

**Savitribai Phule Pune University, Pune**  
**TE (Civil Engineering) 2019 Pattern**  
**(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	TW	PR	OR	TUT	Total
301001	Hydrology and Water Resources Engineering	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301002	Water Supply Engineering	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301003	Design of Steel Structures	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301004	Engineering Economics and Financial Management	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301005	<b>Elective I</b>	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301006	Seminar	--	--	01	--	-	50	--	--	50	--	--	--	--	01	01
301007	Hydrology and Water Resources Engineering <b>Lab</b>	--	02	--	--	--	25	--	--	25	--	01	--	--	--	01
301008	Water Supply Engineering <b>Lab</b>	--	02	--	--	--	--	50	--	50	--	--	01	--	--	01
301009	Design of Steel Structures <b>Lab</b>	--	04	--	--	--	--	--	50	50	--	--	--	02	--	02
301010	Elective I <b>Lab</b>	--	02	--	--	--	25	--	--	25	--	01	--	--	--	01
301011	Audit Course I: Professional Ethics and Etiquettes/ Sustainable Energy Systems	--	--	01	--	GR	--	--	--	GR	--	--	--	--	--	--
<b>Total</b>		<b>15</b>	<b>10</b>	<b>02</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>15</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>21</b>

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

**Elective I: 301005**

S N	Course Code	Course Name
01	301005 a	Advanced Fluid Mechanics and Hydraulic Machines
02	301005 b	Research Methodology and IPR
03	301005 c	Construction Management
04	301005 d	Advanced Concrete Technology
05	301005 e	Matrix Methods of Structural Analysis
06	301005 f	Advanced Mechanics of Structures

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	TW	PR	OR	TUT
301012	Waste Water Engineering	03	--	--	30	70	--	--	--	100	03	--	--	--	03
301013	Design of RC Structures	03	--	--	30	70	--	--	--	100	03	--	--	--	03
301014	Remote Sensing and GIS	03	--	--	30	70	--	--	--	100	03	--	--	--	03
301015	Elective II	03	--	--	30	70	--	--	--	100	03	--	--	--	03
301016	Internship	--	--	--	--	--	100	--	--	100	--	04	--	--	04
301017	Waste Water Engineering Lab	--	02	--	--	--	--	--	50	50	--	--	--	01	01
301018	Design of RC Structures Lab	--	04	--	--	--	--	--	50	50	--	--	--	02	02
301019	Remote Sensing and GIS Lab	--	02	--	--	--	50	--	--	50	--	01	--	--	01
301020	Elective II Lab	--	02	--	--	--	50	--	--	50	--	01	--	--	01
301021	Audit Course II: Leadership and Personality Development/ Industrial Safety	--	--	01	--	GR	--	--	--	GR	--	--	--	--	--
<b>Total</b>		<b>12</b>	<b>10</b>	<b>01</b>	<b>120</b>	<b>280</b>	<b>200</b>	<b>--</b>	<b>100</b>	<b>700</b>	<b>12</b>	<b>06</b>	<b>--</b>	<b>03</b>	<b>21</b>

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

### Elective II: 301015

S N	Course Code	Course Name
01	301015 a	Advanced Engineering Geology with Rock Mechanics
02	301015 b	Soft Computing Techniques
03	301015 c	Advanced Surveying
04	301015 d	Advanced Geotechnical Engineering
05	301015 e	Architecture and Town Planning
06	301015 f	Solid Waste Management

**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	<b>Elective - I</b>	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 &	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>15</b>	<b>10</b>	<b>01</b>	<b>150</b>	<b>350</b>	<b>50</b>	<b>125</b>	<b>25</b>	<b>700</b>	-			-
<b>Total Credit</b>											<b>15</b>	<b>05</b>	<b>01</b>	<b>21</b>

**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 &	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>12</b>	<b>10</b>	<b>00</b>	<b>120</b>	<b>280</b>	<b>125</b>	<b>75</b>	<b>100</b>	<b>700</b>				
<b>Total Credit</b>											<b>12</b>	<b>05</b>	<b>04</b>	<b>21</b>

**Abbreviations:**

In-Sem: In semester

End-Sem: End semester

TH: Theory

TW : Term Work

PR: Practical

OR: Oral

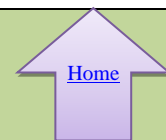
TUT: Tutorial

**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

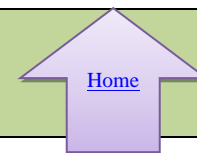
**Savitribai Phule Pune University**  
**Third Year of Computer Engineering (2019 Course)**  
 (With effect from Academic Year 2021-22)



**Semester V**

Course Code	Course Name	Teaching Scheme (Hours/week)			Examination Scheme and Marks						Credit Scheme				
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total	
310241	<a href="#">Database Management Systems</a>	03	-	-	30	70	-	-	-	100	03	-	-	03	
310242	<a href="#">Theory of Computation</a>	03	-	-	30	70	-	-	-	100	03	-	-	03	
310243	<a href="#">Systems Programming and Operating System</a>	03	-	-	30	70	-	-	-	100	03	-	-	03	
310244	<a href="#">Computer Networks and Security</a>	03	-	-	30	70	-	-	-	100	03	-	-	03	
310245	<a href="#">Elective I</a>	03	-	-	30	70	-	-	-	100	03	-	-	03	
310246	<a href="#">Database Management Systems Laboratory</a>	-	04	-	-	-	25	25	-	50	-	02	-	02	
310247	<a href="#">Computer Networks and Security Laboratory</a>	-	02	-	-	-	25	-	25	50	-	01	-	01	
310248	<a href="#">Laboratory Practice I</a>	-	04	-	-	-	25	25	-	50	-	02	-	02	
310249	<a href="#">Seminar and Technical Communication</a>	-	-	01	-	-	50	-	-	50	-	-	01	01	
<b>Total</b>		<b>15</b>	<b>10</b>	<b>01</b>	<b>150</b>	<b>350</b>	<b>125</b>	<b>50</b>	<b>25</b>	<b>700</b>	<b>15</b>	<b>05</b>	<b>01</b>	<b>21</b>	
310250	<a href="#">Audit Course 5</a>											<b>Grade</b>			
<b>Total Credit</b>											<b>15</b>	<b>05</b>	<b>01</b>	<b>21</b>	
<b>310245 Elective I Options:</b>						<b>310250 Audit Course 5 Options:</b>									
310245(A) <a href="#">Internet of Things and Embedded Systems</a>						310250 (A) <a href="#">Cyber Security</a>									
310245(B) <a href="#">Human Computer Interface</a>						310250 (B) <a href="#">Professional Ethics and Etiquettes</a>									
310245(C) <a href="#">Distributed Systems</a>						310250 (C) <a href="#">Learn New Skills</a>									
310245(D) <a href="#">Software Project Management</a>						310250 (D) <a href="#">Engineering Economics</a>									
						310250 (E) <a href="#">Foreign Language</a>									
<b>Laboratory Practice I</b>															
Assignments from <b>Systems Programming and Operating System</b> and <b>Elective I</b>															

**Savitribai Phule Pune University**  
**Third Year of Computer 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 Scheme				
		Lecture	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total	
310251	<a href="#">Data Science and Big Data Analytics</a>	04	-	-	30	70	-	-	-	100	03	-	-	03	
310252	<a href="#">Web Technology</a>	04	-	-	30	70	-	-	-	100	03	-	-	03	
310253	<a href="#">Artificial Intelligence</a>	04	-	-	30	70	-	-	-	100	03	-	-	03	
310254	<a href="#">Elective II</a>	04	-	-	30	70	-	-	-	100	03	-	-	03	
310255	<a href="#">Internship**</a>	-	-	-	-	-	100**	-	-	100	-	-	-	04**	
310256	<a href="#">Data Science and Big Data Analytics Laboratory</a>	-	04	-	-	-	50	25	-	75	-	02	-	02	
310257	<a href="#">Web Technology Laboratory</a>	-	02	-	-	-	25	-	25	50	-	01	-	01	
310258	<a href="#">Laboratory Practice II</a>	-	04	-	-	-	50	25	-	75	-	02	-	02	
<b>Total</b>		<b>12</b>	<b>10</b>	<b>-</b>	<b>120</b>	<b>280</b>	<b>225</b>	<b>50</b>	<b>25</b>	<b>700</b>	<b>12</b>	<b>09</b>	<b>-</b>	<b>21</b>	
310259	<a href="#">Audit Course 6</a>											<b>Grade</b>			
<b>Total</b>		<b>12</b>	<b>09</b>	<b>-</b>											<b>21</b>
<b>310254 Elective II Options:</b>						<b>310259 Audit Course 6 Options:</b>									
310254(A) <a href="#">Information Security</a>						310259(A) <a href="#">Digital and Social Media Marketing</a>									
310254(B) <a href="#">Augmented and Virtual Reality</a>						310259(B) <a href="#">Sustainable Energy Systems</a>									
310254(C) <a href="#">Cloud Computing</a>						310259(C) <a href="#">Leadership and Personality Development</a>									
310254(D) <a href="#">Software Modeling and Architectures</a>						310259(D) <a href="#">Foreign Language</a>									
						310259(E) <a href="#">Learn New Skills</a>									
<b>Laboratory Practice II:</b>															
Assignments from <b>Artificial Intelligence</b> and <b>Elective II</b> .															
<b>** Internship:</b>															
<b>Internship</b> guidelines are provided in course curriculum sheet.															
<b>\$\$ Hours/Week for Theory Course in Third Year of Engineering, Semester VI:</b>															
As per the apex bodies' recommendations and guidelines, it is need of the day to train the pre-final year students for the industrial readiness through internship. As per the guidelines of AICTE, the duration of internship is 4-6 weeks after completion of semester V and before commencement of semester VI, so it is apparent that the contact hours of the TE students need to be managed meticulously. It becomes mandatory as per the structure that 4 credits for internship must be earned by the students. <b>Per semester, 15 weeks duration that is suggested ideally by the affiliated university will eventually reduce to fruitful 12 weeks after the implementation of the revised curriculum (2019 Course). With the evaluatory introduction of internship in the structure, we are left with the choice of 4 theory courses in the sixth semester with 12 weeks instead of traditional 15 weeks.</b> To balance the credits and to achieve the minimum required contact hours, it is the reasonable choice to allot 4 hours / week for each theory course of the sixth semester of Third year of Engineering. The additional one lecture/ week will definitely be instrumental in achieving the largest of minimum contact hours. As such there is no correspondence of weekly load and credits earned, the credit allotted per course remain intact despite of the change. <b>So it is almost imperative that the commencement of VI Semester need to be approx. 3 weeks beyond the schedule.</b>															

Savitribai Phule Pune University														
Third Year of Information Technology (2019 course)														
(With effect from Academic Year 2021-22)														
Semester-V														
Course Code	Course Name	Teaching Scheme (Hours/ week)			Examination Scheme and Marks						Credit Scheme			
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	Term work	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
<a href="#">314441</a>	Theory of Computation	03	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">314442</a>	Operating Systems	03	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">314443</a>	Machine Learning	03	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">314444</a>	Human Computer Interaction	03	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">314445</a>	Elective-I	03	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">314446</a>	Operating Systems Lab	-	04	-	-	-	25	25	-	50	-	2	-	2
<a href="#">314447</a>	Human Computer Interaction- Lab	-	02	-	-	-	-	-	50	50	-	1	-	1
<a href="#">314448</a>	Laboratory Practice-I	-	04	-	-	-	25	25	-	50	-	2	-	2
<a href="#">314449</a>	Seminar	-	01	-	-	-	50	-	-	50	-	1	-	1
<a href="#">314450</a>	Audit Course 5	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Credit</b>											<b>15</b>	<b>06</b>	<b>-</b>	<b>21</b>
<b>Total</b>		<b>15</b>	<b>11</b>	<b>-</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>15</b>	<b>06</b>	<b>-</b>	<b>21</b>
<b>Abbreviations: TH: Theory, TW: Term Work, PR: Practical , OR: Oral ,TUT: Tutorial</b>														
<b>Elective-I:</b>							<b>Audit Course 5:</b>							
<a href="#">314445A</a> - Design and Analysis of Algorithm							<a href="#">314450A</a> -Banking and Insurance							
<a href="#">314445B</a> - Advanced Database and Management System							<a href="#">314450B</a> -Startup Ecosystems							
<a href="#">314445C</a> - Design Thinking							<a href="#">314450C</a> - Foreign Language–(Japanese Language- III )							
<a href="#">314445D</a> - Internet of Things														
<b>Laboratory Practice-I:</b>														
<b>Assignment from Machine Learning and Elective I</b>														
<b>Note: Students of T.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)</b>														

Savitribai Phule Pune University Third Year of Information Technology (2019 Course) (With effect from Academic Year 2021-22)														
Semester-VI														
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	Total	Lecture	Practical	Tutorial	Total
<a href="#">314451</a>	Computer Networks & Security	03	-	-	30	70	-	-	-	100	03			03
<a href="#">314452</a>	Data Science and Big Data Analytics	03	-	-	30	70	-	-	-	100	03			03
<a href="#">314453</a>	Web Application Development	03	-	-	30	70	-	-	-	100	03			03
<a href="#">314454</a>	Elective-II	03	-	-	30	70	-	-	-	100	03			03
<a href="#">314455</a>	Internship	-	04	-	-	-	100	-	-	100		04		04
<a href="#">314456</a>	Computer Networks & Security-Lab	-	04	-	-	-	25	-	50	75		02		02
<a href="#">314457</a>	DS & BDA-Lab	-	02	-	-	-	25	25	-	50		01		01
<a href="#">314458</a>	Laboratory Practice-II	-	04	-	-	-	50	25	-	75		02		02
<a href="#">314459</a>	Audit Course 6	-	-	-	-	-	-	-	-	-		-	-	-
<b>Total</b>											<b>12</b>	<b>09</b>	<b>-</b>	<b>21</b>
<b>Total</b>		<b>12</b>	<b>14</b>	<b>-</b>	<b>120</b>	<b>280</b>	<b>200</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>12</b>	<b>09</b>	<b>-</b>	<b>21</b>
<b>Abbreviations: TH: Theory, TW: Term Work, PR: Practical, OR: Oral, TUT: Tutorial</b>														
<b>Elective-II:</b> <a href="#">314454A</a> - Artificial Intelligence <a href="#">314454B</a> - Cyber Security <a href="#">314454C</a> -Cloud Computing <a href="#">314454D</a> - Software Modeling and Design <b>Laboratory Practice-II:</b>					<b>Audit Course 6:</b> <a href="#">314459A</a> - Green and Unconventional Energy <a href="#">314459B</a> - Leadership and Personality Development <a href="#">314459C</a> - Foreign Language-(Japanese Language- IV)									
<b>Assignments from Web Application Development and Elective-II.</b>														
<b>Note: Students of T.E. (Information Technology) can opt any one of the audit course from the list of audit courses prescribed by BoS (Information Technology)</b>														



**Savitribai Phule Pune University**  
**Board of Studies - Automobile and Mechanical Engineering**  
**Undergraduate Program - Mechanical Engineering (2019 pattern)**

Course Code	Course Name	Teaching Scheme (Hrs./week)			Examination Scheme and Marks						Credit			
		TH	PR	TUT	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
<b>Semester-V</b>														
302041	Numerical & Statistical Methods	3	-	1	30	70	25	-	-	125	3	-	1	4
302042	Heat & Mass Transfer	3	2	-	30	70	-	50	-	150	3	1	-	4
302043	Design of Machine Elements	3	2	-	30	70	-	-	25	125	3	1	-	4
302044	Mechatronics	3	2	-	30	70	-	-	25	125	3	1	-	4
302045	Elective I	3	-	-	30	70	-	-	-	100	3	-	-	3
302046	Digital Manufacturing Laboratory	-	2	-	-	-	50	-	-	50	-	1	-	1
302047	Skill Development	-	2	-	-	-	25	-	-	25	-	1	-	1
302048	Audit course - V <sup>s</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>15</b>	<b>10</b>	<b>1</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>15</b>	<b>5</b>	<b>1</b>	<b>21</b>
<b>Semester-VI</b>														
302049	Artificial Intelligence & Machine Learning	3	2	-	30	70	-	-	25	125	3	1	-	4
302050	Computer Aided Engineering	3	2	-	30	70	-	50	-	150	3	1	-	4
302051	Design of Transmission Systems	3	2	-	30	70	-	-	25	125	3	1	-	4
302052	Elective II	3	-	-	30	70	-	-	-	100	3	-	-	3
302053	Measurement Laboratory	-	2	-	-	-	50	-	-	50	-	1	-	1
302054	Fluid Power & Control Laboratory	-	2	-	-	-	50	-	-	50	-	1	-	1
302055	Internship/Mini project *	-	4	-	-	-	100	-	-	100	-	4	-	4
302056	Audit course - VI <sup>s</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>12</b>	<b>14</b>	<b>-</b>	<b>120</b>	<b>280</b>	<b>200</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>12</b>	<b>9</b>	<b>-</b>	<b>21</b>
<b>Elective-I</b>						<b>Elective-II</b>								
302045-A	Advanced Forming & Joining Processes				302052-A	Composite Materials								
302045-B	Machining Science & Technology				302052-B	Surface Engineering								
<b>Abbreviations:</b> TH: Theory, PR: Practical, TUT: Tutorial, ISE: In-Semester Exam, ESE: End-Semester Exam, TW: Term Work, OR: Oral														
<b>Note:</b> Interested students of TE (Automobile Engineering and Mechanical Engineering) can opt for any one of the audit course from the list of audit courses prescribed by BOS (Automobile and Mechanical Engineering)														
<b>Instructions:</b>														
<ul style="list-style-type: none"> <li>• Practical/Tutorial must be conducted in FOUR batches per division only.</li> <li>• Minimum number of Experiments/Assignments in PR/Tutorial shall be carried out <b>as mentioned in the syllabi</b> of respective courses.</li> <li>• Assessment of tutorial work has to be carried out similar to term-work. The Grade cum marks for Tutorial and Term-work shall be awarded on the basis of <b>continuous evaluation</b>.</li> <li>• <sup>s</sup>Audit course is mandatory but non-credit course. Examination has to be conducted at the end of Semesters for award of grade at institute level. Grade awarded for audit course shall not be calculated for grade point &amp; CGPA.</li> </ul>														

302041: Numerical and Statistical Methods					
Teaching Scheme		Credits		Examination Scheme	
Theory	3Hrs./Week	Theory	3	In-Semester	30 Marks
Tutorial	1Hr./Week	Tutorial	1	End-Semester	70 Marks
				Term Work	25 Marks
<p><b>Prerequisites:</b> System of linear equations, Partial differentiation, Statistics, Probability, Problem solving and programming.</p> <p><b>Course Objectives:</b></p> <ol style="list-style-type: none"> <li>1. <b>UNDERSTAND</b> applications of systems of equations and solve mechanical engineering applications.</li> <li>2. <b>APPLY</b> differential equations to solve the applications in the domain of fluid mechanics, structural, etc.</li> <li>3. <b>LEARN</b> numerical integration techniques for engineering applications.</li> <li>4. <b>COMPARE</b> the system's behavior for the experimental data.</li> <li>5. <b>INTERPRET</b> Statistical measures for quantitative data.</li> <li>6. <b>ANALYZE</b> datasets using probability theory and linear algebra.</li> </ol> <p><b>Course Outcomes:</b></p> <p>On completion of the course the learner will be able to;</p> <p>CO1: <b>SOLVE</b> system of equations using direct and iterative numerical methods.  CO2: <b>ESTIMATE</b> solutions for differential equations using numerical techniques.  CO3: <b>DEVELOP</b> solution for engineering applications with numerical integration.  CO4: <b>DESIGN</b> and <b>CREATE</b> a model using a curve fitting and regression analysis.  CO5: <b>APPLY</b> statistical Technique for quantitative data analysis.  CO6: <b>DEMONSTRATE</b> the data, using the concepts of probability and linear algebra.</p>					
Course Contents					
<b>Unit 1</b>	<b>Roots of Equation and Simultaneous Equations</b>				<b>07 Hrs.</b>
<p><b>Roots of Equation:</b> Bracketing method and Newton-Raphson method  <b>Solution of simultaneous equations:</b> Gauss Elimination Method with Partial pivoting, Gauss-Seidel method, Thomas algorithm for Tri-diagonal Matrix.</p>					
<b>Unit 2</b>	<b>Numerical Solution of Differential Equations</b>				<b>08 Hrs.</b>
<p><b>Ordinary Differential Equations [ODE]:</b> Taylor series method, Euler Method, Runge-Kutta 4<sup>th</sup> order. Simultaneous equations using Runge-Kutta 2<sup>nd</sup> order method.  <b>Partial Differential Equations [PDE]:</b> Finite difference method, Simple Laplace method, PDE's Parabolic explicit solution, Elliptic explicit solution.</p>					
<b>Unit3</b>	<b>Numerical Integration</b>				<b>06 Hrs.</b>
<p><b>Numerical Integration (1D):</b> Trapezoidal rule, Simpson's 1/3<sup>rd</sup>Rule, Simpson's 3/8<sup>th</sup>Rule, Gauss Quadrature 2-point and 3-point method.  <b>Double Integration:</b> Trapezoidal rule, Simpson's 1/3<sup>rd</sup>Rule.</p>					

**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	--	--	--	--	--	--
<b>Total</b>		<b>13</b>	<b>12</b>	<b>01</b>	<b>120</b>	<b>280</b>	<b>150</b>	<b>--</b>	<b>150</b>	<b>700</b>	<b>12</b>	<b>04</b>	<b>--</b>	<b>04</b>	<b>--</b>	<b>20</b>

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

**Elective III and IV**

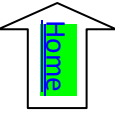
S N	Course Code	Elective III: Course Name	Course Code	Elective IV: Course Name
01	401003 a	Coastal Engineering	401004 a	Air Pollution and Control
02	401003 b	Advanced Design of Concrete Structures	401004 b	Advanced Design of Steel Structures
03	401003 c	Integrated Water Resources Planning & Management	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

<b>SEMESTER-VIII</b>																
<b>Course Code</b>	<b>Course Name</b>	<b>Teaching Scheme (Hours/Week)</b>			<b>Examination Scheme and Marks</b>						<b>Credit</b>					
		<b>Theory</b>	<b>Practical</b>	<b>Tutorial</b>	<b>IN-Sem</b>	<b>End-Sem</b>	<b>TW</b>	<b>PR</b>	<b>OR</b>	<b>Total</b>	<b>TH</b>	<b>TW</b>	<b>PR</b>	<b>OR</b>	<b>TUT</b>	<b>Total</b>
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 <b>Lab</b>	--	02	--	--	--	--	--	50	50	--	--	--	01	--	01
401017	Quantity Surveying, Contracts and Tenders <b>Lab</b>	--	02	--	--	--	--	--	50	50	--	--	--	01	--	01
401018	Elective V <b>Lab</b>	--	02	--	--	--	50	--	--	50	--	01	--	--	--	01
401019	Audit Course II <b>Social Responsibility / Human Rights</b>	--	--	01	--	GR	--	--	--	GR	--	--	--	--	--	--
<b>Total</b>		<b>12</b>	<b>16</b>	<b>01</b>	<b>120</b>	<b>280</b>	<b>150</b>	<b>--</b>	<b>150</b>	<b>700</b>	<b>12</b>	<b>04</b>	<b>--</b>	<b>04</b>	<b>--</b>	<b>20</b>

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

### Elective V and VI

<b>S N</b>	<b>Course Code</b>	<b>Elective V: Course Name</b>	<b>Course Code</b>	<b>Elective VI: Course Name</b>
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



## 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	<a href="#">Design and Analysis of Algorithms</a>	03	-	-	30	70	-	-	-	100	3	-	-	3
410242	<a href="#">Machine Learning</a>	03	-	-	30	70	-	-	-	100	3	-	-	3
410243	<a href="#">Blockchain Technology</a>	03	-	-	30	70	-	-	-	100	3	-	-	3
410244	<a href="#">Elective III</a>	03	-	-	30	70	-	-	-	100	3	-	-	3
410245	<a href="#">Elective IV</a>	03	-	-	30	70	-	-	-	100	3	-	-	3
410246	<a href="#">Laboratory Practice III</a>	-	04	-	-	-	50	50	-	100	-	2	-	2
410247	<a href="#">Laboratory Practice IV</a>	-	02	-	-	-	50	-	-	50	-	1	-	1
410248	<a href="#">Project Stage I</a>	-	02	-	-	-	50	-	-	50	-	2	-	2
<b>Total Credit</b>											<b>15</b>	<b>05</b>	<b>-</b>	<b>20</b>
<b>Total</b>		<b>15</b>	<b>08</b>	<b>-</b>	<b>150</b>	<b>350</b>	<b>150</b>	<b>50</b>	<b>-</b>	<b>700</b>	<b>15</b>	<b>05</b>	<b>-</b>	<b>20</b>
410249	<a href="#">Audit Course 7</a>										<b>Grade</b>			
<b>Elective III</b>						<b>Elective IV</b>								
<a href="#">410244(A) Pervasive Computing</a> <a href="#">410244(B) Multimedia Techniques</a> <a href="#">410244(C) Cyber Security and Digital Forensics</a> <a href="#">410244(D) Object Oriented Modeling and Design</a> <a href="#">410244(E) Digital Signal Processing</a>						<a href="#">410245(A) Information Retrieval</a> <a href="#">410245(B) GPU Programming and Architecture</a> <a href="#">410245(C) Mobile Computing</a> <a href="#">410245(D) Software Testing and Quality Assurance</a> <a href="#">410245(E) Compilers</a>								
<b>Laboratory Practice III:</b> Laboratory assignments Courses- 410241, 410242, 410243						<b>Laboratory Practice IV:</b> Laboratory assignments Courses- 410244, 410245								
<b>Audit Course 7(AC7) Options:</b> <a href="#">AC7- I MOOC- Learn New Skills</a> <a href="#">AC7- II Entrepreneurship Development</a> <a href="#">AC7- III Botnet of Things</a> <a href="#">AC7- IV 3D Printing</a> <a href="#">AC7- V Industrial Safety and Environment Consciousness</a>														



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	<a href="#">High Performance Computing</a>	03	-	-	30	70	-	-	-	100	03			03
410251	<a href="#">Deep Learning</a>	03	-	-	30	70	-	-	-	100	03			03
410252	<a href="#">Elective V</a>	03	-	-	30	70	-	-	-	100	03			03
410253	<a href="#">Elective VI</a>	03	-	-	30	70	-	-	-	100	03			03
410254	<a href="#">Laboratory Practice V</a>	-	02	-	-	-	50	50	-	100		01		01
410255	<a href="#">Laboratory Practice VI</a>	-	02	-	-	-	50	-	-	50		01		01
410256	<a href="#">Project Stage II</a>	-	06	-	-	-	100	-	50	150		06		06
<b>Total Credit</b>											<b>12</b>	<b>08</b>	<b>-</b>	<b>20</b>
<b>Total</b>		<b>12</b>	<b>10</b>	<b>-</b>	<b>120</b>	<b>280</b>	<b>200</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>12</b>	<b>08</b>	<b>-</b>	<b>20</b>
410257	<a href="#">Audit Course 8</a>										<b>Grade</b>			
<b>Elective V</b>					<b>Elective VI</b>									
<a href="#">410252(A) Natural Language Processing</a> <a href="#">410252(B) Image Processing</a> <a href="#">410252(C) Software Defined Networks</a> <a href="#">410252(D) Advanced Digital Signal Processing</a> <a href="#">410252(E) Open Elective I</a>					<a href="#">410253(A) Pattern Recognition</a> <a href="#">410253(B) Soft Computing</a> <a href="#">410253(C) Business Intelligence</a> <a href="#">410253(D) Quantum Computing</a> <a href="#">410253(E) Open Elective II</a>									
<b>Lab Practice V:</b> Laboratory assignments Courses- 410250, 410251					<b>Lab Practice VI:</b> Laboratory assignments Courses- 410252, 410253									
<b>Audit Course 8(AC8) Options:</b> <a href="#">AC8- I Usability Engineering</a> <a href="#">AC8- II Conversational Interfaces</a> <a href="#">AC8- III Social Media and Analytics</a> <a href="#">AC8- IV MOOC- Learn New Skills</a> <a href="#">AC8- V Emotional Intelligence</a>														

**Savitribai Phule Pune University, Pune**  
**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	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>15</b>	<b>10</b>	<b>-</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Credits</b>											<b>15</b>	<b>05</b>	<b>-</b>	<b>20</b>

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

**Savitribai Phule Pune University, Pune**  
**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
<b>Total</b>		<b>09</b>	<b>14</b>	<b>04</b>	<b>90</b>	<b>210</b>	<b>250</b>	<b>50</b>	<b>100</b>	<b>700</b>	-	-	-	-
<b>Total Credits</b>											<b>09</b>	<b>07</b>	<b>04</b>	<b>20</b>

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



Savitribai Phule Pune University Final Year of Information Technology (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	Termwork	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
414441	Information and Storage Retrieval	03	-	-	30	70	-	-	-	100	3	-	-	3
414442	Software Project Management	03	-	-	30	70	-	-	-	100	3	-	-	3
414443	Deep Learning	03	-	-	30	70	-	-	-	100	3	-	-	3
414444	Elective III	03	-	-	30	70	-	-	-	100	3	-	-	3
414445	Elective IV	03	-	-	30	70	-	-	-	100	3	-	-	3
414446	Lab Practice III	-	04	-	-	-	25	-	25	50	-	2	-	2
414447	Lab Practice IV	-	02	-	-	-	25	25	-	50	-	1	-	1
414448	Project Stage-I	-	-	02	-	-	50	-	-	50	-	-	2	2
414449	Audit Course7													
<b>Total Credit</b>											<b>15</b>	<b>03</b>	<b>02</b>	<b>20</b>
<b>Total</b>		<b>15</b>	<b>06</b>	<b>02</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>25</b>	<b>25</b>	<b>650</b>	<b>15</b>	<b>03</b>	<b>02</b>	<b>20</b>
<b>Elective III:</b> <ul style="list-style-type: none"> <li>• Mobile Computing</li> <li>• High Performance Computing</li> <li>• Multimedia Technology</li> <li>• Smart Computing</li> </ul>					<b>Elective IV:</b> <ul style="list-style-type: none"> <li>• Bioinformatics</li> <li>• Introduction to DevOps</li> <li>• Computer Vision</li> <li>• Wireless Communications</li> </ul>									
<b>Lab Practice-III:</b> It is based on subjects: <ul style="list-style-type: none"> <li>• Information and Storage Retrieval</li> </ul>					<b>Lab Practice-IV:</b> It is based on subjects: <ul style="list-style-type: none"> <li>• Deep Learning</li> </ul>									
<b>Audit Courses 7:</b> <ul style="list-style-type: none"> <li>• 414449A: Copyrights and Patents</li> <li>• 414449B: Stress Management by Yoga</li> <li>• 414449C: English for Research Paper Writing</li> </ul>														

Savitribai Phule Pune University Final Year of Information Technology (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	Teamwork	Practical	Oral	Total	Lecture	Practical	Tutorial	Total
414450	Distributed Systems	03	-	-	30	70	-	-	-	100	03			03
414451	Elective V	03	-	-	30	70	-	-	-	100	03			03
414452	Elective VI	03	-	-	30	70	-	-	-	100	03			03
414453	Startup and Entrepreneurship	-	-	03	-	-	50	-	-	50	-	-	03	03
414454	Lab Practice V	-	04	-	-	-	50	25	-	75		02		02
414455	Lab Practice VI	-	02	-	-	-	25	-	50	75		01		01
414456	Project Stage II	-	10	-	-	-	100	-	50	150		05		05
414457	Audit Course 8													
<b>Total Credit</b>											<b>09</b>	<b>08</b>	<b>03</b>	<b>20</b>
<b>Total</b>		<b>09</b>	<b>16</b>	<b>03</b>	<b>90</b>	<b>210</b>	<b>225</b>	<b>50</b>	<b>75</b>	<b>650</b>	<b>09</b>	<b>08</b>	<b>03</b>	<b>20</b>
<b>Elective V:</b> <ul style="list-style-type: none"> <li>• Software Defined Networks</li> <li>• Social Computing</li> <li>• Natural Language Processing</li> <li>• Soft Computing</li> <li>• Game Engineering</li> </ul>					<b>Elective VI:</b> <ul style="list-style-type: none"> <li>• Ethical Hacking and Security</li> <li>• Augmented and Virtual Reality</li> <li>• Business Analytics and Intelligence</li> <li>• Blockchain Technology</li> </ul>									
<b>Lab Practice V:</b> It is based on subjects: <ul style="list-style-type: none"> <li>• Distributed Systems</li> </ul>					<b>Lab Practice VI:</b> It is based on subjects: <ul style="list-style-type: none"> <li>• Elective VI</li> </ul>									
<b>Audit Courses 8:</b> <ul style="list-style-type: none"> <li>• 414457A: Functional Programming in Haskell</li> <li>• 414457B: Cyber Laws and Use of Social Media</li> <li>• 414457C: Constitution of India</li> </ul>														

**Savitribai Phule Pune University**  
**Board of Studies - Mechanical and Automobile Engineering**  
Undergraduate Program – Final Year Mechanical Engineering (2019 pattern)

Course Code	Course Name	Teaching Scheme (Hrs./week)			Examination Scheme and Marks						Credit			
		TH	PR	TUT	ISE	ESE	TW	PR	OR	TOTAL	TH	PR	TUT	TOTAL
<b>Semester-VII</b>														
<a href="#">402041</a>	Heating Ventilation Air-Conditioning and Refrigeration	3	2	-	30	70	-	-	25	125	3	1	-	4
<a href="#">402042</a>	Dynamics of Machinery	3	2	-	30	70	-	-	25	125	3	1	-	4
<a href="#">402043</a>	Turbomachinery	2	2	-	-	50	25	-	25	100	2	1	-	3
<a href="#">402044</a>	Elective – III	3	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">402045</a>	Elective - IV	3	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">402046</a>	Data Analytics Laboratory	-	2	-	-	-	50	-	-	50	-	1	-	1
<a href="#">402047</a>	Project (Stage - I)	-	4	-	-	-	50	-	50	100	-	2	-	2
<b>Total</b>		<b>14</b>	<b>12</b>		<b>120</b>	<b>330</b>	<b>125</b>	<b>-</b>	<b>125</b>	<b>700</b>	<b>14</b>	<b>6</b>	<b>-</b>	<b>20</b>
<b>Semester-VIII</b>														
<a href="#">402048</a>	Computer Integrated Manufacturing	3	2	-	30	70	25	-	25	150	3	1	-	4
<a href="#">402049</a>	Energy Engineering	3	2	-	30	70	25	-	25	150	3	1	-	4
<a href="#">402050</a>	Elective - V	3	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">402051</a>	Elective - VI	3	-	-	30	70	-	-	-	100	3	-	-	3
<a href="#">402052</a>	Mechanical Systems Analysis Laboratory	-	2	-	-	-	25	-	25	50	-	1	-	1
<a href="#">402053</a>	Project (Stage - II)	-	10	-	-	-	100	-	50	150	-	5	-	5
<b>Total</b>		<b>12</b>	<b>16</b>	<b>-</b>	<b>120</b>	<b>280</b>	<b>175</b>	<b>-</b>	<b>125</b>	<b>700</b>	<b>12</b>	<b>8</b>	<b>-</b>	<b>20</b>
<b>Elective-III</b>						<b>Elective-V</b>								
<a href="#">402044A</a>	Automobile Design	<a href="#">402050A</a>				Quality and Reliability Engineering								
<a href="#">402044B</a>	Design of Heat Transfer Equipments	<a href="#">402050B</a>				Energy Audit and Management								
<a href="#">402044C</a>	Modern Machining Processes	<a href="#">402050C</a>				Manufacturing Systems and Simulation								
<a href="#">402044D</a>	Industrial Engineering	<a href="#">402050D</a>				Engineering Economics and Financial Management								
<a href="#">402044E</a>	Internet of Things	<a href="#">402050E</a>				Organizational Informatics								
<a href="#">402044F</a>	Computational Fluid Dynamics	<a href="#">402050F</a>				Computational Multi Body Dynamics								
<b>Elective-IV</b>						<b>Elective-VI</b>								
<a href="#">402045A</a>	Product Design and Development	<a href="#">402051A</a>				Process Equipment Design								
<a href="#">402045B</a>	Experimental Methods in Thermal Engineering	<a href="#">402051B</a>				Renewable Energy Technologies								
<a href="#">402045C</a>	Additive Manufacturing	<a href="#">402051C</a>				Automation and Robotics								
<a href="#">402045D</a>	Operations Research	<a href="#">402051D</a>				Industrial Psychology and Organizational Behavior								
<a href="#">402045E</a>	Augmented Reality and Virtual Reality	<a href="#">402051E</a>				Electrical and Hybrid Vehicle								

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

- Student can select any elective subjects from the list given as per his/her choice. However, it is advised to select the subjects from within a group identified for specialization.

**Instructions:**

- Practical/Tutorial must be conducted in **FOUR batches per division** only.
- Minimum number of Experiments/Assignments in PR/Tutorial shall be carried out **as mentioned in the syllabi** of respective courses.
- Assessment of tutorial work has to be carried out similar to term-work. The Grade cum marks for Tutorial and Term-work shall be awarded on the basis of **continuous evaluation**.