principles of stratigraphy, age of the earth and division of geological time. Indian Geology–Physiographic division of India and their characteristics. Geological history of peninsula, study of formation in peninsula and significance for their structural characters in Engineering.

Unit IV (07)

Engineering Geology: Preliminary geological investigation, use of geological maps and section, bore holes, drilling advantages and limitation of drilling. Engineering significance of geological

structures such as stratification dips faults, joints crush zones, fault zones, dykes etc. Earthquakes losses and geological precaution to be taken while choosing sites of building in seismic zone. Earthquake proof construction of building.

Ground Water: Sources of groundwater, Zonal distribution of subsurface water , relation between surface relief and water table . Perched water table. Types of Aquifer. Fluctuations of water table levels, effect of dams and canals condition. Effects of pumping and cone of depression. geological condition that produces artesian pressures. Water Harvesting: Importance, artificial recharge and natural recharge of wells and tube wells.

Unit V (08)

Geology of Dam Sites: Influence of geological condition on the choice of types and design of dams. Preliminary geological work at the dam sites, favorable and unsuitable condition for location of dam. Precautions to be taken to counteract unsuitable condition. Treatment of leaky rock, fault zones, crush zone, dykes, joints unfavorable dips etc.

Geology of Reservoir Sites: Dependence of water tightness of physical properties and structures of rock. Geological condition suitable and unsuitable for reservoir site. Condition likely to cause leakage through the reservoir rim.

Tunneling: Types, Tunnel Lining, Important geological consideration while choosing alignment of tunnel . Exploration during construction, difficulties during tunneling related with lithology, nature and structure of material to be excavated biological condition likely to be trouble some.

Unit VI (05)

Landslides: Causes, influence dip and slope, safe and unsafe slope, terminal creep. Prevention of landslides. Precaution to be taken while making cut in hill sides.

Engineering Geology of Deccan Trap: Engineering significance of variation in size, number and filling of gas cavities . Hydrothermal alteration and weathering. Factors affecting strength and water tightness of basalt. Suitability of basalts for tunneling, factor that create difficulties in tunneling. Suitability of different types of basalts as a construction material, problems of dykes, red boles, volcanic breccias and river alluvium. Precautions to be taken during subsurface exploration in basalts.

Recommended Books

1. Geology of Engineers by Joseph M. Trefethen
2. Geology and Engineering by Robert F. Legget
3. Engineering Geology and Geotechnis byKrynine and judd
4. Principals of physical Geology by Arthus Holmes
5. Engineering Geology by Rish and waston
6. P.W.D Hand book Chapter No.6: (1980) on Engineering Geology.
7. Principles of Engineering Geology by R.B. Gupte.
8. Engineering and General Geology by Parbin singh.
9. Engineering Geology by D. Venkat Reddy
10. A Text book Engineering Geology by K. M. Bangar.
11. Geology of India by Wadia D. N.
12. Engineering Geology by Vasudev Kanithi, Universities Press

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED305: Transportation Engineering-I

Teaching Schemes	Examination Schemes
Theory: 04 Hrs / Week	Theory: 80 Marks; Class Test: 20 Marks

Unit I: Introduction (08)

History of Bridges and development, classification , alignment finalization, investigation, selection of bridge site, flood discharge , water way , calculations afflux, scour, river training works , types of foundation- shallow , piles, cofferdams, caissons.

Unit II: Approaches and Types of Bridge (06)

Approaches of Bridges, types of construction, slab culvert, box pipe, cause ways, and submersible bridges, IRC loading, piers, abutments, wing wall and its stability.

Unit III: Airport Engineering (06)

Aircraft characteristics related to airport design, general layout of an airport, runway configurations, runway orientations, geometric design of airfields, runways and aprons, air traffic control, airport lighting and marking, air travel demand forecast.

Unit IV: Signalling and Interlocking (10)

Layout, Signalling and Interlocking and their principles, objects, construction of tracks and its maintenance, modern trends in railway.

Permanent Way and Curves

Permanent way, gauges, sleepers, ballast, function of rails, failures of rails, Rail joints, rail fixtures and fastenings, types of gradient, grade compensation, types of curves.

Unit V: Crossing, Junctions and Yards (06)

Points and crossings, junctions, stations and yards, requirements of railway.

Unit VI: Docks & Harbours (04)

Elements of Docks and Harbours Engineering, classification, requirements, selection of site. Qury and Bulkhead.

Recommended Books

1. Railway Track by K. F. Antia
2. Principles of Railway Engineering by S. C. Rangawala
3. Railway Engineering by Saxena
4. Bridge Engineering by S. P. Bindra
5. Elements of Bridge Engineering by J. S. Alagia
6. Elements of bridge Engineering by D. Johnos Victer
7. Airport Engineering by G. Venkatappa Rao
8. Highway Engineering by Kadiyali

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED306: Advanced Surveying

Teaching Schemes	Examination Schemes
Theory: 02 Hrs / Week	Theory: 40 Marks;
	Class Test: 10 Marks

UNIT I: Hydrographic Surveying

Introduction, Soundings, Methods of locating soundings, horizontal and vertical control, the nautical sextant, ranges, plotting of soundings, The Three Point problem mechanical, graphical and analytical solutions.

(4Hrs)

UNIT II: Photogrammetry:

Application to various fields, General idea of terrestrial photogrammetry, Arial photogrammetry, Arial camera, composition of map and vertical photograph, vertical tilted and oblique photographs, concept of principle point, nadir point , isocenter, horizon point and principle plane, scale of vertical photograph, computation of length and height from the photograph, relief displacement on vertical photograph, flight planning, ground control , radial line method, Binocular vision and Stereoscopic fusion, mirror and lens, Stereoscopes. Parallax equation, measurement of parallax and determining difference of elevations, stereo meter, general idea of stereoscopic plotting instruments, basic principle of remote sensing, photo interpretation, applications to Civil Engineering

(8 Hrs)

UNIT III Geographical Information System:

GIS definition and terminology, GIS categories, Components of GIS, Geographic data presentation, Mapping process, Coordinate systems, Transformations, Map projection, Geo referencing, Fundamental operations of GIS, Application of GIS.

(4Hrs)

UNIT IV Remote Sensing:

RS: Fundamentals of RS, Electromagnetic energy & RS, Sensors, Platforms and RS data acquisition system, Image interpretation and classification, Application of RS.

(4Hrs)

Recommended Books

1. Surveying and Leveling Vol. I & II - By Prof. T.P. Kanetkar and Prof. S.V. Kulkarni, Pune Vidyarthi Griha Prakashan Pune.
2. Surveying Vol. I & II& III - By Dr. B.C. Punmia, Laxmi Publications Pvt. Ltd, New Delhi.
3. Surveying and Leveling Vol. II - By Hussain & Nagraj.
4. Surveying - By David Clark
5. Surveying - By Norman Thomas
6. Basics of Remote Sensing and GIS By S.Kumar Laxmi Publications.
7. Basics of Remote Sensing and GIS By S.Kumar Laxmi Publications

Introduction to Remote Sensing By James B. Cambell Taylor and Francis

CED321: Lab-I Building Planning and Design

Teaching Scheme	Examination Scheme	
Practical: 4 Hrs / week	Term Work:	50 Marks
	Pr. / Oral:	25 Marks

Practical Examination:

I) Students should prepare the following working drawings. Individual projects to be planned. Submission of working drawings by 1:50 or suitable scale.

a) Residential building:

i. Layout plan
ii. Floor plans (by hand as well as by computer software)
iii. Elevation (by hand as well as by computer software)
iv. Section through stair (by hand as well as by computer software)
v. Foundation plan (on tracing paper)
vi. Structural plan (on tracing paper)
vii. Water supply & drainage layout (on tracing paper)

b) Public building:

i. Layout plan
ii. Floor plans (by hand as well as by computer software)
iii. Elevation (by hand as well as by computer software)
iv. Section through stair (by hand as well as by computer software)
v. Foundation plan (on tracing paper)
vi. Structural plan (on tracing paper)
vii. Water supply & drainage layout (on tracing paper)

c) Perspective drawing of above any one building on imperial size sheet.

II) Submission of line plans of any four public buildings (not included in I) to be drawn on graph paper using 1:100 or suitable scale.

CED322: Lab-II: Engineering Geology

Teaching Scheme
Practical: 02 Hrs / Week

Examination Scheme
Term Work: 25 Marks
Pr. / Oral: 25 Marks,

The assessment of the term work shall be done on the following criteria's:

Continuous assessment: Performing the experiments in the laboratory.

The term work shall be consists of laboratory work based on the syllabus prescribed below:

Identification of megascopic properties of minerals and rocks.

Minerals and ores : Quartz and its varieties, common varieties of amorphous silica, orthoclase ,plagioclase, zeolite, biotite, hornblende, asbestos, actinolite, olivine, serpentine, tourmaline, kaolin, corundum, kyanite, magnetite, limonite, chromites, pyrolusite, bauxite, laterite, calcite, talc, azurite, gypsum, barites, iron pyrites , fluorspar , graphite, native copper.

Rocks: Granite, syenite, diorite, gabbro, rhylites, trachyte, Basalt, obsidian, pumice, pegmatite, graphic granite, dolerite, volcanic breccias, nepheline syenite, mudstone, shale, sandstone, grit, arkose, quartzite ,conglomerate, lime stone, ,coral , schist ,slate, marble, gneisses, augen gneisses, hematite.

Map and problems: Geological map reading and construction of section, completion of out crops ,solve the problems with the help of map and section on geological base. Core logging.

Practical examination: The practical examination shall consist of an oral test based on the above term work.

CED323: Lab-III: Advanced Surveying

Teaching Scheme	Examination Scheme
Practical: 02 Hrs / Week	Term Work: 25 Marks

The term work shall consists of performing an exercises based on the assignment/practical work done during the course. The assessment will be based on

1) Performing an exercise
2) Record of exercise submitted by the candidate.

Practical / Assignment:

1. Introduction to software's (Open source/Licensed) in Geographical Information System (GIS).
2. Introduction to Total Station :
   a) Measurement of Horizontal and vertical angle.
   b) Measurement of area of traverse.
   c) Block Contouring (Minimum 30 Sq. m).
3. Study of Mirror Stereoscope.
4. Study of Nautical Sextant.

BSH331: Lab-IV: Communication Skill-II

Teaching Scheme
Practical: 02 Hrs / Week

Examination Scheme
Online Exam: 50 Marks
Duration of exam: 1 hour

Unit-I

- Fast calculation techniques, Number system, ratio, proportion, variations averages,
- Simple interest ,compound interest, profit, loss
- Work and time speed and distance
- Set theory and vann diagram, permutation and combination
- Probability, alphanumeric series, logical deduction, reasoning, coding and decoding and blood relation
- Data interpretation

Unit-II

- The key components of non verbal communication i.e. eye contacts, body language, vocal tone and volume.
- Team work and team building, The basics of team intelligence, Diversity awareness, Gender issues
- Group discussion, unstructured group discussions and actual group discussions
- Presentation skills ,self confidence and decision making

Unit-III

- Adapting to corporate life
- Phone etiquettes, Email etiquettes, clothing etiquettes, Dining table etiquettes
- Getting ready for an interviews, corporate dressing, writing reports and proposals, minutes writing,

Recommended Books

1. Gopal Swamy Ramesh, Mahadevan Ramesh ,"The Ace of soft skills" Pearson publication
2. Bansal Harison, "Spoken English"
3. Orientblackswan, "English for Engineers and Technologist"
4. Jerry Wiessman , "Presenting to Win" Pretince Hall publications
5. Willium sanborn Pfeiffer,T.V.S,Padamaja, "Technical Communication"
6. M.Tyra, "Magical book on Quikermaths" BSC publishing Co. pvt.ltd.

CED351: Design of Structures-II (RCC)

Teaching Scheme
Theory: 04 Hrs / Week

Examination Scheme
Theory: 80 Marks
Class Test: 20 Marks

Unit-I (06)
Introduction to various design philosophies of reinforced concrete structures (WSM, LSM), Structural elements, loads on structures and structural properties of concrete, Redistribution of moments and its IS code provision
Limit state of serviceability: Significance of deflection, types of deflection and IS Provisions.
Limit state of cracking: Cracking, causes, mechanisms and effects, Classification, types of cracks, bar detailing rules.

Unit-II (08)
R.C. sections in flexure: Design parameters, maximum values, Analysis and design, singly, doubly reinforced and flanged sections.

Unit-III (06)
Design of beams for shear, bond and torsion

Unit-IV (08)
Design of slab: One way, simply supported, cantilever and continuous. Design of staircase: Dog legged and open well, two way slab-simply supported, continuous and restrained

Unit-V (08)
Design of column: Axially loaded, short and long, uni-axial and biaxial moments. Design of isolated column footing: axial load, uni-axial and biaxial moments.

Unit-VI (04)
Introduction to earthquake engineering: Equivalent static lateral earthquake force, concepts of base isolation, introduction to ductile detailing as per IS 13920.

Reference Books

Reference codes: IS 875-Part I to V, IS 456 – 2000, IS 1893 – 2002.

5. Limit State Analysis and Design by P. Dayaratnram, Wheeler Publishing Company, New Delhi.
6. Limit State Theory and Design by Dr. V. L. Shan and Dr. S. R. Karve, Pune Vidyarthi Gruh Publication, Pune.
7. Comprehensive Design of R. C. structures by Punmia, Jain and Jain, Standarad Book House, New Delhi.
8. RCC Analysis and Design by Sinha, S. Chand and Co; New Delhi.
9. Reinforced Concrete Design by Varghese, PHI, New Delhi.
10. Reinforced Concrete Design by Pillai Menon, Tata Mc Graw Hill, New Delhi.
11. Design of Concrete Structures by J N Bandyopadhyay, PHI, New Delhi.

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED352: Environmental Engineering-I

Teaching Scheme
Theory: 04 Hrs / Week

Examination Scheme
Theory: 80 Marks,
Class test: 20 Marks

Unit I

Air Pollution: Defination, Statement of problems, Sources of air pollution, Types and classification of air pollutant, general physic-chemical properties of atmosphere , various layers of atmosphere and their importance, atmospheric stability, mixing height, atmospheric diffusion theories, stack height design, Gaussian dispersion model estimation of ground level concentration, effect of air pollution on health man animal and vegetation and materials, photochemical smog, green house effect, acid rain.

Unit II

Air pollution control equipments (scrubber, cyclones electrostatic precipitator, louvre type seperator), Sources of smoke and smoke measurement by ringelmans methods.

Unit III

Air pollution legislation and regulation, air quality standards, emission standards, air (prevention and control of pollution, environmental impact assessment.

Unit IV

Water Supply Engineering: Introduction to water supply scheme, data collection for water supply scheme, components and layout, design period , factors affecting design period.
Intake structure – river, canal, well, design of rising main, design of pumping station , Water demand, water system losses, factors affecting rate of water demand, population forecasting water quality standards and tests as per Indian standard.

Unit V

Quality parameters of raw water, water treatments – principle of water treatments process introduction to different water treatment flow sheets, Aeration –principle and concept necessity methods removal of test and odour, Design of aeration fountain, Sedimentations, plain and chemically assisted – sedimentation principal settling velocity ,efficiency of an ideal settling basin types of sedimentation tank design of sedimentation tank, sedimentation with coagulation, theory and types of coagulants, mean velocity gradient, design of flocculation chamber , design of clarriflocculaters.

Unit VI

Filtration: Theory of filtration, mechanism of filtration, filter materials, types of filters- rapid , slow sand and pressure filter, design of rapid sand filter, cleaning of filter, operational trouble
Disinfection: Theory, factors affecting, disinfect types, disinfection, chlorination demand, methods of chlorination (break point chlorination), ground water recharge.

Recommended Books

1. Air pollution volume I-IV , Stern , Mc- Graw hill publication .
2. Air Pollution control engineering , Noel De Nevers, (II Edition) Mc- Graw hill publication International Edition.
3. Water supply engineering, S.K.Garg, Khanna publishers, New Delhi.
4. Water Supply & Sanitary Engineering, G.S.Birde & J.S.Birde, Dhanpat Rai publishing company.
5. Air pollution, Rao H.V.N & Rao M.N , T.M.H Publication.
6. Elements of Environmental Engineering, Duggal K.N S.Chand & company.
7. Environmental Engineering, Peavy & Rawe, Mc Graw Hill publication.

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED353: Geotechnical Engineering

Teaching Scheme	Examination Scheme
Theory: 04 Hrs / Week	Theory: 80 Marks, Class test: 20 Marks

UNIT I :Introduction **(06)**

Origin of soil, scope of Geotechnical Engineering, major soil deposits of India, components of soils, soil minerals, Properties of Soil :Mechanical composition of soil, volume and weight relationship, specific gravity, density, density, relative density, void ratio, porosity, degree of saturation , functional relationship , moisture content, grain size analysis, mechanical and sedimentation analysis, consistency limits soil texture and structure, elementary ideal about swelling, sensitivity and thixotrophy.

UNIT II: Classification of soil **(04)**

Particle size classification, Highway research board classification, ISI classification, unified classification .Soil moisture and permeability, soil moisture, effect of moisture content on soil, structural water, absorbed water, capillary water , effective and neutral pressure, critical hydraulic gradient, seepage of water through soil , permeability, Darcy's law, Discharge velocity and seepage velocity, factors affecting the permeability. Laboratory methods of permeability concept of flow net and its characteristics, Graphical methods of flow net construction and its application to isotropic soil only.

UNIT III : Compaction And Consolidation **(10)**

Proctor density and optimum moisture content, factor affecting compaction, field methods of compaction control and mechanical stabilization of soils.

compressibility, relation between pressure and void ratio, laboratory consolidation test. Pre consolidation pressure in clay. Terzaghi's theory of one dimensional consolidation , degree of consolidation, Determination of Coefficient of consolidation, square root of time fitting method and logarithm of time fitting method, coefficient of consolidation.

UNIT IV: Stress Distribution in soil **(05)**

Boussinesq's equation for point load, vertical pressure under loaded circular area and uniformly loaded rectangular area. Newmark's method for uniformly distributed loads, preparation and use of Newmark's chart.

UNIT V: Shear Strength **(05)**

Concept of shear strength, principles stresses, Mohr's envelops for cohesive, non cohesive and composite soils, General principles of drained, consolidated un-drained and drain tests. Direct unconfined tri-axial

and vane shear tests. Determination of shear strength by direct, unconfined, tri-axial and vane shear tests. Comparison of these methods. Elastic modulus from triaxial test.

UNIT VII: Earth Pressure and Stability of Slope **(10)**

Earth pressure at rest active and passive condition elementary idea about Rankin's and Coulomb's earth pressure. Graphical methods for active earth pressure.

Factors contributing to slope failures. Classification of slope failures, Infinite and finite slope. The Swedish Method and its application to dry cohesive soils and composite soils, friction circle method, Taylor's stability number and stability curve.

Recommended Books

1. Soil Engineering in Theory and Practice, Geotechnical Testing and Instrumentation Alam Singh Asia Publishing House (p) Ltd. New Delhi.

2. PunimiaB.C. "Soil Mechanics and Foundation Engineering" Laxmi Publications Pvt. Ltd., New Delhi. .

3. Soil Mechanics and Foundation Engineering – Murthy V.N.S. (1996) 4th Edition, UBS Publishers and Distributors, New Delhi.

4. Purushottam Raj "Geotechnical Engineering" Tata McGraw Hill Publishing Company Limited, New Delhi.

5. Kasmalkar B.J. "Geotechnical Engineering", Pune Vidyarthi Griha Prakashan, Sadashiv Peth, Pune

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED354: Water Resources Engineering –I

Teaching Scheme
Theory: 04 Hrs / Week

Examination Scheme
Theory: 80 Marks,
Class Test: 20 Marks

Unit I: (08)
Introduction of Hydrology:
Definition, Importance and scope of hydrology, hydrologic cycle, Weather and its precipitation potential.

Precipitation: Forms and types of precipitation, Methods of measurement, Rainguage network Factors affecting precipitation at location, Estimating missing data, Mass rainfall curves, Hyetograph, double mass analysis(Correcting precipitation data) Determination of average precipitation over the catchment.
Evaporation and Infiltration: Evaporation process, evaporimeter, evaporation reduction, Measurement of evapo-transpiration by Penmen's equation. Infiltration process, Factors affecting infiltration, Effect of infiltration on runoff and ground water recharge, measurement indices.

Unit II (06)
Runoff: Factors affecting runoff, rainfall-runoff relationships, components of a flood hydrograph, Base Flow separation , Effective rainfall, runoff hydrograph, , Unit hydrograph – theory – assumptions and limitations, unit hydrograph derivation, use of unit hydrograph S-curve hydrograph, synthetic unit hydrograph.

Unit III (06)
Stream Gauging: Selection of site, various methods and instruments of discharge measurements.
Floods: Definition, Factors affecting, Estimation of peak flow, Empirical formula, frequency analysis Gumbel's and Log Pearson type III Distribution.

Unit IV (06)
Ground water hydrology: Occurrence and distribution of ground water, Specific yield of aquifer, Movement of ground water, Darcy's law, Permeability, Safe yield of basin.
Hydraulics of well under steady flow conditions in confined and unconfined aquifers, Effect of partial penetration, interference of wells and boundary, recharge of ground water.

Unit V (08)
Introduction to Irrigation and Water applications to the crops: Definition, functions, advantages and necessity, methods of irrigation, surface irrigation, subsurface irrigation, micro irrigation.
Consumptive and non consumptive use of water, factors affecting crop water, requirement , irrigation water standards, wilting point, Delta, duty , factors affecting crop determination of duty, important crops in India, Their seasons, crop rotation, Various methods of applying water to crops and their comparison.

Unit VI (06)
Water shed management: Conservation of land and water necessity of watershed, development small structures and steps involved in watershed management, ridge line treatment, upper treatment, drainage line treatments erosion control.

Water Logging and Drainage: Causes and effects of water logging, its remedial measures, Drainage of Irrigation areas.

Recommended Books

1. Irrigation Engineering by S. K. Garg – Khanna Publishers, Delhi.
2. Irrigation, Water Resources and Water power Engineering by Dr P.N. Modi
3. Irrigation and Water power Engineering by Dr Punmia and Dr. Pande – Laxmi Publications, Delhi
4. Engineering Hydrology by Subramany K., -Tata McGraw Hill, New Delhi.
5. Engineering Hydrology by Raghunath H.M. - New Age International Publishers
6. Watershed Management in India by J.V.S. Murthy – Wiley Eastern Publications, Delhi
7. Hydrology and water resources by R.K.Sharma, Dhanpatrai and sons, NewDelhi.
8. Theory and design of irrigation structures by Varshney, Gupta and Gupta vol. I and II and III, Newchand and Brothers.
9. Irrigation Theory and practice by Michael, Vikas Publications House
10. Water management by Jaspal Sing, M. S. Acharya, Arun Sharma, Himanshu Publications.

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED355: Transportation Engineering-II

Teaching Schemes	Examination Schemes
Theory: 04 Hrs / Week	Theory: 80 Marks;
Practical: 02 Hrs /week	Class Test: 20 Marks

Unit I: Highway Planning and Financing (04)
Historical developments, classification of roads, planning surveys, preparation of master plan & its phasing, Nagpur plan, Bombay plan, Lucknow plan, (only salient features of these three plans, no numerical is to be asked in examinations), Vision 2021- details of recommendations, highway cost, highway user benefits, highway economic analysis, highway financing, private sector participation, National Highway development Programme, development of rural roads through PMGSY, National highway development authority, Indian road congress.

Unit II: Highway Alignment and Geometric Design (10)
Highway Alignment, Engineering Surveys, highway cross- section elements, width of formation, sight distances, design of horizontal and vertical alignment including curves, super elevation, extra widening. Set back distance, gradients, alignment & geometrics of hill roads (IRC recommendations should be followed).

Unit III: Highway Materials (06)
soil and its characterization, CBR test , plate bearing test, aggregates, gradation and other tests bituminous materials and different tests on them, bituminous mixes and mix design procedure, cement concrete and their properties.

Unit IV: Design of Pavement (06)
a) Flexible Pavements : Design factors, different methods of design, CBR method, group index method, Burmister's method, Triaxial method, IRC 37-2001, IRC 37-2012, drainage design for pavements.
b) Rigid Pavements: General design considerations, wheel load stresses, Westergrad's wheel load stresses formula, slab thickness for pavements, longitudinal and transverse joints, IRC 58-2002.

Unit V: Pavement Construction and Maintenance: (06)
Construction of earth roads, stabilized soil roads, water bound Mecadam roads, wet mix Mecadam roads, bituminous macadam, semidence bituminous concrete, asphalt concrete, seal coat mix seal surfacing, liquid spray grout, constructions of cement concrete roads.(All procedures as per specifications for road and bridge works -Ministry of road transport & Highways, Govt. of India, fourth revision.) .Highway Construction Machinery Earth moving equipments, spreaders, rollers, paver finishers, binder sprayers, hot mix plant, vibromixes, tippers.

Highway maintenance: Causes of pavement failures, typical flexible and rigid pavements failure, special repairs in flexible pavements.

Unit VI: Traffic Engineering: (08)

Traffic characteristics, traffic studies & their uses, traffic control devices, intersections & their design.

Recommended Books

1. Highway Engineering by S. K. Khanna & Justo
2. Principals of Transportation Engineering by Partha Chakraborty & Animesh Dass
3. Guidelines for the design of flexible pavements, second revision, IRC: 37- 2001
4. Guidelines for the design of rigid pavements, IRC: 58-2002
5. Specifications for road and bridge works, Ministry of Road transportation & Highways-2001, Govt. of India, New Delhi.
6. Highway Engineering by Kadiyali
7. Principles of transportation and highway engineering by G. Venkatappa Rao
8. Highway Material and Testing by S. K. Khanna, Justo and Veerraghwan.
9. Tentative Guidelines for the design of flexible pavements - IRC: 37-2012
10. Text book of Highway Engineering by R Srinivasa Kumar

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Three questions from each section are asked to solve.

CED371: Lab-IV: Structural Design and Drawing-I (Steel)

Teaching Scheme	**Examination Scheme**
Laboratory: 04 Hrs / Week	Term Work: 50 Marks
	Oral: 50 Marks

Design of an industrial building which should include the following

A) Design of roof truss (Analysis may be carried out using commercial software), Design of purlins, Design of connections, Design of beams, Design of columns, Design of base.

B) Design of beam to beam and beam to column connections

OR

B) Design of welded plate girder, design of cross section, curtailment of flange plates, stiffeners and connections.

Four half Imperial size drawing sheet out of which one drawing sheet shall be drawn by using any drafting software.

Report of site visit mentioning structural details with relevant sketches of structural connections. (*Desirable*).

Oral Examination shall be based on the above term work.

Note: Maximum number of students in a group not more than three for design.

CED372: Lab-V: Geotechnical Engineering

Teaching Scheme	Examination Scheme
Laboratory: 02 Hrs / Week	Term Work: 25 Marks
	Oral: 25 Marks

ORAL BASED ON PRACTICAL CONDUCTED AND SYLLABUS

The oral/practical examination shall consist of viva-voice based on the practical work done during the course, the record of experiments submitted by the candidate and the syllabus of the subject. The assessment will be based on perfom1ing an experiment and record of experiments submitted by the candidate. Viva-voice/oral will be based on the syllabus.

The term work shall consist of a record of laboratory experiments **any ten** from list below.

1. Determination of water content by oven drying method
2. Determination of specific gravity by pycnometer
3. Determination of field density and dry unit weight by core cutter method
4. Determination of field density by sand replacement method
5. Determination of grain size distribution by sieve analysis
6. Determination of grain size distribution by hydrometer analysis
7. Determination of liquid limit of soil
8. Determination of plastic limit of soil
9. Determination of compaction properties of soil by standard proctor test
10. Determination of shear parameters of soil by direct shear method
11. Unconfined compression test
12. Permeability test variable or constant head

CED373: Lab-VI: Transportation Engineering-II

Teaching Scheme	Examination Scheme
Laboratory: 02 Hrs / Week	Term Work: 25 Marks
	Oral: 25 Marks

Term Work

Term Work shall consist of laboratory journal covering following laboratory tests (minimum 10) as prescribed below

Test on soil: CBR test.

Tests on aggregates: impact, Los Angeles Abrasion, crushing Value, shape (flakiness, elongation and angularity), soundness, stripping value of aggregate, polished stone value, Specific Gravity and Water absorption

Tests on Bitumen: penetration, viscosity, softening point, ductility and elastic recovery, flash & fire point, specific gravity.

Tests on bituminous mix: Marshall Stability and Mix Design.

CED374: Lab-VII: Computer Lab-III

Teaching Scheme
Laboratory: 02 Hrs / Week

Examination Scheme
Term Work: 50 Marks

TERM WORK:

The assessment of term work shall be done on the basis of the following:

Continuous Assessment

- Performing the assignment given in Laboratory

A. STAAD Pro V8i:

This course provides an overall look over STAAD Pro V8i. It demonstrates the steps to be followed to produce the structural analysis & design of two types of buildings; concrete and steel. Also the course concentrate over the different results generated from the program, and how to read them, view them, and finally generate the necessary reports from them. At the completion of this course, the student will be able to:

- ✓ Understand STAAD Pro way of doing the job.
- ✓ Creating geometry using different methods.
- ✓ Use of more advanced techniques in creating geometry.
- ✓ Defining the cross sections of beams, columns & plates.
- ✓ Defining constant, Specifications & supports.
- ✓ Defining the load system.
- ✓ Analyzing your Model using the appropriate Analysis method
- ✓ Reviewing the Analysis Results
- ✓ Performing Steel Design as per Indian Code
- ✓ Performing Concrete Design as per Indian Code

B. The Analysis & design output file of below assignments to be submitted.

1. Assignment No. 1 – Analysis and design of Steel portal frames.
2. Assignment No. 2 - Analysis and design of Reinforced Concrete frames
3. Assignment No. 3 - Analysis of Two- way concrete slab.

References: STAAD Pro V8i- Help contents (Available with legal purchase of software).