Savitribai Phule Pune University

RULES AND REGULATIONS

FOR

UG CREDIT SYSTEM PROGRAMME
UNDER FACULTY OF ENGINEERING

EFFECTIVE FROM JUNE 2015

PREFACE:

In a bid to fine tune our technical education system to the global standards & practices, the Credit-Grade based performance and assessment system will be implemented with effect from June 2015 onwards for all the Under Graduate Programmes (UG) under the Faculty of Engineering, University of Pune, starting with First Year.

With the advent of technology and ever-changing expectations from the Industry and Society, it has become imperative to relook at the structure and subject contents of various UG courses to make it contemporary and relevant.

As per the decision by the authorities of University of Pune the faculty of Engineering has prepared the credit system and structure. The revised course is of 190 credits and 1 credit is equivalent to 15 hours. Assessments in credit system consist of A) In-semester continuous assessment and B) End-semester assessment for the Theory head and Term Work/ Practical / Oral / Presentation at the end of the semester for Practical, Oral, Seminar and Project Head.

The faculty of Engineering has shouldered the idea of incorporating latest advances in Science and technology and equip the subject/syllabus contents with latest and relevant topics and know-hows. Accordingly the new structure and syllabi are being introduced, to be implemented from **the academic year 2015-16** from First Year and it will continue for subsequent years. The rules governing the programmes shall be as given below with suffix R, followed by the rule number.

- All UG programmes, under Faculty of Engineering shall be offered with credit system.
- All the B.E. programmes running under the Faculty of Engineering will be of four years duration.
- The total no. of credits required for the completion of the programme is 190 credits.
- One credit is equivalent to 15 hours.
- A student is required to earn 190 credits in a minimum period of eight semesters.

1. UG Programme Structure:

Each B.E. / B. Tech. programme is of 4 years duration. The minimum total no. of credits requirement for each programme is 190. In the structure, the credits are distributed over 8 semesters. The open elective included, gives the student a wide choice of subjects from other programmes. The Credit structure for B E programme is given below in table 1.

TABLE -1 Credit structure for B E programme

Course Work	Credits								
	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6	Sem-7	Sem-8	Total
Mandatory Subjects[$]	19	19	20	20	18	18	10	6	130
Elective Subjects							6	6	12
Lab Courses	6	6	5	5	5	4	4	4	39
Seminar						1			1
Project Work							2	6	8
Total	25	25	25	25	23	23	22	22	190

$: Mandatory subjects of first, second and third semester must include at least 40 credits for Engineering Physics, Engineering Chemistry, Engineering Mathematics, social science and soft skills
In addition to above credits, there should be audit courses in semester five, six and seven to develop the various skills. The detail structure is given in Tables

TABLE -2 Structure for Semester-1

	Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
							Theory		TW	PR	OR	Max. Marks	
				Lectures	Tutorials	PR/DRG	In-Semester Exam	End-Semester Exam					
	107001	Engineering Mathematics I		4	1	–	50	50	25	–	–	125	5
#	107002/ 107009.	Engineering Physics OR Engineering Chemistry		4	–	2	50	50	25	–	–	125	5
	110003	Engineering Graphics I		3	–	2	50	50	–	-	–	100	4
#	103004/ 104012	Basic Electrical Engineering OR Basic Electronics Engineering		3	–	2	50	50	25	–	–	125	4
	101005	Basic Civil and Environmental Engineering		3	–	2	50	50	25	–	–	125	4
	102006	Fundamentals of Programming Languages I		1	–	2	-	-	–	50*	–	50	2
	111007	Workshop Practice		–	–	2	–	–	50	–	–	50	1
	Total of Semester I			18	1	12	250	250	150	50	–	700	25

TABLE - 3 Structure for Semester-2

	Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
							Theory		TW	PR	OR	Max. Marks	
				Lectures	Tutorials	PR/ DRG	In-Semester Exam	End-Semester Exam					
	107008	Engineering Mathematics II		4	–	–	50	50	–	–	–	100	4
#	107009/ 107002	Engineering Chemistry OR Engineering Physics		4	–	2	50	50	25	–	–	125	5
	110010	Basic Mechanical Engineering		3	–	2	50	50	25	-	–	125	4
	101011	Engineering Mechanics		4	–	2	50	50	25	–	–	125	5
#	104012/ 103004.	Basic Electronics Engineering OR Basic Electrical Engineering		3	–	2	50	50	25	–	–	125	4
	102013	Fundamentals of Programming Languages II		1	–	2	-	-	-	50*	–	50	2
	102014	Engineering Graphics II		–	–	2	–	–	50	–	–	50	1
	Total of Semester II			19	–	12	250	250	150	50	–	700	25

Instructions:

1. PR/Tutorial must be conducted in minimum three batches (batch size 22 maximum) per division
2. Minimum number of required Experiments/Assignments in PR/DRG/Tutorial be carried out as mentioned in the syllabi of related subjects.
3. * for FPL-I and FPL-II: S.P. Pune University Online Practical Examination shall be conducted at the semester end.
4. # Every student should appear for Engineering Physics, Engineering Chemistry, Basic Electronics Engineering and Basic Electrical Engineering during the year.
5. # College is allowed to distribute Teaching Workload of subjects Physics, Chemistry, BEE, BXE in semester I and II by dividing number of FE divisions appropriately in two groups.

TABLE -4 Structures for Semester-3

Subject Head	Duration/week	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	20	250	250		100	20
Practical/Oral	10			150		5
Total	30	250	250	150	100	25

TABLE -5 Structure for Semester-4

Subject Head	Duration/week	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	20	250	250		100	20
Practical/Oral	10			150		5
Total	30	250	250	150	100	25

TABLE -6 Structure for Semester-5

Subject Head	Duration/week (hrs)	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	18	150	350		100	18
Practical/Oral	10			150		5
Total	28	150	350	150	100	23

TABLE -7 Structure for Semester-6

Subject Head	Duration/week	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	18	150	350		100	18
Practical/Oral	8			100		4
Seminar	1			50		1
Total	27	150	350	150	100	23

TABLE -8 Structure for Semester-7

Subject Head	Duration/week (hrs)	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	16	150	350	-	100	16
Practical/Oral	8			100		4
Project	2			50		2
Total	26	150	350	150	100	22

TABLE -9 Structure for Semester-8

Subject Head	Duration/week	In-semester Exam	End-semester Exam	Practical/Oral Exam	Term Work Marks	Credits
Theory	12	120	280	-	100	12
Practical/Oral	8			100		4
Project	6			100	50	6
Total	26	120	280	200	150	22

Note: Semester 1 and semester 2 will be part of First Year of Engineering (FE)
Semester 3 and semester 4 will be part of Second Year of Engineering (SE)
Semester 5 and semester 6 will be part of Third Year of Engineering (TE)
Semester 7 and semester 8 will be part of Final Year of Engineering (BE)

Practicals/Lab. Work:
The laboratory work will be based on completion of assignments confined to the courses of that semester.

SEMINAR:
Shall be on state of the art topic of student's own choice approved by an authority. The student shall submit the duly certified seminar report in standard format, for satisfactory completion of the work by the concerned Guide and head of the department/institute.

PROJECT WORK:
The project work shall be based on the knowledge acquired by the student during the graduation and preferably it should meet and contribute towards the needs of the society. The project aims to provide an opportunity of designing and building complete system or subsystems based on area where the student likes to acquire specialized skills.

Project work in the seventh semester is an integral part of the project work. In this, the student shall complete the partial work of the project which will consist of problem statement, literature review, project overview, scheme of implementation . As a part of the progress report of Project work, the candidate shall deliver a presentation on the advancement in Technology pertaining to the selected Project topic.

Project Work in the eighth semester, the student shall complete the remaining part of the project which will consist of the fabrication of set up required for the project, work station, conducting experiments and taking results, analysis & validation of results and conclusions.

The student shall prepare the duly certified final report of project work in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.

2. Examination Scheme:

R 2.1
The theory examination shall be conducted in three phases for all the subjects of semesters 1-4 and two phases for the semesters 5-8. For first four semesters (Semester 1, 2, 3 and 4), the Phase-1 and Phase-2 exam are part of in-semester exam and Phase 3 is a part of end-semester exam.

R 2.1.1: Phases of FE and SE

Phase I Online examination of 25 marks, 30 minutes duration, containing objective- multiple choice questions (MCQ) and fill in blanks; based on unit I and unit II of the subject, shall be conducted as per the schedule of the university.

Phase II Online examination of 25 marks, 30 minutes duration, containing objective- multiple choice questions (MCQ)) and fill in blanks; based on unit III and unit IV of the subject, shall be conducted as per the schedule of the university.

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Phase III Written examination of 50 marks, 2 hours duration; based on all the six units, shall be conducted at the end of semester, as per the schedule of the university.

R 2.1.2: Phases of TE and BE

Phase I:
Theory examination of 30 marks, 60/90 minutes duration based on unit I ,unit II and unit III of the subject, shall be conducted as per the schedule of the university.

Phase II:
Theory examination of 70 marks, 150/180 minutes duration, based on all the units of the subject, shall be conducted at the end of semester as per the schedule of the university.

R-2.2
For the subject of Engineering Graphics- I at FE, the mode of examination shall be manual for phase I and phase II. Phase I and phase II examinations shall be of one hour duration each. All these examinations shall be conducted as per the schedule of the University.

R-2.4
The practical examination of 50 marks, one hour duration for Fundamentals of Programming Languages- I and Fundamentals of Programming Languages-II, shall be conducted online at the end of respective semesters as per the schedule of the University.

R-2.5
The third semester (first semester of SE) Phase 1 and Phase 2 will be conducted together by considering the direct second year admissions.

3. Structure of Question Paper :

R 3.1: For FE and SE:

- All questions for online examinations shall be objective type with multiple choice/ fill in the blanks type questions. The weightage for each question will be of one or two marks as per the difficulty level. More or less equal weightage is to be given to every unit pertaining to the examination.
- The nature of all questions in phase III written examination shall be Fundamental, Mathematical and analytical. The weightage for the syllabus units is as in table 10 and every question will have an internal option.

Table 10 Unitwise weightage

Unit	% Weightage
unit I & unit II	25%
unit III & unit IV	25%
unit V	25%
unit VI	25%

R 3.2: For TE and BE

- Three Units (Unit Nos. 1, 2 & 3) will be covered for 30 marks for Phase-1(In semester) Exam. Equal weightage will be given to all units (10 marks each).
- All the Six Units will be covered for 70 marks for Phase -2 (End-semester) Exam. 20 marks will be the weightage for first 3 units and 50 marks will be the weightage for Units 4,5 and 6. Question Paper will have only one section and five questions.

4. Assessment

A. Theory

R 4.1:

- **In-Semester Examination for FE and SE:**

  Since in-semester exam for FE and SE is online, the assessment will be computer based.
- **In-Semester Examination for TE and BE:**

  Assessment will be done at the CAP Centre of the College by the Expert who is appointed as an examiner for the subject as per 32/5 panel for the In-Semester exam.

R 4.2:

End-Semester Examination for FE,SE,TE and BE:

Assessment will be done at the CAP Centre by the Expert who is appointed as an examiner for the subject as per 32/5 panel for the End-Semester exam.

B. Term work:

R 4.3:

Term Work assessment shall be conducted for the Lab Practice, Project, tutorials and Seminar. Term work is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by

subject teacher of the institute for first to sixth semester and by the external examiner at seventh and eighth semester. At the end of the semester, the final grade for a Term Work shall be assigned based on the performance of the student and is to be submitted to the Savitribai Phule Pune University. A student who fails in the Term Work on account of unsatisfactory performance shall be given F grade and on the account of inadequate attendance shall be given FX grade.

C. Practical/Oral/Presentation :

R 4.4:

Practical/Oral/presentation is to be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least one pair of examiners appointed as examiners by the Savitribai Phule Pune University. The examiners will prepare the mark / grade sheet in the format as specified by the Savitribai Phule Pune University, authenticate and seal it.

5. RULES OF PASSING

R-5.1

To pass the term work / Practical / Oral the student has to earn Minimum of 40% marks in each head.

R-5.2

To pass the Theory Subject head the student has to earn minimum of 40 per cent marks in End-Semester exam and 40 percent average marks (In-Semester marks + End-Semester marks).

R-5.3

The failing student can repeat the End-Semester exam to pass the head in any semester and the In-Semester exam marks will be retained as it is. Or the failing student can repeat for End-Semester exam as well as in-semester exam. for the head of Even semester in the Even semester only and for the head of Odd semester in Odd semester only for the theory head.

R-5.4

To earn credits of a course (Theory/term work/practical/oral/presentation) student must pass the course with minimum passing marks/grade.

.R 5.5

Student can only apply for the revaluation/Photocopying of End-Semester exam only.

6. RULES OF A.T.K.T.:

R-6.1

A student can register for the third semester(SE), if he/she earns minimum 50% credits of the total of first and second semesters(FE).

R-6.2

A student can register for the fifth semester(TE), if he/she earns minimum 50% credits of the total of third and forth semesters(SE) and all the credits of first and second semester(FE).

R-6.3

A student can register for the seventh semester(BE), if he/she earns minimum 50% credits of the total of fifth and sixth semesters(TE) and all the credits of third and forth semester(SE).

R-6.4

A student will be awarded the bachelor's degree if he/she earns 190 credits and clears all the audit courses specified in the syllabus.

7. Assessment and Grade Point Average:

R-7.1

Marks/Grade/Grade Point

A grade is assigned to each head based on marks obtained by a student in examination of the course. The marks obtained in in-semester and end-semester examination are considered together to calculate the grade of the course. These grades, their equivalent grade points are given in Table 11.

TABLE 11 Grade and Grade Point

Grade	Grade Points	Percentage of Marks Obtained	Remarks
O	10	90-100	Outstanding
A	9	80-89	Very Good
B	8	70-79	Good
C	7	60-69	Fair
D	6	50-59	Average
E	5	40-49	Below Average
F	0	Below 40	Fail
AP	0	--	Passed Audit Course
FX	0	--	Detained, Repeat the Course
II	0	--	Incomplete -- Absent for Exam but continue for the course
PP	--	--	Passed (Only for non credit courses)
NP	--	--	Not Passed (Only for non credit courses)

- **Passing Grade -**The grades **O, A, B, C, D, E** are passing grades. A candidate acquiring any one of these grades in a course shall be declared as pass. And student shall earn the credits for a course only if the student gets passing grade in that course.
- **F Grade -**The grade F shall be treated as a failure grade. The student with F grade will have to pass the concerned course by re-appearing for the examination. The student with F grade for any stage of the Project Work, will have to carry out additional work/ improvement as suggested by the examiners and re-appear for the examination.

- **AP Grade -**The student registered for auditing a course shall be awarded the grade AP and shall be included such AP grade in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the Savitribai Phule Pune University and satisfactory in-semester performance and secured a passing grade in that course. No grade points are associated with this grade and performance in these courses is not accounted in the calculation of the performance indices SGPA
and CGPA.

- **FX Grade-**The grade FX in a course is awarded by the college, if a student does not maintain the minimum attendance in the Lecture / Tutorial class as prescribed by the Savitribai Phule Pune University and/or his performance during the semester is not satisfactory and/or he/she fails in the Term Work head of that course.
  The student with FX grade in a given course is not permitted to take the end of semester examination in that course. Such a student will have to re-register for the course.
- **Grade II-**Grade II shall be awarded to a candidate in a course in which he has the minimum attendance as prescribed by the University and satisfactory in-semester performance but could not

appear for the end-semester examination. Such a student will have to appear in the subsequent end-semester examination.

- **PP / NP Grade -**The non-credit courses, such as Practical Training, Communication Skill, Field Visit Courses etc. shall be awarded PP/NP grades. No grade points are associated with these grades and performance in these courses is not accounted in the calculation of the performance indices SGPA and CGPA. However, the award of the degree is subject to obtain a PP grade in all such compulsory courses.

- The student with F / FX / grade II in a course shall not be awarded any credits for that course.

8. PERFORMANCE INDICES:

R-8.1

The semester end grade sheet will contain grades for the courses along with titles and SGPA. Final grade sheet and transcript shall contain CGPA.

R-8.2

SGPA -The performance of a student in a semester is indicated by a number called the Semester Grade Point Average (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses, seminars and projects registered by the student during the semester.

(i) Semester Grade Point Average (SGPA) =

$$SGPA = \frac{\sum_{i=1}^{p} Ci\,Gi}{\sum_{i=1}^{p} Ci}$$

$$SGPA = \frac{\sum \text{Grade Points Earned} \times \text{Credits for each course}}{\text{Total Credits}}$$

For Example: suppose in a given semester a student has registered for five courses having credits C1, C2, C3, C4, C5 and his / her grade points in those courses are G1, G2, G3, G4, G5 respectively.

Then students

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4G4 + C5G5}{C1 + C2 + C3 + C4 + C5}$$

SGPA is calculated up to two decimal places by rounding off.

R-8.3

CGPA- The CGPA is the weighted average of the grade points obtained in all the courses (Theory/term work/practical/oral/presentation) of first semester to eighth semester for the students admitted in the First year and third to eighth semester for the students directly admitted at Second year. It is calculated in the same manner as the SGPA.

R-8.3

In case of a student passing a failed course or in case of improvement, the earlier grade would be replaced by the new grade in calculation of the SGPA and CGPA.

9. **RESULT:** Based on the performance of the student in the semester examinations, the University of Pune will declare the results and issue the Semester Grade sheets.

R-9.1

The class shall be awarded to a student on the CGPA calculated as mentioned in Rule no. R 8.3. The award of the class shall be as per Table 12.

TABLE 12 -CGPA and Class awarded

Sr. No.	CGPA	Class of the Degree awarded
1.	7.75 or More than 7.75	First Class with Distinction
2.	6.75 or more but less than 7.75	First Class
3.	6.25 or more but less than 6.75	Higher Second Class
4.	5.5 or more but less than 6.25	Second Class

Savitribai Phule Pune University

UG CHOICE BASED CREDIT SYSTEM

RULES AND REGULATIONS

FOR

UNDER GRADUATE ROGRAMME IN ENGINEERING

UNDER

FACULTY OF SCIENCE AND TECHNOLOGY

WITH EFFECTIVE FROM A.Y. 2019-20

Course Structure, Guidelines, Rules and Regulations

Preamble

Economic progress of country is strongly linked with quality of technical education. Engineering education is gaining new heights and it contributes substantial share in overall education system. Engineering graduates are to be educated and trained with a view of employability and sustainability. With the advent of technology and ever-changing expectations from the Industry and Society, revision of curriculum is need of the day, making it contemporary and relevant. In a bid to fine tune our technical education system to the global standards & practices, the Credit-Grade based performance and assessment system has been already implemented with effect from June 2015 onwards for all the Under Graduate Programme (UG) under the Faculty of Science & Technology.

To fulfill the necessities, the youngsters pursuing engineering studies need to be well equipped and acquaint with the latest technological trends and industrial requirements. This is possible only when the students undergo studies with an updated and evolving curriculum to match global scenario. The faculty of Science & Technology has shouldered the idea of incorporating latest advances and to upgrade the course contents with latest and relevant topics and know-how. Accordingly the new structure and curriculum are being introduced to be implemented from the academic year 2019-20 for First Year Engineering and the process will continue for subsequent years for second, third and fourth year engineering.

General Guidelines

1. All undergraduate programmes in Engineering under faculty of Science & Technology will be of **four years** duration and **eight semesters**.
2. The total number of credits required to earn for the **completion of the programme is 170 credits** in a minimum period of **eight semesters**.
3. All UG programme, under Faculty of Science & Technology shall be offered with **170 credit**; one credit is approximately equivalent to 15 contact hours.
4. Assessments in Choice based Credit System consists of
   A) In-semester examination
   B) End-semester examination
   C) Continuous assessment for various examination heads.
   Assessment and Evaluation is to be done as per guidelines provided by competent authority.
5. Semester 1 and semester 2 will be part of First Year of Engineering (FE),
   Semester 3 and semester 4 will be part of Second Year of Engineering (SE),
   Semester 5 and semester 6 will be part of Third Year of Engineering (TE),
   Semester 7 and semester 8 will be part of Final Year of Engineering (BE)
6. **Induction Program**

   Induction programme for first year students is introduced to familiarize them to the new environment and encourage them to learn beyond classrooms. Objective is to help new students adjust and feel comfortable in the new environment, inculcate in them the ethos and culture of the institution, help them build bonds with other students and faculty members, and expose them to a sense of larger purpose and self exploration. Induction Program should be preferably of 3 weeks **(2 weeks at beginning first semester and 1 week at the beginning of second semester)**. In order to implement the (SIP) in the College the following activities can be taken at College.

   - Physical Activity: - This would involve a daily routine of physical activity with games and sports.
   - Creative Arts: - Every students would chose one skill related to arts whether visual arts or performing arts.
   - Mentoring and Universal Human values:-Mentoring and connecting the students with faculty members and other students is the most important part of student induction. This can be effectively done by forming a group of 22-24 students with a

faculty mentor each. This can be implemented through group discussion and real life activities rather than only lecturing.

- Familiarization with College, Department and Branch :-The incoming student should be told about the credit, grading system and scheme of the examination. They should be explained how the study in College differs from the study in school. They should be taken on College tour and shown important facilities such as library, canteen, gymkhana etc. They should be shown their own department.
- Literary Activity:-Literary Activity would compass reading book, writing a summary, debating, enacting a play etc.
- Proficiency modules: - The modules can be designed to overcome some critical lacunas that students might have like English Speaking, Computer familiarity etc.
- Lectures by Eminent People: - The lectures of Eminent people be organized to expose the students to social activity and public life.
- Visit to local Area:-A couple of visits to the landmarks of the city or a hospital are orphanage could be organized.
- Extracurricular activities in College:-The new students should be introduced to the extracurricular activities at the College.
- Feedback and Report on the program:-Students should be asked to give their mid program Feedback wherein each group of 22-24 students should be asked to prepare a single report on their experience of the program.

To summarize the above activity the sequence of activities can be planned as given below:

- Address by Principal, HOD's and other functionaries and welcome the new students along with their parents.
- The branch wise allocation of students to be done and a group of 22-24 students is to be formed along with one faculty as mentor.
- A detail time table of various activities is to be prepared and displayed for all students. The timetable should give details of location and details of faculty in charge of the activity.
- The visit to local areas can be arranged on Saturdays.
- The various activities to be carried out can be divided into three phases :-
  1. Initial phase:- Which may include Address by Principal, HOD's and other functionaries College and Dept Visit, interaction with parents Forming of students group and assigning of mentor mentee.
  2. Regular Phase:- This phase may include the activities such as creative arts / universal Human values Games & Sports in the morning session and in the afternoon session. Literary activities, Proficiency module, Lectures & workshop, Extracurricular Activities etc. can be scheduled.
  3. Closing Phase:- This phase may include taking feedback of students, preparation of Report by each group, Test of creative Arts, Human Values can be taken.

These are summarized guidelines to be given to the student inducing induction programme (SIP). Please refer SIP Manual published by AICTE for detail guidelines[2].

7. **Project based Learning:**

For better learning experience, along with traditional classroom teaching and laboratory work based learning, project based learning has been introduced with an objective to motivate students to learn by working in group (**5 to 6 students per group**) courteously to

solve a problem. Students may undertake a problem which can be theoretical, practical, social, technical, symbolic, cultural and/or scientific and grows out of students' wondering within different disciplines and professional environments. A chosen problem has to be **exemplary**. The problem may involve an interdisciplinary approach in both the analysis and solving phases. Such practice will also increase their capacity and learning through shared cognition. [3] [5].

8. **Laboratory Course:**
   The laboratory work will be based on completion of experiments/ lab assignments confined to the related companion courses of the semester.
9. **Seminar:**
   Seminar shall be on state-of-the-art topic selected by student and approved by the authority. The student shall submit the duly certified seminar report in standard format, for satisfactory completion of the work by the concerned Guide and head of the department/institute.
10. **Project Work at Final Year:**
    Project work in the seventh semester is an integral part of the project work. The project work shall be based on the knowledge acquired by the student during the graduation and preferably it should meet and contribute towards the needs of the society. The project aims to provide an opportunity of designing and building complete system or subsystems based on area where the student likes to acquire specialized skills. The student shall prepare the duly certified final report of project work in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.
11. **Internship**
    Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as employers are looking for employees who are properly skilled. They are structured, short-term, supervised placements often focused around particular tasks or projects with defined time scales. Core objective is to expose technical students to the industrial environment, which cannot be simulated/experienced in the classroom and hence creating competent professionals in the industry and to understand the social, economic and administrative considerations that influence the working environment of industrial organizations. Student may choose to undergo Internship at Industry/Govt./NGO/MSME/Rural Internship/ Innovation/ IPR/Entrepreneurship. Student may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/NGO's/Government organizations/Micro/Small/ Medium enterprises to make themselves ready for the industry [4]. Conduction, monitoring, assessment, and evaluation is to be done as per guidelines provided by AICTE [4].
12. **Abbreviations:**
    TW: Term Work **TH:** Theory **OR:** Oral **TUT**: Tutorial **PR**: Practical
    Sem: Semester, **PROJ**: Project Work, **ESE**: End Semester Examination **ISE**: In Semester Examination, CA: Continuous Assessment, **DW:** Drawing.

Definition of Credit [1]:**

1 Hour Lecture (L) per week	1 credit for 1 Hour
Tutorial (T) per week	1 credit for 1 Hour
Practical (P) per week 2 Hours Practical(Lab)/week	1 credit for 2 Hours

** The head of Tutorial and Practical (as a special case) may be merged for common credit with the permission of authority.

This document includes following sections-

I. Undergraduate Engineering Programme Structure
II. Examination Scheme
III. Structure of Question Paper
IV. Assessment
V. Rules of Passing
VI. Rules of ATKT (Allowed To Keep Term)
VII. Assessment and Grade Point Average
VIII. Performance Indices
IX. Result
References

1) UG Programme Structure and Credit Distribution:

Each B.E. / B. Tech. programme is of 4 years duration. The minimum total number of credit requirement for each programme is 170. In the structure, the credits are distributed over 8 semesters. The open elective included, gives the student a wide choice of subjects from other programme. The Credit structure for Bachelor of Engineering programme is given below in Table 1.

TABLE 1: Credit Structure for UG programme in Engineering

Credits offered									
Course Work	Semester								Total
	I	II	III	IV	V	VI	VII	VIII	
Professional Theory Courses *	17	16	15	15	12	06	06	06	90
Elective Courses^	-	-	-	-	03	03	06	06	18
Laboratory Courses/ continuous assessment/TW	05	04	07	05	05	05	06	02	42
Seminar &Communication Skills	-	-	-		01	01		-	02
Project Work	-	-	-	-	-	02	02	06	10
Project Based Learning		02		02	--	--	--	--	04
Internship$	--	--	--	--		04	--	--	04
Total	22	22	22	22	21	21	20	20	170
Mandatory Non_Credit_Graded_Audit Course# per semester									
Induction Program at first year Engineering	3 week duration (2 week at the beginning of Sem-I & 1 week at the beginning of Sem -II)								

*: Professional Courses include - Engineering Science Courses including Workshop, Drawing, basics of Electrical/Electronics/Mechanical/Computer/Civil Engineering, Humanities and Social Sciences including Management/Finance Management courses, Basic Science courses and Professional core courses.

^: Professional Elective courses relevant to chosen specialization/branch and Open Electives (interdisciplinary and /or emerging technology)

#: There will be mandatory **Non_Credit Course** per Semester viz- Environmental Studies, Indian Constitution, Essence of Indian Traditional Knowledge, financial Management and courses introduced time to time by university or apex bodies.

$: Internship to be completed after semester 5 and to be assessed in semester 6. Internship will be of 4 to 6 weeks maximum.

TABLE -2 First Engineering _Structure for Semester-I

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107001	Engineering Mathematics-I	03	--	01	30	70	25	--	--	125	03	--	01	04
107002/ 107009	Engineering Physics / Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
102003	Systems in Mechanical Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
111006	Workshop[@]	--	02	--	--	--	--	25	--	25	--	01	--	01
	Total	16	10	01	150	350	25	125	--	650	16	05	01	22
101007	Audit Course 1[&]	02	Environmental Studies-I											

Induction Program : 2 weeks at the beginning of semester-I and 1 week at the beginning of semester-II

TABLE -3 First Engineering_ Structure for Semester-II

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107008	Engineering Mathematics-II	04	--	01	30	70	25	--	--	125	04	--	01	05
107002/ 107009	Engineering Physics/ Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
102012	Engineering Graphics [Ω]	01	02	01	--	50	25		--	75	01	01		02
110013	Project Based Learning[§]	--	04	--	--	--	25	50	--	75	--	02	--	02
	Total	15	12	02	120	330	75	125	--	650	15	05	02	22
101014	Audit Course 2[&]	02	Environmental Studies-II											
107015		--	Physical Education-Exercise and Field Activities											

Instructions:

- PR/Tutorial must be conducted in three batches per division.
- Minimum number of required Experiments/Assignments in PR/ Tutorial shall be carried out as mentioned in the syllabi of respective subjects.
- Every Student should appear for Engineering Physics, Engineering Chemistry, Engineering Mechanics, Basic Electrical Engineering, Basic Electronics Engineering, Programming and Problem solving during the year.
- College is allowed to distribute Teaching workload of subjects Engineering Physics, Engineering Chemistry, Basic Electrical Engineering, Basic Electronics Engineering, Engineering Mechanics, Programming and Problem solving in semester I and II dividing number of FE divisions into two appropriate groups.
- Assessment of tutorial work has to be carried out as term-work examination. Term-work Examination and Practical Examination at first year of engineering course **shall be internal continuous assessment only.**

Ω 1 Credit for Engineering Graphics theory has to be awarded on the basis of End semester examination of 50 marks while 1 credit of tutorial and practical **shall be awarded on internal continuous assessment only**.

@ Credit for the course of workshop practical is to be awarded on the basis of continuous assessment / submission of job work.

§ Project based learning (PBL) requires continuous mentoring by faculty throughout the semester for successful completion of the tasks selected by the students per batch. While assigning the teaching workload a load of 2 Hrs/week/batch needs to be considered for the faculty involved. The Batch needs to be divided into sub-groups of 5 to 6 students. Assignments / activities / models/ projects etc. under project based learning is carried throughout semester and Credit for PBL has to be awarded on the basis of internal continuous assessment and evaluation at the end of semester.

& Audit course for Environmental Studies and II (As per D.O.No.F.13-1/2000 (EA/ENV/COS-I) dated 14 May, 2019) is mandatory but non-credit course. Examination has to be conducted at the end of Sem I & II respectively for award of grade at college level. Grade awarded for audit course shall not be calculated for grade point &CGPA.

Audit course for Physical education is mandatory non-credit course. Examination has to be conducted at the end of Semester for award of grade at college level. Grade awarded for audit course shall not be calculated for grade point &CGPA.

TABLE -4 Structure for Semester-III

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	14			100	100	07
Total	29	150	350	100	100	22

TABLE -5 Structure for Semester-IV

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	10			100	50	05
Project based learning	04				50	02
Total	29	150	350	100	100	22

TABLE -6 Structure for Semester-V

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	15	150	350			15
PR/OR/Tut	10			100	50	05
Seminar	01				50	01
Total	26	150	350	100	100	21

TABLE -7 Structure for Semester-VI

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	12	120	280			12
PR/OR/Tut	10			100	100	05
Internship	04				100	04
Total	26	120	280	100	200	21

TABLE -8 Structure for Semester-VII

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	**TW Marks**	Credits
Theory	12	120	280			12
PR/OR/Tut	08			100	50	04
Moocs etc.					50	02
Project Stage-1	04			50	50	02
Total	24	120	280	150	150	20
Credits of MOOCs Courses shall be awarded based on completion of relevant course (recommended by college / University) of equivalent or more credits and submission of Certificate to college. College shall submit the same to university through online process to be followed in due course.						

TABLE -9 Structure for Semester-VIII

Subject Head	Duration (Hrs/week)	ISE	ESE	PR/OR Marks	TW Marks	Credits
Theory	12	120	280			12
PR/OR/Tut	04			100	50	02
Project Stage-2	12			50	100	06
Total	28	120	280	150	150	20

Note: Any Course offered (Semester-III to Semester-VIII) should be of minimum 2 credits.

2. Examination Scheme:

R.21

The theory examination shall be conducted in two phases for all the subjects of semester-I to semester-VIII.

R2.1.1: Phases of Examination

Phase I as In-Semester Examination of 30 marks written theory examination based on Unit-1 and Unit-2 of course syllabus scheduled by university

Phase II as End-Semester Examination of 70 marks written theory examination based on unit number 3, 4, 5, 6 of course syllabus scheduled by university.

3. Structure of Question Paper:

R3.1 Two units (Unit1 and Unit 2) will be covered for 30 Marks for Phase 1 (ISE). Equal weightage will be given to both the units (15 Marks each)

R3.2 Four units (Unit 3, Unit 4, Unit 5 and Unit 6) shall have weightage of 70 Marks for Phase 2 (ESE). Marks weightage for the unit 3, unit 4, unit 5 and unit 6 shall be as shown in Table no.10

- Marks weightage to be given for questions per unit is as –

TABLE -10. Marks weightage per unit for examination

Unit Number	Phase I ISE Marks Weightage	Phase II ESE Marks Weightage
1	15	--
2	15	--
3		18
4	-	17
5	--	18
6	-	17

R3.3 Paper will have only one section and two questions for ISE and four questions for ESE. For each question there will be alternate Question based on same unit and of the same marks.

R3.4 Framing of questions should be according to Anderson/Blooms Taxonomy and disseminated through the question papers with a mention of course outcomes as well.

4. Assessment

A. Theory:

R4.1

ISE assessment will be done at the centralized assessment programme (CAP) Centre of the College by the Expert who is appointed as an examiner for the courses as per 48(3) panel of Maharashtra public university act 2016.

R4.2

ESE assessment will be done at the CAP Centre designated by the University by the Expert who is appointed as an examiner for the subject as per 48(3) panel.

B. Term work:

R4.3

Term Work assessment shall be conducted for the Lab Practice, Project, Tutorials and Seminar. Term work is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the institute for first to sixth semester and by the external examiner at seventh and eighth semester. At the end of the semester, the final grade for a Term Work shall be assigned based on the performance of the student and is to be submitted to the Savitribai Phule Pune University (SPPU). A student who fails in the Term Work on account of unsatisfactory performance shall be given F grade and on the account of inadequate attendance shall be given FX grade. Failing in a particular course Term Work shall not be the criteria for detention in the semester.

C. Practical/Oral/Presentation:

R.4.5

Practical/Oral/presentation is to be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at

least one pair of examiners appointed as examiners by the Savitribai Phule Pune University. The examiners will prepare the mark / grade sheet in the format as specified by the Savitribai Phule Pune University and authenticate it.

D. Project Based Learning

R4.6

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it PBL work book). Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes.

Recommended parameters for assessment, evaluation and weightage:

- Idea Inception **(5%)**
- Outcomes of PBL/ Problem Solving Skills/ Solution provided/ Final product **(50%)** (Individual assessment and team assessment)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) **(25%)**
- Demonstration (Presentation, User Interface, Usability etc) **(10%)**
- Contest Participation/ publication **(5%)**
- Awareness /Consideration of -Environment/ Social /Ethics/ Safety measures/Legal aspects **(5%)**

PBL workbook will serve the purpose and facilitate the job of students, mentor and project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

E. Internship

R4.7

Student may choose to undergo Internship at Industry/Govt./NGO/MSME/Rural Internship/ Innovation/ IPR/Entrepreneurship. Student may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/NGO's/Government organizations/Micro/Small/ Medium enterprises to make themselves ready for the industry[4].

Every student is required to prepare a maintain documentary proofs of the activities done by him. The evaluation of these activities will be done by Programme Head/Cell In-charge/ Project Head/ faculty mentor or Industry Supervisor based on- Overall compilation of internship activities, sub-activities, the level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Based on internship the assessment and evaluation parameters may include as-

- Working for consultancy/ research project,
- Participation at Events (Technical / Business)
- Participation in innovation related completions for eg. Hackathon etc.),
- Contribution in Incubation/ Innovation/ Entrepreneurship Cell/ Institutional Innovation Council,
- Learning at Departmental Lab/Tinkering Lab/ Institutional workshop,
- Development of new product/ Business Plan/ registration of start-up,
- Participation in IPR workshop/Leadership Talks/ Idea/ Design/ Innovation/ Business Completion/ Technical Expos.

It is necessary to produce participation certificate, if applicable.

F. Seminar and Communication Skills

R4.8

Seminar is the first formal curricular activity at the UG level, where students are supposed to exhibit their communication skills and knowledge by undertaking the study of the chosen topics. Core objective is to explore the basic principles of communication (verbal and non-verbal) and

active, empathetic listening, speaking and writing techniques. It exposes the student to new technologies, researches, products, and services.

Authorities/ examiner (optional) along with a guide would be assessing the seminar work based on various parameters which may include- Topic selection, Contents and Presentation, regularity, Punctuality and Timely Completion, Question and Answers, Report, Paper Presentation/Publication, Attendance and Active Participation in overall class activity.

G. Project Work at Final Year

R4.9

Progress of project work is monitored regularly on weekly project slot/project day. Regular interval presentations are to be arranged to review and assess the work. During process of monitoring and continuous assessment AND evaluation the individual and team performance is to be measured.
Project work is monitored and continuous assessment is done by guide and authorities. During university examination Internal examiner (preferably the guide) and External examiners jointly, evaluate the project work. Recommended performance measure parameters may include-Problem definition and scope of the project, Literature Survey, Appropriate Engineering approach used, Exhaustive and Rational Requirement Analysis, Comprehensive Implementation- Design, modeling, documentation, Usability, Optimization considerations(Time, Resources, Costing), Thorough Testing, Project Presentation and Demonstration(ease of use and usability), Social and environment aspects, Presentation of work in the form of Project Report(s), Understanding individual capacity, Role & involvement in the project, Team Work (Distribution of work, intra-team communication and togetherness), Participation in various contests, Publications and IPR, Manuals(Project Report, Quick reference, System, Installation guide) among other parameters.

5. Rules of Passing

R5.1

To pass the Term Work / Practical / Oral/ presentation the student has to earn Minimum of 40 percent marks in each respective examination head.

R5.2

To pass the Theory Subject head the student has to earn minimum of 40 percent marks in End-Semester examination and 40 percent total marks (In-Semester Examination and End-Semester Examination).

R5.3

The failing student can repeat the End-semester examination to pass the head in any semester and the In-Semester Examination marks will be retained as it is. OR the failing student can repeat for the End-Semester Examination as well as In-semester examination for the head of Even semester in the Even semester only and for the head of Odd semester in the Odd semester only for the theory head

R5.4

To earn credits of a course (Theory/term work/practical/oral/presentation) student must pass the course with minimum passing marks/grade.

R5.5

Student can apply only for the Revaluation/Photocopying of End-Semester theory examination.

6. Rules of ATKT (Allowed To Keep Term):

R6.1

A student can register for the third semester (SE), if he/she earns minimum 50% credits of the total of first and second semesters (FE).

R6.2

A student can register for the fifth semester (TE), if he/she earns minimum 50% credits of the total of third and forth semesters (SE) and all the credits of first and second semester (FE).

R6.3

A student can register for the seventh semester(BE), if he/she earns minimum 50% credits of the total of fifth and sixth semesters(TE) and all the credits of third and forth semester(SE).

R6.4
A student will be awarded the bachelor's degree if he/she earns 170 credits and clears all the mandatory non credit courses in respective semesters

7. Assessment and Grade Point Average:

R7.1 Marks/Grade/Grade Point
A grade is assigned to each head based on marks obtained by a student in examination of the course. The marks obtained in In-semester and end-semester examination are considered together to calculate the grade of the course. These grades, their equivalent grade points are given in Table 11.

TABLE 11. Grade and Grade Point

Grade	Grade Point	Percentage of Marks Obtained	Remarks
O	10	90-100	Outstanding
A	9	80-89	Very Good
B	8	70-79	Good
C	7	60-69	Fair
D	6	50-59	Average
E	5	40-49	Below Average
F	0	Below 40	Fail
FX	**0**	--	Detained, Repeat the Course
IC	**0**	--	Incomplete Course-- Absent for Exam but continue for the course
AC	--	--	Audit Course Completed
ACN	--	--	Audit Course Not Completed

7. Passing Grade:

- The grades O, A, B, C, D, E are passing grades.
- A candidate acquiring any one of these grades in a course shall be declared as PASS. And student shall earn the credits for a course only if the student gets passing grade in that course.
- F Grade -The grade F shall be treated as a failure grade.
- The student with F grade will have to pass the concerned course by re-appearing for the examination.
- The student with F grade for any stage of the Project Work, will have to carry out additional work/ improvement as suggested by the examiners and re-appear for the examination.
- AC and ACN Grade -The student registered for audit course shall be awarded the grade AC after satisfactory completion of audit course and shall be included in the Semester grade report for that course, provided student has the minimum attendance as prescribed by the SPPU and satisfactory In-semester performance and secured a passing grade in that course. Student who is unable to complete audit course will be awarded as ACN grade.
- FX Grade-The grade FX in a course is awarded by the college, if a student does not maintain the minimum attendance in the Lecture / Tutorial class as prescribed by the SPPU and/or his performance during the semester is not satisfactory and/or he/she fails in the Term Work head of that course.
- The student with FX grade in a given course is not permitted to take the end of semester examination in that course. Such a student will have to re-register for the course.
- The student with F / FX in a course shall not be awarded any credits for that course.

8. Performance Indices:

R8.1

The semester end grade sheet will contain grades for the courses along with titles and SGPA. Final grade sheet and transcript shall contain CGPA.

R8.2

SGPA -The performance of a student in a semester is indicated by a number called the Semester Grade Point Average (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses, seminars and projects registered by the student during the semester.

Semester Grade Point Average (SGPA) $= \frac{\sum_{i=1}^{p} CiGi}{\sum_{i=1}^{p} Ci}$

$$\text{SGPA} = \frac{\sum GradePointsEarnedXCreditsForEachCourse}{TotalCredits}$$

For Example: suppose in a given semester a student has registered for five courses having credits C1, C2, C3, C4, C5 and his / her grade points in those courses are G1, G2, G3, G4, G5 respectively. Then students

$$\text{SGPA} = \frac{C1G1+C2G2+C3G3+C4G4+C5G5}{C1+C2+C3+C4+C5}$$

SGPA and CGPA is calculated up to two decimal places by rounding off.

R8.3

CGPA- The CGPA is the weighted average of the grade points obtained in all the courses (Theory/term work/practical/oral/presentation) of first semester to eighth semester for the students admitted in the First year and third to eighth semester for the students directly admitted at Second year.

CGPA is calculated in the same manner as the SGPA.

R8.4

In case of a student passing a failed course or in case of improvement, the earlier grade would be replaced by the new grade in calculation of the SGPA and CGPA.

9. Result:

R9.1

Based on the performance of the student in the semester examinations, the Savitribai Phule Pune University will declare the results and issue the Semester Grade sheets. The class shall be awarded to a student on the CGPA calculated. The award of the class shall be as per Table 12.

Table 12. CGPA and Class awarded

Sr. No.	CGPA	Class of the Degree Awarded
1.	7.75 or More than 7.75	First Class with Distinction
2.	6.75 or more but less than 7.75	First Class
3.	6.25 or more but less than 6.75	Higher Second Class
4.	5.5 or more but less than 6.25	Second Class

X. References

[1] https://www.aicte-india.org/sites/default/files/Vol%201_UG.pdf

[2] https://www.aicte-india.org/sites/default/files/induction-guide-jun17-aicte%20(1).pdf

[3]https://www.aicteindia.org/sites/default/files/ FINAL%20BEST%20PRACTICES% 20 IN %20AICTE%20APPROVED%20INSTITUTUIONS.pdf

[4] https://www.aicte-india.org/sites/default/files/AICTE%20Internship%20Policy.pdf

[5] https://www.aicte-india.org/sites/default/files/ExaminationReforms.pdf

[6] https://www.aicte-india.org/education/model-syllabus

Savitribai Phule Pune University

Examination Session 2020
Marks Inward System for Colleges

2006181118258

College Name	CEGP019690 - Bharati Vidyapeeth's College of Engineering, Lavale [PUNCODE : CEGP019690] Exam code: 510
Pattern Name	7041566 - B.E.(2015 PAT.) (MECHANICAL)
Batch No	202004169216
Subject Name	402047 - ENERGY ENGINEERING
Exam Type	TW OUT OF 25
Teacher Name	Singh Nilesh Rajendra (Mob. No.: 9096426113) - Internal Examiner

Total Students	Present Students	Absent Students	Not Applicable	CopyCase	Detained
119	119	0	0	0	0

Seat No	Marks/Grade	Seat No	Marks/Grade	Seat No	Marks/Grade	Seat No	Marks/Grade
B151110801	21	B151111227	21	B151111253	20	B151111280	21
B151110802	18	B151111228	23	B151111254	22	B151111281	23
B151111202	22	B151111229	23	B151111255	22	B151111283	22
B151111203	20	B151111230	20	B151111256	22	B151111284	23
B151111204	20	B151111231	20	B151111257	22	B151111285	22
B151111205	22	B151111232	22	B151111258	22	B151111286	21
B151111206	22	B151111233	21	B151111260	20	B151111287	22
B151111207	20	B151111234	22	B151111261	20	B151111288	21
B151111209	18	B151111235	22	B151111262	22	B151111289	21
B151111211	21	B151111237	21	B151111263	20	B151111290	21
B151111212	19	B151111238	21	B151111264	21	B151111292	22
B151111213	21	B151111239	21	B151111265	22	B151111293	22
B151111214	20	B151111240	20	B151111266	21	B151111294	23
B151111215	22	B151111241	20	B151111267	22	B151111295	20
B151111216	22	B151111242	21	B151111268	21	B151111296	22
B151111217	22	B151111243	22	B151111269	22	B151111297	21
B151111218	21	B151111244	23	B151111270	21	B151111298	24
B151111219	20	B151111245	23	B151111271	22	B151111299	23
B151111220	21	B151111246	21	B151111272	21	B151111300	22
B151111221	18	B151111247	21	B151111274	20	B151111301	21
B151111222	21	B151111248	22	B151111275	22	B151111302	22
B151111223	20	B151111249	22	B151111276	21	B151111303	21
B151111224	21	B151111250	21	B151111277	21	B151111304	23
B151111225	23	B151111251	22	B151111278	22	B151111305	22
B151111226	22	B151111252	23	B151111279	21	B151111306	22

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Seat No	Marks/Grade
B151111307	22
B151111308	22
B151111309	22
B151111310	21
B151111311	22
B151111312	21
B151111313	22
B151111314	21
B151111315	22
B151111316	21
B151111317	22
B151111318	21
B151111319	23
B151111320	22
B151111321	21
B151111322	22
B151111323	21
B151111324	22
B151111325	23

Stamp & Authorized Signatory

Savitribai Phule Pune University

Examination Session 2022

Marks Inward System for Colleges

221212125 3450

2212121253450

12/12/2022

College Name CEGP019690 - Bharati Vidyapeeth's College of Engineering, Lavale [PUNCODE : CEGP019690] Exam code: 510

Pattern Name 7041966 - B.E. (2019 PAT.) (MECHANICAL)

Batch No 202210012998

Subject Name 402054B - Stress Management

Exam Type AC OUT OF AC|ACN

Teacher Name Singh Nilesh Rajendra (Mob. No.: 9096426113) - Internal Examiner

Total Students	Present Students	Absent Students	Not Applicable	Detained
58	58	0	0	0

Seat No	Marks/Grade	Seat No	Marks/Grade	Seat No	Marks/Grade
B191110801	AC	B191110826	AC	B191110851	AC
B191110802	AC	B191110827	AC	B191110852	AC
B191110803	AC	B191110828	AC	B191110853	AC
B191110804	AC	B191110829	AC	B191110854	AC
B191110805	AC	B191110830	AC	B191110855	AC
B191110806	AC	B191110831	AC	B191110856	AC
B191110807	AC	B191110832	AC	B191110857	AC
B191110808	AC	B191110833	AC	B191110858	AC
B191110809	AC	B191110834	AC		
B191110810	AC	B191110835	AC		
B191110811	AC	B191110836	AC		
B191110812	AC	B191110837	AC		
B191110813	AC	B191110838	AC		
B191110814	AC	B191110839	AC		
B191110815	AC	B191110840	AC		
B191110816	AC	B191110841	AC		
B191110817	AC	B191110842	AC		
B191110818	AC	B191110843	AC		
B191110819	AC	B191110844	AC		
B191110820	AC	B191110845	AC		
B191110821	AC	B191110846	AC		
B191110822	AC	B191110847	AC		
B191110823	AC	B191110848	AC		
B191110824	AC	B191110849	AC		
B191110825	AC	B191110850	AC		

Stamp & Authorized Signatory

CAP Report For Teachers **Date : 7/2/2023 5:43:24 PM**

CAP Center Name :

Sinhgad Technical Education Society Smt. Kashibai Navale College of Engineering
Addr: Survey No 44/1 Sinhgad Road Vadgav Bu Pune-41
Ta: Pune (corporation Area) Dist: Pune

Teacher Name	Paper Name	Semester	Lot No.	Designation	Attendance Date	Paper Count	CAP Trans ID	Exam Rs	Moderation Rs
Patil Uday Shankar	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12585	Moderator	27/06/2023	12		0.0000	285.6000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12586	Moderator	26/06/2023	7		0.0000	166.6000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12587	Moderator	27/06/2023	12		0.0000	285.6000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12588	Moderator	02/07/2023	60		0.0000	1428.0000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12592	Moderator	27/06/2023	12		0.0000	285.6000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12593	Moderator	26/06/2023	10		0.0000	238.0000

Smt. Kashibai Navale College of Engineering
B.E. CAP
Pune-41

Patil Uday Shankar	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12607	Moderator	28/06/2023	14		0.0000	333.2000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12608	Moderator	28/06/2023	10		0.0000	238.0000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12609	Moderator	17/06/2023	60		0.0000	1428.0000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12610	Moderator	26/06/2023	60		0.0000	1428.0000
	B.E. (2019 PAT.) (CIVIL) Quantity Surveying, Contracts and Tenders	8	12617	Moderator	28/06/2023	6		0.0000	142.8000
					Total Paper	**557**			

Smt. Kashibai Navale College of Engineering
B.E. CAP
Pune-41

CAP Report For Teachers

Date : **7/2/2023 5:43:19 PM**

CAP Center Name :

Sinhgad Technical Education Society Smt. Kashibai Navale College of Engineering
Addr: Survey No 44/1 Sinhgad Road Vadgav Bu Pune-41
Ta: Pune (corporation Area) Dist: Pune

Teacher Name	Paper Name	Semester	Lot No.	Designation	Attendance Date	Paper Count	CAP Trans ID	Exam Rs	Moderation Rs
Patil Uday Shankar	B.E. (2019 PAT.) (CIVIL) Transportation Engineering	7	12310	Moderator	01/07/2023	60		0.0000	1428.0000
	B.E. (2019 PAT.) (CIVIL) Transportation Engineering	7	12312	Moderator	30/06/2023	60		0.0000	1428.0000
					Total Paper	120			

Smt. Kashibai Navale College of Engineering
B.E. CAP
Pune-41

45

SAVITRIBAI PHULE PUNE UNIVERSITY

Certificate of Conduction of Practical/Oral Examinations

(To be submitted by the examiner along with the individual claim for PR/T.W/Oral)

Centre: SAOE,Kondhwa (Bk)Pune-48

To,
The Controller of Examinations
Savitribai Phule Pune University
Ganeshkhind, Pune-411007

This is to certify that Dr. V.S. Patil has conducted the examination as an examiner in this college for ~~S.E, T.E~~ & B.E-.2015/2019 Course Civil Engg Examination held in May/June & ~~October/November~~-2023.

For the subject/s as mentioned below:

Sr. No	Date of Examination	Examination	Name of the Subject	No. of Candidates Examined for		
				Practical	Term Work	Oral
01	05/6/2023	~~S.E, T.E &~~ B.E-.2015/2019 Course Civil Engg Examination held in May/June-2023	Project phase-I + II	—	01	01
02						

Date: 07/06/2023

Principal
Stamp & Signature

Engineering Unit

University of Pune

Certificate of Conduction of Practical Examinations

(To be submitted by the examiner alongwith the individual claim for Pr./T.W./Oral)

Centre : 4102.

To

The Controller of Examinations
University of Pune,
Ganeshkhind, Pune-411007.

This is to certify that Prof. Hasabe Ajinkya Suresh has conducted, the examination as an examiner in this college for S.E./T.E./B.E. Examination held in April/May/October/November 200 , for the subject/s as mentioned below :

Sr. No.	Date of Examination	Examination	Subject	No. of candidates examined for		
				Pract.	T.W.	Oral
1)	02/06/2023 and 03/06/2023	May/June Oral 2023	GTE Student:- 67.	—	—	67

Date : 2/6/2023

Sinhgad Technical Institutes Campus, Warje, Pune-58. RMD

PRINCIPAL
Stamp & Signature

Savitribai Phule Pune University
S.E. (Civil Engineering) 2015 Course

Semester I										
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks					
		Theory (TH)	Tutorials (TUT)	Practical (PR)	In-Sem	End-Sem	TW	PR	OR	Total
201001	Building Technology and Materials	04	--	02	50	50	50	--	--	150
207001	Engineering Mathematics III	04	01	--	50	50	50	--	--	150
201006	Surveying	04	--	02	50	50	--	50	--	150
201002	Strength of Materials	04	--	02	50	50	--	--	50	150
201003	Geotechnical Engineering	04	--	02	50	50	--	--	50	150
	Audit Course 1 Awareness to Civil Engineering Practices	--	--	--	--	--	--	--	--	--
Total		**20**	**01**	**08**	**250**	**250**	**100**	**50**	**100**	**750**

Note: For audit courses students are given certificate by the institutes based on the assignment them.

Abbreviations: TW: Term Work, **OR:** Oral, **PP:** Passed (Only for non credit courses), **NP:** Not for non credit courses).

Savitribai Phule Pune University
S.E. (Civil Engineering) 2015 Course

Semester II										
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks					
		Theory (TH)	Tutorials (TUT)	Practical (PR)	In-Sem	End-Sem	TW	PR	OR	Total
201004	Fluid Mechanics I	04	--	02	50	50	--	--	50	150
201005	Architectural Planning and Design of Buildings	04	--	02	50	50	--	50	--	150
201008	Structural Analysis I	03	01	--	50	50	--	--	--	100
207009	Engineering Geology	04	--	02	50	50	50	--	--	150
201007	Concrete Technology	04	--	02	50	50	--	--	50	150
201010	Soft Skill	--		02	--	--	50	--	--	50
	Audit Course 2 Road Safety Management	--	--	--	--	--	--	--	--	--
		19	**01**	**10**	**250**	**250**	**100**	**50**	**100**	**750**

Note: For audit courses students are given certificate by the institutes based on the assignment them.

Abbreviations: TW: Term Work, **OR:** Oral, **PP:** Passed (Only for non credit courses), **NP:** Not for non credit courses).

Savitribai Phule University of Pune
Third Year Civil Engineering
(2015 Course)

Semester I

Course Code	Course	Teaching Scheme hour/week			Semester Examination Scheme of marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	T W	OR	PR	Total	TH/TUT	PR/OR/TW
301001	Hydrology and water resource engineering.	03	--	02	30	70	--	50	--	**150**	03	01
301002	Infrastructure Engineering and Construction Techniques	03	--	--	30	70	--	--	--	**100**	04	--
301003	Structural Design-I	04	--	04	30	70	50	50	--	**200**	04	02
301004	Structural Analysis-II	04	--	--	30	70	--	--	--	**100**	03	--
301005	Fluid Mechanics-II	04	--	02	30	70	--	50	--	**150**	04	01
301006	Employability Skills development	--	--	02	--	--	50	--	--	**50**	--	01
Total		18	--	10	**150**	**350**	**100**	**150**		**750**	**18**	**05**

Semester II

Course Code	Course	Teaching Scheme hour/week			Semester Examination Scheme of marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	T W	OR	PR	Total	TH/TUT	PR/OR/TW
301007	Advanced Surveying	03	--	02	30	70	50	--	--	**150**	03	01
301008	Project Management and Engineering Economics	04	--	--	30	70	--	--	--	**100**	04	--
301009	Foundation Engineering	03	--	--	30	70	--	--	--	**100**	03	--
301010	Structural Design-II	04	--	04	30	70	50	50	--	**200**	04	02
301011	Environmental Engineering-I	04	--	02	30	70	--	--	50	**150**	04	01
301012	Seminar	--	--	01	--	--	--	50	--	**50**	--	01
	Total	18	--	09	**150**	**350**	**100**	**100**	**50**	**750**	**18**	**05**

SAVITRIBAI PHULE PUNE UNIVERSITY

Board of Studies in Civil Engineering

Structure for B.E. Civil 2015 Course (w. e. f. June 2018)

	Semester-I										
Subject code	Subject	Teaching Scheme Hrs/Week			In-Semester Assessment	TW	Pract /Or	End-Semester Exam	Total	Credit	
		Lect	Tu	Pr						Th	Lab
401 001	Environmental Engineering II	3	--	2	30	--	50	70	150	3	1
401002	Transportation Engineering	3	--	2	30	50	--	70	150	3	1
401 003	Structural Design and Drawing III	4	--	2	30	--	50	70	150	4	1
401 004	Elective I	3	--	2	30	50	--	70	150	3	1
401 005	Elective II	3	--	--	30	--	--	70	100	3	--
401 006	Project (Phase-I)	--	2	--	--	--	50	--	50	--	2
Total :		16	2	8	150	100	150	350	750	16	6
										22 Credits	

	Semester-II										
Subject code	Subject	Teaching Scheme Hrs/Week			In-Semester Assessment	TW	Or	End-Semester Exam	Total	Credit	
		Lect	Tu	Pr						Th	Pr
401 007	Dams and Hydraulic Structures	3	--	2	30	--	50	70	150	3	1
401008	Quantity Surveying, Contracts and tenders	3	--	2	30	--	50	70	150	3	1
401 009	Elective III	3	--	2	30	50	--	70	150	3	1
401 010	Elective IV	3	--	2	30	50	--	70	150	3	1
401 006	Project	--	6	--	--	50	100	--	150	--	6
Total :		12	6	8	120	150	200	280	750	12	10
										22 Credits	

Following will be the list of electives.

Semester I

Elective-I 401 004	Elective-II 401 005
1. Structural Design of Bridges	1. Matrix Methods of Structural Analysis
2. Systems Approach in Civil Engineering	2. Integrated Water Resources Planning and Management
3. Advanced Concrete Technology	3. TQM & MIS in Civil Engineering
4. Architecture and Town Planning	4. Earthquake Engineering
5. Advanced Engineering Geology with Rock Mechanics	5. Advanced Geotechnical Engineering

Semester-II

Elective-III 401 009	Elective-IV 401 010
1. Advanced Structural Design	1. Construction Management
2. Statistical Analysis and Computational Methods in Civil Engineering	2. Advanced Transportation Engineering
3. Hydropower Engineering	3. Advanced foundation Engineering.
4. Air Pollution and control	4. Coastal Engineering
5. Finite Element Method in Civil Engineering	**5. Open Elective**
6. Airport and Bridge Engineering	a) Plumbing Engineering
	b) Green Building Technology
	c) Ferrocement Technology
	d) Sub sea Engineering
	e) Geoinformatics

H.O.D.
Dept. of Civil Engineering
Bharati Vidyapeeth's
College of Engineering Lavale, Pune

SE Civil

Savitribai Phule Pune University, Pune
SE(Civil Engineering) 2019 Course
(With effect from Academic Year 2020-21)

Semester-III

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
201001	Building Technology and Architectural Planning	03	-	-	30	70	--	-	-	100	03	--	--	03
201002	Mechanics of structure	03	-		30	70		-	-	100	03	-	-	03
201003	Fluid Mechanics	03	-	-	30	70	-	-	-	100	03	-	-	03
207001	Engineering Mathematics III	03	--	--	30	70	--	--	--	100	03		--	03
207003	Engineering Geology	03	-	-	30	70	-	-	-	100	03	-	-	03
201004	Building Technology and Architectural Planning **Lab**	-	04	-	-	-	50		-	50	-	02	-	02
201005	Mechanics of structure **Lab**	-	04	-	-	-	-	-	50	50	-	02	-	02
201006	Fluid Mechanics **Lab**	-	02	-	-	-	-		50	50		01		01
207002	Engineering Mathematics III **Tutorial**	--	--	01	--	--	25	--	--	25	--		01	01
207004	Engineering Geology **Lab**	-	02	-	-	-	25		-	25	-	01	-	01
201007	**Audit Course 1 Awareness to civil Engineering Practices / Road Safety Management / Foreign Language**	--	01	-	-	Grade	-	-	-	Grade	--	--	-	--
Total		15	13	01	150	350	100	--	100	700	**15**	**06**	**01**	**22**

Abbreviations:
H : Theory TW: Term Work PR : Practical OR: Oral TUT : Tutorial

Note: Interested students of S.E. (Civil) can opt any one of the audit course from the list of audit courses prescribed by BoS (Civil Engineering)

Note: The Underlined portion of the syllabus will be covered by video lectures/ on-line lectures/ flip classroom, self study, NPTEL course lecture and/or using relevant ICT technique

Savitribai Phule Pune University, Pune
SE(Civil Engineering) 2019 Course
(With effect from Academic Year 2020-21)

Semester-IV

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
201008	Geotechnical Engineering	03	-	-	30	70	--	-	-	100	03	--	--	03
201009	Survey	03	-		30	70		-	-	100	03	-	-	03
201010	Concrete Technology	03	-	-	30	70	-	-	-	100	03	-	-	03
201011	Structural Analysis	03	-	--	30	70	-	-	-	100	03	-	--	03
201012	Project management	03	--	-	30	70	--	--	--	100	03		-	03
201013	Geotechnical Engineering **Lab**	-	02	-	-	-	-	-	50	50	-	01	-	01
201014	Survey Lab	-	04	-	-	-	-	50	-	50		02		02
201015	Concrete Technology **Lab**	-	02	-	-	-	25		-	25	-	01	-	01
201016	Structural Analysis **Tutorial**	--	-	01	--	--	25	-	-	25	--	-	01	01
201017	Project Based Learning	-	04	-	-	-	50		-	50	-	02	-	02
Total		15	12	01	150	350	100	50	50	700	**15**	**06**	**01**	**22**

Abbreviations:
TH : Theory TW: Term Work PR : Practical OR: Oral TUT : Tutorial

Note: The Underlined portion of the syllabus will be covered by video lectures/ on-line lectures/ flip classroom, self study, NPTEL course lectures and/or using relevant ICT technique

Savitribai Phule Pune University, Pune
T.E. (Electronics& Telecommunication Engineering) 2019 Course
(With effect from Academic Year 2021-22)

Semester-V

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
304181	Digital Communication	03	-	-	30	70	-	-	-	100	03	-	-	03
304182	Electromagnetic Field Theory	03	-	01	30	70	25	-	-	125	03	-	01	04
304183	Database Management	03	-	-	30	70	-	-	-	100	03	-	-	03
304184	Microcontrollers	03	-	-	30	70	-	-	-	100	03	-	-	03
304185	Elective - I	03	-	-	30	70	-	-	-	100	03	-	-	03
304186	Digital Communication Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
304187	Database Management Lab	-	02	-	-	-	-	-	25	25	-	01	-	01
304188	Microcontroller Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
304189	Elective I Lab	-	02	-	-	-	-	25	-	25	-	01	-	01
304190	Skill Development	-	02	-	-	-	25	-	-	25	-	01	-	01
304191A	Mandatory Audit Course 5 &	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**15**	**10**	**01**	**150**	**350**	**50**	**125**	**25**	**700**	**-**		-	-
										Total Credit	**15**	**05**	**01**	**21**

Elective -I

1) Digital Signal Processing
2) Electronic Measurements
3) Fundamentals of JAVA Programming
4) Computer Networks

Savitribai Phule Pune University, Pune
T.E. (Electronics& Telecommunication Engineering) 2019 Course
(With effect from Academic Year 2021-22)

Semester-VI

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
304192	Cellular Networks	03	-	-	30	70	-	-	-	100	03	-	-	03
304193	Project Management	03	-	-	30	70	-	-	-	100	03	-	-	03
304194	Power Devices & Circuits	03	-	-	30	70	-	-	-	100	03	-	-	03
304195	Elective-II	03	-	-	30	70	-	-	-	100	03	-	-	03
304196	Cellular Networks Lab	-	02	-	-	-	-	-	50	50	-	01	-	01
304197	Power Devices & Circuits Lab	-	02	-	-	-	-	50	-	50		01		01
304198	Elective-II Lab	-	02	-	-	-	-	25	-	25	-	01	-	01
304199	Internship**	-	-	-	-	-	100	-	-	100	-	-	04	04
304200	Mini Project	-	04	-	-	-	25	-	50	75	-	02	-	02
304191 B	Mandatory Audit Course 6 &	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**12**	**10**	**00**	**120**	**280**	**125**	**75**	**100**	**700**				
										Total Credit	**12**	**05**	**04**	**21**

Abbreviations:
In-Sem: In semester
End-Sem: End semester
TH: Theory
TW : Term Work
PR: Practical
OR: Oral
TUT: Tutorial

Note: Students of T.E. (Electronics & Telecommunications) have to opt any one of the audit course from the list of audit courses prescribed by BoS (Electronics & Telecommunications Engineering)

Elective -II

1) Digital Image Processing
2) Sensors in Automation
3) Advanced JAVA Programming
4) Embedded Processors
5) Network Security

Savitribai Phule Pune University, Pune
BE (Civil Engineering) 2019 Pattern
(With effect from Academic Year 2022-23)

SEMESTER: VII

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit					
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	TW	PR	OR	TUT	Total
401001	Foundation Engineering	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
401002	Transportation Engineering	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
401003	Elective III	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
401004	Elective IV	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
401005	Project Stage I	--	04	--	--	--	50	--	50	100	--	01	--	02	--	03
401006	Transportation Engineering **Lab**	--	02	--	--	--	--	--	50	50	--	--	--	01	--	01
401007	Elective III **Lab**	--	02	--	--	--	--	--	50	50	--	--	--	01	--	01
401008	Elective IV **Lab**	--	02	--	--	--	50	--	--	50	--	01	--	--	--	01
401009	Computer Programming in Civil Engineering	01	02	--	--	--	50	--	--	50	--	02	--	--	--	02
401010	Audit Course I **Stress Management by Yoga / Communication Etiquette in Workplaces**	--	--	01	--	GR	--	--	--	GR	--	--	--	--	--	--
	Total	**13**	**12**	**01**	**120**	**280**	**150**	**--**	**150**	**700**	**12**	**04**	**--**	**04**	**--**	**20**

Abbreviations: TH : Theory, TW: Term Work, PR : Practical, OR: Oral, TUT : Tutorial, GR: Grade

Elective III and IV

S N	Course Code	Elective III: Course Name	Course Code	Elective IV: Course Name
01	401003 a	Coastal Engineering	401004 a	Air Pollution and Control
02	401003 b	Advanced Design of Concrete Structures	401004 b	Advanced Design of Steel Structures
03	401003 c	Integrated Water Resources Planning & Management	401004 c	Statistical Analysis and Computational Method
04	401003 d	Finite Element Method	401004 d	Airport and Bridge Engineering
05	401003 e	Data Analytics	401004 e	Design of Prestressed Concrete Structures
06	401003 f	Operation Research	401004 f	Formwork and Plumbing Engineering

SEMESTER-VIII																	
Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit					
		Theory	Practical	Tutorial	IN-Sem	End-Sem	TW	PR	OR	Total	TH	TW	PR	OR	TUT	Total
401011	Dams and Hydraulics Structures	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
401012	Quantity Surveying, Contracts and Tenders	03	--	--	30	70	--	--	--	100	03	--	--		--	03
401013	Elective V	03	--	--	30	70	--	--	--	100	03	--	--		--	03
401014	Elective VI	03	--	--	30	70	--	--	--	100	03	--	--		--	03
401015	Project Stage II	--	10	--	--	--	100	--	50	150	--	03	--	02	--	05
401016	Dams and Hydraulics Structures **Lab**	--	02	--	--	--	--	--	50	50	--		--	01	--	01
401017	Quantity Surveying, Contracts and Tenders **Lab**	--	02	--	--	--	--	--	50	50	--		--	01	--	01
401018	Elective V **Lab**	--	02	--	--	--	50	--	--	50	--	01	--	--	--	01
401019	Audit Course II **Social Responsibility / Human Rights**	--	--	01	--	GR	--	--	--	GR		--	--	--	--	--
	Total	**12**	**16**	**01**	**120**	**280**	**150**	**--**	**150**	**700**	**12**	**04**	**--**	**04**	**--**	**20**
Abbreviations: TH : Theory, TW: Term Work, PR : Practical, OR: Oral and TUT : Tutorial, GR: Grade																	

Elective V and VI

S N	Course Code	Elective V: Course Name	Course Code	Elective VI: Course Name
01	401013 a	Earthquake Engineering	401014 a	TQM and MIS
02	401013 b	Structural Design of Bridges	401014 b	Advanced Transportation Engineering
03	401013 c	Irrigation and Drainage	401014 c	Geo Synthetic Engineering
04	401013 d	Design of Precast and Composite Structures	401014 d	Structural Design of Foundations
05	401013 e	Hydropower Engineering	401014 e	Green Structures and Smart Cities
06	401013 f	Structural Audit and Retrofitting of Structures	401014 f	Rural Water Supply and Sanitation

H.O.D.
Dept. of Civil Engineering
arati Vidyapeeth's
Col[illegible] Engineering Lavale, Pune

Savitribai Phule Pune University
Second Year of Computer Engineering (2015 Course)
(With effect from Academic Year 2016-17)

Semester I

Course Code	Course Name	Teaching Scheme Hours / Week			Examination Scheme & Marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	TW	PR	OR	Total	TH + TUT	PR
210241	Discrete Mathematics	04	--	--	50	50	--	--	--	100	04	--
210242	Digital Electronics and Logic Design	04	--	--	50	50	--	--	--	100	04	--
210243	Data Structures and Algorithms	04	--	--	50	50	--	--	--	100	04	--
210244	Computer Organization and Architecture	04	--	--	50	50	--	--	--	100	04	--
210245	Object Oriented Programming	04	--	--	50	50	--	--	--	100	04	--
210246	Digital Electronics Lab	--	--	02	--	--	25	50	--	75	--	01
210247	Data Structures Lab	--	--	04	--	--	25	50	--	75	--	02
210248	Object Oriented Programming Lab	--	--	02	--	--	25	50	--	75	--	01
210249	Soft Skills	--	--	02	--	--	25	--	--	25	--	01
Total											20	05
210250	Audit Course 1	--	--	--	--	--	--	--	--	--	Grade	
Total		20	--	10	250	250	100	150	--	750	25	

Abbreviations:

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TUT: Tutorial
Sem: Semester

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Second Year of Computer Engineering (2015 Course)
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Semester II

Course Code	Course Name	Teaching Scheme Hours / Week			Examination Scheme & Marks						Credits	
		Theory	Tutorial	Practical	In-Sem	End-Sem	TW	PR	OR	Total	TH+ TUT	PR
207003	Engineering Mathematics III	04	01	--	50	50	25	--	--	125	05	--
210251	Computer Graphics	04	--	--	50	50	--	--	--	100	04	--
210252	Advanced Data Structures	04	--	--	50	50	--	--	--	100	04	--
210253	Microprocessor	04	--	--	50	50	--	--	--	100	04	--
210254	Principles of Programming Languages	03	--	--	50	50	--	--	--	100	03	--
210255	Computer Graphics Lab	--	--	02	--	--	25	50	--	75	--	01
210256	Advanced Data Structures Lab	--	--	04	--	--	25	50	--	75	--	02
210257	Microprocessor Lab	--	--	04	--	--	25	50	--	75	--	02
Total											20	05
210258	Audit Course 2		--	--	--	--	--	--	--	--	Grade	
Total		19	01	10	250	250	100	150	--	750	25	

Abbreviations:

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Semester I

Course Code	Course	Teaching Scheme Hours / Week			Examination Scheme and Marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	TW	PR	OR	Total	TH/ TUT	PR
310241	Theory of Computation	03	--	--	30	70	--	--	--	100	03	--
310242	Database Management Systems (DBMS)	03	--	--	30	70	--	--	--	100	03	--
310243	Software Engineering & Project Management	03	--	--	30	70	--	--	--	100	03	--
310244	Information Systems & Engineering Economics	03	--	--	30	70	--	--	--	100	03	--
310245	Computer Networks (CN)	04	--	--	30	70	--	--	--	100	04	--
310246	Skills Development Lab	--	02	04	--	--	50	--	50	100	02	02
310247	DBMS Lab	--	--	04	--	--	25	50	--	75	--	02
310248	CN Lab	--	--	02	--	--	25	50	--	75	--	01
										Total Credit	18	05
	Total	16	02	10	150	350	100	100	50	750	23	
310249	Audit Course 3										Grade	

310249-Audit Course 3 (AC3) Options:

AC3-I: **Cyber Security**

AC3-II: **Professional Ethics and Etiquettes**

AC3-III: **Emotional Intelligence**

AC3-IV: **MOOC- Learn New Skills**

AC3-V: **Foreign Language (Japanese- Module 3)**

Abbreviations:

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Semester II

Course Code	Course	Teaching Scheme Hours / Week			Examination Scheme and Marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	TW	PR	OR	Total	TH/ TUT	PR
310250	Design & Analysis of Algorithms	04	--	--	30	70	--	--	--	100	04	
310251	Systems Programming & Operating System (SP & OS)	04	--	--	30	70	--	--	--	100	04	--
310252	Embedded Systems & Internet of Things (ES & IoT)	04	--	--	30	70	--	--	--	100	04	--
310253	Software Modeling and Design	03	--	--	30	70	--	--	--	100	03	--
310254	Web Technology	03	--	--	30	70	--	--	--	100	03	--
310255	Seminar & Technical Communication	--	01	--	--	--	50	--	--	50	01	--
310256	Web Technology Lab	--	--	02	--	--	25	50	--	75	--	01
310257	SP & OS Lab	--	--	04	--	--	25	50	--	75	--	02
310258	ES & IoT Lab	--	--	02	--	--	50	--	--	50	--	01
										Total Credit	19	04
	Total	18	01	08	150	350	150	100	--	750	23	
310259	Audit Course 4										Grade	

310259-Audit Course 4(AC4) Options:

AC4-I: Digital and Social Media Marketing
AC4-II: Green Computing
AC4-III: Sustainable Energy Systems
AC4-IV: Leadership and Personality Development
AC4-V: Foreign Language (Japanese- Module 4)

Abbreviations:

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Savitribai Phule Pune University
Fourth Year of Computer Engineering (2015 Course)
(with effect from 2018-19)

Semester I

Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks						Credit	
		Theory	Practical	In-Sem	End-Sem	TW	PR	OR/ *PRE	Total	TH/ TUT	PR
410241	High Performance Computing	04	--	30	70	--	--	--	100	04	--
410242	Artificial Intelligence and Robotics	03	--	30	70	--	--	--	100	03	--
410243	Data Analytics	03	--	30	70	--	--	--	100	03	--
410244	Elective I	03	--	30	70	--	--	--	100	03	--
410245	Elective II	03	--	30	70	--	--	--	100	03	--
410246	Laboratory Practice I	--	04	--	--	50	50	--	100	--	02
410247	Laboratory Practice II	--	04	--	--	50	--	*50	100	--	02
410248	Project Work Stage I	--	02	--	--	--	--	*50	50	--	02
									Total Credit	16	06
	Total	**16**	**10**	**150**	**350**	**100**	**50**	**100**	**750**	**22**	
410249	Audit Course 5									Grade	

Elective I	Elective II
410244 (A) Digital Signal Processing	**410245 (A)** Distributed Systems
410244 (B) Software Architecture and Design	**410245 (B)** Software Testing and Quality Assurance
410244 (C) Pervasive and Ubiquitous Computing	**410245 (C)** Operations Research
410244 (D) Data Mining and Warehousing	**410245 (D)** Mobile Communication

410249-Audit Course 5 (AC5) Options:

AC5-I Entrepreneurship Development
AC5-II: Botnet of Things
AC5-III: 3D Printing
AC5-IV: Industrial Safety and Environment Consciousness
AC5-V: Emotional Intelligence
AC5-VI: MOOC- Learn New Skills

Abbreviations:

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Fourth Year of Computer Engineering (2015 Course)
(with effect from 2018-19)

Semester II

Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks						Credit	
		Theory	Practical	In-Sem	End-Sem	TW	PR	OR/ *PRE	Total	TH/ TUT	PR
410250	Machine Learning	03	--	30	70	--	--	--	100	03	--
410251	Information and Cyber Security	03	--	30	70	--	--	--	100	03	--
410252	Elective III	03	--	30	70	--	--	--	100	03	--
410253	Elective IV	03	--	30	70	--	--	--	100	03	--
410254	Laboratory Practice III	--	04	--	--	50	50	--	100	--	02
410255	Laboratory Practice IV	--	04	--	--	50	--	*50	100	--	02
410256	Project Work Stage II	--	06	--	--	100	--	*50	150	--	06
									Total Credit	12	10
	Total	**12**	**14**	**120**	**280**	**200**	**50**	**100**	**750**	**22**	
410257	Audit Course 6									Grade	

Elective III	Elective IV
410252 (A) Advanced Digital Signal Processing	**410253 (A)** Software Defined Networks
410252 (B) Compilers	**410253 (B)** Human Computer Interface
410252 (C) Embedded and Real Time Operating System	**410253 (C)** Cloud Computing
410252 (D) Soft Computing and Optimization Algorithms	**410253 (D)** Open Elective

410259-Audit Course 6 (AC6) Options:

AC6-I: Business Intelligence
AC6-II: Gamification
AC6-III: Quantum Computing
AC6-IV: Usability Engineering
AC6-V: Conversational Interfaces
AC6-VI: MOOC- Learn New Skills

Abbreviations:

TW: Term Work **TH:** Theory **OR:** Oral **PR:** Practical
Sem: Semester **PRE:** Project/ Mini-Project Presentation

Savitribai Phule Pune University

Second Year of Computer Engineering (2019 Course) (With effect from Academic Year 2020-21)

Semester-III

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
210241	Discrete Mathematics	03	-	01	30	70	-	-	-	100	03	--	01	04
210242	Fundamentals of Data Structures	03	-	-	30	70	-	-	-	100	03	-	-	03
210243	Object Oriented Programming	03	-	-	30	70	-	-	-	100	03	-	-	03
210244	Computer Graphics	03	-	-	30	70	-	-	-	100	03	-	-	03
210245	Digital Electronics and Logic Design	03	-	-	30	70	-	-	-	100	03	-	-	03
210246	Humanity and Social Science	-	-	01	-	-	-	-	-	-	-	-	-	-
210247	Data Structures Lab	-	04	-	-	-	25	50	-	75	-	02	-	02
210248	OOP and Computer Graphics Lab	-	04	-	-	-	25	50	-	75	-	02	-	02
210249	Digital Electronics Lab	-	02	-	-	-	25	-	-	25	-	01	-	01
210250	Business Communication Skills Lab	-	02	-	-	-	25	-	-	25	-	01	-	01
210251	Audit Course 3	-	-	-	-	-	-	-	-	-	-	-	-	-
										Total Credit	15	06	01	22
	Total	**15**	**12**	**02**	**150**	**350**	**100**	**100**	**-**	**700**	**-**	**-**	**-**	**-**

Semester-IV

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
210252	Mathematics III	03	-	01	30	70	-	-	-	100	03	--	01	04
210253	Data Structures and Algorithms	03	-	-	30	70	-	-	-	100	03	-	-	03
210254	Software Engineering	03	-	-	30	70	-	-	-	100	03	-	-	03
210255	Microprocessor	03	-	-	30	70	-	-	-	100	03	-	-	03
210256	Principles of Programming Languages	03	-	-	30	70	-	-	-	100	03	-	-	03
210257	Data Structures and Algorithms Lab	-	04	-	-	-	25	50	-	75	-	02	-	02
210258	Microprocessor Lab	-	04	-	-	-	25	50	-	75	-	02	-	02
210259	Code of Conduct	-	-	01	-	-	-	-	-	-	-	-	-	-
210260	Project Based Learning	-	04	-	-	-	50	-	-	50	-	02	-	02
210261	Audit Course 4	-	-	-	-	-	-	-	-	-	-	-	-	-
										Total Credit	15	06	01	22
	Total	**15**	**12**	**02**	**150**	**350**	**100**	**100**	**-**	**700**	**-**	**-**	**-**	**-**

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Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

(With effect from Academic Year 2021-22)

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BE Computer Engineering 2019 Course tentative Curriculum structure:

Savitribai Phule Pune University
Fourth Year of Computer Engineering (2019 Course)
(With effect from Academic Year 2022-23)

Semester VII

Course Code	Course Name	Teaching Scheme (Hours/week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral\Pre	Total	Lecture	Practical	Tutorial	Total
410241	Design and Analysis of Algorithms	03	-	-	30	70	-	-	-	100	3	-	-	3
410242	Machine Learning	03	-	-	30	70	-	-	-	100	3	-	-	3
410243	Blockchain Technology	03	-	-	30	70	-	-	-	100	3	-	-	3
410244	Elective III	03	-	-	30	70	-	-	-	100	3	-	-	3
410245	Elective IV	03	-	-	30	70	-	-	-	100	3	-	-	3
410246	Laboratory Practice III	-	04	-	-	-	50	50	-	100	-	2	-	2
410247	Laboratory Practice IV	-	02	-	-	-	50	-	-	50	-	1	-	1
410248	Project Stage I	-	02	-	-	-	50	-	-	50	-	2	-	2
										Total Credit	**15**	**05**	**-**	**20**
	Total	**15**	**08**	**-**	**150**	**350**	**150**	**50**	**-**	**700**	**15**	**05**	**-**	**20**
410249	Audit Course 7										**Grade**			

Elective III	**Elective IV**
410244(A) Pervasive Computing 410244(B) Multimedia Techniques 410244(C) Cyber Security and Digital Forensics 410244(D) Object Oriented Modeling and Design 410244(E) Digital Signal Processing	410245(A) Information Retrieval 410245(B) GPU Programming and Architecture 410245(C) Mobile Computing 410245(D)Software Testing and Quality Assurance 410245(E) Compilers
Laboratory Practice III: Laboratory assignments Courses- 410241, 410242, 410243	**Laboratory Practice IV:** Laboratory assignments Courses- 410244, 410245

Audit Course 7(AC7) Options:
AC7- I MOOC- Learn New Skills
AC7- II Entrepreneurship Development
AC7- III Botnet of Things
AC7- IV 3D Printing
AC7- V Industrial Safety and Environment Consciousness

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Savitribai Phule Pune University
Final Year of Computer Engineering (2019 Course)
(With effect from Academic Year 2022-23)
Semester VIII

Course Code	Course Name	Teaching Scheme (Hours/week)			Examination Scheme and Marks						Credit Scheme			
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral/Pre	Total	Lecture	Practical	Tutorial	Total
410250	High Performance Computing	03	-	-	30	70	-	-	-	100	03			03
410251	Deep Learning	03	-	-	30	70	-	-	-	100	03			03
410252	Elective V	03	-	-	30	70	-	-	-	100	03			03
410253	Elective VI	03	-	-	30	70	-	-	-	100	03			03
410254	Laboratory Practice V	-	02	-	-	-	50	50	-	100		01		01
410255	Laboratory Practice VI	-	02	-	-	-	50	-	-	50		01		01
410256	Project Stage II	-	06	-	-	-	100	-	50	150		06		06
										Total Credit	12	08	-	20
	Total	12	10	-	120	280	200	50	50	700	12	08	-	20
410257	Audit Course 8										Grade			

Elective V	Elective VI
410252(A) Natural Language Processing 410252(B) Image Processing 410252(C) Software Defined Networks 410252(D) Advanced Digital Signal Processing 410252(E) Open Elective I	410253(A) Pattern Recognition 410253(B) Soft Computing 410253(C) Business Intelligence 410253(D) Quantum Computing 410253(E) Open Elective II
Lab Practice V: Laboratory assignments Courses- 410250, 410251	Lab Practice VI: Laboratory assignments Courses- 410252, 410253

Audit Course 8(AC8) Options:
AC8- I Usability Engineering
AC8- II Conversational Interfaces
AC8- III Social Media and Analytics
AC8- IV MOOC- Learn New Skills
AC8- V Emotional Intelligence

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Savitribai Phule Pune University, Pune
SE(E&TC/Electronics Engineering) 2015 Course

(With effect from Academic Year 2016-17)

Semester I

Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit	
		Theory	Tutorials	Practicals	In-Sem (On line)	End-Sem (Theory)	TW	PR	OR	Total	TH/TUT	PR+OR
204181	Signals & Systems	3	1	-	50	50	25	-	-	125	4	-
204182	Electronic Devices & Circuits	4	-	2	50	50	-	50	-	150	4	1
204183	Electrical Circuits and Machines	3	-	2	50	50	25	-	-	125	3	1
204184	Data Structures and Algorithms	4	-	2	50	50	-	-	50	150	4	1
204185	Digital Electronics	4	-	2	50	50	-	50	-	150	4	1
204186	Electronic Measuring Instruments & Tools	1	-	2	-	-	50	-	-	50	1	1
204192	**Audit Course 1**	--	--	--	--	--	--	--	--	--		
	Total	19	1	10	250	250	100	100	50	750	20	05
										Total Credits	**25**	

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Note: Interested students of S.E. (Electronics/E&TC) can opt any one of the audit course from the audit courses prescribed by BoS (Electronics/Computer/IT/Electrical/Instrumentation)

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SE(E&TC/Electronics Engineering) 2015 Course

(With effect from Academic Year 2016-17)

Semester II

Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit	
		Theory	Tutorials	Practicals	In-Sem (on line)	End-Sem (Theory)	TW	PR	OR	Total	TH/TUT	PR+OR
207005	Engineering Mathematics III	4	1	-	50	50	25	-	-	125	5	-
204187	Integrated Circuits	4	-	2	50	50	25	50	-	175	4	1
204188	Control Systems	3	-	-	50	50	-	-	-	100	3	-
204189	Analog Communication	3	-	2	50	50	-	50	-	150	3	1
204190	Object Oriented Programming	3	-	4	50	50	-	-	50	150	3	2
204191	Employability Skill Development	2	-	2	-	-	50	-	-	50	2	1
204193	**Audit Course 2**	--	--	--	--	--	--	--	--	--		
	Total	19	1	10	250	250	100	100	50	750	20	05
										Total Credits	**25**	

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Note: Interested students of S.E (Electronics/E&TC) can opt any one of the audit course from the audit courses prescribed by BoS (Electronics/Computer/IT/Electrical/Instrumentation)

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Third Engineering-E&TC (2015 Course)

(With effect from Academic Year 2017-18)

Semester I

Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credits	
		Theory	Tutorials	Practicals	In-Sem	End-Sem	TW	PR	OR	Total	TH/TW	PR+OR
304181	Digital Communication	4	--	--	30	70	--	--	--	100	4	--
304182	Digital Signal Processing	4	--	--	30	70	--	--	--	100	4	--
304183	Electromagnetics	3	1	--	30	70	--	--	--	100	4	--
304184	Microcontrollers	3	--	--	30	70	--	--	--	100	3	1
304185	Mechatronics	3	--	--	30	70	--	--	--	100	3	1
304191	Signal Processing and Communications Lab (DC/DSP)	--	--	4	--	--	50	50		100	--	2
304192	Microcontrollers and Mechatronics Lab	--	--	4	--	--	50	50		100		
304193	Electronics System Design	2	--	2	--	--	-	--	50	50	2	1
	Audit Course 3	--	--	--	--	--	--	--	--	--	----	
	Total	19	1	10	150	350	100	100	50	750		
										Total Credits	**25**	

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Note: Interested students of T.E (Electronics/E&TC) can opt any one of the audit course from the audit courses prescribed by BoS (Electronics/Computer/IT/Electrical/Instrumentation)

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Third Engineering-E&TC (2015 Course)

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Semester II												
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit	
		Theory	Tutorials	Practicals	In-Sem	End-Sem	TW	PR	OR	Total	TH/TW	PR +OR
304186	Power Electronics	4	--	--	30	70	--	--	--	100	4	--
304187	Information Theory, Coding and Communication Networks	4	--	--	30	70	--	--	--	100	4	--
304188	Business Management	3	--	--	30	70	--	--	--	100	3	--
306189	Advanced Processors	4	--	--	30	70	--	--	--	100	4	1
304190	System Programming and Operating Systems	3	--	--	30	70		--	--	100	3	1
304194	Power and ITCT Lab	--	--	4	--	--	50	50	--	100	--	2
304195	Advanced Processors and System Prograaming. Lab	--	--	4	--	--	50	50	--	100		
304196	Employability Skills and Mini Project	2	--	2	--	--	--	--	50	50	2	1
	Audit Course 4	--	--	--	--	--	--	--	--	--		
	Total	20	---	10	150	350	100	100	50	750		
										Total Credits	**25**	

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TH: Theory **OR: Oral**
TW: Term Work **PR: Practical**

Note: Interested students of T.E (Electronics/E&TC) can opt any one of the audit course from the audit courses prescribed by BoS (Electronics/Computer/IT/Electrical/Instrumentation)

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Final Year E&TC Engineering (2015 Course)
(With effect from Academic Year 2018-19)

Semester I													
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credits	
		Theory	Tut	Pract	In-Sem	End-Sem	TW	PR	OR	Total	TH/TW	PR+OR
404181	VLSI Design& Technology	3	--	--	30	70	--	--	--	100	3	--
404182	Computer Networks & Security	4	--	--	30	70	--	--	--	100	4	--
404183	Radiation & Microwave Techniques	3	--	--	30	70	--	--	--	100	3	--
404184	Elective I	3	--	--	30	70	--	--	--	100	3	--
404185	Elective II	3			30	70	--	--	--	100	3	--
404186	Lab Practice -I (CNS+ RMT)	--	--	4	--	--	50	--	50	100	--	2
404187	Lab Practice -II (VLSI + Elective I)	--	--	4	--	--	50	50		100	--	2
404188	Project Stage I	-	2	--	--	--	-	--	50	50	--	2
	Audit Course 5	--	--	--	--	--	--	--	--	--	----	
	Total	16	2	8	150	350	100	50	100	750	16	6
Total Credits											**22**	

Elective I

1 Digital Image and Video Processing

2. Industrial Drives and Control

3. Embedded Systems & RTOS

4. Internet of Things

Elective II

1. Wavelets

2. Electronics Product Design

3. Optimization Techniques

4. Artificial Intelligence

5. Electronics in agriculture

Audit Course 5

1. Green Energy

2. Human Behaviour

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Final Year E&TC Engineering (2015 Course)

(With effect from Academic Year 2018-19)

Semester II

Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit	
		Theory	Tut	Pract	In-Sem	End-Sem	TW	PR	OR	Total	TH/TW	PR+OR
404189	Mobile Communication	3	--	--	30	70	--	--	--	100	3	--
404190	Broadband Communication Systems	4	--	--	30	70	--	--	--	100	4	--
404191	Elective III	3	--	--	30	70	--	--	--	100	3	--
404192	Elective IV	3	--	--	30	70	--	--	--	100	3	--
404193	Lab Practice –III (MC+BCS)	--	--	4	--	--	50	50	--	100	--	2
404194	Lab Practice –IV (Elective III)	--	--	2	--	--	--	--	50	50	--	1
404195	Project Stage II	--	6	-	--	--	150	--	50	200	--	6
	Audit Course 6	--	--	--	--	--	--	--	--	--		
Total		13	6	6	120	280	200	50	100	750	13	9
										Total Credits	**22**	

Elective III	**Elective-IV**	**Audit Course 6**
1. Machine Learning 2. PLC s and Automation 3. Audio and Speech Processing 4. Software Defined Radio 5. Audio Video Engineering	1. Robotics 2. Biomedical Electronics 3. Wireless Sensor Networks 4. Renewable Energy Systems 5. Open Elective*	1. Team Building, Leadership and Fitness 2. Environmental issues and Disaster Management

*Any one course from the list of Elective IV of computer/IT/Electrical/Instrumentation or Institute can offer elective IV based on any industry need with prior approval from BoS(Electronics & Telecommunication). Repetition of course or topics should be avoided.

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Savitribai Phule Pune University, Pune
S.E. (Electronics / E&TC Engineering) 2019 Course
(With effect from Academic Year 2020-21)

Semester-III

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
207005	Engineering Mathematics III	04	-	01	30	70	25	-	-	125	04	-	01	05
204181	Electronic Circuits	03	-	-	30	70	-	-	-	100	03	-	-	03
204182	Digital Circuits	03	-	-	30	70	-	-	-	100	03	-	-	03
204183	Electrical Circuits	03	-	-	30	70	-	-	-	100	03	-	-	03
204184	Data structures	03	-	-	30	70	-	-	-	100	03	-	-	03
204185	Electronic Circuit Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
204186	Digital circuits Lab		02					50		50		01		01
204187	Electrical Circuit Lab	-	02	-	-	-	25	-	-	25	-	01	-	01
204188	Data Structures Lab	-	02	-	-	-	-	-	25	25	-	01	-	01
204189	Electronic Skill Development	-	02	-	-	-	25	-	-	25	-	01	-	01
204190	Mandatory Audit Course 3 &	-	-	-					-	-	-	-	-	-
Total		**16**	**10**	**01**	**150**	**350**	**75**	**100**	**25**	**700**	**16**	**05**	**01**	**22**

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(With effect from Academic Year 2020-21)

Semester-IV

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
204191	Signals & Systems	03	-	01	30	70	25	-	-	125	03	-	01	04
204192	Control Systems	03	-		30	70		-	-	100	03	-	-	03
204193	Principles of Communication Systems	03	-	-	30	70	-	-	-	100	03	-	-	03
204194	Object Oriented Programming	03	-	-	30	70	-	-	-	100	03	-	-	03
204195	Signals & Control System Lab		02				50			50		01		01
204196	Principle of Communication Systems Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
204197	Object Oriented Programming Lab	-	02	-	-	-	-	-	50	50	-	01	-	01
204198	Data Analytics Lab		02				-		25	25		01		01
204199	Employability Skill Development	02	02	-	-	-	50	-	-	50	02	01	-	03
204200	Project Based Learning $^{\eta}$	-	04				50		-	50		02		02
204201	Mandatory Audit Course 4$^{\&}$	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		**14**	**14**	**01**	**120**	**280**	**175**	**50**	**75**	**700**	**14**	**07**	**01**	**22**

Abbreviations:
In-Sem: In semester — End-sem: End semester — TH : Theory — TW : Term Work
PR : Practical — OR : Oral — TUT : Tutorial

Note: Interested students of S.E. (Electronics/E&TC) can opt any one of the audit course from the list of audit courses prescribed by BoS (Electronics & Telecommunications Engineering)

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(With effect from Academic Year 2021-22)

Semester-V

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
304181	Digital Communication	03	-	-	30	70	-	-	-	100	03	-	-	03
304182	Electromagnetic Field Theory	03	-	01	30	70	25	-	-	125	03	-	01	04
304183	Database Management	03	-	-	30	70	-	-	-	100	03	-	-	03
304184	Microcontrollers	03	-	-	30	70	-	-	-	100	03	-	-	03
304185	Elective - I	03	-	-	30	70	-	-	-	100	03	-	-	03
304186	Digital Communication Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
304187	Database Management Lab	-	02	-	-	-	-	-	25	25	-	01	-	01
304188	Microcontroller Lab	-	02	-	-	-	-	50	-	50	-	01	-	01
304189	Elective I Lab	-	02	-	-	-	-	25	-	25	-	01	-	01
304190	Skill Development	-	02	-	-	-	25	-	-	25	-	01	-	01
304191A	Mandatory Audit Course 5 &	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**15**	**10**	**01**	**150**	**350**	**50**	**125**	**25**	**700**	**-**		-	-
										Total Credit	**15**	**05**	**01**	**21**

Elective -I

1) Digital Signal Processing
2) Electronic Measurements
3) Fundamentals of JAVA Programming
4) Computer Networks

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T.E. (Electronics& Telecommunication Engineering) 2019 Course
(With effect from Academic Year 2021-22)

Semester-VI

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
304192	Cellular Networks	03	-	-	30	70	-	-	-	100	03	-	-	03
304193	Project Management	03	-	-	30	70	-	-	-	100	03	-	-	03
304194	Power Devices & Circuits	03	-	-	30	70	-	-	-	100	03	-	-	03
304195	Elective-II	03	-	-	30	70	-	-	-	100	03	-	-	03
304196	Cellular Networks Lab	-	02	-	-	-	-	-	50	50	-	01	-	01
304197	Power Devices & Circuits Lab	-	02	-	-	-	-	50	-	50		01		01
304198	Elective-II Lab	-	02	-	-	-	-	25	-	25	-	01	-	01
304199	Internship**	-	-	-	-	-	100	-	-	100	-	-	04	04
304200	Mini Project	-	04	-	-	-	25	-	50	75	-	02	-	02
304191 B	Mandatory Audit Course 6 &	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**12**	**10**	**00**	**120**	**280**	**125**	**75**	**100**	**700**				
										Total Credit	**12**	**05**	**04**	**21**

Abbreviations:

In-Sem: In semester — End-Sem: End semester — TH: Theory — TW : Term Work

PR: Practical — OR: Oral — TUT: Tutorial

Note: Students of T.E. (Electronics & Telecommunications) have to opt any one of the audit course from the list of audit courses prescribed by BoS (Electronics & Telecommunications Engineering)

Elective -II

1) Digital Image Processing
2) Sensors in Automation
3) Advanced JAVA Programming
4) Embedded Processors
5) Network Security

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B.E. (Electronics & Telecommunication) 2019 Course
(With effect from Academic Year 2022-23)

Semester-VII

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
404181	Radiation & Microwave Theory	03	-	-	30	70	-	-	-	100	03	-	-	03
404182	VLSI Design and Technology	03	-	-	30	70	-	-	-	100	03	-	-	03
404183	Cloud Computing	03	-	-	30	70	-	-	-	100	03	-	-	03
404184	Elective - 3	03	-	-	30	70	-	-	-	100	03	-	-	03
404185	Elective - 4	03	-	-	30	70	-	-	-	100	03	-	-	03
404186	Lab Practice - 1 (RMT & Cloud Computing)	-	04	-	-	-	25	-	50	75	-	02	-	02
404187	Lab Practice - 2 (VLSI Design & Elective -3)	-	04	-	-	-	25	50	-	75	-	02	-	02
404188	Project Stage - I	-	02	-	-	-	50	-	-	50	-	01	-	01
404189	Mandatory Audit Course 7	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**15**	**10**	**-**	**150**	**350**	**100**	**50**	**50**	**700**	-	-	-	-
	Total Credits										**15**	**05**	**-**	**20**

Elective - 3	Elective - 4
1. Speech Processing	1. Data Mining
2. PLC SCADA & Automation	2. Electronic Product Development
3. JAVA Script	3. Deep Learning
4. Embedded & RTOS	4. Low Power CMOS
5. Modernized IoT	5. Smart Antennas

Mandatory Audit Course - 7
1. Management Information System
2. Patent Search & Analysis
3. Knowledge Management
4. Energy Economics & Policy
5. Educational Leadership
6. Human Resource Development

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B.E. (Electronics & Telecommunication) 2019 Course
(With effect from Academic Year 2022-23)

Semester-VIII

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credit			
		Theory	Practical	Tutorial	In-Sem	End-Sem	TW	PR	OR	Total	TH	PR	TUT	Total
404190	Fiber Optic Communication	03	-	-	30	70	-	-	-	100	03	-	-	03
404191	Elective - 5	03	-	-	30	70	-	-	-	100	03	-	-	03
404192	Elective - 6	03	-	-	30	70	-	-	-	100	03	-	-	03
404193	Innovation & Entrepreneurship	-	-	02	-	-	50	-	-	50	-	-	02	02
404194	Digital Business Management	-	-	02	-	-	50	-	-	50	-	-	02	02
404195	Fiber Optic Lab	-	02	-	-	-	25	-	50	75	-	01	-	01
404196	Lab Practice - 3 (Elective - 5)	-	02	-	-	-	25	50	-	75	-	01	-	01
404197	Project Stage - II	-	10	-	-	-	100	-	50	150	-	05	-	05
	Total	**09**	**14**	**04**	**90**	**210**	**250**	**50**	**100**	**700**	-	-	-	-
	Total Credits										**09**	**07**	**04**	**20**

Elective - 5	Elective - 6
1. Biomedical Signal Processing	1. System on Chip
2. Industrial Drives & Automation	2. Nano Electronics
3. Android Development	3. Remote Sensing
4. Embedded System Design	4. Digital Marketing
5. Mobile Computing	5. Open Elective

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SAVITRIBAI PHULE PUNE UNIVERSITY

First Year Engineering

Credit System Syllabus

2015 Course

$: Mandatory subjects of first, second and third semester must include at least 40 credits for Engineering Physics, Engineering Chemistry, Engineering Mathematics, social science and soft skills
In addition to above credits, there should be audit courses in semester five, six and seven to develop the various skills.
The detail structure is given in Tables

TABLE - 2 Structure for Semester-1

	Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
							Theory		TW	PR	OR	Max. Marks	
				Lectures	Tutorials	PR/DRG	In-Semester Exam	End-Semester Exam					
	107001	Engineering Mathematics I		4	1	–	50	50	25	–	–	125	5
#	107002 / 107009.	Engineering Physics OR Engineering Chemistry		4	–	2	50	50	25	–	–	125	5
	102006	Engineering Graphics I		3	–	2	50	50	–	-	–	100	4
#	103004 / 104012	Basic Electrical Engineering OR Basic Electronics Engineering		3	–	2	50	50	25	–	–	125	4
	101005	Basic Civil and Environmental Engineering		3	–	2	50	50	25	–	–	125	4
	110003	Fundamentals of Programming Languages I		1	–	2	-	-	–	50*	–	50	2
	111007	Workshop Practice		–	–	2	–	–	50	–	–	50	1
	Total of Semester I			18	1	12	250	250	150	50	–	700	25

TABLE - 3 Structure for Semester-2

	Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
							Theory						
				Lectures	Tutorials	PR/ DRG	In-Semester Exam	End-Semester Exam	TW	PR	OR	Max. Marks	
	107008	Engineering Mathematics II		4	–	–	50	50	–	–	–	100	4
#	107009 / 107002	Engineering Chemistry OR Engineering Physics		4	–	2	50	50	25	–	–	125	5
	102013	Basic Mechanical Engineering		3	–	2	50	50	25	-	–	125	4
	101011	Engineering Mechanics		4	–	2	50	50	25	–	–	125	5
#	104012 / 103004.	Basic Electronics Engineering OR Basic Electrical Engineering		3	–	2	50	50	25	–	–	125	4
	110010	Fundamentals of Programming Languages II		1	–	2	-	-	-	50*	–	50	2
	102014	Engineering Graphics II		–	–	2	–	–	50	–	–	50	1
	Total of Semester II			19	–	12	250	250	150	50	–	700	25

Instructions:

1. PR/Tutorial must be conducted in minimum three batches (batch size 22 maximum) per division
2. Minimum number of required Experiments/Assignments in PR/DRG/Tutorial be carried out as mentioned in the syllabi of related subjects.
3. * for FPL-I and FPL-II: S.P. Pune University Online Practical Examination shall be conducted at the semester end.
4. # Every student should appear for Engineering Physics, Engineering Chemistry, Basic Electronics Engineering and Basic Electrical Engineering during the year.
5. # College is allowed to distribute Teaching Workload of subjects Physics, Chemistry, BEE, BXE in semester I and II by dividing number of FE divisions appropriately in two groups.

Savitribai Phule Pune University

Syllabus

FOR

S.E. Mechanical and Automobile Engineering

2015 Course

UNDER FACULTY OF ENGINEERING

EFFECTIVE FROM June 2016

Structure of S.E. (Mechanical Engineering/ Automobile Engineering)
2015 Course

Semester-I

Subject Code	Subject	Teaching Scheme Hours/Week			Examination Scheme					Total Marks	Credits	
		L	Tut.	PR	In-Sem (online)	End-Sem	TW	PR.	Oral		Lect/Tut	PR/OR
207002	Engineering Mathematics – III	04	01	-	50	50	25	-	-	125	05	-
202041	Manufacturing Process-I	03	-	02	50	50	50	-	-	150	03	01
202042	Computer Aided Machine Drawing	01	-	02	--	--		50	-	50	01	01
202043	Thermodynamics	04	-	02	50	50	-	-	50	150	04	01
202044	Material Science	03	01	-	50	50	25	-	-	125	03	01
202051	Strength of Materials	04	-	02	50	50	-	-	50	150	04	01
202055	Audit course											
					--	--						
	Total	**19**	**02**	**08**	**250**	**250**	100	50	100	**750**	**20**	**05**
	Total of Part-I	**29 Hrs**				**750**					**25**	

Note: Material Science and Engineering Mathematics-III practical may be carried out fortnightly for two hours, so that the tutorial hours may be used as practical.

Semester-II

Subject Code	Subject	Teaching Scheme Hours/Week			Examination Scheme					Total Marks	Credits	
		L	Tut.	PR	In-Sem (online)	End-Sem	TW	PR.	Oral		Lect/Tut	PR/OR
202045	Fluid Mechanics	04	-	02	50	50	-	50	-	150	04	01
202047	Soft Skills	-	-	02	--	--	25	-	-	25	-	01
202048	Theory of Machines – I	04	01	-	50	50	25	-	25	150	04	01
202049	Engineering Metallurgy	03	01	-	50	50	-	-	25	125	03	01
202050	Applied Thermodynamics	04	-	02	50	50	-	50	-	150	04	01
203152	Electrical and Electronics Engineering	03	-	02	50	50	25	-	-	125	03	01
202053	Machine Shop – I	-	-	02	--	--	25	-	-	25	-	01
	Total	**18**	**02**	**10**	**250**	**250**	**100**	**100**	**50**	**750**	**18**	**07**
	Total of Part-II	**30 Hrs**				**750**					**25**	

Note: Theory of Machine-I and Engineering Metallurgy practical may be carried out fortnightly for two hours, so that the tutorial hours may be used as practical.

SAVITRIBAI PHULE PUNE UNIVERSITY

FACULTY OF ENGINEERING

SYLLABUS FOR
T. E. (MECHANICAL ENGINEERING)
(2015 Course)

WITH EFFECT FROM YEAR 2017-2018

Savitribai Phule Pune University
T.E. Mechanical Engineering 2015 – Course
T. E. (Mechanical) (2015 Course) Semester – I

Code	Subject	Teaching Scheme Hrs / week			Examination Scheme					Total Marks	Credits	
		Lecture	Tut	Pract	In-Sem	ESE	TW	PR	OR		Th	TW / PR / OR
302041	Design of Machine Elements-I	4	-	2	30@	70@	50	-		150	4	1
302042	Heat Transfer*	4	-	2	30	70		50	-	150	4	1
302043	Theory of Machines-II$	3	1		30	70	25	-	25	150	3	1
302044	Turbo Machines	3	-	2	30	70	-	-	25	125	3	1
302045	Metrology and Quality Control$	3	-	2	30	70	-	-	25	125	3	1
302046	Skill Development	-	-	2	-	-	25	25	-	50	-	1
Total		17	1	10	150	350	100	75	75	750	17	6
											23	

T. E. (Mechanical) (2015 Course) Semester – II

Code	Subject	Teaching Scheme Hrs / week			Examination Scheme					Total Marks	Credits	
		Lecture	Tut	Pract	In-Sem	ESE	TW	PR	OR		Th	TW / PR / OR
302047	Numerical Methods and Optimization*	4	-	2	30	70	-	50	-	150	4	1
302048	Design of Machine Elements-II	4	-	2	30@	70@	25	-	25	150	4	1
302049	Refrigeration and Air Conditioning	3	-	2	30	70	-	-	25	125	3	1
302050	Mechatronics%	3	1		30	70	-	-	25	125	3	1
302051	Manufacturing - Process-II$	3	-	-	30	70	-	-	-	100	3	-
302052	Machine Shop-II$	-	-	2	-	-	50	-	-	50	-	1
302053	Seminar$	-	-	2	-	-	25	-	25#	50	-	1
302054	Audit Course*	--	--	--	--	--	-	-	-	-	-	-
Total		17	1	10	150	350	100	50	100	750	17	6
											23	

Though it is under Oral head Internal Panel to be appointed by Principal and HOD. Examination schedule will not be prepared at University level.

* Marked subjects are common with TE (Auto. Engg.) and TE Mech. Sandwich

$ Marked subjects are common with TE (Auto. Engg.) only

% Marked subjects are common with TE Mech. Sandwich only

@ Examination time for Insem examination 1 Hr 30 Min. and Endsem examination 3Hrs.

Savitribai Phule Pune University

Faculty of Science and Technology

Syllabus for Final Year of Mechanical Engineering

(Course 2015)

Savitribai Phule Pune University

B. E. (Mechanical) (2015 Course) Semester – I

Code	Subject	Teaching Scheme Hrs / week			Examination Scheme					Total Marks	Credits	
		Lecture	Tut	Pract	In Sem	End Sem	TW	PR	OR		Theory	TW/ Pr/OR
402041	Hydraulics and Pneumatics	3	-	2	30	70	25	-	25	150	3	1
402042	CAD CAM Automation	3	-	2	30	70	25	50	-	175	3	1
402043	Dynamics of Machinery	4	-	2	30	70	25	-	25	150	4	1
402044	Elective-I	3	-	2	30	70	25	-	-	125	3	1
402045	Elective-II	3	-	-	30	70	-	-	-	100	3	-
402046	Project-I	-	-	4	-	-	25	-	25	50	-	2
Total		16	-	12	150	350	125	50	75	750	16	6
											22	

B. E. (Mechanical) (2015 Course) Semester – II

Code	Subject	Teaching Scheme Hrs / week			Examination Scheme					Total Marks	Credits	
		Lecture	Tut	Pract	In Sem	End Sem	TW	PR	OR		Theory	TW/ Pr/OR
402047	Energy Engineering	3	-	2	30	70	25	-	25	150	3	1
402048	Mechanical System Design	4	-	2	30 (1.5 Hrs)	70 (3 Hrs)	25	-	50	175	4	1
402049	Elective-III	3	-	2	30	70	25	-	-	125	3	1
402050	Elective-IV	3	-	-	30	70	-	-	-	100	3	-
402051	Project-II	-	-	12	-	-	100	-	100	200	-	6
Total		13	-	18	120	280	175	-	175	750	13	9
											22	

Elective – I		Elective – II	
Code	Subject	Code	Subject
402044 A	Finite Element Analysis	402045 A	Automobile Engineering
402044 B	Computational Fluid Dynamics	402045 B	Operation Research
402044 C	Heating Ventilation and Air Conditioning	402045 C	Energy Audit and Management
		402045 D	Open Elective**

Elective – III		Elective – IV	
402049 A	Tribology	402050 A	Advanced Manufacturing Processes
402049 B	Industrial Engineering	402050 B	Solar & Wind Energy
402049 C	Robotics	402050 C	Product Design and Development
		402050 D	Open Elective**

Savitribai Phule Pune University
Faculty of Science & Technology

Curriculum

For

First Year
Bachelor of Engineering
(Choice Based Credit System)

(2019 Course)

(With Effect from Academic Year 2019-20)

TABLE -1 First Engineering _Structure for Semester-I

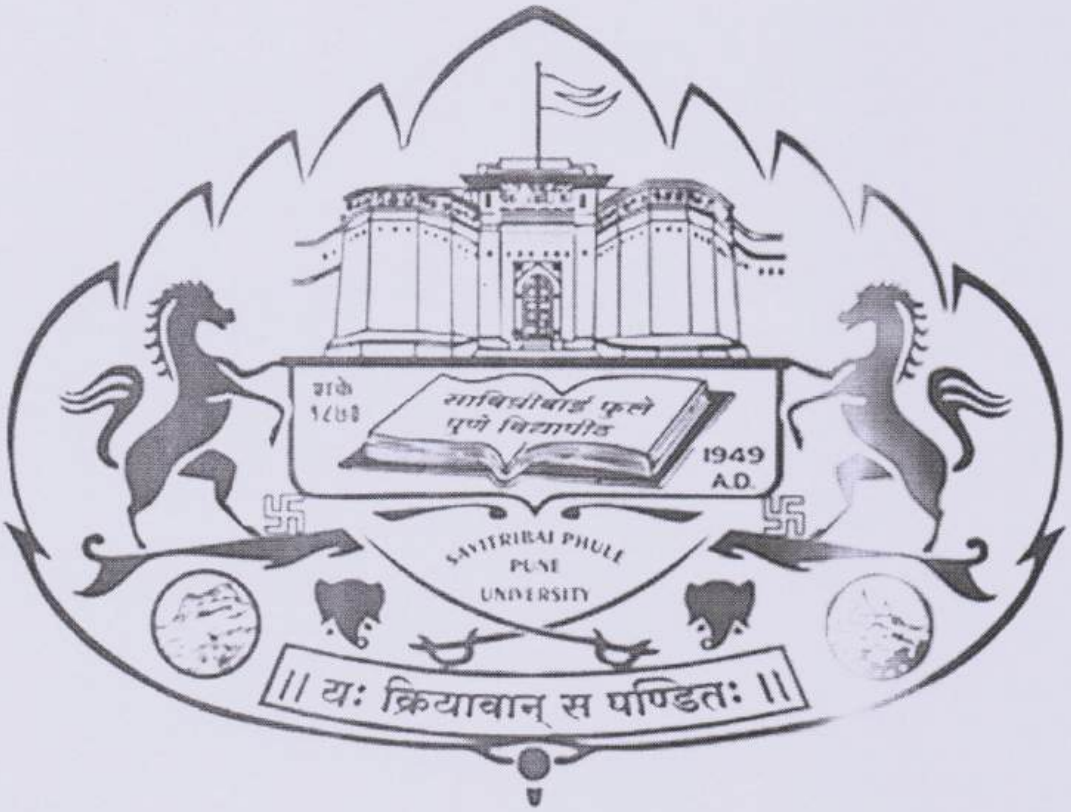
Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107001	Engineering Mathematics-I	03	--	01	30	70	25	--	--	125	03	--	01	04
107002/ 107009	Engineering Physics / Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
102003	Systems in Mechanical Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
111006	Workshop[α]	--	02	--	--	--	--	25	--	25	--	01	--	01
	Total	16	10	01	150	350	25	125	--	650	16	05	01	22
101007	Audit Course 1[&]	02	Environmental Studies-I											

Induction Program : 2 weeks at the beginning of semester-I and 1 week at the beginning of semester-II

TABLE -2 First Engineering_ Structure for Semester-II

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107008	Engineering Mathematics-II	04	--	01	30	70	25	--	--	125	04	--	01	05
107002/ 107009	Engineering Physics/ Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
102012	Engineering Graphics [Ω]	01	02	01	--	50	25		--	75	01	01		02
110013	Project Based Learning[§]	--	04	--	--	--	25	50	--	75	--	02	--	02
	Total	15	12	02	120	330	75	125	--	650	15	05	02	22
101014	Audit Course 2[&]	02	Environmental Studies-II											
107015		--	Physical Education-Exercise and Field Activities											

Savitribai Phule Pune University
Faculty of Science & Technology



Curriculum/Syllabus
for
Second Year
Bachelor of Engineering
(Choice Based Credit System)
Mechanical Engineering and Automobile Engineering
(2019 Course)

Board of Studies - Automobile and Mechanical Engineering
(With Effect from Academic Year 202[illegible]-21)

Savitribai Phule Pune University

Board of Studies - Automobile and Mechanical Engineering

Undergraduate Program - Automobile Engineering & Mechanical Engineering (2019 pattern)

Course Code	Course Name	Teaching Scheme (Hours/ Week)			Examination Scheme and Marks						Credit			
		TH	PR	TUT	ISE	ESE	TW	PR	OR	TOTAL	TH	PR	TUT	TOTAL
Semester-III														
202041	Solid Mechanics	4	2	-	30	70	-	50	-	150	4	1	-	5
202042	Solid Modeling and Drafting	3	2	-	30	70	-	50	-	150	3	1	-	4
202043	Engineering Thermodynamics	3	2	-	30	70	-	-	25	125	3	1	-	4
202044	Engineering Materials and Metallurgy	3	2	-	30	70	25	-	-	125	3	1	-	4
203156	Electrical and Electronics Engineering	3	2	-	30	70	25	-	-	125	3	1	-	4
202045	Geometric Dimensioning and Tolerancing Lab	-	2	-	-	-	25	-	-	25	-	1	-	1
202046	Audit Course - III	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**16**	**12**	**-**	**150**	**350**	**75**	**100**	**25**	**700**	**16**	**6**	**-**	**22**
Semester-IV														
207002	Engineering Mathematics - III	3	-	1	30	70	25	-	-	125	3	-	1	4
202047	Kinematics of Machinery	3	2	-	30	70	-	-	25	125	3	1	-	4
202048	Applied Thermodynamics	3	2	-	30	70	-	-	25	125	3	1	-	4
202049	Fluid Mechanics	3	2	-	30	70	-	-	25	125	3	1	-	4
202050	Manufacturing Processes	3	-	-	30	70	-	-	-	100	3	-	-	3
202051	Machine Shop	-	2	-	-	-	50	-	-	50	-	1	-	1
202052	Project Based Learning - II	-	4	-	-	-	50	-	-	50	-	2		2
202053	Audit Course - IV	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**15**	**12**	**1**	**150**	**350**	**125**	**-**	**75**	**700**	**15**	**6**	**1**	**22**

Abbreviations: TH: Theory, **PR**: Practical, **TUT**: Tutorial, **ISE**: In-Semes Exam, **ESE**: End-Semester Exam,**TW**: Term Work, OR: Oral

Note: Interested students of SE (Automobile Engineering and Mechani neering) can opt for any one of the audit course from the list of audit courses prescribed by B tomobile and Mechanical Engineering)

Instructions

- Practical/Tutorial must be conducted in three batches per division only.
- Minimum number of required Experiments/Assignments in PR/ T shall be carried out as mentioned in the syllabi of respective subjects.
- Assessment of tutorial work has to be carried out as a term-w mination. Term-work Examination at second year of engineering course shall be internal us assessment only.
- Project based learning (PBL) requires continuous mentoring by faculty roughout the semester for successful completion of the tasks selected by the students p h. While assigning the teaching workload of 2 Hrs/week/batch needs to be considered faculty involved. The Batch needs to be divided into sub-groups of 5 to 6 students. Assi s / activities / models/ projects etc. under project based learning is carried throughout sem ster nd Credit for PBL has to be awarded on the basis of internal continuous assessment luation at the end of semester.
- Audit course is mandatory but non-credit course. Examination has onducted at the end of Semesters for award of grade at institute level. Grade awarded it course shall not be calculated for grade point & CGPA.

Savitribai Phule Pune University
Faculty of Science & Technology

Curriculum/Syllabus

For

Third Year

Bachelor of Engineering

(Choice Based Credit System)

Mechanical Engineering

(2019 Course)

Board of Studies – Mechanical and Automobile Engineering

(With Effect from Academic Year 2021-22)

Savitribai Phule Pune University

Board of Studies - Automobile and Mechanical En

Undergraduate Program - Mechanical Engineering (

Course Code	Course Name	Teaching Scheme (Hrs./week)			Examination Scheme and Marks					Credit			
		TH	PR	TUT	ESE			OR	Total	TH	PR	TUT	Total
Semester-V													
302041	Numerical & Statistical Methods	3	-	1	30			-	125	3	-	1	4
302042	Heat & Mass Transfer	3	2	-	30			-	150	3	1	-	4
302043	Design of Machine Elements	3	2	-	30	7		5	125	3	1	-	4
302044	Mechatronics	3	2	-	30	7		5	125	3	1	-	4
302045	Elective I	3	-	-	0	7		-	100	3	-	-	3
302046	Digital Manufacturing Laboratory	-	2	-	-			-	50	-	1	-	1
302047	Skill Development	-	2	-	-	-	25	-	25	-	1	-	1
302048	Audit course - V[$]	-	-	-	-			-	-	-	-	-	-
	Total	15	10	1	150			50	700	**15**	**5**	**1**	**21**
Semester-VI													
302049	Artificial Intelligence &Machine Learning	3	2	-	30	7		5	125	3	1	-	4
302050	Computer Aided Engineering	3	2	-	0	5		-	150	3	1	-	4
302051	Design of Transmission Systems	3	2	-	0	7		5	125	3	1	-	4
302052	Elective II	3	-	-				-	100	3	-	-	3
302053	Measurement Laboratory	-	2	-				-	50	-	1	-	1
302054	Fluid Power &Control Laboratory	-	2	-				-	50	-	1	-	1
302055	Internship/Mini project *	-	4	-	-			-	100	-	4	-	4
302056	Audit course - VI[$]	-	-	-	-			-	-	-	-	-	-
	Total	12	14	-	0			0	700	**12**	**9**	**-**	**21**

Elective-I			-II
302045-A	Advanced Forming & Joining Processes	3020	Materials
302045-B	Machining Science & Technology	3020	gineering

Abbreviations: **TH**: Theory, **PR**: Practical, **TUT**: Tutorial, Exam, **ESE**: End-Semester Exam, **TW**: Term Work, **OR**: Oral

Note: Interested students of TE (Automobile Engineering and Mechanical Engineering) can opt for any one of the audit course from the list of audit cou (Automobile and Mechanical Engineering)

Instructions:

- Practical/Tutorial must be conducted in FOUR batches per
- Minimum number of Experiments/Assignments in PR Tutorial sha out as **mentioned in the syllabi** of respective courses.
- Assessment of tutorial work has to be carried out simil de exam marks for Tutorial and Term-work shall be awarded on the basis
- [$]Audit course is mandatory but non-credit course. Exami ducted at the end of Semesters for award of grade at institute level. Gr course shall not be calculated for grade point & CGPA.

Savitribai Phule Pune University
Faculty of Science & Technology

Curriculum/Syllabus
For
Fourth Year
Bachelor of Engineering
(Choice Based Credit System)
Mechanical Engineering
(2019 Course)
Board of Studies – Mechanical and Automobile Engineering
(With Effect from Academic Year [illegible])

Savitribai Phule Pune University

Board of Studies - Mechanical and Automobile Engineering

Undergraduate Program – Final Year Mechanical Engineering (2019 Course)

Course Code	Course Name	Teaching Scheme (Hrs./week)			Examination Scheme and Marks				Credit			
		TH	TUT	PR	ESE	PA	TW	OR	TH	PR	TUT	TOTAL
	Semester-VII											
402041	Heating Ventilation Air-Conditioning and Refrigeration	3	-	-	70	30	-	-	3	1		4
402042	Dynamics of Machinery	3	-	-	70	30	-	-	3	1		4
402043	Turbomachinery	2	-	-	70	30	-	-	2	1	-	3
402044	Elective – III	3	-	-	70	30	-	-	3	-	-	3
402045	Elective - IV	3	-	-	70	30	-	-	3	-	-	3
402046	Data Analytics Laboratory	-	-	2	-	-	50	-	-	1	-	1
402047	Project (Stage - I)	-	-	4	-	-	50	-	-	2	-	2
	Total	14	-	6	350	150	100	-	14	6	-	20
	Semester-VIII											
402048	Computer Integrated Manufacturing	3	-	-	70	30	-	-	3	1	-	4
402049	Energy Engineering	3	-	-	70	30	-	-	3	1	-	4
402050	Elective - V	3	-	-	70	30	-	-	3	-	-	3
402051	Elective - VI	3	-	-	70	30	-	-	3	-	-	3
402052	Mechanical Systems Analysis Laboratory	-	-	2	-	-	50	50	-	1	-	1
402053	Project (Stage - II)	-	-	10	-	-	100	-	-	5	-	5
		12	-	12	280	120	150	50	12	8	-	20
	Elective-III											
402044A	Automobile Design											
402044B	Design of Heat Transfer Equipments											
402044C	Modern Machining Processes	402										
402044D	Industrial Engineering	4020										Management
402044E	Internet of Things	40205										
402044F	Computational Fluid Dynamics	40										
	Elective-IV											
402045A	Product Design and Development											
402045B	Experimental Methods in Thermal Engineering											
402045C	Additive Manufacturing	40										
402045D	Operations Research	402										nal Behavior
402045E	Augmented Reality and Virtual Reality	4020										

Abbreviations: **TH**: Theory, **PR**: Practical, **TUT**: Tutorial, **ESE**: End-Semester Exam, **TW**: Term Work, **OR**: Oral

- Student can select any elective subjects from the group. However, it is advised to select the subjects from within a group ide

Instructions:

- Practical/Tutorial must be conducted in **FOUR** batches
- Minimum number of Experiments/Assignments in [illegible] **mentioned in the syllabi** of respective courses.
- Assessment of tutorial work has to be carried out [illegible] marks for Tutorial and Term-work shall be awarded on the

TABLE -1 First Engineering _Structure for Semester-I

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107001	Engineering Mathematics-I	03	--	01	30	70	25	--	--	125	03	--	01	04
107002/ 107009	Engineering Physics / Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
102003	Systems in Mechanical Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
111006	Workshop[@]	--	02	--	--	--	--	25	--	25	--	01	--	01
	Total	16	10	01	150	350	25	125	--	650	16	05	01	22
101007	Audit Course 1[&]	02	Environmental Studies-I											

Induction Program : 2 weeks at the beginning of semester-I and 1 week at the beginning of semester-II

TABLE -2 First Engineering_ Structure for Semester-II

Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks						Credits			
		Theory	Practical	Tutorial	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
107008	Engineering Mathematics-II	04	--	01	30	70	25	--	--	125	04	--	01	05
107002/ 107009	Engineering Physics/ Engineering Chemistry	04	02	--	30	70	--	25	--	125	04	01	--	05
103004 / 104010	Basic Electrical Engineering / Basic Electronics Engineering	03	02	--	30	70	--	25	--	125	03	01	--	04
110005/ 101011	Programming and Problem Solving / Engineering Mechanics	03	02	--	30	70	--	25	--	125	03	01	--	04
102012	Engineering Graphics [Ω]	01	02	01	--	50	25		--	75	01	01		02
110013	Project Based Learning[§]	--	04	--	--	--	25	50	--	75	--	02	--	02
	Total	15	12	02	120	330	75	125	--	650	15	05	02	22
101014	Audit Course 2[&]	02	Environmental Studies-II											
107015		--	Physical Education-Exercise and Field Activities											

सावित्रीबाई फुले पुणे विद्यापीठ

(पुर्वीचे पुणे विद्यापीठ)

परिपत्रक क्रं. ६० / २०२०

उत्तरपत्रिकेची छायांकितप्रत (स्कॅनप्रत) व पुनर्मूल्यांकनाचे शुल्कवाढीबाबत

मार्च/एप्रिल २०२० पासून आयोजित केल्या जाणाऱ्या परीक्षांकरीता विद्यार्थ्यांना उत्तरपत्रिकेची छायांकितप्रत (स्कॅनप्रत) प्राप्त करण्यासाठी व पुनर्मूल्यांकन करण्यासाठी सुधारीत शुल्कामध्ये बदल करण्यात आलेला आहे. त्यानुसार परिपत्रक क्र. ७१/२०१८, अध्यादेश १८४ (अ) व (ब) मध्ये सुधारणा खालीलप्रमाणे करण्यात आलेली आहे.

विद्यार्थ्यांना उत्तरपत्रिकेची छायांकित (स्कॅनप्रत) मिळण्यासाठी विद्यापीठ परिपत्रक क्रमांक ११८/२०१६ नुसार सध्या उत्तरपत्रिकेच्या स्कॅनप्रतीसाठी रु. १००/— (अव्यावसायिक अभ्यासक्रमांकरीता) व रु. १५०/— (व्यावसायिक अभ्यासक्रमांसाठी) शुल्क आकारण्यात येत होते. तसेच उत्तरपत्रिकेच्या पुनर्मूल्यांकनासाठी रु. १५०/— (अव्यावसायिक अभ्यासक्रमांकरीता) व रु. २००/— (व्यावसायिक अभ्यासक्रमांसाठी) शुल्क आकारण्यात येत होते.

अध्यादेश १८४ (अ) अंतर्गत उत्तरपत्रिकेची छायांकित/स्कॅनप्रत देण्यासाठी रु. १००/— च्या ऐवजी रु. १५०/— (अव्यावसायिक अभ्यासक्रमांसाठी) आणि रु. १५०/— च्या ऐवजी रु. २००/— (व्यावसायिक अभ्यासक्रमांसाठी) अशी वाढ करण्यात आली आहे.

त्याचप्रमाणे उत्तरपत्रिकेच्या पुनर्मूल्यांकनासाठी रु. १५०/— च्या ऐवजी रु. २००/— (अव्यावसायिक अभ्यासक्रमांसाठी) आणि रु. २००/— च्या ऐवजी रु. २५०/— (व्यायसायिक अभ्यासक्रमांसाठी) अशी वाढ करण्यात आली आहे.

अध्यादेश क्र. १८४ (अ) व (ब) अंतर्गत उत्तरपत्रिकेच्या छायांकितप्रतीसाठी (स्कॅनप्रतीसाठी) आणि पुनर्मूल्यांकनासाठी आकारण्यात येणाऱ्या शुल्कासाठी मा. परीक्षा व मूल्यमापन मंडळाने मांडलेला ठराव क्र. ४६/२०१९ अन्वये शुल्क वाढीस मार्च/एप्रिल, २०२० च्या परीक्षापासून लागू करण्यास मा. व्यवस्थापन परिषदेने मान्यता दिलेली आहे.

सर्व संबंधित संलग्न महाविद्यालयाचे प्राचार्य व मान्यताप्राप्त संस्थांचे संचालक यांना विनंती करण्यात येते की, सदर परिपत्रकानुसार अध्यादेश १८४ (अ) व (ब) मध्ये करण्यात आलेला बदल विद्यार्थ्यांच्या निदर्शनास आणून द्यावा.

गणेशखिंड,पुणे—४११००७
जा.क्रं. परीक्षा/पमूमं/२०
दिं. १८ /०२/२०२०

संचालक,
परीक्षा व मूल्यमापन मंडळ

Bharti Vidyapeeth College of engineering lavale Pune

Department of electronics and telecommunication engineering

T.E(2019 Patt) Cellular Network

Date:24.03.2022. **Time:1hr.**

Marks:30.

1. **Assume a receiver is located at 10km from a 50W transmitter. The career frequency is 6 gigahertz and the game is assumed to be unity. For free space propagation model find the power at the receiver in dbm.**
2. **For antenna that produces 50 Watt power at 900Mhz, for the given distance of 5m using free space propogation model find the path loss, power transmitted in dbm in dbW, power received at 5m distance and 10m distance.**
3. **The received power at a distance of 100 KM is 5 Nano watt for a communication link determine the receive our at a distance 200 km from the same link assume free space progression model.**
4. **For a transmitting antenna with an operating frequency of 100 gigahertz and maximum dimension of 10 m find the value of far field distance.**
5. **Express the output power of hundred watt of a transmitter in terms of dbm and dbW.**
6. **For a large City computer the median laws using hata model for a distance of 12 km and fc=5.1Ghz with hre=2m, hte=50m.**
7. **Explain multipath propogation and diversity**

OR

What is los and with the help of derivation explain the concept of free space propagation model.

Note: question 7 is compulsory attempt any five from 6 numericals.

BHARATI VIDYAPEETH's

COLLEGE OF ENGINEERING, LAVALE, PUNE - 412 115

Class : TE Lecture No. :

Date : 24/3/22 Week :

Subject : CN- Test. Name of the Faculty Member : Prof. A.S. Pathak.

STUDENTS ATTENDANCE SHEET

Lecture No.	Marks	Attendance			Roll No.	Signature	Signature	Signature	Signature
Date	24/3	24/3			40				
Time	9.30				41				
Roll No.	Signature	Signature	Signature	Signature	42				
1	~~AB~~	~~AB~~			43				
2	~~AB~~	~~AB~~			44				
3	~~AB~~	~~AB~~			45				
4	~~AB~~	~~AB~~			46				
5	15	P			47				
6	~~AB~~	~~AB~~			48				
7	12	P			49				
8	19	P			50				
9	5	P			51				
10	~~AB~~	~~AB~~			52				
11	14	P			53				
12	5	P			54				
13	18	P			55				
14	~~AB~~	~~AB~~			56				
15	~~AB~~	~~AB~~			57				
16	14	P			58				
17	19	P			59				
18	10	P			60				
19	18	P	Min:	12	61				
20	2	P	Max:	30/30	62				
21	~~AB~~	~~AB~~			63				
22	~~AB~~	~~AB~~			64				
23			Present	12	65				
24			Absent	10	66				
25			Pass:	8	67				
26			Fail:	4	68				
27					69				
28					70				
29					71				
30					72				
31					73				
32					74				
33					75				
34					76				
35					77				
36					78				
37					79				
38					80				
39					Sign				

Apathak
Subject-Teacher.

H.O.D. Signature

18/30

Bharati Vidyapeeth's
GROUP OF INSTITUTE'S, TECHNICAL CAMPUS,
COLLEGE OF ENGINEERING
Lavale, Tal. : Mulshi, Dist. Pune- 412 115.

Name of the Student Ujjwal Ramavatar Sharma

Class : TE Roll No. : 19 Div. : B

Subject : CN Test : 1

Day : Date: 24-03-22 Subject Teacher : Pathak Mam.

Name and Sign. of the Jr. Supervisor

Q. No.	1	2	3	4	5	6	7	8	Total	Signature
Marks Obtained	4	4	5	0	5	0	—		18/30	

Q.1 Assume a receiver is located at 10 km from a 50 W transmitter. The carrier freq. is 6 GHz and the gain is assume to be unity for free space propagation model, find the power at receiver in dBm.

Q.2 For antenna that produces 50W power at 900 MHz, for the given dist. of 5m. using free space propagation model, find the path loss, Power transmitted in dBm and in dBW, Power received at 5m and 10m in dist.

Q.3 Express the output power of 100 W of a transmitter in terms of dBm and dBW

Q.4 Explain multipath propagation and diversity

or

What is LOS. and with the help of derivation explain the Concept of free space propagation model.

Q. 5 ~~The received power at a dist. of 100 km is 5nW for a communication link. Determine~~

Q. 5 For a transmitting antenna with an operating freq. of 100 GHz. and max. dimension of 10 m. Find the value of far field dist.

Q 6 For a large city computer the median loss using Hata Model for a dist. of ~~to~~ 12 km and $f_c = 5.1$ GHz with $h_{re} = 2m$ and $h_{te} = 50m$.

Q.1 Given – $d = 10\ km = 10 \times 10^3\ m$.

$P_t = 50\ W$

$f_c = 6\ GHz = 6 \times 10^9\ Hz$.

$G_t = G_r = 1$, $P_r(dBm) = ?$

Now,

$$P_r = P_t \left[\frac{G_t G_r \lambda^2}{(4\pi)^2 d^2} \right] = P_t \left[\frac{\lambda^2}{(4\pi)^2 d^2} \right]$$

$$\left(\lambda = \frac{c}{f} = \frac{3 \times 10^8}{6 \times 10^9} = 0.05 m \right)$$

$$\therefore P_r = 50 \left[\frac{(0.05)^2}{(4\pi)^2 (10 \times 10^3)^2} \right]$$

$$= 7.9157 \times 10^{-12}\ watt.$$

$$\therefore P_r(dB) = 10 \log (7.9157 \times 10^{-12})$$

$$\boxed{P_r(dB) = -111.01\ dB}$$

Now,

$$P_r(dBm) = 10 \log \left(\frac{P_r(dB)}{10^{-3}} \right) \quad / \quad = 10 \log \left(\frac{P_r(W)}{10^{-3}} \right)$$

$$= -50.45\ dBm \quad / \quad 87.015\ dB$$

$$\therefore \boxed{P_r(dBm) = -50.45\ dB}$$

Q.2 Given – $P_t = 50\ W$

$f_c = 900\ MHz = 9 \times 10^8\ Hz$.

$d = 15\ m$

To find – P_L, $P_r(dBm)$ & $P_r(dBW)$

$$\therefore P_r = P_t \left(\frac{G_t G_r \lambda^2}{(4\pi)^2 d^2} \right)$$

$$= \left(\lambda = \frac{c}{f_c} = \frac{3 \times 10^8}{9 \times 10^8} = 0.33 \right)$$

for $d = 5m$.

$$P_r = 50 \left[\frac{(0.33)^2}{(4\pi)^2 (5)^2} \right]$$

$$\therefore = 50 \left[2.75 \times 10^{-5} \right] = 1.38 \times 10^{-3} W / 1.3 \text{ sec mW}$$

$$P_r(dB) = 10 \log (1.38 \times 10^{-3})$$

$$\therefore \boxed{P_r(dB) = -28.60 \text{ dB}}$$

for $d = 10 m$.

3

$$P_r = 50 \left[\frac{(0.33)^2}{(4\pi)^2 (10)^2} \right]$$

$$= 3.45 \times 10^{-4}$$

$$\therefore \boxed{P_r(dB) = -34.62 \text{ dB}}$$

Now,

$$P_L(dB) = -10 \log \left[\frac{1^2}{(4\pi)^2 d^2} \right]$$

$$= -10 \log \left[\frac{(0.33)^2}{(4\pi)^2 (5)^2} \right]$$

$$\boxed{P_L(dB = 45.60 \text{ dB}}$$

So,

$$P_t(dBm) = 10 \log \left(\frac{50}{10^{-3}} \right)$$

$$\boxed{P_t(dBm) = 46.989 \text{ dBm}}$$

And,

$$P_t(dBW) = 10 \log \left[\frac{50}{1} \right]$$

$$\boxed{P_t(dBW) = 16.989 \text{ dBW}}$$

Q.5 Given →

$f = 100\ GHz = 100 \times 10^9\ Hz.$

$D = 10\ m.$

$d_f = ?$

Now,

$$\lambda = \frac{c}{f} = \frac{3 \times 10^8}{10^{11}} = 3 \times 10^{-3}$$

∴ far field dist. is —

$$d_f = \frac{2D^2}{\lambda} = \frac{2 \times (10)^2}{3 \times 10^{-3}}$$

$$= 0.66 \times 10^5$$

$$\therefore \boxed{d_f = 6.6 \times 10^4}$$

Q.3

Given —

$P_t = 100\ W.$

$$\therefore P_t(dBm) = 10 \log\left(\frac{P_t}{10^{-3}}\right)$$

$$= 50\ dB$$

$$P_t(dBW) = 10 \log\left(\frac{P_t}{1W}\right)$$

$$P_t(dBW) = 20\ dB$$

Q.

Given - $P_r = 5nW$

$d_1 = 100\ km$

$d_2 = 200\ km$

To find :- P_t

Solutions →

$$P_t = \frac{(5nW)(4\pi)^2 (100 \times 10^3)^2}{(0.33)^2}$$

$$= 7.98 \times 10^3$$

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COLLEGE OF ENGINEERING, LAVALE, PUNE - 412 115

Class : S.E. Lecture No. :

Date : 28/3/23 Week :

Subject : DSA Name of the Faculty Member : M.A.Patil

STUDENTS ATTENDANCE SHEET

Lecture No.	28/3/23	18/4/23			Roll No.	Signature	Signature	Signature	Signature
Date	Test	Test			40				
Time	1	1			41	AB	Absent		
Roll No.	Signature	Signature	Signature	Signature	42				
1					43	AB	Absent		
2					44				
3					45				
4					46	AB	Absent		
5	AB				47	AB	Absent		
6					48				
7					49	AB	Absent		
8					50				
9					51				
10					52				
11					53	AB	Absent		
12					54				
13	AB	AB			55	AB			
14	AB				56	AB	Absent		
15	AB	AB			57	AB	Absent		
16					58	AB	Absent		
17					59				
18					60				
19					61				
20	Abs				62				
21					63	AB	Absent		
22					64				
23					65	AB			
24					66	AB	AB		
25					67				
26					68				
27					69				
28	AB	Absent			70				
29					71	AB	AB		
30					72				
31					73	AB	AB		
32	AB	AB			74				
33	AB	AB			75				
34					76				
35	AB	AB			77				
36					78				
37					79				
38	AB	AB			80				
39	AB	Absent			Sign				

H.O.D. Signature

Dept. of Computer Engineering
Bharati Vidyapeeth's
College of Engineering,

Bharati Vidyapeeth's

COLLEGE OF ENGINEERING

Lavale, Tal. : Mulshi. Dist. Pune- 412 115.

Name of the Student Devansh Asati

Class : S.E comp Roll No. : 45 Div. :

Subject : DSA Test : Test-1

Day : Tuesday Date: 28/3/23 Subject Teacher :

Name and Sign. of the Jr. Supervisor M.A. Patil

Q. No.	1	2	3	4	5	6	7	8	Total	Signature
Marks Obtained	4	5	3	2					14	31/3/23

Q.1) What is collision? explain any one collision handling technique.

Q.2) Write C++ pseudo code to insert element in a BST?

Q.3) explain midsquare hash function method with example.

Q.4) find inorder create BST for given no. 30, 45, 10, 5, 8, 65, 75, 80.

Q.1 ⇒ Collision occur when two or more entities acquire same location in a hash table or resources simultaneously. These can lead to data corruption system crashes or degraded performance.

Suppose we have a hash table, for ex -

keys	index
2	0
21	1
22	2
23	3

Here, 11 & 21 are acquiring same location, therefore collision is occur.

Here we can handle collision by using two technique:

1) chaining
2) open addressing

1) chaining :- In this technique a hash table store a linked list of element at the location where two or more than two element is acquiring same location. It has infinite space & element can be added.

2) Open addressing :- In this technique, when collision occur we check for the another empty slot next to that slot where collision occur & transfer that element to the next slot. This open addressing can be achieved by linear probing, quadratic probing etc. It has limited space & many element can't be added to it.

2.⇒

```
# include <iostream>
using namespace std;

struct Node{
 int data
  Node * left
  Node * right
};

Node * createNode (int value) {
 Node* new node = new
 node ();
  new Node -> data = value ;
  new Node -> left = Null
  new Node -> right = Null
  return new Node ;
 }

Node * insert (Node * root, int value) {
   if (root = = NULL) {
      root = = create Node (value);
   } ;
  else if (value <= root -> data) {
       root -> left = insert (root -> left, values);
 else {
       root -> right = insert (root -> right value);
  }
  return root ;
 };
```

Q.3 => The mid-square method is a hashing technique used to transform a key into an index value for a hash table. It works by squaring the key, then taking the middle digits of the resulting value as the index.

Mid square method can be work in these ways:-

1) Start with a key value.
2) Square the key value to get a larger number
3) Extract a set of digits from the middle of the squared value.
4) use the extracted digits as the index for the hash table.

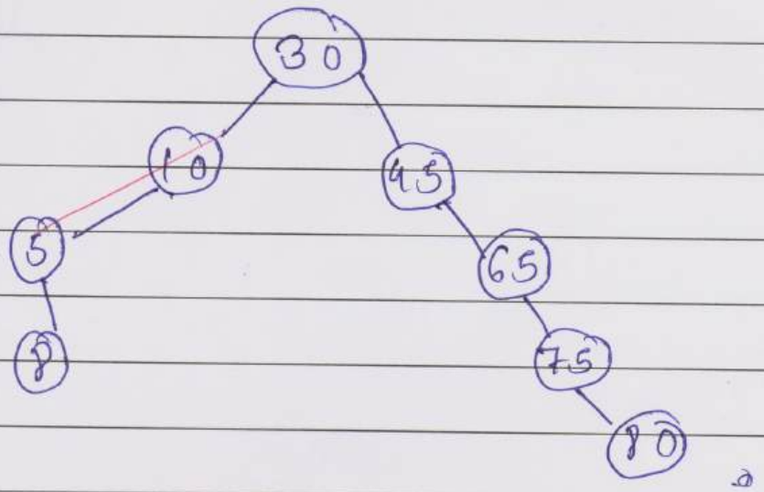
Let's take an example, Suppose we have a key value of 456, So we can use the mid-square method to transform this key into index for a hash table.

key value = 456
on squaring = 207936
extract the middle two digit (39) : 207936
So, the key value of 456 has been transformed into the a index value 39 using the mid square method.

Mid square method is the method which

can lead to confusion.

Q.4) BST for given no- 30, 45, 10, 5, 8, 65, 75, 80



Here, the root element is 30.

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College of Engineering,

Marks = 18/20

MCQ Test

Class: S. E.

Department :Computer Engineering

Student Name: Vedant kulkarni

RoLL. No. 26

Sr No	Question	Option A	Option B	Option C	Option D	Correct Answer
1	If the characters 'D', 'C', 'B', 'A' are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?	ABCD	ABDC	DCAB	DCBA	D ✓

2	Are there any dynamic memory management errors in the following code?
	int *p = new int;
	int *q = new int;
	int *r;
	*p = 17;
	r = q;
	*q = 42;
	p = q;
	delete r;
		No, there are no errors	Yes, a memory leak	Yes, misuse of a dangling pointer	Yes, both a memory leak and misuse of a dangling pointer	B ✓

3	A circular array queue with space for 10 elements in which front =6 and rear=9, insertion of next element will take place at position:	0	7	5	can not take place due to overflow	A
4	In a circular queue with 10 elements, if front is at 9 and rear at 4, the deletion of an element will make front point to which position:	0	-1	3	5	B ✗

5	following code denotes.....operation
	int something()
	{
	int item;
	item=Q.que[Q .front];
	Q .front++;
	cout<< item;
	return Q .front;
	}
		insertion in queue	deletion from queue	pushing onto the stacking	popping off stack	B ✓

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6	consider the following code,
	Q. front=-1; Q. rear=-1;
	insertq(3); insertq(5);
	insertq(9);
	cout<< deletq();//d1
	insertq(12); insertq(40);
	cout<<deletq();//d2
	cout<<deletq();//d3
	insertq(11); insertq(10);
	after the code above executes, how many elements would remain in q?
		0	2	3	4	D

7	consider the following code,
	Q. front=-1; Q. rear=-1;
	insertq(3); insertq(5);
	insertq(9);
	cout<< deletq();//d1
	insertq(12); insertq(40);
	cout<<deletq();//d2
	cout<<deletq();//d3
	insertq(11); insertq(10);
	what will be the value returned by the last cout(d3 comment) statement?
		3	5	9	40	C

8	consider the following code,
	Q. front=-1; Q. rear=-1;
	insertq(3); insertq(5);
	insertq(9);
	cout<< deletq();//d1
	insertq(12); insertq(40);
	cout<<deletq();//d2
	cout<<deletq();//d3
	insertq(11); insertq(10);
	if replace all cout statement by insert(deletq())then queue will contain elements in following order...
		3, 5, 9, 12, 40, 11, 10	3, 12 , 40 , 5 ,9 ,11 ,10	3, 5, 12, 40, 9, 11, 10	none of these	B

9	suppose we have circular queue with 8 items in the queue stored at data[2] through data [9]. The size is 10, where does the add member function place the new entry in the array?	data[0]	data[1]	data[10]	none of these	A

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10	consider a deque _,_,_,10,20,30,40,_,_,_. The front=3,rear=6,there are some operations that that are performed on this deque. These operations are 9 added at front,50 is added at rear,60 is added at rear, then 2elements are deleted from front. finally 70 is added at rear choose the correct option	front=3, rear=7	front=4, rear=7	front=4, rear=8	front=4, rear=9	D ✓
11	consider the following circular queue : - - A D - -, front =2, rear =3. describe the queue after insertion of E,F,G and deletion of two elements.	G - - - E F	E F G - - -	E F - - G -	None of these	A ✓
12	consider circular queue of characters & is of size 6. "-" denotes an empty queue location.What are the contents of queue after performing all following operations. i)F is added ii) two letters deleted iii)K, L, M added Initial condition: F=2, R=4, Queue= - , A , C, D, -, -	L , M, -, D, F, K	K, L, M, D, F, -	L, M, -, - ,F, K	None of these	B ✓
13	circular queue of characters & is of size 5. "-" denotes an empty queue location. What are the contents of queue after performing all following operations i) R is added ii) two lettres deleted iii) S is added Initial condition: F=2, R=4, Queue= - , A , C, D, -	Empty	S, -, -, D,R	S, -, -,-,R	None of these	A ✗
14	consider circular queue of characters & is of size 6. "-" denotes an empty queue location.What are the contents of queue after performing all following operations i) two letters deleted ii)K, L, M added iii) two letters deleted . Initial condition: F=2, R=4, Queue= - , A , C, D, - , -	M, -, -, -, -, L	L, M, -, -, - , -	K, L, M, D, -, -	None of these	A ✓

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15	consider circular queue of characters & is of size 6. "-" denotes an empty queue location. What are the contents of queue after performing all following operations i) two letters deleted ii)K, L, M added iii) two letters deleted. Initial condition: F=3, R=4, Queue= - , - , C, D, -, -	L, -, -, -, -, M	K, L, M, -, -, -	-, -, M, -,-, -	Empty	C
16	consider circular queue of characters & is of size 5. "-" denotes an empty queue location. What are the contents of queue after performing all following operationsi)K, L, M added ii) two letters deleted iii) R is added. Initial condition: F=2, R=4, Queue= - , A , C, D, -	L, R, C, D, R	L, -, -, D,K	L, R, -, D, K	None of these	C
17	Consider the following circular double ended queue of characters of size 6. F=1, R= 3, Initial condition: - , A, C, D, - , - . Show the position of Front & Rear after following operations: i) F is added at rear end ii) Two letters deleted from rear end iii) K, L, M added to front end.	F= 3, R= 1	F= 4 , R= 2	F= 1, R= 4	none of these	B
	Consider the following circular double ended queue of characters of size 6. F=4, R= 2, Initial condition: K, A, C, - , M , L Show the position of Front & Rear after following operations: i) One letter deleted from front end ii) R is added at front end	F= 3, R= 1	F= 4 , R= 2	F= 1, R= 4	none of these	B
19	Consider the following circular double ended queue of characters of size 6. F=4, R= 2, Initial condition: K, A, C, - , R , L. Show the dequeue content after following operations: i) S is added at rear end ii) T is added at rear end	Overflow	Underflow	F= 1, R= 4	none of these	A

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20	Consider the following circular double ended queue of characters of size 6. F=1, R= 3, Initial condition: - , 5, 9, 6, - , - . Show the position of Front & Rear after following operations: i) added 2 at rear end ii) one letter deleted from front end	F= 3, R= 1	F= 2 , R= 4	F= 1, R= 4	none of these	B

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COLLEGE OF ENGINEERING, LAVALE, PUNE - 412 115

Class : S.E. Lecture No. :

Date : 31/3/23 Week :

Subject : DSA Test Evaluation Name of the Faculty Member : M.A. Patil

STUDENTS ATTENDANCE SHEET

Lecture No.					Roll No.	Signature	Signature	Signature	Signature
Date					40	10	11		
Time	Test 1	Test 2			41	AB	AB		
Roll No.	Signature	Signature	Signature	Signature	42	9	13		
1	10	14			43	AB	AB		
2	9	13			44	13	15		
3	8	12			45	14	9		
4	9	16			46	AB	AB		
5	AB	15			47	AB	AB		
6	11	12			48	13	11		
7	13	11			49	AB	AB		
8	8	10			50	14	12		
9	13	12			51	14	14		
10	12	13			52	13	10		
11	7	16			53	AB	AB		
12	10	17			54	12	8		
13	AB	AB			55	AB	12		
14	AB	13			56	AB	AB		
15	AB	AB			57	AB	AB		
16	13	13			58	AB	AB		
17	12	12			59	07	13		
18	16	13			60	12	15		
19	8	19			61	11	11		
20	AB	AB			62	09	8		
21	4	11			63	15	AB		
22	13	14			64	14			
23	9	12			65	AB	15		
24	14	13			66	AB	AB		
25	13	13			67	13	11		
26	12	18			68	12	07		
27	12	14			69	12	18		
28	AB	AB			70	10	11		
29	15	13			71	AB	AB		
30	13	15			72	11	14		
31	10	16			73	AB	AB		
32	AB	AB			74	13	15		
33	AB	AB			75	AB	AB		
34	10	16			76				
35	AB	AB			77				
36	11	17			78				
37	11	11			79				
38	AB	AB			80				
39	AB	AB			Sign				

H.O.D. Signature

Dept. of Computer Engineering
Bharati Vidyapeeth's

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College of Engineering, Lavale

Tal.- Mulshi, Dist.- Pune 412115.

CERTIFICATE

This is to certify that,

Miss/~~Mrs~~. Tejaswi baburao Chavan

Class BE (Civil) *Roll No.* 26 *has completed all the Practical Work, Team Work satisfactorily in the Subject of* QSCT *in the Department of* Civil Engineering *as prescribed by the Savitribai Phule Pune University in the academic year* 2021-22

11/5/2022
Date

Teacher

H.O.D. / In-Charge of the Department

H.O.D
Civil Engineering
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College of Engineering, Lavale, Pune.

Department of civil Engineering.

Vision

Vision-To be an excellence Centre in Civil Engineering education through teaching-learning, research, and consultancy

Mission-

To provide Civil Engineering graduates for professional career and higher studies through excellent teaching-learning environment.

To provide a community to civil Engineering graduates through knowledge and expertise.

Goals

To Bridging the gap between Academa and Industry by arranging industrial visits. To help the students to inculcate the leadership qualities, team building, Enable them to interpret and analyze data and to make them learn the software's like AutoCAD, Stadd.pro, Primavera.

Bharati Vidyapeeth's College of Engineering Lavale.

Department of Civil Engineering

Course Outcomes: Subject -Quantity Surveying Contracts and Tenders

CO	Statement
CO-01	Students will be able to identify the meaning of important terms in estimating and importance of approximate
CO-02	Students will be able to take out quantities of various items of works from drawings, make abstract of the same.
CO-03	Students will be able to draft suitable specifications to meet expectations of client and prepare a rate analysis of various items of works.
CO-04	Students will be able to choose suitable method of valuation of property and assess the value of a property
CO-05	Students will be able to execute works in PWD & prepare documents required for a tender
CO-06	Students will be able to identify various facts of contract including its meaning, validity, the conditions of contract, measures to solve disputes law of contract etc.

Program Outcomes (PO):

PO	Statement
PO-01	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engg. specialization to the solution of complex engineering problems.
PO-02	**Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
PO-03	**Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO-04	**Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO-05	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO-06	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO-07	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO-08	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO-09	**Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
PO-10	**Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.
PO-11	**Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments
PO-12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO):

PSO	Statement
PSO-01	Analyze and Design of civil Engineering structures
PSO-02	Should be able to clearly understand the concepts and applications in the field of survey.
PSO-03	Should have the capability to comprehend the use of modern design tools to analyze and design the structures

Program Education Objectives (PEO):

PSO	Statement
PSO-01	Use Technical, Teamwork, Communication skills along with leadership principals to pursue civil Engineering Courses.
PSO-02	Our Engineering Graduates will be able to apply new knowledge as needed using appropriate learning strategy in civil Engineering
PSO-03	To serve community by providing Employment through Entrepreneurship
PSO-04	Ethical and Professional responsibilities in Engineering situations with social, Environment, Safety and Economic factors

BHARATI VIDYAPEETH'S

COLLEGE OF ENGINEERING, LAVALE

TAL.- MULSHI, DIST.- PUNE 412115.

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2]	Centreline method (long wall short wall method)	12~~4~~-26-~~22~~	13/4/22	C	
				C	
3]	RCC frame building	26-36	13/4/22	C	
4]	Bar Bending Schedule.	37-45	13/4/22	C	
5]	Rate Analysis.	46-64	20/4/22	C	
6]	Valuation of building	65-69	20/4/22	C	
7]	Estimation of watertank	70-75	21/4/22	C	
8]	Tender Notice	76-80	21/4/22	C	
				C	

Name = Tejaswi Baburao Chavan.
Roll No = 26
Sub = QSCT
Assignment = D.S.R & Specification.

Page No.
Date

- Dristrict Schedule rate (DSR)

→ -To facilitate the preparation of estimate and also to serve as gudes in setting rates in connection which contract aggreement a schedule of rate for each kind of work is commanly executed
-This is prepared on the basis of rates prevailing in each locality including cost of transport & profit.
~~-This is prepared on the basis of rates~~
-All rates should be inclusive of labour materials & unless specifically mentioned otherwise should all chagnges like octroi, tall, local charge, income tax, sales tax as may have to be incurred by contractor for getting respective items of work executed to proper order & complete and finish
-In schedule of rates necessary analysis of rates for varying condition should be prouide
-A booklet containing rates of various engineering, item for the preparation of details estimate such as building, roads, bridges, canal etc called as schedule of rate
-A list of rates vary from place to place. maharashtra Gouverment. publish rate as per district. These rates are in the form of printed booklet & called as dristrict schedule rates.

(2)

Page No.
Date

- A list of rate of various items is prepared to facilitate preparation of estimates by Gouverment bodies like public works department.
- This booklet is revised every year because of changes in cast of labour, material every year.
- If rates of contractors differs much from DSR. rates, his tender may be rejected.
- It consist of group of items such as excavation items, concrete item, demolition item, plumbing items, electrification item etc.
- The descriptions of items & the unit of measurement are similar to those used in a normal BOQ, but no quantities are given.
- It is common for seperate rate to quated for labour plant & material.
- District schedule for seperate rate is booklet contains list of various item of civil engineering work.
- It is used to prepare estimate of various structure & to to be serve as guide to decide the rate of various item as per specification.

Page No.
Date

1) Excavation for foundation :-

- Site clearance :- Befor earthwork is started whole area is shall be cleared of grass, roots trees & all obstructions.

- lime out :- The centre line of proposed structure is marked on plot shown on drawing with correct dimensions of plan & excavation is started.

- Excavation :- It is carried out to exact dimension (L x B x H) as indicated drawing.

- Disposal :- The excavated material should be disposal off away from site and should not be nearer than 1.5 m from outer edge of excavation.
  Engineer-in-charge have responsibility to dispose off excavated material by damper or other means of transportation.

- Dewatering :- the excess quantity of water in the trenches should be removed by pumping or any other method. The tranches water replace with the ramming of the soil.

(A)

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Date

- Back fill :- After ending foundation concrete work, shoring should be removed and space between foundation and side of excavation shall be refilled to original ground level.

- Mode of measurement and ~~pt~~ payment :-
Measurement is done in term of cubic content of excavation. No payment should be made for excess work carried out by contractor. payment is depending on type of strata.

a) Plain cement concrete (PCC)

i) Material

- Cement :- Cement used should be ordinary portland cement conforming to IS 269-1958. The cement should measured on weight basis in whole bag, each bag weighing 50 kg. Which is equal to 35 litres in volume.

- Fine aggregate (sand) :-
Aggregate which passes through 4.75 mm IS sieve No-480 is called fine aggregate. Such aggregate shall be coarse, consisting of sharp, angular grains, Sea sand shall not be used.

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- Coarse aggregate :-
  It should be broken/crushed from hard stone obtained from approved quarry. It should be strong, hard, dense, clean & durable. It should clean from dirt & dust.

- Whater :
  Water used should be free from injurious quantities of deleterious material lik oil, acids, alkalis, salts

ii) Mix of Concrete :-
Two method are used ~~to~~ for mixing concrete a) Hand mixing b) Machine mixing which are used depending upon grade quantity & quality of concrete. For pcc work concrete of grade is 1:2:4 is used, for one bag of cement weighing 50 kg. the quantities sand, aggregate & water register for 1:2:4 concrete is 70 litre, 30 litre. respectively and water cement ratio is 0.60.

iii) laying of Concrete :-
The concrete is prepared is laid is position before 30 minutes of adding water to mix concrete shall not be dropped from a height more than 60 cm but laid gently in its position to avoid sagregation.

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iv) Compaction :-

Compaction is important to fulfill each & every corner of member. Hence concrete shall be compacted by rods after laying is its position to get dense concrete without any honey comb.

v) Curing ~~&~~ and Protection :-

Freshly laid concrete should be protected from rain by suitable covering concrete after it began to hargen after laying should be cured with wet gunny bags for period of 14 days.

vi) Mode of measurement & payment :-

The quantity of concrete is to be measured for (l x b x H) is cubic meter & paid according to dimensions limited to given on drawing.

B) Cement Concrete :-

1) Material :-

• Coarse aggregate :-

It Coarse It shall be crushed or broken from hard stone obtained from approved quarry It shall be hard, strong, dense & durable clean & free from soft fabric, thin flat elongated or laminated, flacky pieces and shall be roughly cubical in shape. It shall be from dust and

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Date

any other activities foreign matter. unless specially mensioned the size of the coarse aggregate shall be 20 mm graded down and shall be retained in 5mm square mesh. So that the voids do not exceed 42 percent. In the case of road or mass concrete work bigger size 40 to 80 mm may be specified.

ii) Fine aggregate :-

Aggregate most of which passes 4.75mm IS size is known as fine aggregate. Sand & fine aggregate shall be coarse, consisting sharp, angular grains & be of ~~spo~~ standerd specifiation.

ii Cement :-

Cement shall be fresh portland cement & confirm to the IS:269 up-to-date modification.

iii) Proportioning :-

Proportioning of cement, sand, aggregate, shall be 1:2:4 or as specified. Coarse aggregate & sand shall be measured by measuring box of 30x30x38 cm or suitable size equipment to the content of one bag of cement 1/30 cum or 0.035 cum. cement shall be measured by bag weighing 50 kg.

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iii) Mixing :-

Hand mixing ~~be~~ by batches shall be permitted small works. Normally all structure concrete shall be mixed only in special cases with the specific minor permission of engineer-in charge. The mixing shall be done on a clean water tight masonry or concrete ~~sha~~ slab or steel plate platform.

Machine mixing :-

The mixer dum shall be flushed cleaned with water. Measure quantity of dry coarse aggregate shall be placed first in the hopper. This shall be followed with measured quantity of fine aggregate and cement.

iv) Consistency :-

The quantity of water to be used for each mix of 50kg cement to give the required consisency shall be not more than 34 lit for 1:3:6 mix. 30 lit. for 1:2:4 mix, 27 lit for $1:1\frac{1}{2}:3$ mix.

v) Protection & Curing :-

Freshly laid concrete shall be protected from rain by suitable covering. The work should also be protected from damage and rain during construction. After 24 hours of laying of concrete the surface shall be secured by flooding with water of about 25 mm depth or by covering with wet absorbent material.

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4) Filling :-

Earth is used for filling shall be loose, free from brick bat stone The space around the foundations, pipes & drains in trenches shall be cleared of all debris brick-bat etc. The filling shall be done in layers, not exceeding 20 cm each layer. Each layer shall be watered rammed and consolidated befor the succeeding one is laid. Earth shall be rammed with iron rammers where rammer cannot be used.

5) Burnt brick masonry, first class in cement mortar.

i) Material

Brick :-

Brick should be first class of standard specification. It should be uniform, regular shape, size and colour, & well burnt, The edges should be sharp, straight and at right angles free from defects with a frog of 10mm depth on one of its flat surface.

When one brick is struck an other brick then it produce ringing sound. The size of brick should be 19cm x 9cm x 9cm. & should not absorb more than 20% of water of its dry wet.

(10)

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Date

- Cement :-
  Cement used should be opc. The Cement should measured on weight basis & in whole bags, each bag weighting 50 kg is equal to 0.035 lit in volume.

- Fine aggegate :-
  It should be either natural river sand or broken stone satisfying all IS requirement.

- Whater : Water to be used should be potable. It should be free from oil, acids, alklis etc.

ii) Preparation of cement mortar :-
  Cement & sand should be mixed first in dry condition in predetermined proportion by volume & then just sufficient quantity of water should be added to it & then turned up side down & forward direction till a homogeneous mass of cement mortar is obtained.

iii) Brick laying :-
  Brick firstly thoughly soacked in water for 2 hours before used in masonry, so that it should ~~abo~~ absorb water from mortar. Bricks should be laid in mortar to lines & level as per the plan.

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Date

iii) Watering :-

The entire brick work should be kept continuously wet by sprinkling water at least for 14 days.

iv) Mode of measurement :-

The brickwork should be measured in cubic meter correct to decimal places for the completed work subject to dimension as shown on drawing. Deduction of lintel, beam, ginders, deduction for opening like window & door are considered.

20/04/2022

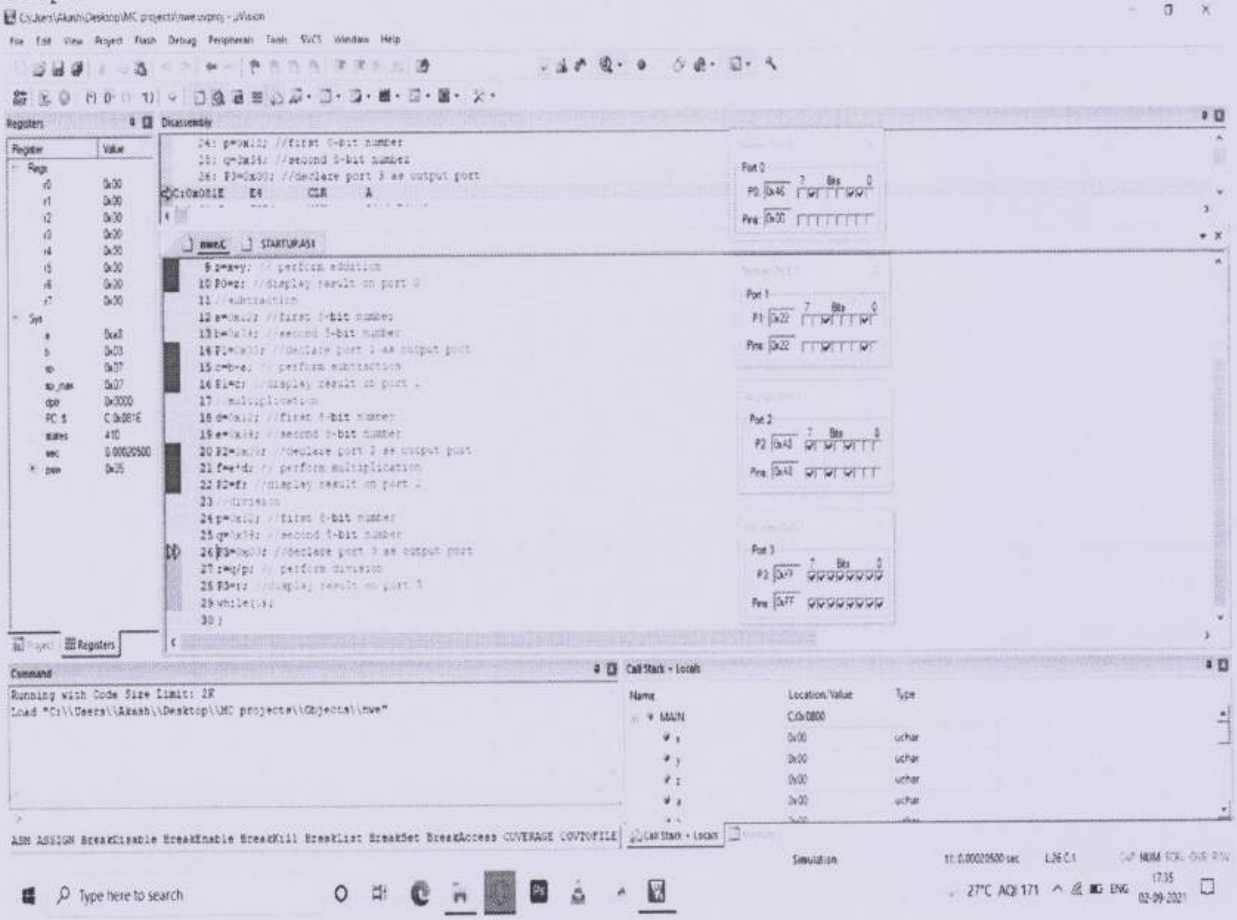
Microcontroller Assignment-1

Name : Atharv Wanjari
Roll No : 4

1. Write a program to add ,sub, multiply and Divide two 8 bit number.

```
# include<reg51.h>

void main(void)

{
unsigned char x,y,z, a,b,c, d,e,f, p,q,r; //define variables //addition

x=0x12; //first 8-bit number
y=0x34; //second 8-bit number
P0=0x00; //declare port 0 as output port
z=x+y; // perform addition
P0=z; //display result on port 0
//subtraction
a=0x12; //first 8-bit number
b=0x34; //second 8-bit number
P1=0x00; //declare port 1 as output port
c=b-a; // perform subtraction
P1=c; //display result on port 1
//multiplication
d=0x12; //first 8-bit number
e=0x34; //second 8-bit number
P2=0x00; //declare port 2 as output port
f=e*d; // perform multiplication
P2=f; //display result on port 2
//division
p=0x12; //first 8-bit number
q=0x34; //second 8-bit number
P3=0x00; //declare port 3 as output port
r=q/p; // perform division
P3=r; //display result on port 3
while(1);
}
```

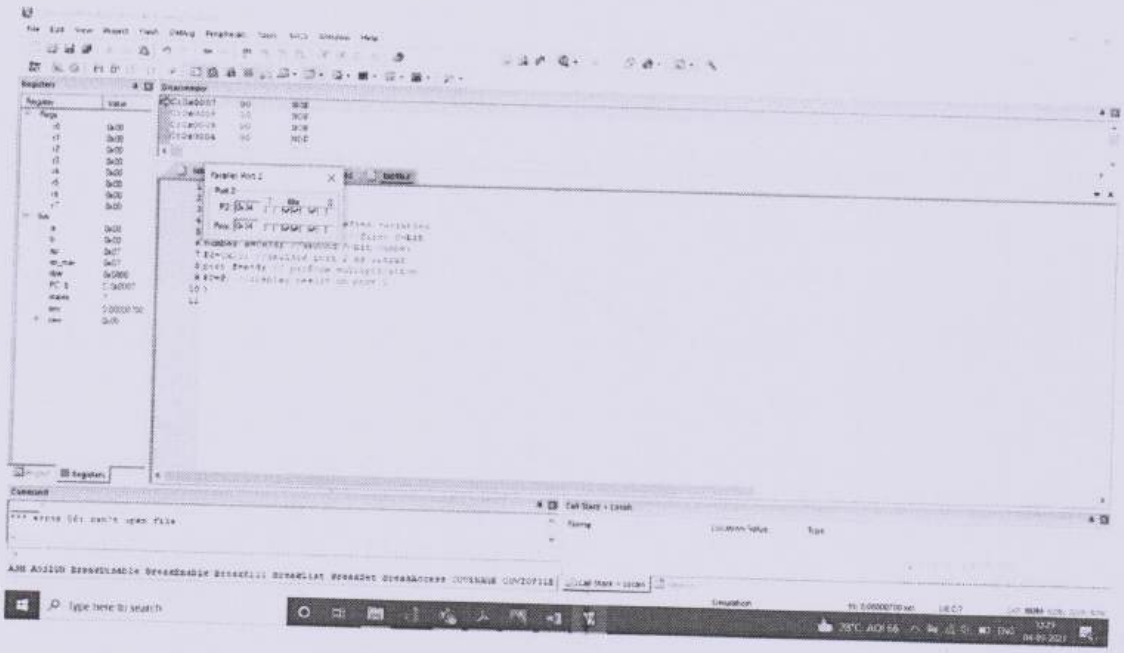
Output

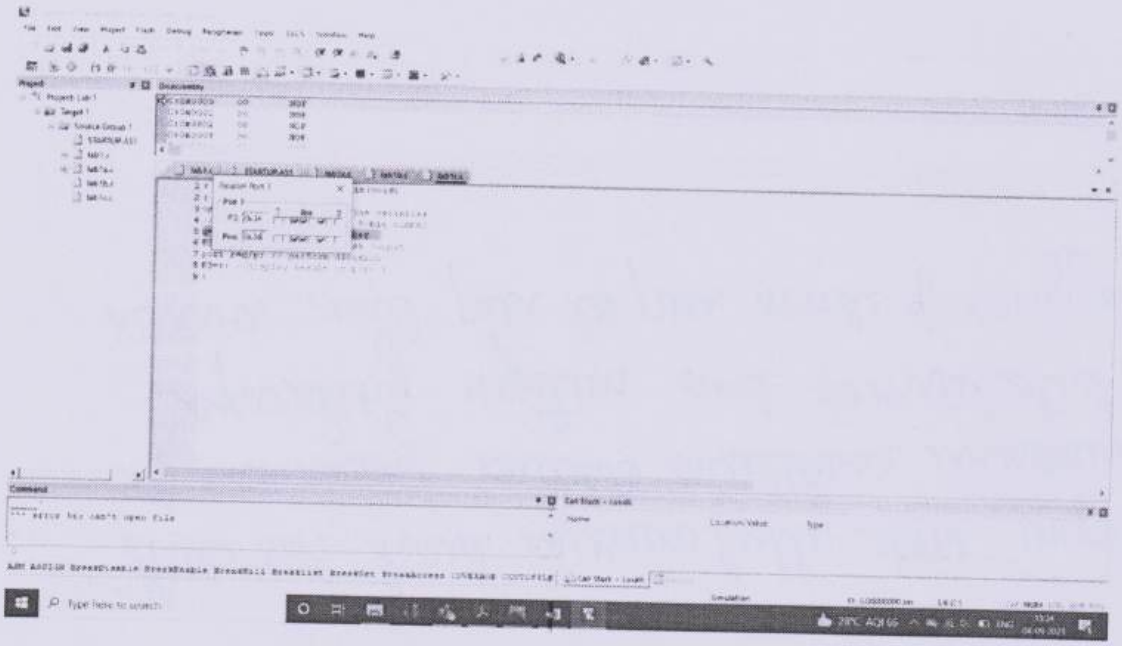

Registers
Disassembly
Command
Running with Code Size Limit: 2K
Call Stack + Locals
Name
Location/Value
Type
MAIN
Simulation
Type here to search
27°C AQI 171
ENG
17:35
02-09-2021

Aim: CLP to perform basic arithmetic operations like addition, subtraction, multiplication and division

```
# include<reg51.h> void

main(void)

{

unsigned char x,y,z, a,b,c; //define variables

x=0x12; //first 8-bit number y=0x34;

//second 8-bit number

P0=0x00; //declare port 0 as output port

P1=0x00; //declare port 1 as output port

P2=0x00; //declare port 2 as output port

P3=0x00; //declare port 3 as output port z=x+y;

// perform addition

P0=z; //display result of addition on port 0 a=y-

x//perform subtraction

P1=a// display result of subtraction on port 1

b=x*y// perform multiplication

P2=b//display result of multiplication on port 2

c=y/x//perform division

P3=c // display result of division on port 3

while(1);

}
```

```
# include<reg51.h> void
main(void)
{
unsigned char x,y,z, a,b,c, d,e,f, p,q,r; //define variables
//addition x=0x12; //first 8-bit number
y=0x34; //second 8-bit number
P0=0x00; //declare port 0 as output
port z=x+y; // perform addition
P0=z; //display result on port 0
//subtraction a=0x12; //first 8-bit
number b=0x34; //second 8-bit number
P1=0x00; //declare port 1 as output
port c=b-a; // perform subtraction
P1=c; //display result on port 1
//multiplication d=0x12; //first 8-bit
number e=0x34; //second 8-bit number
P2=0x00; //declare port 2 as output
port f=e*d; // perform multiplication
P2=f; //display result on port 2
//division p=0x12; //first 8-bit number
q=0x34; //second 8-bit number
P3=0x00; //declare port 3 as output
port r=q/p; // perform division
P3=r; //display result on port 3
while(1);
}
```





BHARATI VIDYAPEETH'S

GROUP OF INSTITUTES, TECHNICAL CAMPUS

COLLEGE OF ENGINEERING

Lavale, Pune - 412115.

RECORD BOOK

Academic Year : 2018 - 2019

Semester : I / II

Name of the Faculty : PATIL UDAY SHANKAR

Designation : Associate Professor

Department : Civil Engineering

PROFILE OF FACULTY

Affix Recent Photograph Here

1. **Name :** Patil Uday Shankar
2. **Date of Birth :** 20 - 04 - 1975
3. **Educational Qualification :** M. Tech. civil (CM)
4. **Work Experience :** (No. of Years)

   Teaching : 18 Research : 02

   Industry : 02 Others : Nil
5. **Area of Specialization :** construction Management (Hydraulics)
6. **Courses Teaching :**

Sr. No.	Class	Subject	L	P	Tut	Total
1	SE	Surveying	04	08	-	12
2	BE	Project	-	02	-	02
3	BE	ATP Practical	-	02		02

7. **UG Projects Ongoing :**

1.	Critical shear stress near Bridge Pier for non uniform sediments.
2.	
3.	
4.	

8. **Research Projects :** _____ Nos.
9. **Technology Transfer :**

   _____

   _____
10. Awards : _____
11. Membership of Professional Bodies : ISTE.

12. **Research Papers Published / Presented : (For Present Term)**

Sr. No.	Title of the Paper	Name of Journal / Periodical / Seminar /Conference	Details (Year & Month, Vol. No., page nos. etc)	Name of Co-author
1.				
2.				
3.				
4.				
5.				

13. **Books published with details :**

Sr. No.	Title	Name of the Publisher	Details
1.			
2.			

14. **Seminar / Conference / QIP / WORKSHOP / Industrial Training/ Summer / Winter School Attended:**

Sr. No.	Name of Programme	Subject	Place	Date and Duration of Programme
1.	Workshop. 5th October	RERA	BV. COE Pune	5/10/2018 2p 6/10/2018
2.				
3.				
4.				

TEACHING LOAD

Sr. No.	Class	Subject	L	P	T	Total
1.	SE	Surveying	04	08	–	12
2.	BE	Project	–	02	–	02
3.	BE	Architecture and Town Planning.	–	02	–	02
4.						
5.						
6.						
		Total	04	10	–	14

TIME TABLE

Day / Time	Mon	Tue	Wed	Thur	Fri	Sat
9·30–10·30			SUR	SUR (C)	SUR (A)	
10·30–11·30						
11·30–12·15	BREAK					
12·15–1·15		SUR			SUR	
1·15–2·15						
2·15–3·30	SHORT		BREAK.			
3·30–3·30	SUR	SUR (B)			PROJECT.	
3.30–4.30						

Remarks :

LESSON PLAN

Class : SE Sem. : I Subject : Surveying. Lectures Per Week : 04 Hrs.

Lect. No.	Unit No.	Planned Date	Topics / Subtopics Planned
25	IX	6/9/18	Tacheometry Applications and limitations.
26	IX	7/9/18	Principal of stadia Tacheometry.
27	IX	8/9/18	Fixed hair Method with vertical staff.
28	IX	9/9/18	determine Horizontal and vertical distance.
29	IX	13/9/18	find Tacheometric constants.
30	IX	14/9/18	Electronic Tacheometer. (Total station).
31	IX	15/9/18	Remote Elevation Measurment.
32	IX	16/9/18	Remote distance Area Measurement.
33	X	20/9/18	Introduction to Horizontal & vertical curve.
34	XI	21/9/18	Applications of curves problems.
35	XI	22/9/18	Radial offset, ~~vertical~~ tar offset,
36	XI	23/9/18	long chord, successive bisection of chords.
37	XI	27/9/18	offsets from chords Produced.
38	XII	28/9/18	Rankines Method. simple curve
39	VII	29/9/18	Compound curve. Transition curve.
40	VII	30/9/18	Problems on curves.
41	VI	3/10/18	Construction Survey.
42	VI	4/10/18	Establishing horizontal and vertical controls.
43	VI	5/10/18	setting out of Building.
44	VI	6/10/18	Survey for open Traverse., Roadway.
45	VI	10/10/18	Railway, drainage line.
46	VI	11/10/18	GPS, Glonass, Galileo, Gagan
47	VI	12/10/18	Bi Dou and Their features.
48	VI	13/10/18	Segments of SBPS. Application of SBPS

Signature of Faculty _____ HOD _____

ACTUAL COVERAGE

Class : SE Sem. : I Subject : Surveying Lectures Per Week : 04 Hrs.

Actual Conduction Date	Topics / Subtopics Actually covered	HoD Sign
26/6/18	Introduction to Survey, classification.	
26/6/18	Introducing the terms of Surveying.	
27/6/18	offsets. - concept - 1st & 2nd, oblique.	
28/6/18	Prismatic compass. and its problems.	
2/7/18	Problems of Prismatic compass.	
4/7/18	Dumpy level. Levelling parts.	
4/7/18	Examples on Dumpy level.	
5/7/18	Problems on D. Level.	
6/7/18	Methods of plane Table.	
10/7/18	Levelling Benchmarks	
11/7/18	Dumpy level. Auto level.	
12/7/18	Adjustments of Dumpy level.	
16/7/18	Problems on. Two point Problem.	
17/7/18	curvature and Refraction.	
18/7/18	Contouring Methods.	
19/7/18	Profile Levelling.	
23/7/18	20" Theodolite	
24/7/18	Horizontal Angle and Vertical Angle.	
25/7/18	Magnetic Bearing of a line.	
26/7/18	fundamental Axis of a line.	
30/7/18	Adjustments of - Theodolite	
30/7/18	consecutive and independant coordinates	
31/7/18	Gale Traverse Table.	
6/8/18	Transit Rule and Bowditch Rule.	
7/8/18	Tacheometry Applications and limitations	
8/8/18	stadia Tacheometry.	
21/8/18	fixed hair method of stadia Tacheometry	

Signature of Faculty

ACTUAL COVERAGE

Class : SE Sem. : I Subject : Surveying. Lectures Per Week : 04 Hrs.

Actual Conduction Date	Topics / Subtopics Actually covered	HoD Sign
6/8/18	Horizontal and vertical distance.	
7/8/18	Tacheometric constants.	
8/8/18	Electronic Tacheometer	
10/8/18	Remote Elevation.	
13/8/18	Remote Measurement	
14/8/18	Horizontal & vertical curves.	
20/8/18	Curve problems	
21/8/18	Long chord successive Bisecting chords	
29/8/18	offsets from chords produced.	
30/8/18	Ranking Method of curve	
04/9/18	Compound curve & Transition curve.	
28/8/18	Problems on Curve.	
31/8/18	Construction Survey.	
31/8/18.	Construction Survy, setting out of Bldg.	
26/9/18	Project on Road (Profile levelling)	
26/9/18	project on Road. (Profile levelling)	
29/9/9/18	Project on Tacheometry (Theodolite)	
29/9/18	Project on Tacheometry Theodolite)	
1/10/18	Horizontal & vertical control.	
3/10/18	GPS, Glonass, Galileo, Gagan.	
8/10/18	Biodeo and Their features.	
8/10/18	Segments of SBPS. Applications of SBPS.	

Signature of Faculty

Session : 2017 / 2018 Semester : I

Branch : civil Engineering

COLLEGE OF

Roll No.	Name of the Student	Date	26/6	26/6/18	27/6	28/6	2/7/18	2/3/18	4/7/18	5/7/18	6/7/18	10/7/18	11/7/18	12/7/18	16/7/18	17/7/18	18/7/18	18/7/18	19/07/18	23/7/18	24/7/18	25/7/18	26/7/18	30/7/18
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
01	Pratik Namdev Pawar		.	.	.	.	P	-	P	P	.	4	5	6	7	.	7	7	.	.	8	9	10	.
02	Wagh Sourabh Sanjay		.	.	.	.	-	.	.	.	.	1	2	3	3	4	5	5	5	.	.	.	6	7
03	Nagare V. Tanaji		.	.	P	.	-	.	.	.	.	1												
04	Tarul Sanjay R		P	P	P	P	P	P	P	P	P	9	10	11	12	13	14	14	.	14	15	16	17	18
05	Yash K. Patel.		.	.	.	.	.	.	.	.	.	1	2	3	4	5	6	7	8	9	10	11	12	13
06	Salunkhe Akash Vasant		.	.	.	P	P	P	P	P	P	7	8	9	10	.	11	11	11	12	13	14	15	16
07	Tripathi Aman Ramesh		.	.	.	P	P	P	.	.	.	4	5	6	7	8	9	9	9	10	11	12	13	14
08	Marode V. Arvind.		.	.	.	.	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	3
09	Rudrani P. Yerabhar		P	P	P	P	P	P	P	P	P	10	11	12	13	14	14	15	16	.	17	18	19	.
10	Rokade Gaurav N		.	.	P	P	P	P	P	P	P	8	9	9	9	10	11	11	11	.	12	13	14	15
11	Kyatanakeri V. S.		.	.	.	.	-	.	.	.	.	1	2	2	2	3	4	5	.	.	6	7	.	
12	Jondhale A. B.		.	.	P	P	.	P	P	P	P	6	7	8	9	9	10	11	12	.	13	.	.	14
13	Vaibhav J. Yerme		.	.	P	P	-	.	P	P	P	6	7	7	7	8	9	10	11	.	12	13	14	.
14	Anand Parghram. P.		.	.	.	.	P	P	P	.	P	5	6	7	7	8	9	10	11	.	.	.	.	.
15	Gaurav Pithare .		.	.	.	P	P	P	P	.	.	5	6	6	6	.	7	7	7	.	8	9	10	.
16	Girish Bajaj		.	.	.	.	.	.	.	.	.	.	1	1	2	3	4	4	.	.	.	.	.	.
17	Pranil Sawindkar				.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
18	Rahul Dangarwar		.	.	.	.	.	P	.	.	.	2	3	4	5	6	7	8	9	10	11	12	13	.
19	Sushant Shepe.		-	.	.	.	P	.	.	.	.	1	1	1	1	1	1	1	1	.	.	.	.	.
20	Shehal S. Kulkarni						1																	
21	Pooja Baelve																							
22	Kokare Priyanka																							
23	Ghule Kajal																							

Signature of Faculty :-

2/2 6 8 9 9 9 7 7 15

ENGINEERING, LAVALE

Name of Subject : Surveying.

24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	Online Test Marks: Total	%	I	II	Insem Exam
11	•	12	13	14	•	15	16	17	18	•	•	•	•	•	•	18	:	•		19	20	21	22	•	23	24	3+					
9	•	10	•	•	11		•	•	•	•	•	•	•	•	•	•		•		12	13	14	15	16	17	18	19					
ADMISSION CANCEL																																
20	21	22	23	24	25	26	27	28	29	•	30	31	32	•	33	34	35	36	37	38	39	40	41	42	•	43	44					
15	16	17	18	19	20	21	22	23	24	•	25	•	25	•	26	27	28	29	30	31	32	33	34	35	36	37	38					
18	19	20	•	•	21	22	23	•	24	25	26	•	26	•	27	28	29	30	31	32	33	34	35	36	37	38	39					
16	17	18	19	•	20	•	•	•	•	•	•	•	•	21	22	23	24	25	26	27	28	29	30	31	32	33						
5	5	•	•	•	6	•	•	•	7	8	•	9	•	10	11	12	•	•	13	14	14	14	15	16	17	18						
20	21	22	23	24	25	26	27	28	29	•	30	"	31	•	31	•	31	•	•	32	33	34	35	36	37	38	39					
17	17	18	19	•	•	20	•	•	•	•	•	•	21	•	22	-	23	24	25	26	27	28	29	30	31	32	33					
8	8	9	•	•	10	11	•	•	•	12	•	•	13	•	14	-	-	•		•	•	15	16	17	18	19	20					
16	17	18	19	20	21	22	23	24	25	26	27	•	28	•	29	30	31	32	33	34	35	36	37	38	39	•	•					
15	16	16	17	18	19	•	20	21	•	•	•	•	•	•	22	•	23	•		24	25	26	27	28	•	29	30					1 1 3 4
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	12	13	14	15	16			17	18	19	20	•	•					3 3 3 3
•	•	•	•	•	•	11	•	•	•	•	•	•	•	•	11	•	12	13	14	15	16	17	18	19	•	•	•					5 6
5	•	•	•	•	6	•	•	•	7	8	•	9	10	•	10	11	12	13	14	15	16	16	16	•	•	•	•					
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•												
14	15	•	16	•	17	•	•	•	18	19	•	•	20	•	21	22	23	•	•	24	25	26	27	28	29	30	31					
2	03	•	•	•	4	•	•	•	•	•	•	•	5	•	5	6	7	•	•	8	9	10	11	12	13	14	15					
												1	2	•	2	3	4	5	6	7	8	9	10	11	12	13	14					
												1	2	•	2	3	4	•	•	5	6	7	8	9	10	11	12					
												1	2	•	2	3	4	5	6	7	8	9	10	11	12	13	14					
												•	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15					
차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차	차					

Friday.

PLAN & ACTUAL COVERAGE OF LABORATORY WORK

Class : SE civil Batch : A

Sr. No.	Name of Experiment / Assignment / Drawing sheet	Planned Date	Date of Completion	Signature	
				Faculty	HOD
01	Bearing of Triangle poly.	02/07/2018	02/07/2014	[illegible]	
02	Plane Table Intersection.	06/08/2018	06/8/18	[illegible]	[illegible]
03	H. & V. Distance by Tacheometric.	03/8/2018	03/08/17	[illegible]	
04	Simple Levelling.	3/07/2018	3/7/2018	[illegible]	
05	H. Angle by Transit Theodolite.	16/07/2018	16/07/2018	[illegible]	[illegible]
06	Road Project - I.	20/07/2018	26/9/2018	[illegible]	
07	Tacheometric contouring.	17/08/18	29/9/2018	[illegible]	
08	Total station (Traversing)	24/08/18	24/08/18	[illegible]	[illegible]

Tuesday.

PLAN & ACTUAL COVERAGE OF LABORATORY WORK

Class : SE civil Batch : B.

Sr. No.	Name of Experiment / Assignment / Drawing sheet	Planned Date	Date of Completion	Signature	
				Faculty	HOD
01	Prismatic compass	28/08/18	28/8/18	3/9	
02	Plane Table Survey.	4/09/18	4/9/18	3/9	3/9/18
03	Horizontal & vertical Angle by Tacheometer	4/9/18	4/9/18	3/9	
04	Simple levelling.	11/9/18	11/9/18	3/9	
05	H. Angle by Theodolite	18/9/18	18/9/18	3/9	3/9/18
06	Road Project	24/9/18	26/9/2018	3/9	
07	Tacheometry.	25/9/18	29/9/2018	3/9	
08	Total station.	09/10/2018	09/10/2018	3/9	3/9/18

Short form	Meaning	Evaluation out of
T.S.	Timely Submission	04
Pres.	Presentation	06
Und.	Understanding	15

COLLEGE OF

CONTINUOUS

Prismatic compass. simple levelling

Roll No.	Name of the student	Date	2/7	6/7	9/7	11/7	11/7	16/7	18/7	23/7	30/7	16/8/19			Expt. No.					Expt. No.				
			1	2	3	4	5	6	7	8	9	10	11	12	Date of Perf.	Assessment T.S.	Pres.	Und.	Marks	Date of Perf.	Assessment T.S.	Pres.	Und.	Marks
01	Bortik Namdeo Pawar		P	.		P	P	.	.	.	.	.			2/7	4	6	14	24	9/7	4	6	14	24
02	Inagh Sarath Sanjay		.	.		P	P	.	P	.	P	.			7/18.	4	6	10	20	7/18	3	4	12	19
03	Nagare V. Tanaji		.	.							.													
04	Tarwl Sanjay R.		P	P		P	P	P	P	P	P	.				4	6	14	24		2.	6	14	24
05	Yash K. Patel.		.	.		P	P	P	P	P	P	.				4	6	14	24		3	4	12	19
06	Salunkhe Akash V.		P	P		P	P	.	P	P	.	-				4	6	10	20		3	4	13	20
07	Tripathi A. R.		P	-		P	P	P	P	P	P	.				4	6	14	24		3	6	12	21
08	Marode V. Arind.		.	.	.	.		.	P	.	P	P				4	6	10	20		3	4	12	19
09	Rudrani P. Y.		P	P		P	P	P	P	.	.	P				4	6	14	24		4	6	14	24
10	Rokade G. N.		P	P		P	P	.	P	.	P	.				3	6	10	19		3	4	13	20
11	Kyatanakeri V. S.		.	.		P	P	.	P	.	.	.				4	6	12	22		3	4	14	24
12	Jondhale A. B.		.	P		P	P	P	P	.	P	.			6/7	4	6	14	24	9/7	4	6	14	24
13	Vaibhav J. Y.		P	P		P	P	.	P	.	.	.				4	6	10	20		3	4	12	19
14	Anand. P. D.		P	P		P	P	.	P	.	.	-				4	6	10	20		3	4	13	24
15	Gawai Pitambar		P	.		P	P	.	P	.	.	-				4	6	10	20		3	4	13	21
16	Girish Bajaj		.	.	.	.		-	P	.	.	-				4	6	11	21		3	4	13	20
17			.	.	.	.	.	.	.	.	.	-				4	6	12	22					
18	Rahul Dongarwar		-	-	.	.	P	.	.	P	.	D				4	6	14	24		2	4	18	24
19	Sushant Bhepe											-				4	6	10	20		3	4	12	19
~~20~~	~~Shehat D Kottwani~~		-									P												

Signature of Faculty :-

ENGINEERING; LAVALE

Class : SE civil Batch : A.

ASSESSMENT OF TERM - WORK

Name of the subject : Surveying

Plane Table. H. Angle. Tachometry. Road Project

Expt. No.					Expt. No.					Expt. No.					Expt. No.					Total Marks 150	Marks out of 25	Exam. No.
Date of Perf.	Assessment T.S.	Pres.	Und.	Marks	Date of Perf.	Assessment T.S.	Pres.	Und.	Marks	Date of Perf.	Assessment T.S.	Pres.	Und.	Marks	Date of Perf.	Assessment T.S.	Pres.	Und.	Marks			
23	4	6	10	20	16	4	6	14	24	29	4	6	12	22	21	4	6	12	22	23	134	5151110043
7	4	5	12	21	07	4	6	12	22	9	4	6	10	20	9	4	6	10	20	20	124	
					18																	
	4	5	12	21		4	6	12	22		4	6	11	21		4	6	10	20	21	132	5151110053
	4	6	10	20		4	6	10	20		4	6	10	20		4	6	10	20	20	123	5151110061
	3	4	10	17		4	6	12	22		4	6	12	22		4	6	12	22	23	124	5151110048
	3	6	12	21		3	6	12	21		4	6	10	20		4	6	8	18	18	125	5151110003
	4	5	10	19		4	6	10	20		4	6	11	21		4	6	9	19	18	118	5151110034
	4	5	12	21		4	6	14	24		4	6	12	22		4	6	10	20	23	135	5151110062
	4	5	12	21		4	6	10	20		4	6	11	21		4	6	12	22	21	123	5151110046
	4	6	10	20		4	6	12	22		4	6	10	20		4	6	12	22	22	127	
	4	6	14	24		4	6	14	24		4	6	14	24		4	6	14	24	23	144	5151110022
	3	4	12	19		4	6	10	20		4	6	12	22		4	6	12	22	21	122	5151110056
	4	5	12	21		4	6	10	20		4	6	10	20		4	6	10	20	21	122	
	4	5	12	21		4	6	12	22		4	6	10	20		4	6	12	22	21	126	
	4	5	12	21		4	6	12	22		4	6	10	20		4	6	12	22	21	126	
	2	4	13	19		2	4	13	19		4	6	12	22		4	6	12	22	21	125	5151110016
	3	4	12	19		4	6	10	20		4	6	10	20		4	6	12	22	20	120	

(A) Performance Index of Engaging Lectures / Practicals

Sr.No.	Class/Sem.	Name of Subjects taught	No. of lectures targeted	No. of Lectures actually engaged	Percentage target achieved (Col 5/Col 4)* 100	Average of Col.(6)	Performance and multiplying factor	Max. weight	Weight achieved (8) * (9)
1	2	3	4	5	6	7	8	9	10
1	SE civil	Surveying	48	51	106.25	106.25	1	5	05
2									
3									
4									

* Guidelines for computation of Performance and multiplying factor

Averaged percentage target achieved (Col. 7)	100-91	90-81	80-61	60-00
Multiplying factor	1.0	0.7	0.5	0.2

(B) Performance Index of Attendance of Students :

Sr.No.	Class/ Sem.	Subjects taught	Sum of students present for all lectures engaged	Lectures actually engaged	Students on roll	Average attendance= (col.4/co.5) / (Col 6/100)	Average of col. 7	Performance and multiplying factor	Max. weight	Weight achieved (9)*(10)
1	2	3	4	5	6	7	8	9	10	11
1	SE	Surveying	478	51	17	55.132	56.593	0.5	5	2.5
2	SE	Surveying (PSE)	418	16	45	58.055				
3										
4										

* Guidelines for computation of Performance and multiplying factor

Averaged percentage target achieved (Col. 8)	100-81	80-61	60-41	40-00
Multiplying factor	1.0	0.7	0.5	0.2

(C) Performance Index of Results (Theory Subjects) :

Sr.No.	Class/ Sem.	Subjects taught	Average marks of same subject for last 3 years in institute	% of students securing marks above 3 years average	Average of col.(5)	Performance and multiplying factors	Max. weight	Weight achieved (7) * (8)
1	2	3	4	5	6	7	8	9
1	III	Surveying	15-16 – 16-17 – 17-18 –	15-16 – 16-17 – 17-18 –			5	
2	VIII	Quantity s. CT.	17-18 –	17-18 –				
3			16-17 – 15-16 –	16-17 –				
4				15-16 –				

* Guidelines for computation of Performance and multiplying factor

Averaged percentage target achieved (Col. 6)	100-70	69-50	49-40	39-00
Multiplying factor	1.0	0.7	0.5	0.2

(D) Performance Index of Research

Sr.No.	Parameter	No.	Weightage	Max. weight	Weightage achieved
1	2	3	4	5	6
1	**Publications (Journal)**				
	International :	–	1 / paper	5	
	National :	–	0.5 / paper	5	
	Publications (Conferences)				
	International :	–	0.5 / paper	5	
	National :	–	0.25 / paper	5	
2	**Patents**	–			
	Abroad :	–	1 / patent	3	
	Indian :	–	0.5 / patent	2	
3	**Students Guided**				
	Ph.D :	–	1 / student	3	
	PG :	–	0.5 / student	2	
		–		**Total**	

API – Academic Performance Indicator

A –	0.5
B –	2.5
C –	
D –	NIL
Total	