



Dattakala Shikshan Sanstha's

# DATTAKALA GROUP OF INSTITUTIONS

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Affiliated to Savitribai Phule Pune University, Pune and M.S.B.T.E., Mumbai

| DTE Code: 6628 | MSBTE Code: 1712 | AICTE ID: 1-5986711 | AISHE Code: C-44576 |

Ref: NAAC 2024/ MLD/Cr-1.3.2

Date-05/04/2024

<b>Criteria 1.3.2</b>	<b>Percentage of students undertaking project work/field work/ internships (Data for the latest completed academic year)</b>
<b>Findings of DVV</b>	HEI to affix the e- copies of the syllabus highlighting the project work , internships , field work ; HEI to provide the e-copies certificate of project work completion for the metric 1.3.2.Since HEI is has engineering and MBA and MCA programmes the data shuld include 3 rd year students completing internships ; final BE students completing project work ; 1st year MBA students completing internships ;final year students completing project ; MCA 2nd year completing internships and final year MCA students completing project work .
<b>Response/ Clarification</b>	<ol style="list-style-type: none"><li>1. E-copy of university syllabus showing provision <b>project work/field work/ internships</b> for are attached (<b>Appendix I</b>)</li><li>2. Samples of project reports/internship completion certificates/field work completion certificates of BE,MBA and MCA students are attached (<b>Appendix II</b>)</li></ol>



**Director**

Dattakala Group of Institutions  
Swami-Chincholi, Tal Daund  
Dist.-Pune. Pin - 413 130

# Appendix I

# Savitribai Phule Pune University, Pune



## Syllabus for TE Civil Engineering (2019 Pattern)

Implemented from Academic year 2021-22

Board of Studies in Civil Engineering

Faculty of Science and Technology

**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	Elective I	03	--	--	30	70	--	--	--	100	03	--	--	--	--	03
301006	Seminar	--	--	01	--	-	50	--	--	50	--	--	--	--	01	01
301007	Hydrology and Water Resources Engineering Lab	--	02	--	--	--	25	--	--	25	--	01	--	--	--	01
301008	Water Supply Engineering Lab	--	02	--	--	--	--	50	--	50	--	--	01	--	--	01
301009	Design of Steel Structures Lab	--	04	--	--	--	--	--	50	50	--	--	--	02	--	02
301010	Elective I Lab	--	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**  
**TE Civil (2019 Pattern) w. e. f. June 2021**  
**301016: Internship**

<b>Teaching scheme</b>	<b>Credit</b>	<b>Examination scheme</b>
Tutorial: 04 Hours/week	04	Term Work: 100 Marks

**Pre-requisites:** Fundamentals of Civil Engineering covered in earlier courses

**Course objectives**

- 01 To encourage and provide opportunities for students to get professional/personal experience through internships.
- 02 To learn to apply the technical knowledge gained from academics /classroom learning in real life/industrial situations.
- 03 To get familiar with various tools and technologies used in industries and their applications.
- 04 To enable students to develop professional skills and expand their professional network with the development of employer-valued skills like teamwork, communication.
- 05 To apply the experience gained from industrial internship to the academic course completion project.
- 06 To nurture professional and societal ethics in students
- 07 Understand the social, economic and administrative considerations that influence the working environment of industrial organizations

**Course outcomes**

On successful completion of this course, the learner will be able to:

- 01 To develop professional competence through industry internship
- 02 To apply academic knowledge in a personal and professional environment
- 03 To build the professional network and expose students to future employees
- 04 Apply professional and societal ethics in their day to day life
- 05 To become a responsible professional having social, economic and administrative considerations
- 06 To make own career goals and personal aspirations

**CO-PO Mapping Matrix**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	3	1	1	1	1	2	1	1
CO2	1	2	2	2	3	2	1	1	1	2	2	1
CO3	-	-	-	-	-	1	-	-	2	2	1	1
CO4	2	-	-	-	-	2	2	3	-	1	-	2
CO5	-	-	-	-	-	1	2	1	1	1	2	1
CO6	-	-	-	-	-	1	1	-	2	1	-	1

## Guidelines of Internship

Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as the employers are looking for employees who are properly skilled and having awareness about industry environment, practices and culture. Internship is structured, short-term, supervised training 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.

Engineering internships are intended to provide students with an opportunity to apply theoretical knowledge from academics to the realities of the field work/training. The following guidelines are proposed to give academic credit for the internship undergone as a part of the Third Year Engineering curriculum.

**1. Duration:** Internship to be completed after semester V and before commencement of semester VI of at least 4 to 6 weeks. It is to be assessed and evaluated in semester VI.

**2. Internship work Identification:** 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 [1].

Contacting various companies for Internship and Internship work identification process should be initiated in the V<sup>th</sup> semester in coordination with training and placement cell/ industry institute cell/internship cell. This will help students to start their internship work on time. Also, it will allow students to work in vacation period after their V<sup>th</sup> semester examination.

Student can take internship work in the form of online/onsite work from any of the following but not limited to:

- a. Working for consultancy/ research project
- b. Participation at events (technical/business) in innovation related completions like Hackathon
- c. Contribution in incubation/innovation/entrepreneurship cell/institutional innovation council/startups cells of institute
- d. Learning at departmental lab/tinkering lab/institutional workshop
- e. Development of new product/business plan/registration of start-up
- f. Participation in IPR workshop/leadership talks/ideal design/innovation/business completion/technical expos
- g. Industry/government organization internship
- h. Internship through Internshala

- i. In-house product development, intercollegiate, inter department research internship under research lab/group, micro/small/medium enterprise/online internship
- j. Research internship under professors, IISC, IIT's, research organizations
- k. NGOs or social internships, rural internship
- l. Participate in open source development
- m. Development of Physical and/or numerical, mathematical, soft computing model
- n. Carrying out surveys related to society related but Engineering problems. For example, a survey of solid waste management in a particular area/town/village, survey of water supply network in a locality, town, village etc. , survey of air quality etc.

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

**3. Internship Diary/ Internship Workbook:** Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary the day-to-day account of the observations, impressions, information gathered and suggestions given, if any. The training diary/workbook should be signed after every day by the supervisor/ in charge of the section where the student has been working.

Internship diary/workbook and internship report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the institute immediately after the completion of the training. Internship diary/workbook may be evaluated on the basis of the following criteria.

- i. Proper and timely documented entries
- ii. Adequacy & quality of information recorded
- iii. Data recorded
- iv. Thought process and recording techniques used
- v. Organization of the information

**4. Internship Work Evaluation:** Every student is required to prepare and maintain documentary proofs of the activities done by him as internship diary or as workbook. 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, level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Assessment and evaluation is to be done in consultation with internship supervisor (internal and external) and a supervisor from place of internship.

***Recommended evaluation parameters: Post internship internal evaluation 50 Marks and internship diary/workbook and internship report 50 Marks. Evaluation through Seminar Presentation/Viva-Voce at the Institute***

The student will present a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria.

***Depth of knowledge, communication skills, presentation skills, team work, creativity, planning & organizational skills, adaptability, analytical skills, attitude and behavior at work, societal understanding, ethics, regularity and punctuality, attendance record, log book, student's feedback from external internship supervisor***

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact industrial supervisor/faculty mentor/TPO for assigning special topics and problems and should prepare the final report on the student's presence physically, if the student is found absent without prior intimation to the department/institute/concern authority/T & P Cell, entire training can be cancelled.

***The report shall be presented covering following recommended fields but not limited to:***

- ✓ Title/cover Page
- ✓ Internship completion certificate
- ✓ Internship place details: Company background-organization and activities/scope and object of the study/personal observations
- ✓ Index/table of contents
- ✓ Introduction
- ✓ Title/problem statement/objectives
- ✓ Motivation/scope and rationale of the study
- ✓ Methodological details
- ✓ Results/analysis/inferences and conclusion
- ✓ Suggestions/recommendations for improvement to industry, if any
- ✓ Attendance record
- ✓ Acknowledgement
- ✓ List of reference (books, magazines and other sources)

**5. Feedback from internship supervisor (external and internal):** Post internship, faculty coordinator should collect feedback about student with following recommended parameters.

Technical knowledge, discipline, punctuality, commitment, willingness to do the work, communication skill, individual work, team work and leadership

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# Savitribai Phule Pune University, Pune



## Syllabus for BE Civil Engineering (2019 Pattern)

Implemented from Academic year 2022-23

Board of Studies in Civil Engineering

Faculty of Science and Technology

**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>

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**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	<b>Project Stage II</b>	--	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>

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### 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

**Savitribai Phule Pune University, Pune**  
**B. E. Civil (2019 Pattern) w. e. f. June 2022**

**401 005: Project Stage I**

<b>Teaching scheme</b>	<b>Credits</b>	<b>Examination scheme</b>
Practical: 04 Hours/week	01	Term Work: 50 Marks
	02	Oral: 50 Marks

**Pre-requisites**

Fundamentals of Civil Engineering

**Course objectives**

- 01 Identify latest technical/practical problems in the field of Civil Engineering.
- 02 Inculcate the ability to describe, interpret and analyze technical content.
- 03 Develop competence in preparing report which will enhance critical thinking and develop the skill of technical writing along with presentation.

**Course outcomes**

On successful completion of this course, the learner will be able to:

- 01 Appraise the current Civil Engineering research/techniques/developments/interdisciplinary areas.
- 02 Review and organize literature survey utilizing technical resources, journals etc.
- 03 Evaluate and draw conclusions related to technical content studied.
- 04 Demonstrate the ability to perform critical writing by preparing a technical report.
- 05 Develop technical writing and presentation skills.

**Term Work**

***The Project Stage I report should contain the following. Internal guides may prepare a continuous evaluation sheet of each individual and refer as continuous assessment for term work marks. Project group must comprise of minimum two and maximum five students.***

- 01 Introduction of the topic, its relevance to civil engineering, need for the study, aims and objective, limitations.
- 02 Literature review from reference books, journals, conference proceedings, published reports/articles/documents with conclusion. The literature review should be from published literature in the last five years.
- 03 Problem statement and methodology
- 03 Theoretical contents related to the chosen topic or case studies if applicable.
- 04 Concluding remarks or summary.
- 05 References

**Oral Examination: The students must prepare presentation on Project Stage I and present in presence of pair of examiners through a viva-voce examination.**

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**Savitribai Phule Pune University, Pune**  
**B. E. Civil (2019 Pattern) w. e. f. June 2022**

**401 015: Project Stage II**

<b>Teaching scheme</b>	<b>Credits</b>	<b>Examination scheme</b>
Practical: 04 Hours/week	03	Term Work: 100 Marks
	02	Oral: 50 Marks

**Pre-requisites**

Fundamentals of Civil Engineering

**Course objectives**

- 01 Identify latest technical/practical problems in the field of Civil Engineering.
- 02 Inculcate the ability to describe, interpret and analyze technical content.
- 03 Develop competence in preparing report which will enhance critical thinking and develop the skill of technical writing along with presentation.

**Course outcomes**

On successful completion of this course, the learner will be able to:

- 01 Appraise the current Civil Engineering research/techniques/developments/interdisciplinary areas.
- 02 Review and organize literature survey utilizing technical resources, journals etc.
- 03 Evaluate and draw conclusions related to technical content studied.
- 04 Demonstrate the ability to perform critical writing by preparing a technical report.
- 05 Develop technical writing and presentation skills.

**Term Work**

*The Project Stage II report should contain the following. Internal guides may prepare a continuous evaluation sheet for each student and refer as continuous assessment for term work marks.*

- 01 Introduction including aim and objective
- 02 Review of literature
- 03 Problem statement and methodology
- 03 Concepts associated with the project topic
- 04 Results and discussion
- 05 Validation of results
- 06 Conclusions and future scope of work
- 07 References
- 08 Students publication/achievements

In Project Work Stage II, the student shall complete the project and prepare the final report of project work in standard format duly certified for satisfactory completion of the project work by the concerned guide and Head of the Department/Institute. The final project report shall be submitted in hard bound copy as well as a soft copy. The term work of project stage II shall be assessed jointly by the pair of internal and external examiners, along with oral examination of the same. It is recommended that at least one publication on the project topic to be presented in a conference or published in a referred journal.

**Oral Examination: The students must prepare presentation on Project Stage II and present in presence of pair of examiners through a viva-voce examination.**

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**Curriculum  
for  
Third Year of Computer Engineering  
(2019 Course)**

**(With effect from 2021-22)**



<http://unipune.ac.in>

**Faculty of Science and Technology**

**Savitribai Phule Pune University  
Maharashtra, India**

Savitribai Phule Pune University

## Third Year of Computer Engineering (2019 Course)

(With effect from Academic Year 2021-22)

Home

## 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)

Home

## 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 Computer Engineering (2019 Course)****310255: Internship\*\***[Home](#)**Teaching Scheme:**

\*\*

**Credit: 04****Examination Scheme:****Term work: 100 Marks****Course Objectives:**

Internship provides an excellent opportunity to learner to see how the conceptual aspects learned in classes are integrated into the practical world. Industry/on project experience provides much more professional experience as value addition to classroom teaching.

- To encourage and provide opportunities for students to get professional/personal experience through internships.
- To learn and understand real life/industrial situations.
- To get familiar with various tools and technologies used in industries and their applications.
- To nurture professional and societal ethics.
- To create awareness of social, economic and administrative considerations in the working environment of industry organizations.

**Course Outcomes:**

On completion of the course, learners should be able to

**CO1:** To demonstrate professional competence through industry internship.

**CO2:** To apply knowledge gained through internships to complete academic activities in a professional manner.

**CO3:** To choose appropriate technology and tools to solve given problem.

**CO4:** To demonstrate abilities of a responsible professional and use ethical practices in day to day life.

**CO5:** Creating network and social circle, and developing relationships with industry people.

**CO6:** To analyze various career opportunities and decide carrier goals.

**\*\* Guidelines:**

Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as the employers are looking for employees who are properly skilled and having awareness about industry environment, practices and culture. Internship is structured, short-term, supervised training 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.

Engineering internships are intended to provide students with an opportunity to apply conceptual knowledge from academics to the realities of the field work/training. The following guidelines are proposed to give academic credit for the internship undergone as a part of the Third Year Engineering curriculum.

**Duration:**

Internship is to be completed after semester 5 and before commencement of semester 6 of at least 4 to 6 weeks; and it is to be assessed and evaluated in semester 6.

**Internship work Identification:**

Student may choose to undergo Internship at Industry/Govt. Organizations/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[1].



Students must register at Internshala [2]. Students must get Internshala approval from college authority well in advance. Internship work identification process should be initiated in the Vth semester in coordination with training and placement cell/ industry institute cell/ internship cell. This will help students to start their internship work on time. Also, it will allow students to work in vacation period after their Vth semester examination and before academic schedule of semester VI.

Student can take internship work in the form of the following but not limited to:

- Working for consultancy/ research project,
- Contribution in Incubation/ Innovation/ Entrepreneurship Cell/ Institutional Innovation Council/ startups cells of institute /
- Learning at Departmental Lab/Tinkering Lab/ Institutional workshop,
- Development of new product/ Business Plan/ registration of start-up,
- Industry / Government Organization Internship,
- Internship through Internshala,
- In-house product development, intercollegiate, inter department research internship under research lab/group, micro/small/medium enterprise/online internship,
- Research internship under professors, IISc, IIT's, Research organizations,
- NGOs or Social Internships, rural internship,
- Participate in open source development.

### **Internship Diary/ Internship Workbook:**

Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary the day-to-day account of the observations, impressions, information gathered and suggestions given, if any. The training diary/workbook should be signed every day by the supervisor.

Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.

### **Internship Work Evaluation:**

Every student is required to prepare a maintain documentary proofs of the activities done by him as internship diary or as workbook. 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.

Assessment and Evaluation is to be done in consultation with internship supervisor (Internal and External – a supervisor from place of internship).

**Recommended evaluation parameters-Post Internship Internal Evaluation -50 Marks + Internship Diary/Workbook and Internship Report - 50 Marks**

### **Evaluation through Seminar Presentation/Viva-Voce at the Institute-**

The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

- Depth of knowledge and skills
- Communication & Presentation Skills
- Team Work
- Creativity
- Planning & Organizational skills
- Adaptability
- Analytical Skills
- Attitude & Behavior at work



- Societal Understanding
- Ethics
- Regularity and punctuality
- Attendance record
- Diary/Work book
- Student's Feedback from External Internship Supervisor

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period.

Internship Diary/workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries
- Adequacy & quality of information recorded
- Data recorded
- Thought process and recording techniques used
- Organization of the information

The report shall be presented covering following recommended fields but limited to,

- Title/Cover Page
- Internship completion certificate
- Internship Place Details- Company background-organization and activities/Scope and object of the study / Supervisor details
- Index/Table of Contents
- Introduction
- Title/Problem statement/objectives
- Motivation/Scope and rationale of the study
- Methodological details
- Results / Analysis /inferences and conclusion
- Suggestions / Recommendations for improvement to industry, if any
- Attendance Record
- Acknowledgement
- List of reference (Library books, magazines and other sources)

### Feedback from internship supervisor(External and Internal)

Post internship, faculty coordinator should collect feedback about student with recommended parameters include as- Technical knowledge, Discipline, Punctuality, Commitment, Willingness to do the work, Communication skill, individual work, Team work, Leadership.....

Reference:

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

[2] <https://internship.aicte-india.org/>

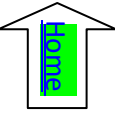
### @ The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	3	1	1	1	1	2	1	1
CO2	1	2	2	2	3	2	1	1	1	2	2	1
CO3	-	-	-	-	-	1	-	-	2	2	1	1
CO4	2	-	-	-	-	2	2	3	-	1	-	2
CO5	-	-	-	-	-	1	2	1	1	1	2	1
CO6	-	-	-	-	-	1	-	-	2	1	-	1

**Faculty of Engineering  
Savitribai Phule Pune University, Pune  
Maharashtra, India**

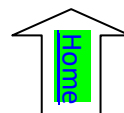


**Curriculum  
for  
Fourth Year of Computer Engineering  
(2019 Course)  
(With effect from 2022-23)**



## 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**  
**Fourth Year of Computer Engineering (2019 Course)**  
**410248: Project Work Stage I**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Practical:02Hours/Week</b>	<b>02</b>	<b>Presentation:50Marks</b>

**Course Objectives:**

- To Apply the knowledge for solving realistic problem
- To develop problem solving ability
- To Organize, sustain and report on a substantial piece of team work over a period of several months
- To Evaluate alternative approaches, and justify the use of selected tools and methods
- To Reflect upon the experience gained and lessons learned
- To Consider relevant social, ethical and legal issues
- To find information for yourself from appropriate sources such as manuals, books, research journals and from other sources, and in turn increase analytical skills.
- To Work in Team and learn professionalism

**Course Outcomes:**

On completion of the course, student will be able to–

- Solve real life problems by applying knowledge.
- Analyze alternative approaches, apply and use most appropriate one for feasible solution.
- Write precise reports and technical documents in a nutshell.
- Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work
- Inter-personal relationships, conflict management and leadership quality.

**Guidelines**

Project work Stage – I 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, SRS, Model and Design. The student is expected to complete the project at least up to the design phase. As a part of the progress report of project work Stage-I, the candidate shall deliver a presentation on the advancement in Technology pertaining to the selected project topic. The student shall submit the duly certified progress report of Project work Stage-I in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute. The examinee will be assessed by a panel of examiners of which one is necessarily an external examiner. The assessment will be broadly based on work undergone, content delivery, presentation skills, documentation, question-answers and report.

**Follow guidelines and formats as mentioned in Project Workbook recommended by Board of Studies**



## Savitribai Phule Pune University

### Fourth Year of Computer Engineering (2019 Course)

#### 410256: Project Work Stage II

<b>Teaching Scheme:</b>  <b>TH: 06 Hours/Week</b>	<b>Credit</b>  <b>06</b>	<b>Examination Scheme:</b>  <b>Term work: 100 Marks</b> <b>Presentation: 50Marks</b>
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#### Prerequisite Courses: Project Stage I(410248)

#### Course Objectives:

- To follow SDLC meticulously and meet the objectives of proposed work
- To test rigorously before deployment of system
- To validate the work undertaken
- To consolidate the work as furnished report

#### Course Outcomes:

On completion of the course, student will be able to–

- CO1: Show evidence of independent investigation
- CO2: Critically analyze the results and their interpretation.
- CO3: Report and present the original results in an orderly way and placing the open questions in the right perspective.
- CO4: Link techniques and results from literature as well as actual research and future research lines with the research.
- CO5: Appreciate practical implications and constraints of the specialist subject

### Guidelines

In Project Work Stage–II, the student shall complete the remaining project work which consists of Selection of Technology and Tools, Installations, UML implementations, testing, Results, performance discussions using data tables per parameter considered for the improvement with existing/known algorithms/systems and comparative analysis and validation of results and conclusions. The student shall prepare and submit the report of Project work in standard format for satisfactory completion of the work that is duly certified by the concerned guide and head of the Department/Institute

**Follow guidelines and formats as mentioned in Project Workbook recommended by Board of Studies**

**Faculty of Engineering  
Savitribai Phule Pune University, Pune**



**Syllabus**

**Master of Computer Engineering  
(Course 2017)**

**(with effect from Year 2017-18 )**

**Savitribai Phule Pune University, Pune**  
**Master of Computer Engineering (2017 Course)**  
(with effect from June 2017)

**Semester I**

Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks					Credit	
		Theory	Practical	In-Sem	End-Sem	TW	OR/PRE	Total	TH	PR
510101	<a href="#">Research Methodology</a>	04	--	50	50	--	--	100	04	--
510102	<a href="#">Bio-Inspired Optimization Algorithms</a>	04	--	50	50	--	--	100	04	--
510103	<a href="#">Software Development and Version Control</a>	04	--	50	50	--	--	100	04	--
510104	<a href="#">Embedded and Real Time Operating Systems</a>	04	--	50	50	--	--	100	04	--
510105	<a href="#">Elective I</a>	05	--	50	50	--	--	100	05	-
510106	<a href="#">Laboratory Proficiency I</a>	--	08	--	--	50	50	100	--	04
<b>Total Credit</b>									21	04
<b>Total</b>		<b>21</b>	<b>08</b>	<b>250</b>	<b>250</b>	<b>50</b>	<b>50</b>	<b>600</b>	<b>25</b>	
510107	<a href="#">Non-Credit Course I</a>								Grade	
<b><u>Elective I</u></b>										
510105A	<a href="#">Advanced Digital Signal Processing</a>			510105B	<a href="#">Data Mining</a>					
510105C	<a href="#">Network Design and Analysis</a>			510105D	<a href="#">Data Algorithms</a>					
510105E	Open Elective									

**Semester II**

Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks					Credit	
		Theory	Practical	In-Sem	End-Sem	TW	OR/PRE	Total	TH	PR
510108	<a href="#">Operations Research</a>	04	--	50	50	--	--	100	04	--
510109	<a href="#">System Simulation and Modeling</a>	04	--	50	50	--	--	100	04	--
510110	<a href="#">Machine Learning</a>	04	--	50	50	--	--	100	04	--
510111	<a href="#">Elective II</a>	05	--	50	50	--	--	100	05	--
510112	<a href="#">Seminar I</a>		04	--	--	50	50	100	--	04
510113	<a href="#">Laboratory Proficiency II</a>	--	08	--	--	50	50	100	--	04
<b>Total Credit</b>									17	08
<b>Total</b>		<b>17</b>	<b>12</b>	<b>200</b>	<b>200</b>	<b>100</b>	<b>100</b>	<b>600</b>	<b>25</b>	
510114	<a href="#">Non-Credit Course II</a>								Grade	
<b><u>Elective II</u></b>										
510111A	<a href="#">Image Processing</a>			510111B	<a href="#">Web Mining</a>					
510111C	<a href="#">Pervasive and Ubiquitous Computing</a>			510111D	<a href="#">Network Security</a>					
510111E	Open Elective									

**Abbreviations:** **TW:** Term Work , **TH:** Theory, **OR:** Oral, **PRE:** Presentation, **Sem:** Semester

Savitribai Phule Pune University, Pune										
Master of Computer Engineering (2017 Course)										
<u>Semester III</u>										
Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks					Credit	
		Theory	Practical	In-Sem	End-Sem	TW	OR/PRE	Total	TH	PR
610101	<a href="#">Fault Tolerant Systems</a>	04	--	50	50	--	--	100	04	--
610102	<a href="#">Information Retrieval</a>	04	--	50	50	--	--	100	04	--
610103	<a href="#">Elective III</a>	05	--	50	50	--	--	100	05	--
610104	<a href="#">Seminar II</a>	--	04	--	--	50	50	100	--	04
610105	<a href="#">Dissertation Stage I</a>	--	08	--	--	50	50	100	--	08
<b>Total Credit</b>									13	12
<b>Total</b>		<b>13</b>	<b>12</b>	<b>150</b>	<b>150</b>	<b>100</b>	<b>100</b>	<b>500</b>	<b>25</b>	
610106	<a href="#">Non-Credit Course III</a>								Grade	
<u>Elective III</u>										
610103A	<a href="#">Cloud Security</a>	610103B		<a href="#">Speech Signal Processing</a>						
610103C	<a href="#">Mobile Ad-hoc Network</a>	610103D		<a href="#">Pattern Recognition</a>			610103E Open Elective			
<u>Semester IV</u>										
Course Code	Course	Teaching Scheme Hours / Week		Examination Scheme and Marks			Credit			
		Practical		TW	OR/PRE	Total	PR			
610107	<a href="#">Seminar III</a>	05		50	50	100	05			
610108	<a href="#">Dissertation Stage II</a>	20		150	50	200	20			
<b>Total</b>		<b>25</b>		<b>200</b>	<b>100</b>	<b>300</b>	<b>25</b>			
<u>Non-Credit Courses</u>										
Typically curriculum is constituted by credit, non-credit and audit courses. These courses are offered as compulsory or elective. Non Credit Courses are compulsory. No grade points are associated with non-credit courses and are not accounted in the calculation of the performance indices SGPA & CGPA. However, the award of the degree is subject to obtain a PP grade for non credit courses. Conduction and assessment of performance in said course is to be done at institute level. The mode of the conduction and assessment can be decided by respective course instructor. Recommended but not limited to- (one or combination of) seminar, workshop, MOOC Course certification, mini project, lab assignments, lab/oral/written examination, field visit, field training. Examinee should submit report/journal of the same. Reports and documents of conduction and assessment in appropriate format are to be maintained at institute. <u>Result of assessment will be PP or NP</u> . Set of non-credit courses offered is provided. The Examinee has to select the relevant course from pool of courses offered. Course Instructor may offer beyond this list by seeking recommendation from SPPU authority. The selection of 3 distinct non-credit courses, one per semester (Semester I, II & III). The <a href="#">Contents of Non Credit Courses</a> are Provided at page 63 onwards.										
<u>Open Elective:</u> The open elective is to invite the attention to multidisciplinary, interdisciplinary, exotic, employability or update to technology course. The institute may design the syllabus accordingly. However such designed syllabus needs to be approved by SPPU authority before implementation.										
<b>Recommended Set of Non-Credit Courses(510107, 510114, 610106):</b>										
<b>NCC1: <a href="#">Game Engineering</a></b>				<b>NCC2: Advanced Cognitive Computing</b>						
<b>NCC3: Reconfigurable Systems</b>				<b>NCC4: Convergence Technology</b>						
<b>NCC5: Machine Learning</b>				<b>NCC6: Storage Area Networks</b>						
<b>NCC7: Search Engine Optimization</b>				<b>NCC8: Virtual Reality</b>						
<b>NCC9: Machine Translation</b>				<b>NCC10: Infrastructure Management</b>						

<b>Savitribai Phule Pune University</b> <b>Master of Computer Engineering (2017 Course)</b> <b>610105 : Dissertation Stage I</b>		
<b>Teaching Scheme:</b> <b>Practical: 08 Hrs/week</b>	<b>Credit</b> <b>08</b>	<b>Examination Scheme:</b> <b>TW: 50 Marks</b> <b>Presentation: 50 Marks</b>
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• To identify the domain of research</li> <li>• To learn to communicate in a scientific language through collaboration with guide.</li> <li>• To understand the various means of technical publications and terminologies associated with publications</li> <li>• To categorize the research material confined to the domain of choice</li> <li>• To formulate research problem with the help of the guide/mentor elaborating the research.</li> <li>• To Acquire information independently and assessing its relevance for answering the research questions.</li> </ul>		
<b>Course Outcomes:</b> On completion of the course the student should be able to- <ul style="list-style-type: none"> <li>• Conduct thorough literature survey confined to the domain of choice</li> <li>• Develop presentation skills to deliver the technical contents</li> <li>• Furnish the report of the technical research domain</li> <li>• Analyze the findings and work of various authors confined to the chosen domain</li> </ul>		
<p>Dissertation Stage – I is an integral part of the Dissertation work. In this, the student shall complete the partial work of the Dissertation which will consist of problem statement, literature review, design, scheme of implementation (Mathematical Model/SRS/UML/ERD/block diagram/ PERT chart,) and Layout &amp; Design of the Set-up.</p> <p>The student is expected to complete the dissertation at least up to the design phase. As a part of the progress report of Dissertation work Stage-I, the candidate shall deliver a presentation on the advancement in Technology pertaining to the selected dissertation topic. The student shall submit the duly approved and certified progress report of Dissertation Stage-I in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.</p> <p>The examiner will be assessed by a panel of examiners of which one is necessarily an external examiner. The assessment will be broadly based on literature study, work undergone, content delivery, presentation skills, documentation and report.</p> <p>The students are expected to validate their study undertaken by publishing it at standard platforms.</p> <p>The investigations and findings need to be validated appropriately at standard platforms – conference and/or peer reviewed journal.</p> <p>The student has to exhibit the continuous progress through regular reporting and presentations and proper documentation the frequency of the activities in the sole discretion of the PG coordination.</p> <p>The continuous assessment of the progress need to be documented unambiguously. For standardization and documentation, it is recommended to follow the formats and guidelines circulated / as in dissertation workbook approved by Board of Studies. Follow guidelines and formats as mentioned in Dissertation Workbook.</p>		

<b>Savitribai Phule Pune University</b> <b>Master of Computer Engineering (2017 Course)</b> <b>610108 : Dissertation Stage II</b>		
<b>Teaching Scheme:</b> <b>Practical: 20 Hrs/week</b>	<b>Credit</b> <b>20</b>	<b>Examination Scheme:</b> <b>TW: 150 Marks</b> <b>Presentation: 50 Marks</b>
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• To follow SDLC meticulously and meet the objectives of proposed work</li> <li>• To test rigorously before deployment of system</li> <li>• To validate the work undertaken</li> <li>• To consolidate the work as furnished report</li> </ul>		
<b>Course Outcomes:</b> On completion of the course the student shall be able to- <ul style="list-style-type: none"> <li>• Show evidence of independent investigation</li> <li>• Critically analyze the results and their interpretation ; infer findings</li> <li>• Report and present the original results in an orderly way and placing the open questions in the right perspective.</li> <li>• Link techniques and results from literature as well as actual research and future research lines with the research.</li> <li>• Appreciate practical implications and constraints of the specialist subject</li> </ul>		
<b>Guidelines:</b> In Dissertation Work Stage–II, the student shall consolidate and complete the remaining part of the dissertation which will consist of Selection of Technology, Installations, UML implementations, testing, Results, measuring performance, discussions using data tables per parameter considered for the improvement with existing/known algorithms/systems, comparative analysis, validation of results and conclusions. The student shall prepare the duly certified final report of Dissertation in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.  The students are expected to validate their study undertaken by publishing it at standard platforms.  The investigations and findings need to be validated appropriately at standard platforms – conference and/or peer reviewed journal.  The student has to exhibit the continuous progress through regular reporting and presentations and proper documentation the frequency of the activities in the sole discretion of the PG coordination.  The continuous assessment of the progress need to be documented unambiguously. <b><u>It is recommended to continue with guidelines and formats as mentioned in Dissertation Workbook approved by Board of Studies.</u></b>		

# Savitribai Phule Pune University, Pune



**Faculty of Science and Technology**

Board of Studies

**Electrical Engineering**

Syllabus

**Third Year Electrical Engineering**

**(2019 course)**

**(w.e.f. 2021-22)**

**Savitribai Phule Pune University, Pune**  
**Syllabus: Third Year (TE) Electrical Engineering (2019 course)**  
**(w.e.f 2021-22)**

**SEMESTER-I**

Course code	Course Name	Teaching Scheme				Examination Scheme						Credit				
		Th	Pr	Tu	SEM /PW /IN	ISE	ESE	TW	PR	OR	Total	Th	Pr	Tu	SEM /PW /IN	Total
303141	<u>Industrial and Technology Management</u>	3	0	0	0	30	70	0	0	0	100	3	0	0	0	3
303142	<u>Power Electronics</u>	3	4#	0	0	30	70	0	50	0	150	3	2	0	0	5
303143	<u>Electrical Machines-II</u>	3	2	0	0	30	70	25	25	0	150	3	1	0	0	4
303144	<u>Electrical Installation Design and Condition Based Maintenance</u>	3	4#	0	0	30	70	25	0	25	150	3	2	0	0	5
303145	<u>Elective-I</u>	3	0	0	0	30	70	0	0	0	100	3	0	0	0	3
303146	<u>Seminar</u>	0	0	0	1	0	0	50	0	0	50	0	0	0	1	1
303147	<u>Audit course-V</u>	2*	0	0	0	0	0	0	0	0	0	GRADE: PP/NP				0
<b>Total</b>		<b>15</b>	<b>10</b>	<b>0</b>	<b>1</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>75</b>	<b>25</b>	<b>700</b>	<b>15</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>21</b>

**303145: Elective-I**

**303147 : Audit Course-V**

303145A : Advanced Microcontroller and Embedded System

303147A : Energy storage systems

303145B : Digital Signal Processing

303147B : Start-up & Disruptive innovation

303145C : Open Elective

**SEMESTER-II**

Course code	Course Name	Teaching Scheme				Examination Scheme						Credit				
		Th	Pr	Tu	SEM /PW /IN	ISE	ESE	TW	PR	OR	Total	Th	Pr	Tu	SEM /PW /IN	Total
303148	<u>Power System-II</u>	3	2	1	0	30	70	25	50	0	175	3	1	1	0	5
303149	<u>Computer Aided Design of Electrical Machines</u>	3	4#	0	0	30	70	50	0	25	175	3	2	0	0	5
303150	<u>Control System Engineering</u>	3	2\$	1\$	0	30	70	25	0	25	150	3	1	0	0	4
303151	<u>Elective-II</u>	3	0	0	0	30	70	0	0	0	100	3	0	0	0	3
303152	<u>Internship</u>	0	0	0	4	0	0	100	0	0	100	0	0	0	4	4
303153	<u>Audit Course VI</u>	2*	0	0	0	0	0	0	0	0	0	GRADE: PP/NP				0
<b>Total</b>		<b>12</b>	<b>8</b>	<b>2</b>	<b>4</b>	<b>120</b>	<b>280</b>	<b>200</b>	<b>50</b>	<b>50</b>	<b>700</b>	<b>12</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>21</b>

**303151: Elective-II**

**303153 : Audit Course-VI**

303151A : IoT and its Applications in Electrical Engineering

303153A: Ethical Practices for Engineers

303151B : Electrical Mobility

303153B : Project Management

303151C: Cybernetic Engineering

303151D: Energy Management

#Practical consists of Part A & part B. PART A; Regular experiments & part B; to bridge the gap between theory & actual industrial practices. For subject 303144; there will be auto cad drawing on Electrical installation, Electrical wiring, cabling etc. For 303149, Part A, Regular drawing by hand & part B same drawing by AutoCAD.

\$ tutorial credit merged with Practical.

\* Conduct over and above these lectures.

## 303152: Internship

Teaching Scheme			Credits		Examination Scheme	
IN	04	Hr/Week	IN	04	TW	100 Marks

### Preamble

Internship is a short-term industrial working experience for the students. The internship aims at providing entry-level exposure to a particular industry. It is expected that students should spend time working on relevant projects or part of the project and acquire learning about the field, along with developing industry connections, and employability skills.

### Course Objectives:

1. Encourage and provide opportunities to the students to acquire professional learning experiences.
2. Empower students to relate and then apply the theoretical knowledge in real-life industrial situations.
3. Provide exposure for handling and using various tools, measuring instruments, meters, and technologies used in industries.
4. Enable students to develop professional and employability skills and expand their professional network.
5. Empower students to apply the internship learnings to the academic courses and project completions.
6. Impart professional and societal ethics in students through the internship.
7. Make students aware of social, economic, and administrative aspects influencing the working environment of the industry.

### Course Outcomes: At the end of this course, student will be able to

<b>CO1</b>	Understand the working culture and environment of the Industry and get familiar with various departments and practices in the industry.
<b>CO2</b>	Operate various meters, measuring instruments, tools used in industry efficiently and develop technical competence.
<b>CO3</b>	Apply internship learning in other course completions and final year project management, i.e. topic finalization, project planning, hardware development, result interpretations, report writing, etc.
<b>CO4</b>	Create a professional network and learn about ethical, safety measures, and legal practices.
<b>CO5</b>	Appreciate the responsibility of a professional towards society and the environment.
<b>CO6</b>	Identify career goals and personal aspirations.

**Guidelines:** The guidelines related to the internship are given below.

**Duration:** Guidelines related to duration are as follows.

1. The internship should be started after semester 5 and should be completed before the commencement of semester 6.
2. It should be for at least 4 to 6 weeks.
3. It should be assessed and evaluated in semester 6.

### 2. Internship Identification:

A student may choose to undergo an Internship at Industries, Government organizations, NGOs, Micro-Small-Medium enterprises, startups, Innovation and Incubation Centers, Institutes of National interests, organizations working for rural development, organizations promoting IPR and Entrepreneurship, etc. Approaching various industries for Internships and finalizing the same should be initiated in the 5<sup>th</sup> semester in consultation with Institute's Training and Placement Cell, Industry-Institute Cell, or Internship Cell. This will help students to start their internship work on time. Also, it will allow students to work in a vacation period after their 5<sup>th</sup>-semester examination and before the start of the 6<sup>th</sup> semester. Student can take internship work in the form of Online/Onsite work from any

of the following but not limited to:

1. Working for consultancy or the funded research project of the institute/Department.
2. Contributing at Incubation, Innovation, Entrepreneurship Cell, Institutional Innovation Council, Start-up Cell of Institute where students will get learning opportunities on projects.
3. Learning at Departmental Lab leading to lab development and modernization, Tinkering Lab, Institutional workshop for prototyping and model development, etc.
4. Working at Industry or Government Organization on project or part of the project.
5. Internship through Internshala, AICTE, Government initiatives, etc.
6. In-house product or working model development, intercollegiate, inter-department research under research lab or research group, etc.
7. Working at micro-small-medium enterprises on solving their specific problems.
8. Research internship under professors at IISc, IIT's, NIT's, Research organizations, etc.
9. Working with NGOs or Social Internships, Rural Internship, etc.

Further, other internship opportunities should be discussed and finalized in consultation with Department/Institute constituted committees for Internship.

### 3. Internship Record Book:

Students must maintain an Internship record book. The main purpose of maintaining a record book is to nurture the habit of documenting and keeping records by students. The students should maintain the record of daily activities completed which may include, field visits, important discussions, observations, project work completed, suggestions received, etc. The record book should be signed every day by the supervisor or in-charge where the student is undergoing an internship. The internship record book and well-drafted Internship Report should be submitted by the students to the department faculty coordinator within a week after the completion of the internship.

### 4. Internship Evaluation:

The evaluation of activities recorded in the Internship Record Book will be done by Program Head, Cell In-charge, Project Head, faculty mentor, or Industry Supervisor based on the overall compilation of internship activities, sub-activities, the level of achievement expected, and the duration for certain activities. Assessment and Evaluation are to be done in consultation with the internship supervisors (Internal from the institute and External from industry).

### 5. Evaluation and Assessment of Internship:

Internship Record Book – 25 Marks + Internship Report - 25 Marks + Post Internship Internal Evaluation-50 Marks = Total 100 Marks

**5.1 Internship Record Book:** The attendance record of the student along with the evaluation sheet, duly signed and stamped by the industry should be submitted by the industry Supervisor or Mentor to the Institute/Department after the completion of the internship. The internship record book may be evaluated based on the following criteria:

- Proper and timely documented entries
- Adequacy and quality of information
- Data, observations, discussions recorded
- Thought process and recording techniques used
- Organization of the information

**5.2 Internship Report:** After completion of the Internship, the student should prepare a comprehensive report to indicate what he/she has observed and learned in the internship period. The report shall be presented covering the following recommended fields but not limited to:

- Title/Cover Page
- Internship certificate with details like company name, location, duration, supervisor, etc.
- Institute Certificate
- Declaration
- Abstract
- Index/Table of Contents
- List of Figures/Tables
- **Chapter 1:** Introduction: Brief about company, industry or organization, objectives, motivation, organization of the report
- **Chapter 2:** Problem Identification/Problem statement/objectives and scope/expected outcomes
- **Chapter 3:** Methodological details
- **Chapter 4:** Results / Analysis /inferences and conclusion
- **Chapter 5:** Suggestions/Recommendations for improvement to industry, if any
- Attendance Record
- Acknowledgement
- List of reference (Library books, magazines, and other sources)

**5.3 Post Internship Internal Evaluation:** The student will give a presentation based on his Internship report before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

1. Internship Identification and Selection
2. Problem Studied with objectives and expected outcomes
3. Consideration of Environment/ Social /Ethics/ Safety measures/Legal aspects.
4. Methodology/System/Procedure Q&A
5. Block-diagram, flow-chart, algorithm, system description Q&A
6. Final results, discussions, suggestions, comments, etc. Q&A
7. Presentation and Communication

**6. Feedback from internship supervisor (External and Internal)**

Post internship, the faculty Internship coordinator should collect feedback about the student on the following suggested parameters from Industry Supervisor.

- Technical knowledge,
- Discipline and Punctuality,
- Work Commitment,
- Willingness to do the work,
- Communication skills, etc.

# **SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE**



**Faculty of Science and Technology**

**Board of Studies**

**Electrical Engineering**

**Syllabus**

**Final Year Electrical Engineering  
(2019 Course)  
(w.e.f. 2022-2023)**

## BE Electrical (2019 Course)

### SEM-I

Course Code	Course Name	Teaching Scheme				Examination Scheme						Credit				
		Th	Pr	Tu	PW	ISE	ESE	TW	PR	OR	Total	Th	Pr	Tu	PW	Total
403141	Power System Operation & Control	3	2	–	–	30	70	25	–	25	150	3	1	–	–	4
403142	Advanced Control System	3	2	–	–	30	70	–	–	50	150	3	1	–	–	4
403143	Elective-I	3	2	–	–	30	70	–	–	25	125	3	1	–	–	4
403144	Elective-II	3	–	2*	–	30	70	25	–	–	125	3	–	1	–	4
403145	Project Stage-I	–	–	–	4	–	–	50	–	50	100	–	–	–	2	2
403146	MOOCs	–	–	–	–	–	–	50	–	–	50	–	–	–	2	2
403147	Audit Course-VII	2#	–	–	–	–	–	–	–	–	–	–	–	–	–	–
<b>Total</b>		<b>12</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>120</b>	<b>280</b>	<b>150</b>	<b>–</b>	<b>150</b>	<b>700</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>20</b>
<b>403143: Elective-I</b>					<b>403144: Elective-II</b>						<b>403147: Audit Course-VII</b>					
403143A: PLC and SCADA 403143B: Power Quality Management 403143C: High Voltage Engineering 403143D: Robotics and Automation					403144A : Alternate Energy System 403144B : Electrical & Hybrid Vehicle 403144C : Special-purpose Machines 403144D: HVDC & FACTS						403147 A: German Language I 403147B: Engineering Economics I 403147C: Sustainability(IGBC)					

### SEM-II

Course Code	Course Name	Teaching Scheme				Examination Scheme						Credit				
		Th	Pr	Tu	PW	ISE	ESE	TW	PR	OR	Total	Th	Pr	Tu	PW	Total
403148	Switchgear and Protection	3	2	–	–	30	70	25	–	50	175	3	1	–	–	4
403149	Advanced Electrical Drives & Control	3	2	–	–	30	70	25	50	–	175	3	1	–	–	4
403150	Elective-III	3	–	–	–	30	70	–	–	–	100	3	–	–	–	3
403151	Elective-IV	3	–	–	–	30	70	–	–	–	100	3	–	–	–	3
403152	Project stage II	–	–	–	12	–	–	100	–	50	150	–	–	–	6	6
403153	Audit course VIII	2#	–	–	–	–	–	–	–	–	–	–	–	–	–	–
<b>Total</b>		<b>12</b>	<b>4</b>	<b>–</b>	<b>12</b>	<b>120</b>	<b>280</b>	<b>150</b>	<b>50</b>	<b>100</b>	<b>700</b>	<b>12</b>	<b>2</b>	<b>–</b>	<b>6</b>	<b>20</b>
<b>403150: Elective-III</b>					<b>403151: Elective-IV</b>						<b>403153: Audit Course-VIII</b>					
403150 A : Digital Control System 403150 B : Restructuring and Deregulation 403 150 C: Smart Grid 403150 D: SensorTechnology (Open Elective)					403151A: EHV AC Transmission 403151B : Illumination Engineering 403151C: Electromagnetic Fields 403151D: AI and ML (Open Elective)						403153A: German Language II 403153B: Engineering Economics II 403153C: Green Building					

\* For the tutorial, one credit is given. # Audit Course: Conduct over and above these lectures.

## 403145: Project Stage I

Teaching Scheme			Credits		Examination Scheme	
SEM/P W/IN	4	Hrs./Week	SEM/PW/IN	2	ORAL	50
					Term work	50

### Preamble:

Project is an important part of the engineering curriculum covered in the final year. It is divided into Project Stage I and Project Stage II at Semesters I and II of the Final Year. This project is a substantial piece of work that will require creative activity and original thinking. The project aims to provide students with a transitional experience from the academic world to the professional world. The objectives, outcomes, and guidelines for Project Stage I are given below.

### Course Objectives:

The objectives of this course are to:

1. Provide an opportunity to learn new software, interdisciplinary theory, concepts, technology, etc. not covered in earlier subjects.
2. Empower students to use engineering knowledge and skills learned in previous courses to deliver a product that has passed through the design, analysis, testing, and evaluation.
3. Encourage multidisciplinary project work through the integration of knowledge.
4. Allow students to develop problem-solving, analysis, synthesis, and evaluation skills.
5. Encourage teamwork.
6. Improve students' communication skills by asking them to produce both a professional report and to give an oral presentation.

### Course Outcomes:

Course outcomes can be different for the different projects undertaken by the student groups. However, in general, the course outcomes for Project Stage-I can be stated as follows.

At the end of this course, students should be able to:

CO1: Define the project problem statement and identify the scope of the project.

CO2: Search the appropriate research papers, standards and e-resources and write a literature survey.

CO3: Identify tools, techniques, methods, concepts, measuring devices, and instruments required for the project to define the methodology of the project.

CO4: Justify the selection of electrical, electronic and mechanical components for the project prototyping

CO5: Simulate or develop a system for software or hardware verification.

CO6: Write a project report with proper interpretation of results.

### Guidelines for students:

1. Form a group of 3-4 students.
2. Select a project problem statement based on an industrial or societal issue and ideate on it.
3. Research on the project topic through existing theories, literature, technology, patents, etc.
4. Define objectives, scope, and outcomes of the project in the 1st presentation.
5. Maintain a notebook to keep records of all the meetings, discussions, notes, etc. This is to be done by the individual student.
6. Some of the parameters mentioned in the above table will be evaluated and assessed at the group

level and some at an individual level.

## Guidelines:

Term work evaluation guidelines are given below.

Sr. No.	Activity	Deadline (Semester I)	Parameters for Evaluation
1.	Topic Approval Presentations	Up to 3 <sup>rd</sup> Week	<ul style="list-style-type: none"> <li>● Problem definition clearly stated (YES/NO)</li> <li>● Objectives clearly defined (YES/NO)</li> <li>● The overall project idea is feasible (YES/NO)</li> </ul>
2.	Progress Review-1 Presentation	Up to 8 <sup>th</sup> Week	<ul style="list-style-type: none"> <li>● Problem Definition (5)</li> <li>● Scope &amp; Objectives (10)</li> <li>● Literature Review (10)</li> <li>● Methodology (10)</li> <li>● Block Diagram / Architecture (10)</li> <li>● <u>Project Planning (5)</u></li> <li>● <b>Total Marks (50)</b></li> </ul>
3.	Progress Review-2 Presentation	Up to 12 <sup>th</sup> Week	<ul style="list-style-type: none"> <li>● Requirement Specification (10)</li> <li>● Literature Review (revised) (5)</li> <li>● Detailed Design (10)</li> <li>● Experimental Setup/Simulation (10)</li> <li>● Performance Parameters (10)</li> <li>● <u>Partial Conclusion (5)</u></li> <li>● <b>Total Marks (50)</b></li> </ul>
4.	Submission of Project Stage –I Report	Up to 14 <sup>th</sup> Week	<ul style="list-style-type: none"> <li>● Timely submission (5)</li> <li>● Formatting and Report Writing Style (5)</li> <li>● Abstract, Literature Survey, Conclusion (5)</li> <li>● Refereed References (5)</li> <li>● <u>Grammatical correctness in the report (5)</u></li> <li>● <b>Total Marks (25)</b></li> </ul> <p><b>(Review 1+ Review 2) conversion to 25 marks +Report (25 marks) = 50 Marks</b></p>

## 403152: Project Stage II

Teaching Scheme			Credits		Examination Scheme	
SEM/P W/IN	12	Hrs./Week	SEM/PW/IN	6	ORAL	50
					Termwork	100

### Preamble:

Project is an important part of the engineering curriculum covered in the final year. It is divided into Project Stage I and Project Stage II in Semesters I and II of the Final Year. This project is a substantial piece of work that will require creative activity and original thinking. The project aims to provide students with a transitional experience from the academic world to the professional world. The objectives, outcomes, and guidelines for Project Stage II are given below.

### Course Objectives:

The objectives of this course are to:

1. Provide an opportunity to learn new software, interdisciplinary theory, concept, technology, etc. not covered in earlier subjects
2. Empower students to use engineering knowledge and skills learned in previous courses to deliver a product that has passed through the design, analysis, testing, and evaluation
3. Encourage multidisciplinary project work through the integration of knowledge
4. Allow students to develop problem-solving, analysis, synthesis, and evaluation skills.
5. Encourage teamwork.
6. Improve students' communication skills by asking them to produce both a professional report and to give an oral presentation
7. Exposed to the project management skills and ethical practices in project

### Course Outcomes:

Course outcomes can be different for the different projects undertaken by the student groups. However, in general, the course outcomes for Project Stage-II can be stated as follows.

At the end of this course, students should be able to:

CO1: Identify tools, techniques, methods, concepts, measuring devices, and instruments required for the project to define the methodology of the project

CO2: Justify the selection of electrical, electronic and mechanical components for the project prototyping

CO3: Select the appropriate testing method for system performance evaluation

CO4: Interpret results obtained by simulation, and hardware implementation and decide on further action or write a conclusion

CO5: Write a project report and research paper on the project work

### Guidelines:

Termwork evaluation guidelines are given below.

Sr. No.	Activity	Deadline (Semester II)	Parameters for Evaluation
1	Progress Review- 3 Presentation	Up to 6 <sup>th</sup> Week	Revised Final Design (10) Tools and Techniques Used with justification (10) Partial Implementation/ development (15) Partial Results (15)

			<b>Total Marks (50)</b>
2	Progress Review- 4 Presentation	Up to 12 <sup>th</sup> Week	Implementation Status of project (10) Testing and Evaluation (10) Intermediate Results (15) Conclusion (10) <u>Future Scope (5)</u> <b>Total Marks (50)</b>
3	Submission of Project Stage –II Report	Up to 14 <sup>th</sup> Week	Timely submission (5) Formatting and Report Writing Style (5) Abstract, Literature Survey, Conclusion (10) Grammatical correctness in the report (5) <u>Publication/participation in project exhibition (20)</u> <b>Total Marks (50)</b>  <b>Review 3+ Review 4+ Final Project Report = 150 Rounded to 100 Marks</b>

**Guidelines to students:**

1. Continue with the same group and identify opportunities for self-learning and upgrading skills.
2. Actively participate in all the activities related to the project.
3. Document the project in the form of a hard-bound report at the end and submit it to the department.
4. Attempt to make a prototype, working model, and demonstration of the project to display during the final presentation.
5. Participate in project competitions, paper presentations, etc.
6. Maintain an institutional culture of authentic collaboration, self-motivation, peer learning, and personal responsibility.
7. Maintain a notebook to keep records of all the meetings, discussions, notes, etc. This is to be done by the individual student and submitted at the end to the supervisor or guide.
8. Some parameters, mentioned in the above table, will be evaluated and assessed at a group level and some at an individual level.

**Savitribai Phule Pune University**  
**Faculty of Science and Technology**



**Syllabus for**

**T.E (Electronics & Telecommunication Engineering)**

**(Course 2019)**

**(w.e.f. June 2021)**

**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 &	-	-	-	-	-	-	-	-	-	-	-	-	-
<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 E & Tc Engineering (2019 Course)**

**304199: Internship**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
**	<b>04</b>	<b>Term Work: 100 Marks</b>

**Course Objective:**

- Will expose technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry.
- Provide possible opportunities to learn, understand and sharpen the real time technical / managerial skills required at the job.
- Exposure to the current technological developments relevant to the subject area of training.
- Experience gained from the ‘**Internship**’ will be used in classroom discussions.
- Create conditions conducive to quest for knowledge and its applicability on the job.
- Learn to apply the Technical knowledge in real industrial situations.
- Gain experience in writing Technical reports/projects.
- Expose students to the engineer’s responsibilities and ethics.
- Familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
- Promote academic, professional and/or personal development.
- Expose the students to future employers.
- Understand the social, economic and administrative considerations that influence the working environment of industrial organizations.
- Understand the psychology of the workers and their habits, attitudes and approach to problem solving.

**Course Outcomes:** On completion of the internship, learner will be able to –

**CO1:** To develop professional competence through internship.

**CO2:** To apply academic knowledge in a personal and professional environment.

**CO3:** To build the professional network and expose students to future employees.

**CO4:** Apply professional and societal ethics in their day to day life.

**CO5:** To become a responsible professional having social, economic and administrative considerations.

**CO6:** To make own career goals and personal aspirations.

Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as the employers are looking for employees who are properly skilled and having awareness about industry environment,

practices and culture. Internship is structured, short-term, supervised training 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.

Engineering internships are intended to provide students with an opportunity to apply theoretical knowledge from academics to the realities of the field work/training. The following guidelines are proposed to give academic credit for the internship undergone as a part of the Third Year Engineering curriculum.

#### **A. Duration:**

Internship to be completed after semester 5 and before commencement of semester 6 of at least 4 to 6 weeks; and it is to be assessed and evaluated in semester 6.

#### **B. Framework of Internship:**

- ✓ Students are required to be involved in Inter/ Intra Institutional Activities viz; Training with higher Institutions.
- ✓ Soft skill training organized by Training and Placement Cell of the respective institutions; contribution at incubation/ innovation /entrepreneurship cell of the institute; participation in conferences/ workshops/ competitions etc.
- ✓ Learning at Departmental Lab/ Tinkering Lab/ Institutional workshop.
- ✓ During the vacation after 5<sup>th</sup> semester, students are ready for industrial experience. Therefore, they may choose to undergo Internship / Innovation / Entrepreneurship related activities.
- ✓ Students 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.
- ✓ Every student is required to prepare a file containing documentary proofs of the activities done by him. The evaluation of these activities will be done by Programmed Head / Cell In-charge / Project Head / TPO / faculty mentor or Industry Supervisor.

#### **C. Internship Guidelines:**

##### **a) Guidelines to the Institute:**

Department will arrange internship for students in industries / organization after fifth semester or as per AICTE/ affiliating University guidelines & managing internships. The general procedure for arranging internship is given below:

**Step 1:** Request Letter/ Email should go to industry to allot various slots of 4-6 weeks as internship periods for the students. Students request letter /profile / interest areas may be submitted to industries for their willingness for providing the training.

**Step 2:** Industry will confirm the training slots and the number of seats allocated for internships via Confirmation Letter/ Email. In case the students arrange the training themselves the confirmation letter will be submitted by the students.

**Step 3:** Students on joining Training at the concerned Industry / Organization, submit the Joining Report/ Letters / Email.

**Step 4:** Students undergo industrial training at the concerned Industry / Organization. In-between Faculty Member(s) evaluate(s) the performance of students once/twice by visiting the Industry/Organization and Evaluation Report of the students is submitted in department.

**Step 5:** Students will submit training report after completion of internship.

**Step 6:** Training Certificate to be obtained from industry.

**Step 7:** List of students who have completed their internship successfully will be issued by Training and Placement Cell.

**b) Guidelines to the students:**

Any absenteeism by students during their internship should be informed immediately to the mentor/reporting manager and the internal guide. No special considerations will be accepted. Students cannot take leave for college work or fest activities. The leave permission for any college related activities will be solely approved by the HOD. The monthly attendance format should be duly submitted to the internal guide by the intern.

**c) Internal reporting Guidelines:**

Every intern should send weekly report to their internal guide without fail. It is mandatory for the intern to send weekly reports to their respective guide on regular basis. Interns should have at least fortnightly verbal communication with the internal guide without fail. In cases where in the company wants to secure their confidential information in the project / internship report, the internal guide should duly co-ordinate with the respective mentor/reporting manager on the method of reporting to assure that no information will be leaked outside and is purely for academic purposes.

**d) Internship Diary / Internship Workbook:**

Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary account of the observations, impressions, information gathered and

suggestions given, if any. The training diary/workbook should be signed after every day by the supervisor/ in charge of the section where the student has been working.

Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training. Internship Diary / workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries.
- Adequacy & quality of information recorded
- Data recorded.
- Thought process and recording techniques used.
- Organization of the information.

**e) Internship Work Evaluation:**

Every student is required to prepare a maintain documentary proofs of the activities done by him / her as internship diary or as workbook. 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.

Assessment and Evaluation is to be done in consultation with internship supervisor (Internal and External - a supervisor from place of internship).

**f) Evaluation through Seminar presentation / Viva-voce at the institute:**

The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

- ✓ Depth of knowledge and skills Communication & Presentation Skills.
- ✓ Team Work
- ✓ Creativity
- ✓ Planning & Organizational skills
- ✓ Adaptability and Analytical Skills
- ✓ Attitude & behavior at work.
- ✓ Societal Understanding
- ✓ Ethics
- ✓ Regularity and punctuality
- ✓ Attendance record
- ✓ Log book
- ✓ Student's Feedback from External Internship Supervisor

**g) Internship Report:**

The report shall be presented covering following recommended fields but limited to:

- Title/Cover Page
- Internship completion certificate.
- Internship Place Details- Company background-organization and activities/Scope and object of the study / personal observation.
- Index/Table of Contents
- Introduction
- Title/Problem statement/objectives
- Motivation/Scope and rationale of the study
- Methodological details
- Results / Analysis /inferences and conclusion
- Suggestions / Recommendations for improvement to industry, if any
- Attendance Record
- List of reference (Library books, magazines and other sources)

**h) Feedback from internship supervisor (External and Internal):**

Post internship, faculty coordinator should collect feedback about student with following recommended parameters:

- ✓ Technical knowledge
- ✓ Discipline
- ✓ Punctuality
- ✓ Commitment
- ✓ Willingness to do the work
- ✓ Communication skill
- ✓ Individual work
- ✓ Team work
- ✓ Leadership

**Savitribai Phule Pune University**

**Faculty of Science and Technology**



**Syllabus for**

**B.E (Electronics & Telecommunication Engineering)**

**(Course 2019)**

**(w.e.f. June 2022)**

**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>-</b>	<b>-</b>	<b>-</b>	<b>-</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**

**Fourth Year of E & Tc Engineering (2019 Course)**

**404188: Project Phase – I**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Practical: 02 Hrs. / Week</b>	<b>01</b>	<b>Term Work: 50 Marks</b>

**Course Objectives:**

- To understand the basic concepts & broad principles of projects.
- To understand the value of achieving perfection in project implementation & completion.
- To apply the theoretical concepts to solve real life problems with teamwork and Multidisciplinary approach.
- To demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.

**Course Outcomes:**

**CO1: Demonstrate** a sound technical knowledge in field of E&TC in the form of project.

**CO2: Undertake** real life problem identification, formulation and solution.

**CO3: Design** engineering solutions to complex problems utilizing a systematic approach.

**CO4: Demonstrate** the knowledge, effective communication skills and attitudes as professional engineer.

Project phase 1 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 in the field of Electronics and communication where the student likes to acquire specialized skills. The student shall prepare the duly certified Fourth report of project work in standard format for satisfactory completion of the work by the concerned guide and head of the Department/Institute.

**Guidelines:**

1. **Group Size:** The student shall carry the project work individually or by a group of students. Optimum group size shall be 3 students. However, if project complexity demands a maximum group size of 4 students, the project committee should be convinced about such complexity and scope of the work. Projects selected should meet and contribute towards the needs of the society.
2. **Selection and approval of topic:** Topic should be related to real life application in the field of Electronics and Telecommunication engineering.
3. **The topic may be based on :** Investigation of the latest development in a specific field of Electronics or Communication / The investigation of practical problem in manufacture and / or testing of electronics or communication equipment/ Software based projects related to VHDL, Communication, Instrumentation, Signal Processing agriculture Engineering etc. with the justification for techniques used / any topic in the field of E&TC may be allowed.
4. **Interdisciplinary projects** should be encouraged. The examination of Interdisciplinary projects shall be conducted independently in respective departments.
5. **The term work assessment of project phase 1** shall be based on Innovative Idea of selected project, literature survey, Depth of understanding, Applications, Individual contributions, presentation, project report, timely completion of work.
6. **The department** should prepare project planner and should follow accordingly
7. **A log book of work** carried out during the semester should be maintained with weekly review remarks by the guide and committee.
8. **A certified copy of report** preferably using LATEX is required to be presented to external examiner at the time of Fourth examination.
9. **The project report** must undergo by plagiarism check and the similarity index must be less than 15%. The plagiarism report should be included in the project report.

**Savitribai Phule Pune University**

**Fourth Year of E & Tc Engineering (2019 Course)**

**404197: Project Phase – II**

<b>Teaching Scheme:</b>	<b>Credit</b>	<b>Examination Scheme:</b>
<b>Practical: 10 Hrs. / Week</b>	<b>05</b>	<b>Term Work: 100 Marks</b>
		<b>Oral: 50 Marks</b>

Project phase 2 is extension of Project phase 1 carried out in seventh semester. The student shall prepare the duly certified Fourth report of project work in standard format preferably in LATEX for satisfactory completion of the work by the concerned guide and head of the Department/Institute.

**GUIDELINES**

1.	The project TW/OR assessment shall be based on Live Project Demonstration and presentation by the students. The assessment parameters shall be Innovative Idea of selected project, literature survey, Depth of understanding, Applications, Individual contributions, presentations, project report, timely completion of work (Project review presentations), participation in project competition, publication of research work in journal/conference, publication in the form of patent and copyright etc. The college can prepare the rubrics based on these parameters
2.	Certified hard bound project report to be submitted by the students in prescribed format.
3.	Students must preferably publish at least one technical paper on project work in the conference or peer reviewed Journals or publish patent or copyright or should participate into one of the project competition at university/State/National/International level.
4.	A log book of work carried out during the semester should be maintained with weekly review remarks by the guide and committee.
5.	A certified copy of report preferably using LATEX is required to be presented to external examiner at the time of Fourth examination.
6.	The project report must undergo by plagiarism check and the similarity index must be less than 10%. The plagiarism report should be included in the project report.

# 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 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>														

**302055: Internship/Mini project**

Teaching Scheme**		Credits	Examination Scheme	
		04	TW	100 Marks

**Prerequisites:** Knowledge of design, manufacturing processes, modeling, and mechanical systems

**Course Objectives:**

Internship provides an excellent opportunity to learner to see understand the conceptual aspects learned in classes and deployed into the practical world. Industry/on project experience provides much more professional experience as value addition to classroom teaching.

1. To encourage and provide opportunities for students to get professional/personal experience through internships.
2. To learn and understand real life/industrial situations.
3. To get familiar with various tools and technologies used in industries and their applications.
4. To nurture professional and societal ethics.
5. To create awareness of social, economic and administrative considerations in the working environment of industry organizations.

**Course Outcomes:**

On completion of the course, learners should be able to

- CO1. **DEMONSTRATE** professional competence through industry internship.
- CO2. **APPLY** knowledge gained through internships to complete academic activities in a professional manner.
- CO3. **CHOOSE** appropriate technology and tools to solve given problem.
- CO4. **DEMONSTRATE** abilities of a responsible professional and use ethical practices in day to day life.
- CO5. **DEVELOP** network and social circle, and **DEVELOPING** relationships with industry people.
- CO6. **ANALYZE** various career opportunities and **DECIDE** career goals.

**\*\*Guidelines:**

Internships are educational and career development opportunities, providing practical experience in a field or discipline. Internships are far more important as the employers are looking for employees who are properly skilled and having awareness about industry environment, practices and culture. Internship is structured, short-term, supervised training 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.

Engineering internships are intended to provide students with an opportunity to apply conceptual knowledge from academics to the realities of the field work/training. The following guidelines are proposed to give academic credit for the internship undergone as a part of the Third Year Engineering curriculum.

<b>Duration:</b>
Internship is to be completed after semester 5 and before commencement of semester 6 of at least 4 to 6 weeks; and it is to be assessed and evaluated in semester 6.
<b>Internship work Identification:</b>
<p>Student may choose to undergo Internship at Industry/Govt. Organizations/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.</p> <p>Students must get Internship proposals sanctioned from college authority well in advance. Internship work identification process should be initiated in the Vth semester in coordination with training and placement cell/ industry institute cell/ internship cell. This will help students to start their internship work on time. Also, it will allow students to work in vacation period after their Vth semester examination and before academic schedule of semester VI.</p> <p>Student can take internship work in the form of the following but not limited to:</p> <ol style="list-style-type: none"> <li>1. Working for consultancy/ research project,</li> <li>2. Contribution in Incubation/ Innovation/ Entrepreneurship Cell/ Institutional Innovation Council/ startups cells of institute /</li> <li>3. Learning at Departmental Lab/Tinkering Lab/ Institutional workshop,</li> <li>4. Development of new product/ Business Plan/ registration of start-up,</li> <li>5. Industry / Government Organization Internship,</li> <li>6. Internship through Internshala,</li> <li>7. In-house product development, intercollegiate, inter department research internship under research lab/group, micro/small/medium enterprise/online internship,</li> <li>8. Research internship under professors, IISC, IIT's, Research organizations,</li> <li>9. NGOs or Social Internships, rural internship,</li> <li>10. Participate in open source development.</li> </ol>
<b>Internship Diary/ Internship Workbook:</b>
<p>Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary the day-to-day account of the observations, impressions, information gathered and suggestions given, if any. The training diary/workbook should be signed every day by the supervisor.</p> <p>Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.</p>
<b>Internship Work Evaluation:</b>
<p>Every student is required to prepare and maintain documentary proofs of the activities done by him as internship diary or as workbook. The evaluation of these activities will be done by Program 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.</p> <p>Assessment and Evaluation is to be done in consultation with internship supervisor (Internal and External – a supervisor from place of internship).</p>

Recommended evaluation parameters-Post Internship Internal Evaluation -50 Marks + Internship Diary/Workbook and Internship Report - 50 Marks

### **Evaluation through Seminar Presentation/Viva-Voce at the Institute**

The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

- Depth of knowledge and skills
- Communication & Presentation Skills
- Team Work and Creativity
- Planning & Organizational skills
- Adaptability
- Analytical Skills
- Attitude & Behavior at work
- Societal Understanding
- Ethics
- Regularity and punctuality
- Attendance record
- Diary/Workbook
- Student's Feedback from External Internship Supervisor

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period.

Internship Diary/workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries
- Adequacy & quality of information recorded
- Data recorded
- Thought process and recording techniques used
- Organization of the information

The report shall be presented covering following recommended fields but limited to,

- Title/Cover Page
- Internship completion certificate
- Internship Place Details- Company background-organization and activities/Scope and object of the study / Supervisor details
- Index/Table of Contents
- Introduction
- Title/Problem statement/objectives
- Motivation/Scope and rationale of the study
- Methodological details
- Results / Analysis /inferences and conclusion
- Suggestions / Recommendations for improvement to industry, if any
- Attendance Record
- Acknowledgement
- List of reference (Library books, magazines and other sources)

**Feedback from internship supervisor(External and Internal)**

Post internship, faculty coordinator should collect feedback about student with recommended parameters include as- Technical knowledge, Discipline, Punctuality, Commitment, Willingness to do the work, Communication skill, individual work, Team work, Leadership...

**Reference:**

1. <https://www.aicte-india.org/sites/default/files/AICTE%20Internship%20Policy.pdf>
2. <https://internship.aicte-india.org/>

**IMPORTANT NOTE:**

The student shall be encouraged to undertake the industrial internships however the Industry may provide opportunity to a limited few amongst the students available. In such scenario it becomes the moral responsibility of the faculty to create opportunity for such group of students (similar to the ones in Industry) by assigning them some real life problem as a part of the mini project and encouraging/mentoring them to attempt viable solutions. Hence the provision of Mini project is being done to accommodate such students and expose them with the Industrial practices in house. The students can be encouraged to consider analysis of the global patents available as a mini project,

Mini project					
Teaching Scheme		Credits		Examination Scheme	
Practical	4 Hrs./Week	Practical	4	Term work	100

**Course Objectives:**

Students shall UNDERTAKE and EXECUTE a Mini Project through a group of students to

1. **UNDERSTAND** the “Product Development Cycle”, through Mini Project.
2. **PLAN** for various activities of the project and distribute the work amongst team members.
3. **LEARN** budget planning for the project.
4. **INCULCATE** mechanical/interdisciplinary implementation skills.
5. **DEVELOP** students’ abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Mini Project.
6. **UNDERSTAND** the importance of document design by compiling Technical Report on the Mini Project work carried out.

**Course Outcomes:**

On completion of the course, learner will be able to

- CO1. **EXPLAIN** plan and execute a Mini Project with team.
- CO2. **IMPLEMENT** hardware/software/analytical/numerical techniques, etc.
- CO3. **DEVELOP** a technical report based on the Mini project.
- CO4. **DELIVER** technical seminar based on the Mini Project work carried out.

Course Contents					
<p><b>Maximum Group Size:</b> Minimum 2 and maximum 4 students can form a group for the mini project.</p> <p><b>Project Type: (The selected mini project must be based on any of the following)</b></p> <ol style="list-style-type: none"> <li>1. Development of a prototype mechanical system/product.</li> <li>2. Investigate performance of mechanical systems using experimental method</li> </ol>					

3. Parametric analysis of components/systems/devices using suitable software
4. Investigation of optimum process/material for product development using market survey.
5. Solution for society/industry problems

The Assessment Scheme will be:

- a. **Continuous Assessment 50 marks** (*based on regular interaction, circuit development*)
- b. **End Semester 50 marks** (*based on poster presentation, demonstration / Seminar*)

**Project domain may be from the following, but not limited to:**

1. Thermal Systems
2. Robotics Mechanisms/design systems
3. Production/advance manufacturing
4. Materials: Composite/Nano
5. Automation and Control Systems
6. Mechatronic Systems
7. Agriculture system.
8. Smart systems using AI-ML

**A project report with following contents shall be prepared:**

1. Title
2. Objectives
3. Relevance and significance
4. Methodology
5. Analysis-Simulation/experimentation/survey/testing etc.
6. Result and Discussion
7. Conclusion

# 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 2022-23)**

**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
<a href="#">402054</a>	Audit Course VII <sup>s</sup>	-	-	-	-	-	-	-	-	-	-	-	-	NC
<b>Total</b>		<b>14</b>	<b>12</b>	<b>-</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
<a href="#">402055</a>	Audit Course VIII <sup>s</sup>	-	-	-	-	-	-	-	-	-	-	-	-	NC
<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							
<b>Audit Courses</b>														
<a href="#">402054A</a>	Yoga Practices					<a href="#">402054B</a>	Stress Management							
<a href="#">402055A</a>	Managing Innovation					<a href="#">402055B</a>	Operations Management							

**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.

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

<b>402047: Project (Stage I)</b>					
<b>Teaching Scheme</b>		<b>Credits</b>		<b>Examination Scheme</b>	
<b>Practical</b>	<b>4 Hrs./Week</b>	<b>Practical</b>	<b>2</b>	<b>Term Work</b>	<b>50 Marks</b>
				<b>Oral</b>	<b>50 Marks</b>
<b>Prerequisites:</b> Project Based Learning, Internship/Mini Project, Laboratory works, Skill Development, Audit Courses, Industrial Visits					
<b>Course Objectives:</b>					
<ol style="list-style-type: none"> <li>1. To provide an opportunity of designing and building complete system or subsystems based on areas where the student likes to acquire specialized skills.</li> <li>2. To obtain hands-on experience in converting a small novel idea / technique into a working model / prototype involving multi-disciplinary skills.</li> <li>3. To embed the skill in a group of students to work independently on a topic/ problem/ experimentation selected by them and encourage them to think independently on their own to bring out the conclusion under the given circumstances of the curriculum period in the budget provided with the guidance of the faculty.</li> <li>4. To encourage creative thinking processes to help them to get confidence by planning and carrying out the work plan of the project and to successfully complete the same, through observations, discussions and decision making process.</li> </ol>					
<b>Course Outcomes:</b>					
On completion of the course the learner will be able to; <ol style="list-style-type: none"> <li>CO1. <b>IMPLEMENT</b> systems approach.</li> <li>CO2. <b>CONCEPTUALIZE</b> a novel idea / technique into a product.</li> <li>CO3. <b>THINK</b> in terms of a multi-disciplinary environment.</li> <li>CO4. <b>TAKE ON</b> the challenges of teamwork, and <b>DOCUMENT</b> all aspects of design work.</li> <li>CO5. <b>UNDERSTAND</b> the management techniques of implementing a project.</li> <li>CO6. <b>DEMONSTRATE</b> the final product for Functionality, Designability, and Manufacturability.</li> </ol>					
<b>Course Contents</b>					
Project work in the seventh semester is an integral part of the Term 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. <ol style="list-style-type: none"> <li>1. Fabrication of product/testing setup of an experimentation unit/small equipment, in a group.</li> <li>2. Experimental verification of principles used in Mechanical Engineering Applications</li> </ol>					

3. Projects having valid database, algorithm, and output reports, preferably software based.
4. Study projects are strictly **not** allowed.

### **Project Lab**

1. There has to be a **Project Lab** in the department.
  - a. It consists of necessary tools required to do a project.
  - b. Previous projects and their components.
  - c. Common measuring instruments.
  - d. Previous years' project reports.
  - e. Project related books and Publications.
  - f. Proper linkage with central workshop and various laboratories.
  - g. Safety measures.
  
2. All the project activities must be handled with a digital platform which is developed in the department according to the policies laid down by the institution. Respective authority levels to be created to maintain the transparency and confidentiality of the process. (ERP)

### **Books and other resources**

#### **Web References:**

1. SWAYAM-NPTEL Course.
2. MOOCs' Courses.

### **Guidelines for Project Execution**

#### **At the end of the VI<sup>th</sup> Semester**

1. A group of 3-4 students shall be formed according to their suitability.
2. Department faculty will float prospective Project Titles through Project Coordinator.
3. Department will take care of a list of titles at least two times of the groups.
4. Students will interact with guides for scope and outline of the project.
5. Maximum of two groups will be given to a guide.
6. Guide and Project groups will be finalized at the end of sixth semester so that project work can be started at the start of Seventh semester.

#### **During the VII<sup>th</sup> Semester**

1. Project work is expected to be done in the Project Lab.
2. Projects must be executed in association with industrial experts/facilities.
3. Progress of project work is monitored regularly on weekly project slots/project day.
4. Regular interval presentations are to be arranged to review and assess the work.
5. Project work is monitored and continuous assessment is done by guide and authorities.

### **Term Work**

- 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.
- 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.
- The term work under project submitted by students shall include work Diary;  
Work Diary to be maintained by a group and countersigned by the guide (weekly). The contents of work diary shall reflect the efforts taken by project group for;
  - a. Searching suitable project work
  - b. Brief report preferably on journals/research or conference papers/books or literature surveyed to select and bring up the project.
  - c. Brief report of feasibility studies carried to implement the conclusion.
  - d. Rough Sketches/ Design Calculations
  - e. Synopsis
- The group should submit the synopsis in the following form.
  - i. Title of Project
  - ii. Names of Students
  - iii. Name of Guide
  - iv. Relevance
  - v. Present Theory and Practices
  - vi. Proposed work
  - vii. Expenditure
  - viii. References
- The synopsis shall be signed by each student in the group, approved by the guide (along with external guide in case of sponsored projects) and endorsed by the Head of the Department.
- Presentation: The group has to make a presentation in front of the faculty of department at the end of semester.

#### Examination Scheme

- During university examination Internal examiner (preferably the guide) and External examiners jointly, evaluate the project work.
- During the process of monitoring and continuous assessment & evaluation the individual and team performance is to be measured.
- The project term work shall be evaluated on the basis of reviews. In first semester two reviews are to be taken and evaluated for total 50 marks (25 marks each)
- Review 1 and 2 will be based on synopsis submission (team members, Title of the Project Work, Abstract, Problem Definition, work done earlier, Objectives of the Project, Methodology of the Project, Application / Significance of the Project, Duration of the Project, Individual Role of the Student, References, sponsored etc.)
- The final presentation shall be taken in front of external examiner and to be evaluated for 50 marks
  - 20 marks for presentation (Oral, Written)
  - 30 marks for quality of the project work

<b>Project Report</b>
<ul style="list-style-type: none"><li>● Stage I report shall be in the booklet form</li><li>● Plagiarism check is must, and certificate shall be attached in the report</li></ul>
<b>References:</b> <ul style="list-style-type: none"><li>● References format MUST BE STANDARD – ASME, SAE or IEEE</li></ul>






SPPUQuestionPapers.com

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

<b>402053: Project (Stage II)</b>					
<b>Teaching Scheme</b>		<b>Credits</b>		<b>Examination Scheme</b>	
<b>Practical</b>	<b>10 Hrs./Week</b>	<b>Practical</b>	<b>5</b>	<b>Term Work</b>	<b>100 Marks</b>
				<b>Oral</b>	<b>50 Marks</b>
<b>Prerequisites:</b> Project Based Learning, Internship/Mini Project, Laboratory works, Skill Development, Audit Courses, Industrial Visits, Project (Stage I)					
<b>Project Stage II is the extension of Project Stage I.</b>					
<b>Course Objectives, Course Outcomes, Course Contents and Guidelines for Project Execution are same as that of Project Stage I</b>					
<b>Term Work Evaluation</b>					
<ol style="list-style-type: none"> <li>1. In Project Stage II, two reviews shall be taken for total 100 marks (50 marks each)</li> <li>2. Review III shall be based on the approximate end of fabrication / design validation etc. in front of an expert panel from the department.</li> <li>3. Review IV shall be third party evaluation by Faculty/Student/Industry person/Alumni</li> <li>4. Evaluation committee shall consist of Guide, One Industry person and One Faculty appointed by the Institution.</li> <li>5. Students shall be encouraged to publish a research paper/patent/technical note. Their credential shall be considered while term work evaluation.</li> </ol>					
<b>Examination Scheme</b>					
<ol style="list-style-type: none"> <li>1. Examination committee shall consist of Internal Examiner and External Examiner appointed by University. (External Examiner shall be a competent Industry/Research/Laboratory person. A list shall be provided by Board of Studies)</li> <li>2. Well in advance soft copies of the project shall be shared with examination committee.</li> </ol>					
<b>Presentation of Project Work</b>					
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. Team members with guide information shall be added at the end of the report.					

### **Project Report**

1. The report shall be both side print hard bound. A hardbound report shall be made after examination and examiner and guide's expected correction, before that report must be loosely bound.
2. Plagiarism check is must, and certificate shall be attached in the report.
3. A group activity shall be presented in report.
4. Report copies shall be submitted in the department, one for university and one for supervisor.
5. For standardization of the project reports the following format shall be strictly followed.  
Page size: Trimmed A4  
Top Margin: 1"  
Bottom Margin: 1.32"  
Left Margin: 1.5"  
Right Margin: 1"  
Para Text: Times New Roman 12-point font  
Line Spacing: 1.15 Lines  
Page Numbers: Right aligned at footer. Font 12 point Times New Roman  
Headings: Times New Roman, 14 Points, Boldface 10.

### **Certificate**

1. All students shall attach a standard format of Certificate as described by the department.
2. Certificates shall be awarded to project groups and not individual students of the group.
3. Certificates shall have signatures of Guide, External Examiner, HOD and Principal.

### **Index of Report**

1. Title Sheet
2. Certificate (Institution)
3. Certificate (Company, if sponsored by company)
4. Acknowledgement
5. Abstract of the Project
6. List of Figures
7. List of Photographs / Plates
8. List of Tables
9. Table of Contents
10. Introduction
11. Literature Survey / Theory
12. Design / Experimentation / Fabrication / Production / Actual work carried out for the same
13. Observation Results
14. Discussion on Result and Conclusion
15. Student and Guide details. (A common photograph with project)

**UNIVERSITY OF PUNE, PUNE**

**Structure and Syllabus**

**FOR**

**M. E. (Mechanical) (Design Engineering)  
2017- Course**



**UNDER FACULTY OF ENGINEERING**

**EFFECTIVE FROM JULY 2017**

# University of Pune

## M.E. Mechanical Engineering (Design Engineering) - 2017 Course

### SEMESTER I

CODE	SUBJECT	TEACHING SCHEME	EXAMINATION SCHEME					CREDITS	
			Lect./ Pr	Paper		TW	Oral/ Presentation		Total
				In Semester Assessment	End Semester Assessment				
507201	Advanced Mathematics@	4	50	50	-	-	100	4	
502202	Material Science and Mechanical Behavior of Materials	4	50	50	-	-	100	4	
502203	Advanced Stress Analysis	4	50	50	-	-	100	4	
502104	Research Methodology	4	50	50	-	-	100	4	
502205	Elective I**	5	50	50	-	-	100	5	
502206	Lab Practice I	4			50	50	100	4	
<b>Total</b>		25	250	250	50	50	600	25	

### SEMESTER II

CODE	SUBJECT	TEACHING SCHEME	EXAMINATION SCHEME					CREDITS	
			Lect./ Pr	Paper		TW	Oral/ Presentation		Total
				In Semester Assessment	End Semester Assessment				
502207	Analysis and Synthesis of Mechanisms	4	50	50	-	-	100	4	
502208	Advanced Mechanical Vibrations	4	50	50	-	-	100	4	
502209	Finite Element Method	4	50	50	-	-	100	4	
502210	Elective II	5	50	50	-	-	100	5	
502211	Lab Practice II	4	-	-	50	50	100	4	
502212	Seminar I	4	-	-	50	50	100	4	
<b>Total</b>		25	200	200	100	100	600	25	

**Note:**

**Elective I\*\*:** Common to All M.E. Mechanical Specializations

@ Syllabus is common with Automotive Engineering. Hence End Semester examination paper will be same.

# University of Pune

## SEMESTER III

CODE	SUBJECT	TEACHING SCHEME	EXAMINATION SCHEME					CREDITS
		Lect./ Pr	Paper		TW	Oral/ Presentation	Total	
			In Semester Assessment	End Semester Assessment				
602213	Optimization Techniques	4	50	50	-	-	100	4
602214	Mechanical Measurements and Controls	4	50	50	-	-	100	4
602215	Elective III	5	50	50	-	-	100	5
602216	Seminar II	4	-	-	50	50	100	4
602217	Project Stage I	08	-	-	50	50	100	8
<b>Total</b>		25	150	150	100	100	500	25

## SEMESTER IV

CODE	SUBJECT	TEACHING SCHEME	EXAMINATION SCHEME				CREDITS	
		Lect./ Pr	Paper		TW	Oral/ presentation		Total
602218	Seminar III	5	-	-	50	50	100	5
602219	Project Work Stage II	20	-	-	150	50	200	20
<b>Total</b>		25	-	-	200	100	300	25

### Lab Practice I & II:

The laboratory work will be based on completion of assignments confined to the courses of that semester.

### SEMINAR:

The student shall deliver the seminar on a topic approved by authorities.

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

**Seminar II :** shall be on the topic relevant to latest trends in the field of concerned branch, preferably on the topic of specialization based on the electives selected by him/her approved by authority. The student shall submit the seminar report in standard format, duly certified for satisfactory completion of the work by the concerned Guide and head of the department/institute.

**Seminar III:** shall be extension of **seminar II**. The student shall submit the seminar report in standard format, duly certified 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 coursework 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 Stage – I**

Project work Stage – I is the integral part of the project Work. In this, the student shall complete the partial work of the Project that will consist of problem statement, literature review, project overview, scheme of implementation (UML/ERD/block diagram/ PERT chart, etc.) and Layout & Design of the Set-up. The candidate shall deliver a presentation as a part of the progress report of Project work Stage-I, on the advancement in Technology pertaining to the selected dissertation topic.

The student shall submit the progress report of Project Work Stage-I in standard format duly certified for satisfactory completion of the work by the concerned guide and head of the department/Institute.

### **Project Work Stage - II**

In Project Work Stage – II, the student shall complete the balance part of the Project that will consist of fabrication of set up required for the project, conducting experiments and taking results, analysis & validation of results and conclusions.

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

**Note:** Institute must submit the list of candidates, guide and project details (title, area, problem definition, and abstract - clearly indicating objectives and scope, sponsorship details, if any) to the university within month of commencement of third semester. The guide must be approved/qualified teacher of the institute. A guide can guide at the most 8 students per year.

## Project Stage – I and II [602217, 602219]

CODE	TEACHING SCHEME	EXAMINATION SCHEME					CREDITS
	Lect/Week	Paper		TW	Oral/ Presentation	Total	
		In Semester Assessment	End Semester Assessment				
602217	8	-	-	50	50	100	8
602219	20	-	-	150	50	200	20

**Assessment of Project stage-I has to be carried out as per R-1.4 and R-1.5 of PG Rules and Regulations of Credit System.**

### INSTRUCTIONS FOR DISSERTATION WRITING

It is important that the procedures listed below be carefully followed by all the students of M.E. (Mechanical Engineering).

1. Prepare **Three Hard Bound Copies** of your manuscript.
2. Limit your Dissertation report to 80 – 120 pages (preferably)
3. The footer must include the following:  
Institute Name, M.E. (Mechanical) (Design Engineering) Times New Roman 10 pt. and centrally aligned.
4. Page number as second line of footer, Times New Roman 10 Pt, centrally aligned.
5. Print the manuscript using
  - a. Letter quality computer printing.
  - b. The main part of manuscript should be Times New Roman 12 pt. with alignment - justified.
  - c. Use 1.5 line spacing.
  - d. Entire report shall be of 5- 7 chapters.
6. Use the paper size **8.5'' × 11''** or **A4 (210 × 197 mm)**. Please follow the margins given below.

Margin Location	Paper 8.5'' × 11''	Paper A4 (210 × 197 mm)
Top	1''	25.4 mm
Left	1.5''	37 mm
Bottom	1.25''	32 mm
Right	1''	25.4 mm

7. All paragraphs will be 1.5 line spaced with a one blank line between each paragraph. Each paragraph will begin with without any indentation.
8. Section titles should be bold with 14 pt typed in all capital letters and should be left aligned.
9. Sub-Section headings should be aligning at the left with 12 pt, bold and Title Case (the first letter of each word is to be capitalized).
10. Illustrations (charts, drawings, photographs, figures) are to be in the text. Use only illustrations really pertinent to the text. Illustrations must be sharp, clear, **black and white**. **Illustrations downloaded from internet are not acceptable.**
  - a. Illustrations should not be more than **two** per page. One could be ideal
  - b. Figure No. and Title at bottom with **12 pt**

- c. Legends below the title in **10 pt**
  - d. Leave proper margin in all sides
  - e. Illustrations as far as possible should not be photo copied.
11. **Photographs** if any should of glossy prints
  12. Please use **SI** system of units only.
  13. Please **number the pages** on the front side, centrally below the footer
  14. **References** should be either in order as they appear in the thesis or in alphabetical order by last name of first author
  15. **Symbols** and **notations** if any should be included in nomenclature section only
  16. Following will be the order of report
    - i. **Cover page** and **Front page** as per the specimen on separate sheet
    - ii. **Certificate** from the Institute as per the specimen on separate sheet
    - iii. **Acknowledgements**
    - iv. **List of Figures**
    - v. **List of Tables**
    - vi. **Nomenclature**
    - vii. **Contents**
    - viii. **Abstract** (A brief abstract of the report not more than **150 words**. The heading of abstract i.e. word “Abstract” should be **bold, Times New Roman, 12 pt** and should be typed at the **centre**. The contents of abstract should be typed on new line without space between heading and contents. Try to include one or two sentences each on **motive, method, key-results** and **conclusions** in Abstract
      - 1 **Introduction** (2-3 pages) (TNR – 14 Bold)
        - 1.1 Problem statement (TNR – 12)
        - 1.2 Objectives
        - 1.3 Scope
        - 1.4 Methodology
        - 1.5 Organization of Dissertation
      - 2 **Literature Review** (20-30 pages)  
Discuss the work done so far by researchers in the domain area and their significant conclusions. No derivations, figures, tables, graphs are expected.
      - 3 This chapter shall be based on your own simulation work (Analytical/ Numerical/FEM/CFD) (15- 20 pages)
      - 4 Experimental Validation - This chapter shall be based on your own experimental work (15-20 pages)
      - 5 **Concluding Remarks and Scope for the Future Work** (2-3 pages)
  17. All section headings and subheadings should be numbered. For sections use numbers **1, 2, 3, ....** and for subheadings **1.1, 1.2, ....** etc and section subheadings **2.1.1, 2.1.2, ....** etc.
  18. **References** should be given in the body of the text and well spread. No verbatim copy or excessive text from only one or two references. If **figures** and **tables** are taken from any reference then indicate source of it. Please follow the following procedure for references
    - Reference Books**  
Collier, G. J. and Thome, J. R., Convective boiling and condensation, 3<sup>rd</sup> ed., Oxford University Press, UK, 1996, pp. 110 – 112.

## **Papers from Journal or Transactions**

Jung, D. S. and Rademacher, R., Transport properties and surface tension of pure and mixed refrigerants, *ASHRAE Trans*, 1991, 97 (1), pp. 90 – 98.

Bansal, P. K., Rupasinghe, A. S. and Jain, A. S., An empirical correction for sizing capillary tubes, *Int. Journal of Refrigeration*, 1996, 19 (8), pp.497 – 505.

## **Papers from Conference Proceedings**

Colbourne, D. and Ritter, T. J., *Quantitative assessment of flammable refrigerants in room air conditioners*, Proc. of the Sixteenth International Compressor Engineering Conference and Ninth International Refrigeration and Air Conditioning Conference, Purdue University, West Lafayette, Indiana, USA, 2002, pp. 34 – 40.

## **Reports, Handbooks etc.**

United Nations Environmental Programme, Report of the Refrigeration, Air Conditioning and Heat Pumps, Technical Option Committee, 2002, Assessment - 2002.

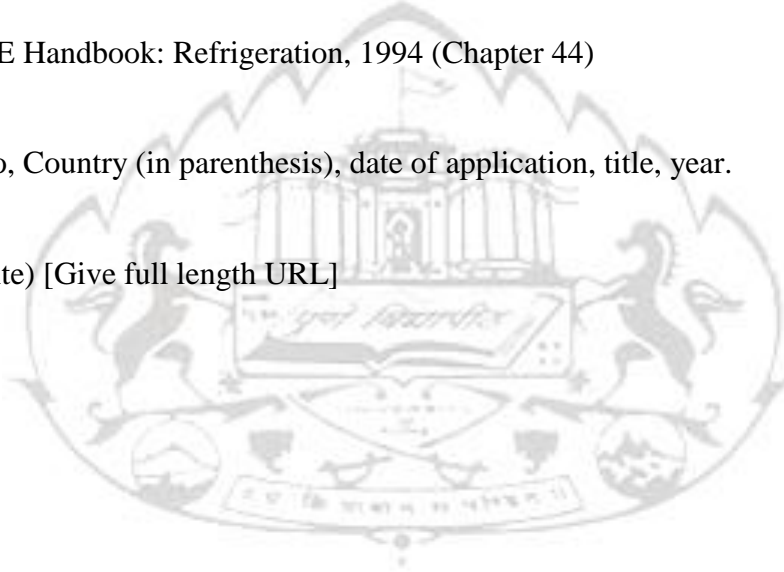
ASHRAE Handbook: Refrigeration, 1994 (Chapter 44)

## **Patent**

Patent no, Country (in parenthesis), date of application, title, year.

## **Internet**

www.(Site) [Give full length URL]



A Project Stage-I Report on (TNR, 16pt, centrally aligned)

**Title (TNR, 27pt, Bold, Centrally Aligned, Title Case)**

By (TNR, 16pt, Centrally Aligned)

**Mr. Student's Name**(TNR, 16pt, Centrally Aligned)

Guide

**Guide's Name** (TNR, 16pt, Centrally Aligned)

**Institute**

**Logo**

Department of Mechanical Engineering

**Name of the Institute**

[2011-12](TNR, 22pt, Title Case Centrally Aligned)

Name of the Institute

Institute

Logo

## CERTIFICATE

This is to certify that *Mr.* ....., has successfully completed the Project Stage-I entitled “Performance analysis of.....” under my supervision, in the partial fulfilment of Master of Engineering (Mechanical) (Design Engineering) of University of Pune.

Date :

Place :

Guide’s Name  
Guide

\_\_\_\_\_  
Head  
Department and  
Institute Name

External Examiner

Seal

\_\_\_\_\_  
Principal,  
Institute Name

A Dissertation on (TNR, 16pt, centrally aligned)

**Title (TNR, 27pt, Bold, Centrally Aligned, Title Case)**

By (TNR, 16pt, Centrally Aligned)

**Mr. Student's Name** (TNR, 16pt, Centrally Aligned)

Guide

**Guide's Name** (TNR, 16pt, Centrally Aligned)

Institute

Logo

Department of Mechanical Engineering

**Name of the Institute**

[2011-12](TNR, 22pt, Title Case Centrally Aligned)

Name of the Institute

Institute

Logo

## CERTIFICATE

This is to certify that ....., has successfully completed the Dissertation entitled “Performance analysis of...” under my supervision, in the partial fulfilment of Master of Engineering (Mechanical) (Design Engineering) of University of Pune.

Date :

Place :

Guide's Name  
Guide

\_\_\_\_\_  
Head  
Department and  
Institute Name

External Examiner

Seal

\_\_\_\_\_  
Principal,  
Institute Name

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**Master of Business Administration (MBA) – Revised Syllabus 2019**

**2 year, 4 Semester Full time Programme  
Choice Based Credit System (CBCS) and Grading System  
Outcome Based Education Pattern**

MBA I effective from AY 2019-20

MBA II effective from AY 2020-21

**1.0 Preamble:** The revised MBA Curriculum 2019 builds on the implementation of the Choice Based Credit System (CBCS) and Grading System initiated in the AY 2013. The curriculum takes the MBA programme to the next level in terms of implementing Outcome Based Education along with the Choice Based Credit System (CBCS) and Grading System.

**2.0 Definitions:**

**2.1 Outcome Based Education:**

**2.1.1 Outcome Based Education (OBE) Approach:** Outcomes are about performance, and this implies:

- a) There must be a performer – the student (learner), not only the teacher
- b) There must be something performable (thus demonstrable or assessable) to perform
- c) The focus is on the performance, not the activity or task to be performed

**2.1.2 Programme Educational Objectives (PEOs):** Programme Educational Objectives are a set of **broad future-focused student performance outcomes** that explicitly identify what students will be **able to do with what they have learned**, and **what they will be like** after they leave school and are **living full and productive lives**. Thus PEOs are what the programme is preparing graduates for in their **career and professional life** (to attain within a **few years** after graduation<sup>1</sup>).

**2.1.3 Graduate Attributes (GAs):** Graduate Attributes (GAs) are the **qualities, knowledge and capabilities** that students are encouraged to take responsibility for developing throughout their studies and are the **defining characteristics** of the students passing out of the MBA program. These attributes include, but go **beyond, the disciplinary expertise or technical knowledge**.

**2.1.4 Programme Outcomes (POs):** Programme Outcomes are a set of **narrow statements** that describes what students (learners) **of the programme** are expected to know and be able to perform or attain **by the time of graduation**.

**2.1.5 Programme Specific Outcomes (PSOs):** Programme Outcomes are a set of **narrow statements** that describes what students (learners) **of a particular specialization of the programme** are expected to know and be able to perform or attain **by the time of graduation**. PSOs are also a function of the various course combinations offered by the Institute.

**2.1.6 Learning Outcomes:** A learning outcome is what a student **CAN DO** as a result of a learning experience. It describes a **specific task** that he/she is able to perform at a **given level of competence under a certain situation**. The three broad types of learning outcomes are:

- a) Disciplinary knowledge and skills
- b) Generic skills
- c) Attitudes and values

**2.1.7 Course Outcomes (COs):** A set of specific statements that describes the **complex performances** a student should be capable of as a result of **learning experiences within a course**.

**2.1.8 Teaching and Learning Activities (TLAs):** The set of **pedagogical tools and techniques** or the teaching and learning activities that aim to **help students to attain** the intended learning outcomes and engage them in these learning activities through the teaching process.

**2.1.9 Outcome Based Assessment (OBA):** An assessment system that asks course teachers to first identify what it is that we expect students to be able to do once they have completed a course or program. It then asks course teachers to provide evidence that they are able to do so. In other words, how will each learning outcome be assessed? What **evidence of student learning** is most **relevant for each learning outcome** and **what standard or criteria** will be used to evaluate that evidence? Assessment is therefore a key part of outcome-based education and used to determine whether or not a qualification has been achieved.

**2.2 Credit:** *In terms of credits, for a period of one semester of 15 weeks:*

- a) *every ONE hour session per week of L amounts to 1 credit per semester*

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<sup>1</sup> Graduation refers to passing out of the MBA programme. Graduation does NOT refer to 10+2+3/4 degree e.g. BA, BE, etc.

b) a minimum of TWO hours per week of T amounts to 1 credit per semester,

c) a minimum of TWO hours per week of P amounts to 1 credit per semester,

Each credit is a combination of 3 components viz. Lecture (L) + Tutorials (T) + Practice (Practical / Project Work / Self Study) (P) i.e. LTP Pattern. Indicative LTP, for each course, is documented in the syllabus.

The course teacher may modify the LTP of the course in view of the course requirements, nature of the course, the level of learners and the type of pedagogy and assessment tools proposed. The modified LTP shall have to be approved by the Director / Head of the Department / Designated academic authority of the Institute.

**2.3 Session:** Each teaching-learning, evaluation session shall be of 60 minutes. However, institutes shall have the flexibility to define their time slots in a manner as to use their faculty and infrastructure resources in the best possible way and ensure effective learning.

**2.4 Course Announcement:** The institute shall announce the elective courses and specializations it proposes to offer the students out of the wider course basket. It is not mandatory to offer all the specializations and all the electives. The decision of the Director shall be final in this case. However, in the spirit of Choice Based Credit System, institutes should offer choices to the students for the elective courses and not offer only the minimum number of electives.

**2.5 Course Registration:** It is mandatory for every student, to register every semester, for the courses opted for that semester. Each student, on admission shall be assigned to a Faculty Advisor who shall advise her/him about the academic programs and counsel on the choice of courses considering the student's profile, career goals and courses taken in the earlier semesters. With the advice and consent of the Faculty Advisor, the student shall register for a set of courses he/she plans to take up for the Semester. Students shall have to register for the courses for the semester within first week of Semester I and immediately after conclusion of the preceding term for subsequent Semesters II, III and IV.

### 3.0 MBA Programme Focus:

#### 3.1 Programme Educational Objectives (PEOs):

- PEO1:** Graduates of the MBA program will *successfully integrate core, cross-functional and inter-disciplinary aspects of management theories, models and frameworks with the real world practices and the sector specific nuances to provide solutions to real world business, policy and social issues in a dynamic and complex world.*
- PEO2:** Graduates of the MBA program will possess excellent *communication skills, excel in cross-functional, multi-disciplinary, multi-cultural teams, and have an appreciation for local, domestic and global contexts so as to manage continuity, change, risk, ambiguity and complexity.*
- PEO3:** Graduates of the MBA program will be appreciative of the significance of *Indian ethos and values in managerial decision making and exhibit value centered leadership.*
- PEO4:** Graduates of the MBA program will be ready to *engage in successful career pursuits covering a broad spectrum of areas in corporate, non-profit organizations, public policy, entrepreneurial ventures and engage in life-long learning.*
- PEO5:** Graduates of the MBA program will be recognized in their chosen fields for their *managerial competence, creativity & innovation, integrity & sensitivity to local and global issues of social relevance and earn the trust & respect of others as inspiring, effective and ethical leaders, managers, entrepreneurs, intrapreneurs and change agents.*

#### 3.2 Programme Outcomes (POs): At the end of the MBA programme the learner will possess the

- Generic and Domain Knowledge** - Ability to articulate, illustrate, analyze, synthesize and apply the knowledge of principles and frameworks of management and allied domains to the solutions of real-world complex business issues
- Problem Solving & Innovation** - Ability to Identify, formulate and provide innovative solution frameworks to real world complex business and social problems by systematically applying modern quantitative and qualitative problem solving tools and techniques.
- Critical Thinking** - Ability to conduct investigation of multidimensional business problems using research based knowledge and research methods to arrive at data driven decisions

4. **Effective Communication** - Ability to effectively communicate in cross-cultural settings, in technology mediated environments, especially in the business context and with society at large
5. **Leadership and Team Work** - Ability to collaborate in an organizational context and across organizational boundaries and lead themselves and others in the achievement of organizational goals and optimize outcomes for all stakeholders.
6. **Global Orientation and Cross-Cultural Appreciation:** Ability to approach any relevant business issues from a global perspective and exhibit an appreciation of Cross Cultural aspects of business and management.
7. **Entrepreneurship** - Ability to identify entrepreneurial opportunities and leverage managerial & leadership skills for founding, leading & managing startups as well as professionalizing and growing family businesses.
8. **Environment and Sustainability** - Ability to demonstrate knowledge of and need for sustainable development and assess the impact of managerial decisions and business priorities on the societal, economic and environmental aspects.
9. **Social Responsiveness and Ethics** - Ability to exhibit a broad appreciation of the ethical and value underpinnings of managerial choices in a political, cross-cultural, globalized, digitized, socio-economic environment and distinguish between ethical and unethical behaviors & act with integrity.
10. **LifeLong Learning** – Ability to operate independently in new environment, acquire new knowledge and skills and assimilate them into the internalized knowledge and skills.

**3.3 Programme Specific Outcomes (PSOs):** It is expected that **Institutes define the PSOs for each specialization / major-minor combination.** PSOs shall also vary based upon the **customized combination** of Generic Core, Generic Elective, Subject Core, Subject Elective, Foundation, Enrichment & Alternative Study Credit Courses that they offer.

**3.4 Graduate Attributes (GAs):** At the end of the MBA programme the learner shall exhibit:

GA1: Managerial competence

GA2: Proficiency in Communication, Collaboration, Teamwork and Leadership

GA3: Competence in Creativity & Innovation

GA4: Research Aptitude, Scholarship & Enquiry

GA5: Global Orientation

GA6: Proficiency in ICT & Digital Literacy

GA7: Entrepreneurship & Intrapreneurship Orientation

GA8: Cross-functional & Inter-disciplinary Orientation

GA9: Results Orientation

GA10: Professionalism, Ethical, Values Oriented & Socially Responsible behaviour

GA11: Life-Long Learning Orientation

#### 4.0 MBA Programme Course Types & Evaluation Pattern:

Sr.No.	Course Type	Credits	Nature	Comprehensive Concurrent Evaluation (CCE)	End Semester Evaluation (ESE) Marks	Total Marks
<b>BASIC COURSE TYPES</b>						
1	Generic Core (GC)	3	Compulsory	50	50	100
2	Subject Core (SC)	3	Compulsory (Specialization specific)	50	50	100
3	Generic Elective (GE - UL)	2	Elective	0	50	50
4	Generic Elective (GE - IL)	2	Elective	50	0	50
5	Subject Elective (SE - IL)	2	Elective (Specialization specific)	50	0	50
6	Summer Internship Project (SIP)	6	Project (Compulsory)	50	50	100
<b>ADDITIONAL COURSE TYPES</b>						
1	Enrichment Courses (ENR)	1	Elective	25	0	25
2	Foundation Courses (FOU)	1	Elective	25	0	25

3	Alternative Study Credit Courses (ASCC)	2	Elective	50	0	50
4	Open Electives (OE)	3 or 2	Subject Core / Subject Elective	As per Subject Core / Subject Elective Pattern		

#### 4.1 Course Types

- 4.1.1 **Foundation Course:** These courses focus on developing the basic abilities that support the understanding of other courses.
- 4.1.2 **Core courses** are the compulsory courses for all the students. Core courses are of two types: Generic Core & Subject Core.
- 4.1.3 **Generic Core:** This is the course which should compulsorily be studied by a candidate as a core requirement to complete the requirement of a degree in a said discipline of study. Therefore, Generic Core courses are mandatory and fundamental in nature. These courses cannot be substituted by any other courses. Such courses are also known as Hard Core Courses.
- 4.1.4 **Subject Core:** A Core course may be a Subject Core if there is a choice or an option for the candidate to choose from a broad category (grouping) of subjects (specializations / electives). These are also known as Soft Core Courses.
- 4.1.5 **Elective Course:** Elective course is a course which can be chosen from a pool of courses. It may be:
- Very Specialized or advanced course focusing on a specific aspect
  - Supportive to the discipline of study
  - Providing an extended scope
  - Enabling an exposure to some other discipline/domain
  - Nurturing candidate's proficiency/skills.
- 4.1.6 **Generic Elective:** An elective course which is common across disciplines / subjects is called a generic elective. 'Generic Elective' courses develop generic proficiencies amongst the students.
- 4.1.7 **Generic Elective – University Level:** These elective courses are supportive to the discipline of study and focus on the knowledge aspect of competence building. The course outcomes for such courses can be better assessed through traditional End Semester Evaluation.
- 4.1.8 **Generic Elective – Institute Level:** These elective courses are aimed to develop inter-personal, technical and other skills aspect of competence building. The course outcomes for such courses can be better assessed through Comprehensive Concurrent Evaluation.
- 4.1.9 **Subject Elective:** A 'Discipline (specialization) centric' elective is called 'Subject Elective.' Subject Elective courses, in the Semester II, III and IV are focused on a specialization.
- 4.1.10 **Open Elective:** A subject elective course chosen generally from another Discipline / specialization / subject, with an intention to seek cross-functional exposure is called an Open Elective. A Subject Elective offered in one specialization area may be treated as an Open Elective by another specialization area and vice-a-versa.
- 4.1.11 **Enrichment Course:** This is a course generally offered to bright learners / fast learners for advanced inputs beyond the curriculum. Enrichment / Add-on Course shall be a 1 Credit Course. The course is of the nature of Course of Independent Study (CIS) and is designed for learners who have the ability and inclination to work independently with limited guidance, supervision and interaction with the faculty member(s).
- 4.1.12 **Alternative Study Credit Courses:** These courses prepare the learners for a VUCA (Volatile Uncertain, Complex and Ambiguous) world by going beyond the boundaries of their campus. Apart from core and elective courses, these courses engage students in discussion, debate and solution of real world challenges.
- 4.1.13 **Massive Open Online Courses (MOOCs)<sup>2</sup>:** Massive Open Online Courses (MOOCs) are such online courses which are developed as per the pedagogy stated in the AICTE regulation (2016) or equivalent; following the four quadrant approach and made available on the SWAYAM platform of Government of India.

<sup>2</sup> AICTE (Credit Framework for online learning course through SWAYAM) Regulations, 2016

- e) Generic Elective (GE - IL) courses
- f) Subject Elective (SE - IL) courses
- g) Open Elective Courses
- h) Major + Minor specialization combination
- i) Foundation Courses
- j) Enrichment Courses
- k) Alternative Study Credit Courses

**SUBJECT TO THE minimum and maximum limits of credits prescribed and**, subject to institutional norms and guidelines, issued from time to time.

**6.0 Summer Internship Project:** At the end of Second Semester each student shall undertake a Summer Internship Project (SIP) for a **minimum of 8 weeks**. For SIP, 1 credit is equivalent to minimum 40-45 hours of effective work. SIP shall have 6 credits. It is mandatory for the student to seek advance written approval from the faculty guide and the Director of the Institute about the topic and organization before commencing the SIP.

The SIP may or may not have a Functional Focus, i.e. the student may take up a SIP in his/her intended area of specialization or in any other functional area of management. **Ideally the SIP should exhibit a cross-functional orientation.** SIP can be carried out in a Corporate Entity / NGO / SME / Government Undertaking / Cooperative Sector. SIP may be a research project – based on primary / secondary data or may be an operational assignment involving working by the student on a given task/assignment/project/ etc. in an organization / industry. It is expected that the SIP shall sensitize the students to the demands of the workplace.

**Each student shall maintain a SIP Progress Diary detailing the work carried out and the progress achieved on a daily basis.** The student shall submit a written structured SIP report based on work done during this period. The student shall submit the SIP Progress Diary along with the SIP Report.

**Students shall also seek a formal evaluation of their SIP from the company guide.** The formal evaluation by the company guide shall comment on the nature and quantum of work undertaken by the student, the effectiveness and overall professionalism. The learning outcomes of the SIP and utility of the SIP to the host organization must be specifically highlighted in the formal evaluation by the company guide. The SIP evaluation sheet duly signed and stamped by the industry guide shall be included in the final SIP report.

The SIP report must reflect 8 weeks of work and justify the same. The SIP report should be well documented and supported by –

1. Institute's Certificate
2. Certificate by the Company
3. Formal feedback from the company guide
4. Executive Summary
5. Organization profile
6. Outline of the problem/task undertaken
7. Research methodology & data analysis (in case of research projects only)
8. Relevant activity charts, tables, graphs, diagrams, AV material, etc.
9. Learning of the student through the project
10. Contribution to the host organization
11. References in appropriate referencing styles. (APA, MLA, Harvard, Chicago Style etc.)

The completion of the SIP shall be certified by the respective Faculty Guide & approved by the Director of the Institute. The external organization (Corporate / NGO/ SME/ Government Entity/ Cooperative/ etc.) shall also certify the SIP work.

The students shall submit a spiral bound copy of the SIP report by 15<sup>th</sup> September. The Institute shall conduct an internal viva-voce for evaluation of the SIP for 50 marks between 15<sup>th</sup> September to 30<sup>th</sup> September. The Panel shall comprise of two evaluators appointed by the Director of the Institute / Head of Department (for MBA departments in engineering colleges). Institutes are encouraged to involve senior alumni, industry experts, recruiters to conduct the internal viva-voce. The internal viva-voce panel shall provide a detailed assessment of the SIP report and suggest changes required, if any.

After the internal viva-voce, the student shall finalize the SIP report by incorporating all the suggestions and recommendations of the internal viva-voce panel. The internal guide shall then issue the Institute's Certificate to the student.

The student shall submit TWO hard copies & one soft copy (CD) of the project report before 30<sup>th</sup> October in Sem III. One hard copy of the SIP report is to be returned to the student by the Institute after the External Viva-Voce. In the interest of environmental considerations, students are encouraged to print their project reports on both faces of the paper. Spiral bound copies may be accepted.

There shall be an external viva-voce for the SIP for 50 marks. The external viva-voce shall be conducted after the theory exam of Semester III.

The Internal & the External viva-voce shall evaluate the SIP based on:

1. Adequacy of work undertaken by the student
2. Application of concepts learned in Sem I and II
3. Understanding of the organization and business environment
4. Analytical capabilities
5. Technical Writing & Documentation Skills
6. Outcome of the project – sense of purpose
7. Utility of the project to the organization
8. Variety and relevance of learning experience

Copies of SIP report and records of evaluation shall be maintained by the Institute for a period of 3 academic years.

#### **7.0 Comprehensive Concurrent Evaluation (CCE) / Concurrent Internal Evaluation (CIE):**

1. The course teacher shall prepare the scheme of Comprehensive Concurrent Evaluation (Formative Assessment) before commencement of the term. The scheme of Comprehensive Concurrent Evaluation shall explicitly state the linkages of each CCE with the Course Outcomes and define the targeted attainment levels for each CO.
2. The Director / Head of the Department / designated academic authority shall approve the scheme of Comprehensive Concurrent Evaluation with or without modifications.
3. The course teacher shall display, on the notice board, the approved CCE scheme of the course and the same shall also be hosted on the website, not later than the first week of the term.
4. Each CCE item shall be of minimum 25 marks.
5. For a 3 Credit Course there shall be a MINIMUM of three CCE items. The final scores shall be converted to 50, using an average or best two out of three formula.
6. For 2 Credit Course there shall be a MINIMUM of two CCE items. The final scores shall be converted to 50.
7. For a 1 Credit Course there shall be a MINIMUM of one CCE item.
8. CCE shall be spread through the duration of course and shall be conceptualized, executed, assessed and documented by the course teacher along with student-wise and class-wise attainment levels of the COs and the attainment levels of the course.
9. The assessment outcome of each CCE shall be duly signed by the course teacher, programme coordinator / academic head and the Director / Head of the Department / designated academic authority of the Institute.
10. A copy of the duly signed CCE *outcome* shall be displayed on the notice boards, within a week of the assessment and course teachers shall guide the students on a need basis.
11. Institute may conduct additional make up / remedial CCE items at its discretion.
12. At the end of the term aggregate CCE scores / grades shall be calculated and the CO attainment levels shall be calculated by the course teacher. The same shall be displayed on the notice board

**7.1 Comprehensive Concurrent Evaluation Methods:** Course teachers shall opt for a combination of one of more CCE methods listed below.

Group A (Individual Assessment) – Not more than 1 per course

1. Class Test
2. Open Book Test

# Savitribai Phule Pune University, Pune

## *Faculty of Commerce and Management*

### Master of Computer Applications (MCA)

#### **Syllabus**

(2020-2022)

#### **Preamble:**

1. The name of the programme shall be Masters of Computer Applications (M.C.A)
2. The revised MCA Curriculum 2020 builds on the implementation of the Choice Based Credit System (CBCS) and Grading System initiated in the AY 2015. The curriculum takes the MCA programme to the next level in terms of implementing Outcome Based Education along with the Choice Based Credit System (CBCS) and Grading System.
3. The Institutes should organize placement programme for M.C.A. students by interacting with Industries and software consultancy.
4. At the end of each semester, appearing for various certifications is possible for each student enabling them to make their resume rich.
5. With the rapidly changing scenario industry and academia should identify possible areas of collaboration and work together. Institute's placement cell should focus on identifying industrial expectations and institutional preparation for meeting industrial needs.

#### **Introduction:**

##### **1. Definition: Outcome Based Education:**

**1.1 Outcome Based Education (OBE) Approach:** Outcomes are about performance, and this implies:

- 1.1.1** There must be a performer – the student (learner), not only the teacher
- 1.1.2** There must be something performable (thus demonstrable or assessable) to perform
- 1.1.3** The focus is on the performance, not the activity or task to be performed

**1.2 Programme Educational Objectives (PEOs):** Programme educational objectives are broad statements that describe the career and professional accomplishments that the programme is preparing graduates to achieve. Programme Educational Objectives are a set of broad future focused learner's performance outcomes that explicitly identify what learners will be able to do with what they have learned, and what they will be like after they leave institution and are living full and productive lives. Thus, PEOs are what the programme is preparing graduates for in their career and professional life (to attain within a few years after graduation).

- 1.3 Programme Outcomes (POs):** Programme Outcomes are a set of narrow statements that describes what students (learners) of the programme are expected to know and be able to perform or attain by the time of graduation.
- 1.4 Course Outcomes (COs):** Course Outcomes are narrower statements that describe what students are expected to know and be able to do at the end of each course. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the course.
- 1.5 Learning Outcomes:** A learning outcome is what a student CAN DO because of a learning experience. It describes a specific task that he/she can perform at a given level of competence under a certain situation. The three broad types of learning outcomes are: a) Disciplinary knowledge and skills b) Generic skills c) Attitudes and values
- 1.6 Teaching and Learning Activities (TLAs):** The set of pedagogical tools and techniques or the teaching and learning activities that aim to help students to attain the intended learning outcomes and engage them in these learning activities through the teaching process.
- 1.7 Assessment and Evaluation:** Assessment is one or more processes, carried out by the institution, that identify, collect, and prepare data to evaluate the achievement of programme educational objectives and programme outcomes. Evaluation is one or more processes, done by the evaluation team, for interpreting the data and evidence accumulated through assessment practices. Evaluation
- 1.8** determines the extent to which programme educational objectives or programme outcomes are being achieved, and results in decisions and actions to improve the programme.

## 2. MCA Programme Focus:

The basic objective of the Master of Computer Applications (MCA) is to provide a steady stream of necessary knowledge, skills and foundation for acquiring a wide range of rewarding careers into rapidly expanding world of Information Technology

**2.1 Programme Educational Objectives:** PEOs are defined by institution. Following are the guidelines for defining PEOs

- 2.1.1** PEOs should be assessable and realistic within the context of the committed resources.
- 2.1.2** The PEOs should be consistent with the mission of the institution.
- 2.1.3** All the stakeholders should participate in the process of framing PEOs.
- 2.1.4** The number of PEOs should be manageable.
- 2.1.5** It should be based on the needs of the stakeholders.
- 2.1.6** It should be achievable by the programme.
- 2.1.7** It should be specific to the programme and not too broad.
- 2.1.8** It should not be too narrow and similar to the POs.

**2.2 MCA Programme Outcomes (POs):** At the end of the MCA programme the learner will possess the following Program Outcome:

**PO1:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

**PO2:** Identify, formulate, research literature, and solve *complex* Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.

**PO3:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

**PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

**PO5:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

**PO6:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

**PO7:** Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.

**PO8:** Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO9:** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

**PO10:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

**PO11:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

**PO12:** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

### **3. Admission Details:**

**3.1 Eligibility for Admission:** The eligibility criteria for admission for the MCA course will be as decided by the All Indian Council of Technical Education (AICTE), New Delhi and Directorate of Technical Education (DTE), Government of Maharashtra. It will be published on their respective websites time to time.

**3.2 Reservation of Seat:** The percentage of seat reserved for candidates belonging to backward classes only from Maharashtra State in all the Government Aided, Un-aided Institutions/Colleges and University Departments is as per the norms given by Government of Maharashtra, time to time.

**3.3 Selection Basis:** The selection would be done as per the guidelines given by the Director of Technical Education, Maharashtra State, time to time.

#### **4. Lecture-Practical/Project-Tutorial (L-P-T)**

A course shall have either or all the three components, i.e. a course may have only lecture component, or only practical/project component or a combination of any two/three components

**4.1 Lecture(L):** Classroom sessions delivered by faculty in an interactive mode. It should be conducted as per the scheme of lectures indicated in respective course.

**4.2 Practical/Project(P):** Practical / Project Work consisting of Hands-on experience /Field Studies / Case studies that equip students to acquire the much-required skill component. Besides separate Practical/Project course, three courses in each semester include few practical assignments and it will be evaluated under internal evaluation

**4.3 Tutorial(T):** Session consisting of participatory discussion/ self-study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture sessions

**4.4 A Mini project** is an assignment that the student needs to complete at the end of every semester in order to strengthen the understanding of fundamentals through effective application of the courses learnt. The details guidelines have been given in the course structure.

**4.5 The Project Work** to be conducted in the FINAL Semester and evaluated at the end of the semester. The detail guidelines have been in the respective course structure.

**4.6** The teaching / learning as well as evaluation are to be interpreted in a broader perspective as follows:

- i) Teaching – Learning Processes: Classroom sessions, Group Exercises, Seminars, Small Group Projects, Self-study, etc.
- ii) Evaluation: Tutorials, Class Tests, Presentations, Field work, Assignments, competency-based Activity, Research papers, Term papers, etc.

**The MCA programme is a combination of:**

- a. Three-Credit Courses (75 Marks each): 3 Credits each
- b. Two-Credit Courses (50 Marks each): 2 Credits each
- c. One-Credit Courses (25 Marks each) : 1 Credits each

**Following are the session details per credit for each of L-P-T model**

- 1) Every ONE-hour session per week of Lecture(L) amounts to 1 credit per semester,
- 2) Minimum of TWO hours per week of Practical(P) amounts to 1 credit per semester,
- 3) Minimum of ONE hours per week of Tutorial(T) amounts to 1 credit per semester

#### **5. Open Courses (OC):**

Institute has to offer two open courses of 1 credit each per semester to the students from Semester I to Semester III. The motive behind keeping an open course is to make students aware of current/upcoming trends in Information Technology and other domains. Full autonomy is given to the Institute to plan and execute the open courses. It is expected to extend the autonomy to the student

The final total assessment of the candidate is made in terms of an internal (concurrent) evaluation and an external (university) examination for each course. In total the internal (concurrent) to external (university) marks ratio is maintained 50:50.

In general

- 1) For each course, 25 will be based on evaluation and 50 marks for semester end examination conducted by University, unless otherwise stated.
- 2) The internal evaluation of 25 marks further divided into Written Examination (Assignments/Unit test/written examination etc.), Practicals and Tutorials. The details have been specified in each course.
- 3) There will be one Practical course and one Mini Project course in each semester with 75 marks allotted for internal evaluation and 50 marks allotted for University examination. External assessment will be done by university appointed examiner. During external examination, examiner should ask the programs/practical ONLY from the work book of the students.
- 4) The internal marks will be communicated to the University at the end of each semester, but before the semester-end examinations. These marks will be considered for the declaration of the results.

#### **Guidelines to conduct Mini-Project evaluation for Semester I, Semester II and Semester III of MCA – 2020 pattern**

##### For Internal Evaluation

1. Internal evaluation will be of 75 Marks. It will be distributed as follows

Description	Marks
Project Report	35
Viva	15
Working Demo	25
<b>Total</b>	<b>75</b>

2. Project Report (including Project Diary) should be evaluated only during INTERNAL evaluation. Textual chapters should be given 10 marks while diagrams, test cases/validations, screen designs should be evaluated for 20 marks and 5 Marks should be given for Project Diary. Thus, totaling up to 35 marks.

##### For External Evaluation

1. Evaluation will be conducted by one Internal (Appointed by Institute) and one External examiner (Appointed by university).
2. External evaluation will be of 50 Marks. It will be distributed as follows

Description	Marks
Viva	15
Working Demo	35
<b>Total</b>	<b>50</b>

##### For Internal Evaluation and External Evaluation

1. VIVA should be conducted based on project domain and technologies used for developing the project. Every team member's individual contribution to the project may vary. Hence VIVA should be based on individual contribution pertaining to the project.
2. Working Demo is given maximum weightage to make sure that each group submits executable version of their project.
3. Examiners should evaluate efforts and contribution of every individual in the team (in case of group project).
4. Examiner may review code of the project while evaluating its working demo and modules.

**Examination:** Examinations shall be conducted at the end of the semester i.e. during November and in April/May. However supplementary examinations will also be held in November and April/May.

**Concurrent Evaluation:** A continuous assessment system in semester system (also known as internal assessment/comprehensive assessment) is spread through the duration of course and is done by the teacher teaching the course. The continuous assessment provides a feedback on teaching learning process. The feedback after being analyzed is passed on to the concerned student for implementation and subsequent improvement. As a part of concurrent evaluation, the learners shall be evaluated on a continuous basis by the Institute to ensure that student learning takes place in a graded manner. Concurrent evaluation components should be designed in such a way that the faculty can monitor the student learning & development and intervene wherever required. The faculty must share the outcome of each concurrent evaluation component with the students, soon after the evaluation, and guide the students for betterment. Individual faculty member shall have the flexibility to design the concurrent evaluation components in a manner so as to give a balanced assessment of student capabilities across Knowledge, Skills & Attitude (KSA) dimensions based on variety of assessment tools.

Suggested components for Concurrent Evaluation (CE) are:

1. Case Study / Situation Analysis – (Group Activity or Individual Activity)
2. Class Test
3. Open Book Test
4. Field Visit / Study tour and report of the same
5. Small Group Project & Internal Viva-Voce
6. Learning Diary
7. Scrap Book
8. Group Discussion
9. Role Play / Story Telling
10. Individual Term Paper / Thematic Presentation
11. Written Home Assignment
12. Industry Analysis – (Group Activity or Individual Activity)
13. Literature Review / Book Review
14. Model Development / Simulation Exercises – (Group Activity or Individual Activity)
15. In-depth Viva
16. Quiz

Institute can decide the type, method and frequency of Concurrent Evaluation for each course and execute accordingly. Detailed record of the Concurrent Evaluation shall be maintained by the Institute. The same shall be made available to the University, on demand.

Semester I					
Sr. No.	Course Title	Course Code	CP	EXT	INT
1	Java Programming	IT11	3	50	25
2	Data Structure and Algorithms	IT12	3	50	25
3	Object Oriented Software Engineering	IT13	3	50	25
4	Operating System Concepts	IT14	3	50	25
5	Network Technologies	IT15	3	50	25
6	Open Course 1	OC11	1		25
7	Open Course 2	OC12	1		25
<b>* Practicals</b>					
8	Practical	IT11L	5	50	75
9	Mini Project	ITC11	5	50	75
<b>Soft Skills</b>					
10	Soft Skills - I	SS11	1		25
			<b>28</b>	<b>350</b>	<b>350</b>

Semester II					
Sr. No.	Course Title	Course Code	CP	EXT	INT
1	Python Programming	IT21	3	50	25
2	Software Project Management	IT22	3	50	25
3	Optimization Techniques	MT21	3	50	25
4	Advanced Internet Technologies	IT23	3	50	25
5	Advanced DBMS	IT24	3	50	25
6	Open Course 3	OC21	1		25
7	Open Course 4	OC22	1		25
<b>* Practicals</b>					
8	Practical	IT21L	5	50	75
9	Mini Project	ITC21	5	50	75
<b>Soft Skills</b>					
10	Soft Skills - II	SS21	1		25
			<b>28</b>	<b>350</b>	<b>350</b>

Semester III					
Sr. No.	Course Title	Course Code	CP	EXT	INT
1	Mobile Application Development	IT31	3	50	25
2	Data Warehousing and Data Mining	IT32	3	50	25
3	Software Testing and Quality Assurance	IT33	3	50	25
4	Knowledge Representation & Artificial Intelligence - ML, DL	IT34	3	50	25
5	Cloud Computing	IT35	3	50	25
6	Open Course 5	OC31	1		25
7	Open Course 6	OC32	1		25
<b>* Practicals</b>					
8	Practical	IT31L	5	50	75
9	Mini Project	ITC31	5	50	75
<b>Soft Skills</b>					
10	Soft Skills- III	SS31	1		25
			<b>28</b>	<b>350</b>	<b>350</b>

Semester IV					
Sr. No.	Course Title	Course Code	CP	EXT	INT
1	DevOps	IT41	3	50	25
2	PPM and OB	BM41	3	50	25
2	Project	ITC41	22	250	300
			<b>28</b>	<b>350</b>	<b>350</b>

Semester	Credit	IE	UE
Semester I	28	350	350
Semester II	28	350	350
Semester III	28	350	350
Semester IV	28	350	350
<b>Total</b>	<b>112</b>	<b>1400</b>	<b>1400</b>
			<b>2800</b>

13. Practical based on Divide and Conquer Technique-Binary Search, Tower of Hanoi
14. Implementation of Dynamic Programming- LCS, Regular Expression Matching
15. Practical based on backtracking- N Queen's problems

**Course Code: ITC11**

**Course Name: Mini Project**

Credit Scheme			Evaluation Scheme				
Lecture	Practical	Credit	Internal			External	Total
			Written	Practical	Tutorial		
-	10 Hrs./Week	5	-	75	-	50	125

### **Course Description:**

A mini project is an assignment that the student needs to complete at the end of every semester to strengthen the understanding of fundamentals through effective application of the subjects learnt.

#### *Course Outcomes:*

Student will be able to

CO1: Create working project using tools and techniques learnt in this semester (Create)

#### *Course Structure:*

#### **Guidelines for Mini Project**

1. Students are expected to undertake one mini project starting from first semester till third semester.
2. The student may take up the mini project in first semester based on the courses learnt in that semester and for every next semester the mini project may be based on the courses learnt in the current semester along with all the subjects learnt in earlier semesters.
3. The student may take up the project individually or in group. However, if project is done in group, each student must be given a responsibility for distinct modules.
4. Selected project/module must have relevant scope as per the marks assigned and must be carried out in the Institute.
5. Internal guide should monitor and evaluate the progress of the project on individual basis through handwritten workbook (Project Diary) maintained by students containing various project milestones with learnings and remarks from internal guide for concurrent evaluation.
6. The Project Synopsis should contain an Introduction to Project clearly stating the project scope in detail justifying enough scope for 125 marks. The project work will carry 75 marks for internal assessment and 50 marks for external assessment.
7. Students are expected to show working demo of the project during final evaluation.
8. **Students are expected to upload mini-project on GITHUB as project repository of the institution.**
9. Students are expected to submit the soft copy of mini project report as a part of final submission.

10. The project will be assessed internally as well as externally by the examiners appointed by University. University may appoint Industry Experts as an external examiner

Course Code: ITC21

Course Name: Mini Project

Credit Scheme			Evaluation Scheme				
Lecture	Practical	Credit	Internal			External	Total
			Written	Practical	Tutorial		
-	10 Hrs./Week	5	-	75	-	50	125

### Course Description:

A mini project is an assignment that the student needs to complete at the end of every semester to strengthen the understanding of fundamentals through effective application of the subjects learnt.

#### *Course Outcomes:*

Student will be able to

CO1: Create working project using tools and techniques learnt in this semester (Create)

#### *Course Structure:*

#### **Guidelines for Mini Project**

1. Students are expected to undertake one mini project starting from first semester till third semester.
2. The student may take up the mini project in first semester based on the courses learnt in that semester and for every next semester the mini project may be based on the courses learnt in the current semester along with all the subjects learnt in earlier semesters.
3. The student may take up the project individually or in group. However, if project is done in group, each student must be given a responsibility for distinct modules.
4. Selected project/module must have relevant scope as per the marks assigned and must be carried out in the Institute.
5. Internal guide should monitor and evaluate the progress of the project on individual basis through handwritten workbook (Project Diary) maintained by students containing various project milestones with learnings and remarks from internal guide for concurrent evaluation.
6. The Project Synopsis should contain an Introduction to Project clearly stating the project scope in detail justifying enough scope for 125 marks. The project work will carry 75 marks for internal assessment and 50 marks for external assessment.
7. Students are expected to show working demo of the project during final evaluation.
- 8. Students are expected to upload mini-project on GITHUB as project repository of the institution.**
9. Students are expected to submit the soft copy of mini project report as a part of final submission.
10. The project will be assessed internally as well as externally by the examiners appointed by University. University may appoint Industry Experts as an external examiner
- 11.

**Course Code: ITC31**

**Course Name: Mini Project**

Credit Scheme			Evaluation Scheme				
Lecture	Practical	Credit	Internal			External	Total
			Written	Practical	Tutorial		
-	10 Hrs./Week	5	-	75	-	50	125

### **Course Description:**

A mini project is an assignment that the student needs to complete at the end of every semester to strengthen the understanding of fundamentals through effective application of the subjects learnt.

#### *Course Outcomes:*

Student will be able to

CO1: Create working project using tools and techniques learnt in this semester  
(Create)

#### *Course Structure:*

#### **Guidelines for Mini Project**

1. Students are expected to undertake one mini project starting from first semester till third semester.
2. The student may take up the mini project in first semester based on the courses learnt in that semester and for every next semester the mini project may be based on the courses learnt in the current semester along with all the subjects learnt in earlier semesters.
3. The student may take up the project individually or in group. However, if project is done in group, each student must be given a responsibility for distinct modules.
4. Selected project/module must have relevant scope as per the marks assigned and must be carried out in the Institute.
5. Internal guide should monitor and evaluate the progress of the project on individual basis through handwritten workbook (Project Diary) maintained by students containing various project milestones with learnings and remarks from internal guide for concurrent evaluation.
6. The Project Synopsis should contain an Introduction to Project clearly stating the project scope in detail justifying enough scope for 125 marks. The project work will carry 75 marks for internal assessment and 50 marks for external assessment.
7. Students are expected to show working demo of the project during final evaluation.
- 8. Students are expected to upload mini-project on GITHUB as project repository of the institution.**
9. Students are expected to submit the soft copy of mini project report as a part of final submission.
10. The project will be assessed internally as well as externally by the examiners appointed by University. University may appoint Industry Experts as an external examiner

**Course Code: ITC41**

**Course Name: Project**

Credit Scheme			Evaluation Scheme				
Lecture	Practical	Credit	Internal			External	Total
			Written	Practical	Tutorial		
-	40 Hrs./Week	22	-	300	-	250	550

### **Course Description:**

A project is an assignment that the student needs to complete at the end of semester IV to strengthen the understanding of fundamentals through effective application of the subjects learnt.

#### *Course Outcomes:*

Student will be able to

CO1: Create working project using tools and techniques learnt in the programme (Create)

#### *Course Structure:*

The project is an outcome of technical skills and domain knowledge acquired by the students during the program. Students demonstrate problem solving skills, analytical ability, logical thinking, communication skills and team work during the course of the project. The project can be implementation of a research work published in any reputed journal.

1. The project may be done individually or in groups. However, if project is done in groups, each student must be given a responsibility for distinct modules.
2. Selected project/module must have relevant scope as per the marks assigned and can be carried out in the Institute or outside with prior permission of the Institute.
3. Internal guide should monitor and evaluate the progress of the project on individual basis through handwritten workbook maintained by students containing various project milestones with learnings and remarks from internal guide for concurrent evaluation.
4. The Semester IV project should be having sufficient scope for 400 marks. The project work will carry 300 marks for internal assessment and 250 marks for external assessment.
5. Students are expected to show working demo of the project during final evaluation in semester IV.
6. The project report should be prepared as per the University prescribed format with all the chapters mentioned in project guidelines. And it should be printed on back-to-back pages (one copy) which should be signed by the internal guide and the Director of the Institute. A client (colleges, Non IT organization, and IT organization) certificate should be attached to prove the authenticity of the project work done.
7. The project will be assessed internally as well as externally by the examiners appointed by the institutions and University.

### **Type of Projects**

## **1. Application Development**

The students are advised to choose a project that involves window-based development, web-based development, mobile-based development, projects based on machine learning. Analysis and interpretation of any company specific data is not permitted.

## **2. Embedded Systems / IoT**

A project should be developed and implemented for application specific system after thorough investigation of the latest development in the field of electronics or communication to facilitate their efficient operation. The Real Time Operating System (RTOS) or open source platform can be used to develop embedded applications such as Robotics, Microcontroller / Microprocessor based projects etc. An IOT project can be used to design products for reliability and security using simple electronics concepts and integrating with a cloud platform to get the data real-time and make some operational analysis. It has to use efficient algorithms for strong authentication and security protocols and disable non-essential services.

Few examples of IoT applications

Smart home, Health care applications, Smart waste management, Activity Tracker etc.

## **3. ETL Projects**

Extract, transform, load (ETL) is the process of integrating the data from one or more sources. It is expected from the student that he should demonstrate the entire ETL process with reference to any domain like finance, banking, insurance, retail etc.

Data extraction consists of extracting the data from homogeneous or heterogeneous sources and transforming it into a proper format using data cleansing. The data can be finally loaded into a final target database such as operational data base, a data mart or data warehouse. This data can be further used for the purpose of querying and analyzing.

## **4. Research Projects**

The research project will be able to demonstrate the skills of working scientifically, and through the project the students will be able to understand how to do a literature review, and how to appraise the literature to address questions. To explore an area of interest (develop some expertise and a deeper understanding of a topic). Understand the tools to critically and thoughtfully appraise problems which are faced every day; to learn communicate scientific research in verbal presentations and written form. As an example, the students can identify any problem, by observation or through survey to understand the problem in depth and propose the solution by applying the research methodology.

## Project Guidelines:

### 1. Application Development Project

Chapter No		Details
<b>1</b>		<b>Introduction</b>
	1.1	Company Profile / Institute Profile / Client Profile
	1.2	Abstract
	1.3	Existing System and Need for System
	1.4	Scope of System
	1.5	Operating Environment - Hardware and Software
	1.6	Brief Description of Technology Used 1.6.1 Operating systems used (Windows or Unix) 1.6.2 RDBMS/No Sql used to build database (mysql/ oracle, Teradata, etc.)
<b>2</b>		<b>Proposed System</b>
	2.1	Study of Similar Systems ( If required research paper can be included)
	2.2	Feasibility Study
	2.3	Objectives of Proposed System
	2.4	Users of System
<b>3</b>		<b>Analysis and Design</b>
	3.1	System Requirements (Functional and Non-Functional requirements)
	3.2	Entity Relationship Diagram (ERD)
	3.3	Table Structure
	3.4	Use Case Diagrams
	3.5	Class Diagram
	3.6	Activity Diagram
	3.7	Deployment Diagram
	3.8	Module Hierarchy Diagram
	3.9	Sample Input and Output Screens (Screens must have valid data. All reports must have at-least 5 valid records.)
<b>4</b>		<b>Coding</b>
	4.1	Algorithms
	4.2	Code snippets
<b>5</b>		<b>Testing</b>
	5.1	Test Strategy
	5.2	Unit Test Plan
	5.3	Acceptance Test Plan
	5.4	Test Case / Test Script
	5.5	Defect report / Test Log
6		<b>Limitations of Proposed System</b>
7		<b>Proposed Enhancements</b>
8		<b>Conclusion</b>

9		<b>Bibliography</b>
10		<b>Publication / Competition certificates</b>
11		<b>Appendix – Cost sheet , Data sheet</b>
12		<b>User Manual</b> (All screens with proper description/purpose Details about validations related to data to be entered.)

## 2. Embedded Systems / IoT Project

Chapter No		Details
<b>1</b>		<b>Introduction</b>
	1.1	Company Profile / Institute Profile / Client Profile
	1.2	Abstract
	1.3	Existing System and Need for System
	1.4	Scope of System
	1.5	Operating Environment - Hardware and Software
	1.6	Brief Description of Technology Used 1.6.1 Operating systems used (Windows or Unix) 1.6.2 Database (if applicable)
<b>2</b>		<b>Proposed System</b>
	2.1	Study of Similar Systems ( If required research paper can be included)
	2.2	Feasibility Study
	2.3	Objectives of Proposed System
	2.4	Users of System
<b>3</b>		<b>Analysis and Design</b>
	3.1	Technical requirements – H/W , S/W
	3.2	System Architecture / Block Diagram
	3.3	System Hardware Details
	3.4	Pin Diagrams
	3.5	Interface diagrams
	3.6	Design Sequence
	3.7	System Software Details
	3.8	Process / System Flow chart
<b>4</b>		<b>Coding</b>
	4.1	Algorithms
	4.2	Code snippets (if applicable)
<b>5</b>		<b>Testing</b>
	5.1	Results & reports
	5.2	Test cases
	5.3	Acceptance Testing
	5.4	Test reports in IEEE format
<b>6</b>		<b>Limitations of Proposed System</b>
<b>7</b>		<b>Proposed Enhancements</b>

8		<b>Conclusion</b>
9		<b>Bibliography</b>
10		<b>Publication / Competition certificates</b>
11		<b>Appendix – Cost sheet , Data sheet</b>
12		<b>User Manual</b> (All screens with proper description/purpose Details about validations related to data to be entered.)

### 3. ETL Projects

Chapter No		Details
<b>1</b>		<b>Introduction</b>
	1.1	Company Profile / Institute Profile / Client Profile
	1.2	Existing System functionality (Source System for which the ANALYTICS is being developed)
	1.3	Business process understanding and specifications 1.3.1 Business Requirement Specifications: 1.3.1.1 The o/p from BR Analysis are BRS Business Requirement Specifications (Business specific Rules to be mentioned here from analysis point of view) 1.3.1.2 Identify the dimensions, required attributes, measures, filter conditions, adjustments for KPIs going to be used in the Target system and its availability in the Source System. If any gaps suggest remediation of gaps 1.3.2 Business Rules Collection 1.3.3 Identify the Key Performance Indicator (specified by client) 1.3.4 Establish the User Acceptance Criteria
	1.4	Scope of the project
	1.5	Operating Environment - Hardware & Software, Description of Tools / Technology to be used in the Target system 1.5.1.1 Operating systems used (Windows or Unix) 1.5.1.2 RDBMS/NoSql used to build database (mysql/ oracle, Teradata, etc.) 1.5.1.3 ETL tools used (Talend/Informatica, Datastage etc) 1.5.1.4 OLAP/ Data mining/ machine learning/ analytics tools used (Python/ Cognos, BO, etc.) 1.5.1.5 Data visualization tools (power BI / Tableau)
<b>2</b>		<b>Proposed System</b>
	2.1	Creating multiple ETL strategies - Specifying metadata details, identifying heterogeneous architectures, processes for I/O only for ETL, scrapping , identifying the volatilities in the channels , designing strategies in the context of the business and existing ERP
	2.2	Comparing them in the context of selected business system (as per the business requirements)
	2.3	Suggesting optimum solution (process)
<b>3</b>		<b>Analysis and Design</b>
	3.1	Use Case Diagram
	3.2	Activity diagram to demonstrate Process flow (execution of ETL process)

	3.3	Design of Target system (Elaborate the tiers of DW architecture in the Target System)
	3.4	Database schema / Table specifications of Target system
	3.5	Details of Source & Targets of mapping in the database
	3.6	Details of Load (Full/Incremental etc.)
	3.7	Design of ETL schema/strategy
<b>4</b>	<b>4.1</b>	<b>Design of strategy for Visualization</b> 4.1.1 Visualizations in support of comparison of performance of various ETL strategies 4.1.2 Data visualization using different techniques (if any)
<b>5</b>		<b>Drawbacks and Limitations Proposed Enhancements</b>
<b>6</b>		<b>Conclusion</b>

#### 4. Research Projects

Research projects especially are designed to gain knowledge about some specified area and the deliverable is that knowledge gained, usually encapsulated in some form of report.

Students are expected to contribute something new to academic or practical knowledge in their research area—something original that is more than the accepted knowledge.

Completing a Research Project as part of your coursework is an opportunity to:

- learn to read and interpret other people’s research critically by doing your own. This gives you an insight into the effects of practical difficulties and theoretical debates on published research
- develop and apply the knowledge that you have learnt in 4 semesters of your curriculum.
- submit a paper for peer-reviewed publication. (If successful, this will give a boost to your c.v.) If you wish to enroll in a research degree such as PhD, a research project as part of your coursework will assist the committee evaluating your application in assessing whether you are ready to do independent research.

#### Research Index

1. Title page
2. Acknowledgements

You should acknowledge the assistance given to you by your supervisors, and any other person or organization that has helped you in the planning, conduct, analysis or reporting of your project.

3. Abstract

This is a synopsis of your study question, aims and objectives, background literature, methods, results, key conclusions and recommendations. This should be 250–300 words long and should be very clear and easy to follow.

#### 4. Introduction

In this section of your report you introduce the subject, provide the background to the topic or problem, outline the study question (or problem or study hypothesis), and outline the aims and objectives of your study.

#### 5. Literature review

This is a review of the literature on the topic or problem you are studying. It should include a review of any other studies or projects similar or relevant to yours, and perhaps a review of the literature on the method you have chosen if your project tests a new method of research or analysis.

#### 6. Methods

This section includes the methodology of your research. It will cover such issues as:  
In case of Computer Management Research :

- Study design
- Study population, sampling frame and numbers, sampling method
- survey design
- survey or data collection instruments
- protocol for obtaining data
- ethical issues and how they are addressed
- information letters, consent forms
- data management and analysis methods
- statistical analysis and tests
- In case of Computer Science Research:
  - Study design
  - System Architecture
  - Implementation
    - Experimental Implementation
    - Simulation
  - Data management and analysis methods
  - Analysis and testing

#### 7. Results

In this section you present the results of your research. Tables, figures and graphs are an excellent means of presenting this sort of information. All tables, figures and graphs, should be numbered consecutively throughout the whole report, and labelled with a clear and concise descriptive title.

#### 8. Discussion

In this section you interpret your results and discuss their implications, with reference to other published research. Any limitations in your research methodology should also be referred to here. Examiners expect you to acknowledge these limitations as an integral part of your evaluation of your project.

## 9. Conclusion

This section summarizes the key results and the conclusions that you can draw from these results. It also needs to reflect what your initial project aims and objectives were.

## 10. Recommendations

It is good research practice to make recommendations or to suggest directions for further research or actions as a result of your project findings.

## 11. References

This is a list of all the references and sources you used in your literature review, methodology and discussion. This includes books, journal articles, abstracts, conference and symposium papers, media articles, and any form of published literature or comment.

## 12. Appendices

This section may contain copies of any questionnaires if any or evaluation instruments used covering letters, participant information and ethics approvals, or additional explanations.

# Appendix II



Dattakala Group of Institutions  
**FACULTY OF ENGINEERING**  
Swami-Chincholi, Tal: - Daund, Dist: - Pune  
Department :- Computer Engineering  
Academic Year: - 2021-22

**INTERNSHIP DETAILS**

SR. NO	SEAT NO	NAME OF THE STUDENTS	FIRM DETAILS
1	T190854202	ALKA SURYKANT YEJARE	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
2	T190854203	BANGAR SAKSHI SUHAS	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
3	T190854204	BARAVKAR OMKAR ANIL	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
4	T190854205	DAGADE MAYUR GORAKH	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
5	T190854207	DARADE ANISHA GANESH	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
6	T190854211	GUNAWARE PRAJAKTA HANUMANT	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
7	T190854212	GURAV GAYATRI RAVINDRA	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
8	T190854213	HARKARE JAIBA MAHIBOOB	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
9	T190854214	JADHAV KAJAL MAHADEV	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
10	T190854215	JADHAV PRIYANKA RAGHUNATH	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
11	T190854216	KADU VISHAL VILAS	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022

12	T190854221	KOKANE REKHA LALASO	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
13	T190854222	KOLKAR PRITI BHAUSAHEB	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
14	T190854225	MOHITE SAYLI SAMPAT	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
15	T190854227	PAWAR RAVINA RAMESH	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
16	T190854228	PRAVIN SANJAY SHELKE	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
17	T190854230	RUPNAWAR ANIKET CHANDRASHEKHAR	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
18	T190854231	SAYYAD MUSKAN ASLAM	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
19	T190854233	VIDHATE MANALI SANJAY	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022
20	T190854234	WAYASE SONALI NAVANATH	Internship in "Robotic Process Automation (RPA)" by ProAzure Software Solutions Pvt.Ltd Date: 01st June to 30th June 2022

H.O.D.  
H.O.D.

Computer Dept.  
Dattakala Group of Institutions  
Faculty of Engineering  
Swami Chincholi, Tal. Daund, Dist. Pune



# Certificate of Internship **COMPLETION**



This Certificate is awarded to

**Mr/Ms. Dagade Mayur Gorakh**

For Successful Completion of the One Month Internship in  
**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Darade Anisha Ganesh**

For Successful Completion of the One Month Internship in

**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Gayatri Ravindra Gurav**

For Successful Completion of the One Month Internship in  
**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Harkare Jaiba Mahiboob**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship **COMPLETION**



This Certificate is awarded to

**Mr/Ms. Kadu Vishal Vilas**

For Successful Completion of the One Month Internship in  
**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



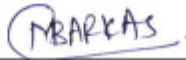
This Certificate is awarded to

**Mr/Ms. Kajal Mahadev Jadhav**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



  
Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Kokane Rekha Lalaso**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Kolkar Priti Bhausaheb**

For Successful Completion of the One Month Internship in  
**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Pawar Ravina Ramesh**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Prajakta Hanumant Gunaware**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*PRAKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Pravin Sanjay Shelke**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Rupnawar Aniket Chandrashekhar**

For Successful Completion of the One Month Internship in  
**“Robotic Process Automation (RPA)”**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Sakshi Suhas Bangar**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Sayli Sampat Mohite**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Nazim Nabu Sayyad**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

Mr/Ms. **NEHA SUNIL PATIL**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Shraddha Sudhir Shinde**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Tanvi Dhananjay Ghare**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARKAS*

Signature

Registration No: 181557



# Certificate of Internship COMPLETION



This Certificate is awarded to

**Mr/Ms. Yash Jitendra Ambekar**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*YASH J. AMBEKAR*

Signature

Registration No: 181557



# Certificate of Internship **COMPLETION**



This Certificate is awarded to

**Mr/Ms. Baravakar Omkar Anil**

For Successful Completion of the One Month Internship in  
**"Robotic Process Automation (RPA)"**

**Date: 01<sup>st</sup> June to 30<sup>th</sup> June 2022**



*MBARAVAKAR*

Signature

**Dattakala Group of Institutions**  
**Faculty of Engineering**  
**Department of Mechanical Engineering**  
**B.E.(Mechanical) 2021-22**  
**Project Group List**

Group No	Name of Student	Mobile Number	Title of project	Project Guides
1	GURAV PRASHANT SURESH	7757068690	Development of pneumatically actuated valve mechanism in IC engine	Prof.S.S. Kathale
	JADHAV CHARUDATT SAMPATRA	9689899394		
	KAMBLE VISHAL ARUN	7397849717		
	MORE SURAJ WAMAN	9561268008		
2	SATYAM RAJESHKUMAR JADHAV	7744093812	Vertical Mini Honing Machine	Prof.J.A. Sodal
	KAJALE AJINKYA HANUMANT	9404998426		
	DALVI KARAN DNYANESHWAR	7219515500		
	KALE SAGAR DADARAM	9665642485		
3	HARNOL KARTIKA SANJAY	7040056454	Design and development of hybrid and wind turbine for electricity generation	Prof.S.S. Kathale
	HINGASE SAYALI MOHAN	7387424185		
	SANDIP HANUMANT NIKAM	9130860869		
	ANIKET RAJENDRA AHIWALE	9970401920		
4	DIVASE SUNIL JAMDAR	7028601050	Pedal pressed pneumatic jack	Prof.V.T.Rathod
	GAWADE NEHAL APPA	9860018566		
	RANMODE KIRAN RAMESH	7028626055		
	KAWARE POPAT SHANKAR	8669627529		
5	LONDHE SHRIKANT SURESH	9922677814	Six leg walking robot with auto jacking vehicle	Prof.A.D.Rajput
	BRAMHADEV NAGNATH BHOSAL	9423048479		
	KUMBHAR TUSHAR PANDURANG	7066804155		
	PATIL RAVINDRA ANANDRAO	9850966030		
6	SHINDE AMIT BABURAO	7517017177	Milk can tilter mechanism	Prof.S.S. Kathale
	MARADE ABHIJEET BALASO	9763449849		
	GOLE SWAPNIL DATTATRAY	9604427781		
	PAWAR AKSHAY VITTHAL	9730114266		
7	NIGADE AKSHAY SAMBHAJI	9922458596	Shell and tube type heat exchanger	Prof.J.A. Sodal
	BHOITE OMKAR	9561528101		
	TEKAWADE AKSHAY SANDIP	7218751854		
	TILEKAR SHRIKANT PRAKASH	8600227630		

Group No	Name of Student	Mobile Number	Title of project	Project Guides
8	BHUNJE RUSHIKESH DHANANJAY	8329744354	Motor Operated Hack Saw Machine	Prof.J.A. Sodal
	DURGUDE NITIN BALASAHEB	9960998047		
	GATKAL SHUBHAM TUKARAM	8888219519		
	GHORPADE ROHIT BALASAHEB	9921643863		
9	NALE SUHAS BALASO	9763612591	Design and fabrication of stair climber trolley	Prof.V.T.Rathod
	DEOKATE ROCKY BABASO	9921251625		
	KHARTODE SANTOSH BALU	7057325560		
	POL SAURABH RAMHARI	8007550864		
10	SABALE TUSHAR NAVNATH	8390353015	Electricity generation by using suspension system	Prof.A.D.Rajput
	PANKAJ SUNIL JAGTAP	9673494549		
	KHAIRE SIDDHANT PRAKASH	8530233061		
	KARANJKAR PRATIK PRAKASH	8669894242		
11	SHILWANT ROHIT ANIL	7057132567	Automatic hydraulic Bar bending Machine	Prof.V.T.Rathod
	PAWAR AMOL ASHOK	9860413238		
	SANDIP ANIL BHISE	9309944805		
12	UTPAT MILIND SURESHRAO	9011009270	Design and fabrication of grain separation using solar energy	Prof.A.D.Rajput
	POKHARKAR AMOL SHIVAJIRAO	9767214534		
	DESHMUKH NARENDRARAO P.	9922051144		



*[Signature]*  
H.O.D.

Mechanical Dept.  
Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Dist. Pune-413130



**DATTAKALA GROUP OF INSTITUTION'S  
FACULTY OF ENGINEERING**

**Swami- Chincholi, Tal: Daund, Dist.: Pune, 413130, Maharashtra, India.**

***CERTIFICATE***

This is certify that the project report entitled “ **Development of Pneumatically Actuated Valve Mechanism in IC Engine**” has successfully completed by,

**Mr. Jadhav Charudatt S.**

**Mr. More Suraj W.**

**Mr. Gurav Prashant S.**

**Mr. Kamble Vishal A.**

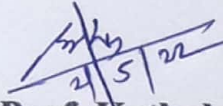
Under my supervision, in the partial fulfillment of Bachelor of Engineering (Mechanical Engineering) of Savitribai Phule Pune University, Pune for the academic year 2021-2022

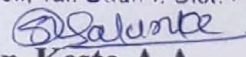
  
**Prof. Kathale S.S.**

Project Guide

**External Examiner**



  
**Prof. Kathale S.S.**  
H.O.D.  
Mechanical Dept.  
H.O.D. (Mech. Engg.)  
Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130

  
**Dr. Keste A.A.**

Principal  
Dattakala Faculty of Engineering  
Swami-Chincholi, Tal. Daund, Dist. Pune

Dattakala Group Of Institute's  
Faculty of Engineering,  
Swami-Chincholi, Daund-413130.



CERTIFICATE

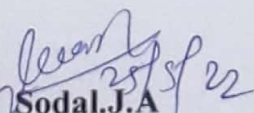
This is to certify that

Mr. Kajale Ajinkya H.  
Mr. Jadhav Satyam R.  
Mr. Dalvi Karan D.  
Mr. Kale Sagar D.

has successfully completed First review course work of the seminar entitled  
"VERTICAL MINI HONING MACHINE" under my supervision,  
in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of  
Savitribai Phule Pune University.

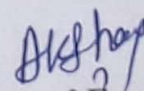
Place: SWAMI-CHINCHOLI

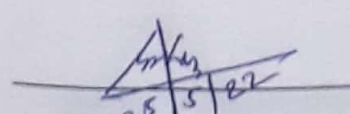
Date:

  
Prof. Sodal J.A.

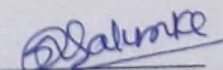
(Project guide)



  
Internal Examiner

  
Prof. Kathale S.S.  
H.O.D.

M. (HOD)  
Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130

  
Dr. Keste A. A.

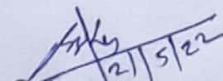
(PRINCIPAL)  
Dattakala Faculty of Engineering  
Swami-Chincholi, Tal. Daund, Dist. Pune

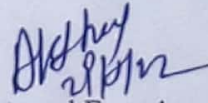
DEPARTMENT OF MECHANICAL ENGINEERING COLLEGE  
OF ENGINEERING  
SWAMI-CHINCHOLI  
2021-2022

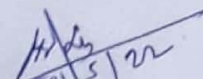


CERTIFICATE

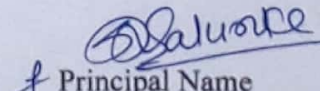
This is to certify that this report entitled “**DESIGN & DEVELOPMENT OF HYBRID SOLAR & WIND TURBINE FOR ELECTRICITY APPLICATION**” submitted herewith is a bonafide record of the PROJECT done by **ANIKET RAHIWALE ; KARTIKA SHARNOL ; SAYALI M HINGAS; SANDIP H NIKAM.** of Department OF Mechanical Engineering in partial fulfilment of requirements for the award of **Bachelor of Engineering in Mechanical Engineering** under the **University of Pune**, during the academic year 2021-2022.

  
Guide Name  
Prof. S.S. Kathale

  
Internal Examiner

  
HOD Name  
H.O.D.



  
Principal Name

Mechanical Dept.  
Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130

Dattakala Group Of Institute's  
Faculty of Engineering,  
Swami-Chincholi, Daund-413130.



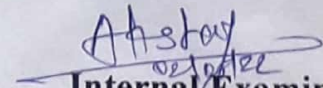
CERTIFICATE

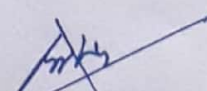
This is to certify that Mr. DIVASE SUNIL JAMDAR, Mr. GAWADE NEHAL APPA, Mr. RANMODE KIRAN RAMESH, Mr. KAWARE POPAT SHANKAR, has successfully completed First review course work of the seminar entitled " **PEDAL PRESSED PNEUNAMATIC JACK** " under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University.

Date:

Place: SWAMI-CHINCHOLI

**Prof. Rathod V.T.**  
(Project guide)

  
Internal Examiner

  
**Prof. Kathale sir.**  
(HOD)

H.O.D.

Mechanical Dept.

Dattakala Group of Institutions,  
Faculty of Engineering,

Swami-Chincholi, Tal. Daund, Dist. Pune-413130



  
**Dr. Keste A.A.**  
(PRINCIPAL)  
Dattakala Faculty of Engineering  
Swami-Chincholi Tal. Daund, Dist. Pur

Dattakala Group Of Institute's

Faculty of Engineering,

Swami- Chincholi, Daund-413130.



CERTIFICATE

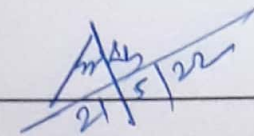
This is to certify that Mr. Ravindra Patil, Mr. Bramhadev Bhosale,,Mr. Shrikant Londhe, Mr. Tushar Kumbhar has successfully completed Final review course work of the project entitled “**SIX LEG WALKING ROBOT WITH AUTO JACKING VEHICLE**” under my supervision, in the partial fulfilment of Bachelor of Engineering-Mech. Engineering of Savitribai Phule Pune University.

Date:

Place: SWAMI-CHINCHOLI

  
Prof. RAJPUT A.D.

(Project guide)

  
Prof. KATHALE S.S.

(HOD)

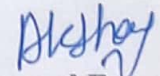
H.O.D.

Mechanical Dept.

Dattakala Group of Institutions,

Faculty of Engineering,

Swami-Chincholi, Tal. Daund, Dist. Pune-413130

  
Internal Examiner

  
Dr. KESTE A.A.

Principal

(PRINCIPAL)  
Dattakala Faculty of Engineering  
Swami-Chincholi, Tal. Daund, Dist. Pune



**DATTAKALA GROUP OF INSTITUTION  
FACULTY OF ENGINEERING  
SWAMI-CHINCHOLI**

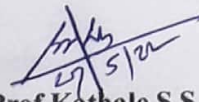



# CERTIFICATE

This is to certify that Mr. Amit Baburao Shinde , Mr. Abhijeet Balaso Marade,  
Mr.Akshay Vitthal Pawar, Mr.Swapnil Dattatray Gole has successfully completed  
First review course work of the seminar entitled “**Milk Can Tilter Mechanism**” under my  
supervision,in the partial fulfillment of Bachelor of Engineering Mechanical Engineering  
of Savitribai Phule Pune University .

**Date:**

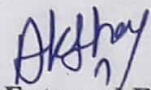
**Place: Swami-Chincholi**

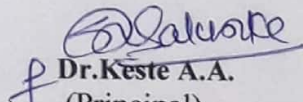
  
**Prof.Kathale S.S**  
(Project Guide)

  
**Prof.Kathale S.S**  
(H.O.D.)

Mechanical Dept.  
Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130



  
**External Examiner**

  
**Dr.Keste A.A.**  
(Principal)  
**Principal**  
Dattakala Group of Institutions  
Faculty of Engineering  
Swami-Chincholi, Tal.Daund, Dist. Pune-413130

**DATTAKALA GROUP OF INSTITUTIONS, SWAMI-  
CHINCHOLI**



**CERTIFICATE**

This is to certify that

**Mr. Akshay S Tekawade,  
Mr. Omkar Bholte,  
Mr. Shrikant Telaker  
Mr. Akshay Nigde**

, has successfully completed the Project Stage – II entitled “ **Shell and Tube Type Heat exchanger** ” under my supervision ,in the partial fulfillment of Bachelor of Engineering-Mechanical Engineering of University of pune.

Date :

Place :

*Pro. J. A. Sodal*  
24/05/2022

**Guide's Name**

*Pro. S.S. Kathale*  
24/5/22

**H.O.D.**

**Mechanical Dept.**

**Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130**



*Akshay*  
**Internal Examiner**

*@Salunke*  
**Principal**

**External Examiner**

Dattakala Group of Institutions Faculty of Engineering, BE Mechanical

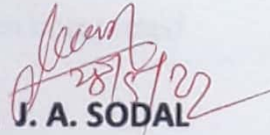
Dattakala Group Of Institute's  
Faculty of Engineering,  
Swami-Chincholi, Daund-413130.



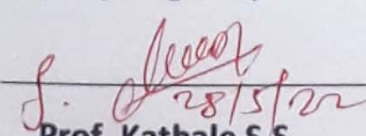
CERTIFICATE

This is to certify that Mr. Nitin Durgude, Mr. Bhunje Rushikesh, Mr. Shubham Gatkal, has successfully completed First review course work of the seminar entitled "MOTOR OPERATED HACKSAW MACHINE" under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University. Date:

Place: SWAMI-CHINCHOLI

  
Prof. J. A. SODAL

(Project guide)

  
Prof. Kathale S.S.

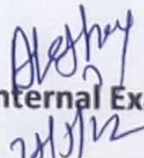
H.O.D.

(HOD) Mechanical Dept.

Dattakala Group of Institutions,

Faculty of Engineering,

Dattakala Group Of Institutions, Faculty Of Engineering Swami Chincholi  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130

  
Internal Examiner

  
Dr. Keste A. A.

Principal

Dattakala Group of Institutions,  
Faculty of Engineering  
Swami-Chincholi, Tal. Daund, Dist. Pune

Dattakala Group Of  
Institutions Faculty of  
Engineering,

Swami-Chincholi, Daund-413130.



CERTIFICATE

This is to certify that **Mr. Saurabh Pol, Mr. Rocky Deokate, Mr. Santosh Khartode, Mr. Suhas Nale**, has successfully completed project stage second work "DESIGN AND FABRICATION OF STAIR CLIMBER TROLLEY" under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University.

Date:

Place: Swami-Chincholi

Prof. Rathod V.T.

(Project guide)

External Examiner

Prof. Kathale S. S.

(HOD.)

Mechanical Dept.

Dattakala Group of Institutions,

Faculty of Engineering,

Swami-Chincholi, Tal. Daund, Dist. Pune-413130



Dr. Keste A. A.

(PRINCIPAL)

Dattakala Group of Institutions

Faculty of Engineering

Swami-Chincholi, Tal. Daund, Dist. Pune-413130

Dattakala Group Of Institute's

Faculty of Engineering,

Swami-Chincholi, Daund-413130.



## CERTIFICATE

This is to certify that Mr.Pankaj Jagtap, Mr.Tushar Sable , Mr. Pratik Karanjkar , Mr. Siddhant Khaire , has successfully completed First review course work of the seminar entitled "*Electricity generation by using suspension system*" under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University.

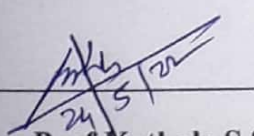
Date:

Place:

  
Prof. Rajendra A.D.

(Project guide)

  
Internal Examiner

  
Prof.Kathale.S.S

H.O.D. (HOD)

Mechanical Dept.

Dattakala Group of Institutions, External Examiner

Faculty of Engineering,

Swami-Chincholi, Tal. Daund, Dist. Pune-413130



  
Dr. Keste.A.A

(PRINCIPAL)

Dattakala Group Of Institute's

Faculty of Engineering,

Swami-Chincholi, Daund-413130.



## CERTIFICATE

This is to certify that Mr. Amol Pawar, Mr. Sandip Bhise, Mr. Rohit Shilwant , has successfully completed First review course work of the seminar entitled "AUTOMATIC HYDRAULIC BAR BENDING MACHINE" under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University. Date:

Place: SWAMI-CHINCHOLI

Prof. Rathod V. T.

(Project guide)

Prof. Kathale S.S.

(HOD)

Mechanical Dept.

Dattakala Group of Institutions,  
Faculty of Engineering,  
Swami-Chincholi, Tal. Daund, Dist. Pune-413130



Internal Examiner

Dr. Keste A. A.

(PRINCIPAL)

# Dattakala Group Of Institute's

Faculty of Engineering,

Swami-Chincholi, Daund-413130.



## CERTIFICATE

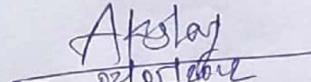
This is to certify that Mr. Amol S Pokharkar, Mr. Millind Suresh Utpat, Mr. Deshmukh Narendra Pandurang, Mr. Parkale Shivrup Shantaram, has successfully completed First review course work of the seminar entitled "DESIGN AND FABRICATION OF GRAIN SEPARATOR USING SOLAR ENERGY" under my supervision, in the partial fulfilment of Bachelor of Engineering-Mechanical Engineering of Savitribai Phule Pune University.

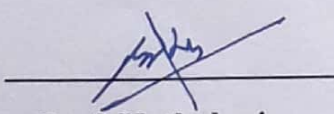
Date:

Place: SWAMI-CHINCHOLI

  
Prof. Rajput Sir.

(Project guide)

  
Internal Examiner

  
Prof. Kathale sir.

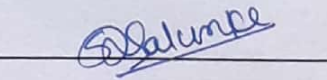
H.O.(HOD)

Mechanical Dept.

Dattakala Group of Institutions,  
Faculty of Engineering,

Swami-Chincholi, Tal. Daund, Dist. Pune-413130



  
Dr. Kesze A.A.

Principal  
(PRINCIPAL)  
Dattakala Faculty of Engineering  
Swami-Chincholi Tal. Daund, Dist. Pur

A  
PROJECT REPORT  
ON  
"Student Fees Management System"

Submitted to  
Savitribai Phule Pune University in the Partial Fulfillment of  
the requirement for the award of the Degree of

**MASTER OF COMPUTER APPLICATION**

In  
Semister -1

Submitted by

**Mrs.Rathod Manisha Mohan**  
**Mrs.Nagawade Siddhika Subarav**  
**Mr.Thorat Harshad Anil**

Under the guidance of  
**Prof. Salunke Shrikant D.**



**Department of Master of Computer Application**  
**DATTAKALA GROUP OF INSTITUTIONS**  
**FACULTY OF MANAGEMENT**  
**SWAMI-CHICHOLI (DAUND), OFF PUNE-SOLAPUR HIGHWAY,**  
**SWAMI-CHINCHOLI, DAUND - 413 130**  
**(2022-23)**

# CERTIFICATE

This is to certify that, the project entitled

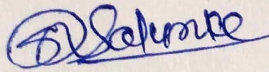
“Student Fees Management System”

Submitted by,

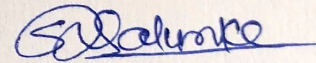
**Mrs.Rathod Manisha Mohan**

is a confide work carried out by her under the Guidance of Prof. Salunke S.D. And it is approved for the partial fulfillment of the requirement of the Savitribai Phule Pune University for the award of the Master Degree of **Master of Computer Application.**

This project report has not been earlier submitted to any other institute of university for the award of any degree.



**Prof. Salunke S.D.**  
**Guide**



**Prof. Salunke S.D.**  
**HoD. MCA Dept.**

**Dr.Karne S.S.**  
**Director**

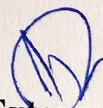
**Director**

**Dattakala Group of Institutions**

**Faculty of Management**

**Swami Chincholi, Tal. Daund, Dist. Pune**

**Pin -413130**



**External Examiner**

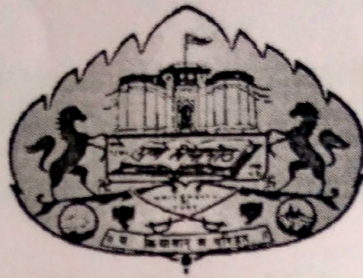
**Department of Master of Computer Application**

**Dattakala Group of Institutions**

Place: Swami-Chincholi

Date:

A  
PROJECT REPORT  
ON  
"TRANSPORT MANAGEMENT SYSTEM"



SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY

FOR THE PARTIAL FULFILLMENT OF AWARD OF DEGREE

Of

MASTER OF COMPUTER APPLICATIONS

ACADEMIC YEAR 2021-2022.

SUBMITTED BY

1.Mr. Rohan Mohan Shelake.

Roll No:-24919

2.Mr. Dhairysheel Dilip Gole.

Roll No:-24880

3.Mr. Pankaj Gajanan Patil.

Roll No:-24901

UNDER THE GUIDANCE OF  
Prof. Mr. Shrikant Salunkhe(HOD)

NAME OF THE FACULTY

MCA- 1<sup>ST</sup> (SEM-I)

DATTAKALA SHIKSHAN SANSTHA'S

**DATTAKALA GROUP OF INSTITUTIONS,  
FACULTY OF MANAGEMENT,  
MASTER OF COMPUTER APPLICATIONS,**

SWAMI-CHINCHOLI(BHIGWAN), TAL-DAUND, DIST-PUNE 413 130.



**Certificate**

This is to certify that *Mr. Rohan Mohan Shelake*, has successfully & satisfactorily completed & submitted the report of **Mini Project -Transport Management System**. In Partial fulfillment for the degree course in Master of Computer Application prescribed by University of Pune, under the guidance of **Prof. Shrikant Salunkhe**, for academic year **2021 - 22**



*Rudhey*

In-Charge

*M/S*

Examiner

*Salunkhe*

Head of Department

**A**

**PROJECT REPORT**

**ON**

**"FARM IN HAND"**



**University of Pune**

**SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY**

**FOR THE PARTIAL FULFILLMENT OF AWARD OF DEGREE**

**Of**

**MASTER OF COMPUTER APPLICATIONS**

**ACADEMIC YEAR 2021-2022.**

**SUBMITTED BY**

**1.Mr. Avinash Narayan Surve.**

**Roll No:- 24871**

**2.Mr. Prathamesh Subhash Chavan.**

**Roll No:- 24913**

**3.Mr. Shubham Sunil Suryawanshi.**

**Roll No:- 24931**

**UNDER THE GUIDANCE**

**OF**

**Prof. Mr.Shrikant Salunke(HOD)**

**NAME OF THE FACULTY**

**MCA- 1<sup>ST</sup> (SEM-1)**

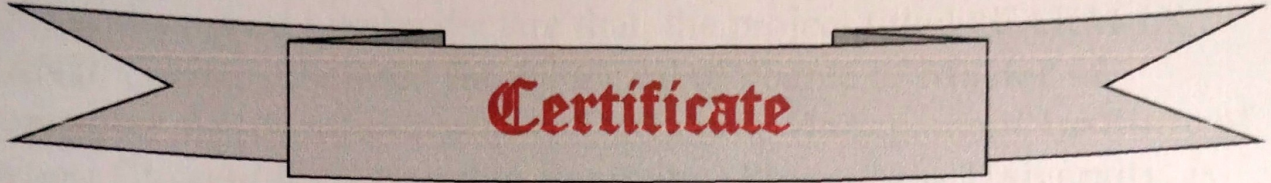


DATTAKALA SHIKSHAN SANSTHA'S

DATTAKALA GROUP OF INSTITUTIONS,  
FACULTY OF MANAGEMENT,

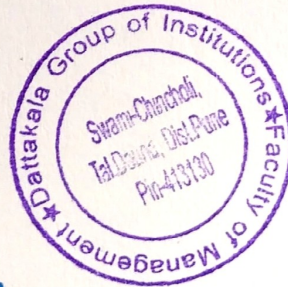
MASTER OF COMPUTER APPLICATIONS,

SWAMI-CHINCHOLI(BHIGWAN), TAL-DAUND, DIST-PUNE 413 130.



This is to certify that **Mr. Avinash Narayan Surve**, has successfully & satisfactorily completed & submitted the report of **Mini Project - FARM IN HAND**. In Partial fulfillment for the degree course in Master of Computer Application prescribed by University of Pune, under the guidance of **Prof. Shrikant Salunke**

For academic year **2021 - 22**



*[Signature]*

Prof. In-Charge

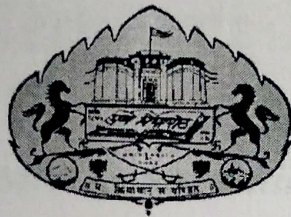
*[Signature]*

Examiner

*[Signature]*

H.O.D of Dept.

A  
PROJECT REPORT  
ON  
"LIBRARY MANAGEMENT SYSTEM"



University of Pune

SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY

FOR THE PARTIAL FULFILLMENT OF AWARD OF DEGREE

Of

MASTER OF COMPUTER APPLICATIONS

ACADEMIC YEAR 2021-2022.

**SUBMITTED BY**

1. Mr. Adhav Rohit Balasaheb

Roll No:-

2. Mr. Rohit anil khillare

Roll No:-

3. Miss. sudhir shelke.

Roll No:-

UNDER THE GUIDANCE

OF

Prof. Mr. Shrikant Salunke<sub>(HOD)</sub>

NAME OF THE FACULTY

MCA- 1<sup>ST</sup> (SEM-I)

DATTAKALA SHIKSHAN SANSTHA'S  
DATTAKALA GROUP OF INSTITUTIONS,  
FACULTY OF MANAGEMENT,  
MASTER OF COMPUTER APPLICATIONS,  
SWAMI-CHINCHOLI(BHIGWAN), TAL-DAUND, DIST-PUNE 413 130.

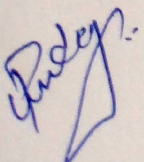


**Certificate**

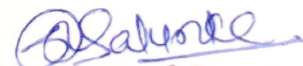
This is to certify that *Mr. Rohit Anil Khilare* has successfully & satisfactorily completed & submitted the report of **Mini Project –Library Management System**. In Partial fulfillment for the degree course in Master of Computer Application prescribed by University of Pune, under the guidance of **Prof. Shrikant Salunke**

For academic year **2021 - 22**



  
Prof. In-Charge

  
Examiner

  
H.O.D of Dept.

**A**  
**PROJECT REPORT**  
**ON**  
**"TOUR AND TRAVEL MANAGEMENT SYSTEM"**



University of Pune

**SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY**

**FOR THE PARTIAL FULFILLMENT OF AWARD OF DEGREE**

**Of**

**MASTER OF COMPUTER APPLICATIONS**

**ACADEMIC YEAR 2021-2022.**

**SUBMITTED BY**

**1.Mr. Sirajuddin Johar Shafiuddin.**

**Roll No:- 65**

**2.Mr. Abhisek Senapati.**

**Roll No:- 02**

**UNDER THE GUIDANCE**

**OF**

**Prof. Mrs. Punde Amruta Arun**

**NAME OF THE FACULTY**

**MCA- 1<sup>ST</sup> (SEM-I)**



DATTAKALA SHIKSHAN SANSTHA'S  
DATTAKALA GROUP OF  
INSTITUTIONS, FACULTY OF  
MANAGEMENT, MASTER OF COMPUTER  
APPLICATIONS,  
SWAMI-CHINCHOLI (BHIGWAN), TAL-DAUND, DIST-PUNE 413 130.

**Certificate**

This is to certify that **Mr. Sirajuddin Johar Shafiuddin**, has successfully & satisfactorily completed & submitted the report of **Mini Project Tour and Travel Management System**. In Partial fulfillment for the degree course in Master of Computer Application prescribed by University of Pune, under the guidance of **Prof.**

**Punde Amruta Arun**

For academic year **2021 – 22**

**Prof. In-Charge**

**Dept.**

**Examiner**



**H.O.D of**

**A PROJECT REPORT ON**

**“A STUDY OF CUSTOMER SATISFACTION LEVEL FOR HONDA  
DIO SHOOTERS ”**

**AT**

**ATHARVA HONDA**

**( BHIGWAN )**

**Submitted to**

**SAVITRIBAI PHULE PUNE UNIVERSITY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE IN**

**MASTER OF BUSINESS ADMINISTRATION (MBA)**

**IN MARKETING MANAGEMENT**

**Submitted by**

**MR. KAKADE DIPAK GORAKH**

**Under the Guidance of**

**DR. NARENDRA DESHMUKH**

**(ASSISTANT PROFESSOR)**



**DATTAKALA FACULTY OF MANAGEMENT**

**BHIGWAN, DIST - PUNE**

**PIN - 413130**



Dattakala Shikshan Sanstha's

# DATTAKALA GROUP OF INSTITUTIONS DATTAKALA FACULTY OF MANAGEMENT

(Approved by AICTE & DTE Recognized by Govt. of Maharashtra & Affiliated to Savitribai Phule Pune University)  
Gat No. 541/2,527, Off. Pune-Solapur Highway, A/p. Swami-Chincholi (Bhigwan) Tal.Daund, Dist.Pune - 413 130  
Phone : 02117-203183/84, Email ID : dkcom.edu@rediffmail.com, Website : www.dattakala.edu.in

**Mrs. Maya R. Zol**  
M.A.(English) B.Ed.  
Founder Secretary

**Dr.Sharad S. Karne**  
BSC.LLB.MBA.MPM.Ph.D.  
Director


**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Date

Ref. No.

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **KAKADE DIPAK GORAKHA** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled " **A STUDY OF CUSTOMER SATISFACTION LEVEL FOR HONADA DIO SCOOTERS AT ATHARVA HONDA Bhigwan** ". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022. in **Marketing Management (MKT)** as per the rules of Savitribai Phule University.

  
**Dr. Narendra Deshmukh**  
(Internal Project Guide)



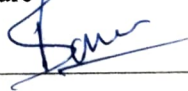
  
**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:

S.S. Sadave



2.Internal Examiner:

Dr. Deshmukh N.P.



**A**  
**PROJECT REPORT**  
**ON**  
**“A STUDY OF COMPARATIVE ANALYSIS OF PRODUCTS & SERVICES”**  
**“AT AXIS BANK”**

**SUBMITTED TO SAVITRI BAI PHULE UNIVERSITY OF PUNE**  
**IN PARTIAL FULFILLMENT OF THE REQUIREMENT**  
**FOR AWARD OF DEGREE OF**  
**MASTER OF BUSINESS ADMINISTRATION**

**BY**  
**MRS. AKSHADA UMAKANT KADAM**  
**MBA II-FINANCE**

**UNDER THE GUIDANCE OF**  
**Dr. NARENDRA DESHMUKH**  
**(ASSISTANT PROFESSOR)**



**DATTAKALA FACULTY OF MANAGEMENT**  
**SWAMI CHINCHOLI - (BHIGWAN),**  
**TAL – DAUND, DISTRICT – PUNE,**  
**PIN – 413130**  
**2021-2022**

Dattakala Shikshan Sanstha's

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**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

**CERTIFICATE**

This is to certify that Mr./ Ms./ Mrs. **Kadam Akshada Umakant** is a bonafide student of our Institute. He/ She has successfully carried out his/ her **Project Report** entitled "**A Study of comparative analysis of products and services at Axis Bank**". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.



**Dr. Narendra Deshmukh**  
(Internal Project Guide)

**Dr. Sharad Karne**

Director  
Dattakala Group of Institutions  
Faculty of Management  
Swami Chincholi, Tal. Daund, Dist. Pune  
Pin -413130

Name of the Examiners for Viva

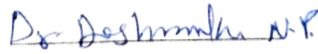
Signature

1.External Examiner:





2.Internal Examiner:







**A PROJECT REPORT ON  
“A STUDY ON RECRUITMENT AND  
SELECTION PROCESS”**

**AT  
SHREERAM CONSULTANCY  
(PUNE)**

*Offered By  
Submitted to the Savitribai Phule Pune University, Pune  
In partial fulfillment of the requirement for the award of the Degree  
Of  
Master of Business Administration*

**Submitted By  
Mr. Onkar Suresh Kulkarni**

**Under The Guidance of**

**Prof. Shinde S P**

**THROUGH**



**DATTAKALA GROUP OF INSTITUTION  
FACULTY OF MANAGEMENT**

**BHIGWAN**

**Academic Year  
(2021-22)**



Dattakala Shikshan Sanstha's

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Director

**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **KULKARNI ONKAR SURESH** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**A study on recruitment and selection process at Shreeram Consultancy , Pune.**" report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Human Resource Management (HRM)** as per the rules of Savitribai Phule University.

**Prof Shinde S. P**  
(Internal Project Guide)



**Dr. Sharad Karne**

Name of the Examiners for Viva

1.External Examiner:

S.S. Sadane

Signature

2.Internal Examiner:

Dr. Deshpande N.P.

**A PROJECT REPORT ON**

**“A STUDY OF RATIO ANALYSIS WITH REFERENCE TO NATURE  
DELIGHT DAIRY AND DAIRY PRODUCTS PVT. LTD.”**

**Submitted to**

**SAVITRIBAI PHULE PUNE UNIVERSITY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE IN**

**MASTER OF BUSINESS ADMINISTRATION (MBA)**

**IN FINANCIAL MANAGEMENT (FIN)**

**Submitted by**

**MR. PRASHANT JAYSING DESHMUKH**

**Under the Guidance of**

**DR. NARENDRA DESHMUKH**

**(ASSISTANT PROFESSOR)**



**DATTAKALA FACULTY OF MANAGEMENT**

**BHIGWAN, DIST - PUNE**

**PIN - 413130**



Dattakala Shikshan Sanstha's

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Director


**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **Prashant Jaysing Deshmukh** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**A STUDY OF RATIO ANALYSIS WITH REFERENCE TO NATURE DELIGHT DAIRY AND DAIRY PRODUCTS PVT. LTD**". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

  
**Dr. Narendra Deshmukh**  
(Internal Project Guide)

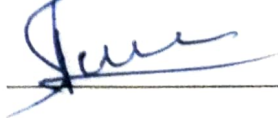


  
**Dr. Sharad Karne**

Name of the Examiners for Viva  
1.External Examiner:




Signature



2.Internal Examiner:





**A PROJECT REPORT ON**  
**“A STUDY ON HEALTH CARE**  
**SECURITY”**  
**AT**  
**GLENMARK LIFE SCIENCE LTD**  
**(Kurkumbh, Daund)**

*Offered By*  
*Submitted to the Savitribai Phule Pune University, Pune*  
*In partial fulfillment of the requirement for the award of the Degree*  
*Of*  
*Master of Business Administration*

**Submitted By**  
**Mr. Prashant Rajendra Saptal**

**Under The Guidance of**

**Prof. Dr. Narendra Deshmukh**

**THROUGH**



**DATTAKALA GROUP OF INSTITUTION**  
**FACULTY OF MANAGEMENT**  
**BHIGWAN**  
**Academic Year**  
**(2021-22)**



**A PROJECT REPORT ON**

**“ To Study On Customer Satisfaction Level Of HDFC Bank  
Ltd Indapur ”**

**Submitted to**

**SAVITRIBAI PHULE PUNE UNIVERSITY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE IN**

**MASTER OF BUSINESS ADMINISTRATION (MBA)**

**IN OPERATIONS & SUPPLY CHAIN MANAGEMENT (OSCM)**

**Submitted by**

**MISS.PRIYANKA PRABHAKAR BHANGE**

**Under the Guidance of**

**Dr . Deshmukh Narendra**

**( ASSISTANT PROFESSOR )**



**DATTAKALA FACULTY OF MANAGEMENT**

**BHIGWAN , Dist - Pune**

**PIN - 413130**



Dattakala Shikshan Sanstha's  
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**Mrs. Maya R. Zol**  
M.A. (English) B.Ed.  
Principal Secretary

**Dr. Sharad S. Karne**  
BSC. LL.B. MBA. MPM. Ph.D.  
Director


**Prof. Ramdas M. Zol**  
M.Sc(Maths). B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **BHANGE PRIYANKA PRABHAKAR** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled “**To study on customer satisfaction level of HDFC bank , Indapur.**” report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

  
**Dr. Narendra Deshmukh**  
(Internal Project Guide)



  
**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1. External Examiner:

S.S. Sadore



2. Internal Examiner:

Dr. Deshmukh NP



**A**  
**Project Report**  
**On**  
**A STUDY OF RELIGARE MUTUAL FUND**

**Submitted to fulfillment**  
**Of the requirement to award the degree of**

**Master of Business Administration**

**BY**  
**STUDENT NAME: SOMESH TILEKAR**

**Under the guidance of**  
**"Prof. Dr Narendra Deshmukh Sir"**  
**Through**  
**"AU SMALL FINANCE BANK LTD"**  
**Submitted to**  
**"Savitribai Phule Pune University"**



**Savitribai Phule Pune**  
**University**

**Dattakala Shikshan Sanstha Swami-Chincholi Daund**

**2021-2022**





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Director

**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.


Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **TILEKAR SOMESH MARUTI** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled “ **A study on investor perception of mutual fund at AU Small Financial Bank** ”. The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

  
**Dr. Narendra Deshmukh**  
(Internal Project Guide)



  
**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:





2.Internal Examiner:





**A**

**DISSERTATION REPORT ON**

**“A STUDY OF FINANCIAL ANALYSIS & INTERPERTATION OF RATIO”**

**AT**

**INDAPUR DAIRY & MILK PRODUCTS LIMITED,**

**INDAPUR**

**SUBMITTED TO**

**SAVTRIBAI PHULE PUNE UNIVERSITY**

**IN PARTIAL FULFLLMENT OF THE REQUIREMENT FOR THE**

**AWARD OF DEGREE OF**

**MASTER OF BUSINESS ADMINISTRATION**

**SUBMITTED BY**

**MR. RIYAJ SHABBIR SHAIKH**

**(MBA-II FINANCE MANAGEMENT)**

**UNDER THE GUIDANCE OF**

**PROF. SIDDHESHWAR PANDITRAO SHINDE**

**THROUGH**



**DATTAKALA SHIKSHAN SANSTHA**

**DATTAKAL FACULTY OF MANAGEMENT**

**SWAMI CHINCHOLI, BHIGWAN, TAL-DAUND, DIST-PUNE**

**(ACADEMIC YEAR 2020-22)**



Dattakala Shikshan Sanstha's

**DATTAKALA GROUP OF INSTITUTIONS**  
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**Dr.Sharad S. Karne**  
BSC.LLB.MBA.MPM.Ph.D.  
Director

**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **SHAIKH RIYAJ SHABBIR** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**A STUDY OF FINANCIAL ANALYSIS & INTERPERTATION OF RATIO AT INDAPUR DAIRY & MILK PRODUCTS LIMITED,INDAPUR**". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

**Prof Shinde S.P**

(Internal Project Guide)



**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:

S.S. Ladne

[Signature]

2.Internal Examiner:

Dr. Deshmukh W.P.

[Signature]

A Project Report

On

**" A STUDY ON ANALYSIS OF MUTUAL FUND AND SYSTEMATIC INVSTMENT PLAN"**

"At"

**" VANSI CAPITAL .LTD "**

By

**"Mr. Shubham Kishor Pardeshi"**

Under the guidance of

**"Prof. Dr Narendra Deshmukh Sir"**

Submitted to

**"Savitribai Phule Pune University"**



In partial fulfillment of the requirement for the award of the degree of  
Master of Business Administration (MBA)




**Dattakala Shikshan Sanstha, Swami-Chincholi (Bhigwan),  
Tal Daund Dist Pune  
2021-2022**

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **Shubham Kishor Pardeshi** is a bonafide student of our Institute. He/ She has successfully carried out his/ her **Project Report** entitled "**A STUDY ON ANALYSIS OF MUTUAL FUND AND SYSTEMATIC INVESTMENT PLAN**". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2019-2021, in \_\_\_\_\_ as per the rules of Savitribai Phule University.

*Finance management  
(FN)*

  
**Dr. Narendra Deshmukh**  
(Internal Project Guide)



  
**Dr. Sharad KARNE**  
Director

Name of the Examiners for Viva

Signature

1. External Examiner: *S. S. Badar*



2. Internal Examiner: *Dr. Deshmukh N.P.*



**A PROJECT REPORT  
ON  
“MARKETING STRATEGIES OF MICRONUTRIENT  
FERTILIZERS”**

**At  
ARIES AGRO LTD. IN SHRIGONDA TEHSIL OF  
AHMEDNAGAR DISTRICT**

**By  
ATUL SUBHASH SHELAR  
(MBA-II Marketing)**

**Under The Guidance of**

**Prof. Shinde S. P.**

**(Project Guide)**

**Submitted To**



**SAVITRIBAI PHULE UNIVERSITY PUNE**

**In partial fulfillment of the requirement for the award of the degree of  
Master of Business Administration (MBA)**



**DATTAKALA FACULTY OF MANAGEMENT  
SWAMI CHINCHOLI (BHIGWAN)  
TAL-DAUND DIST-PUNE  
PINCODE-413130  
2021-22**



Dattakala Shikshan Sanstha's

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Founder Secretary

**Dr.Sharad S. Karne**  
BSC.LLB.MBA.MPM.Ph.D.  
Director

**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **SHELAR ATUL SUBHASH** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**Marketing strategies of Micronurient fertilizers at Aries Agro Ltd in Shrigonda Tahashil of Ahamadnage District**". The report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Marketing Management (MKT)** as per the rules of Savitribai Phule University.

**Prof Shinde S. P**

(Internal Project Guide)



**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:

S. S. Badve

2.Internal Examiner:

Dr. Deshmukh N.P.

**A PROJECT REPORT ON  
“COMPARISON OF HOME LOAN SCHEME  
OF DIFFERENT BANKS”**

**Submitted to**

**SAVITRIBAI PHULE PUNE UNIVERSITY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE IN**

**MASTER OF BUSINESS ADMINISTRATION (MBA)**

**FINANCE MANAGEMENT**

**Submitted by**

**MR. Tolepatil Akash Balasaheb**

**Under the Guidance of**

**Dr . Deshmukh Narendra**

**( ASSISTANT PROFESSOR )**



**DATTAKALA FACULTY OF MANAGEMENT**

**BHIGWAN , Dist - Pune**

**PIN - 413130**



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Director

**Prof. Ramdas M.Zol**

M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

Date

## CERTIFICATE

This is to certify that Mr./ Ms./ Mrs. **Tolepatil Akash Balasaheb** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**COMPARISON OF HOME LOAN SCHEMES OF DIFFERENT BANKS.**" report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022. in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

  
**Dr. Narendra Deshmukh**

(Internal Project Guide)



  
**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:

S.S. Badar



2.Internal Examiner:

Dr. Deshmukh N.P.



**A PROJECT REPORT ON‘  
“ CYCLE TIME REDUCTION ON CNC MACHINE ”  
“ PIAGGIO VEHICLES PVT LTD”**

**Submitted to**

**SAVITRIBAI PHULE PUNE UNIVERSITY  
IN-PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE IN  
MASTER OF BUSINESS ADMINISTRATION (MBA)  
IN FINANCIAL MANAGEMENT .**

**Submitted by  
MR. TUSHAR TANAJI LAVAND.  
Under the Guidance of**

**Dr . Deshmukh Narendra  
( ASSISTANT PROFESSOR )**



**DATTAKALA FACULTY OF MANAGEMENT  
BHIGWAN , Dist - Pune  
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Dattakala Shikshan Sanstha  
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**Mrs. Maya R. Zol**  
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**Dr.Sharad S. Karne**  
BSC.LLB.MBA.MPM.Ph.D.  
Director

**Prof. Ramdas M.Zol**  
M.Sc(Maths).B.Ed.  
Founder President

Ref. No.

## CERTIFICATE

Date

This is to certify that Mr./ Ms./ Mrs. **LAVAND TUSHAR TANAJI** is a bonafide student of our Institute. He/ She has successfully carried out his/ her Project Report entitled "**A Study on cycle time reduction on CNC Machine in Piaggio Vehicles Pvt Ltd, Baramati.**" report is submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration (MBA) 2020-2022, in **Financial Management (FIN)** as per the rules of Savitribai Phule University.

**Prof Shinde S. P**

(Internal Project Guide)



**Dr. Sharad Karne**

Name of the Examiners for Viva

Signature

1.External Examiner:

S.S. Godve

[Signature]

2.Internal Examiner:

Dr. Deshmukh N.P

[Signature]



# HONDA

## CERTIFICATE

This is certify that **Mr. Dipak Gorakh Kakade** Student of Dattakala Faculty of Management, Bhigwan, has successfully completed her project work entitled “**A Study of Customer Satisfaction Level For Honda Dio Scooters**” At **Atharva Honda(Bhigwan)**. In our organization during the period between (11<sup>th</sup> Oct 2021 to 10<sup>th</sup> Dec 2021) He has completed project work satisfactory and found proficient in project work.

This is for your information

Thanking you  
Sincere regards

Founder

**Mr.Nanaso Bandgar**



AXIS BANK

Date: - 01/02/2022

AXISB/WZ/MAHWESTCIRCLE/2022-43

Mrs. Akshada U. Kadam,  
A-204, Sai Orchid C.H.S.  
Plot no- 21, Sector-17,  
Ulwe, Navi Mumbai.  
410206.

### CERTIFICATE OF COMPLETION OF SUMMER PROJECT

This is to certify that Mrs. Akshada Umakant Kadam, a student of Master of Business Administration, has successfully completed a summer project of 8 week (1<sup>st</sup> Dec, 2021 to 31<sup>st</sup> Jan 2022) in our company.

Candidate has worked on "**Comparative Analysis of products & services**" at Axis Bank and added value through her work.

During this period of her internship program with us she was found punctual and hardworking.

We wish her all the best in her future Endeavour's.

Authorized Signature



West Circle Head





Upper Ground Floor, Vohra Collection Indapur, Indapur, Maharashtra - 413106, India

Date: 16/02/2022

This is to certify that **Miss Priyanka Prabhakar Bhang**, MBA student of our institute **bigwan** has successfully completed the internship entitled "**Study on Customer Satisfaction HDFC Bank**" **Indapur** for period of 06 weeks i.e. from 01<sup>st</sup> January 2022 to 16<sup>th</sup> February 2022. He has worked satisfactorily towards completion of project assigned to her.

During the course of training we found him sincere, enthusiastic and punctual, well behaved and obedient in nature.

We wish all the best for his future.

Authorized person

Place: Indapur



# aries agro limited

AN ISO 9001 COMPANY : Quality Management System : 9001:2015 Certified

Regd Office : Aries House, Plot No. 24 Deonar, Govandi East 400 043

## CERTIFICATE

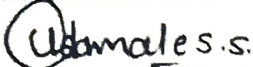
### TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. Arul Sabbash Shelar** student of MBA II Year from Dattakala faculty Of Management Swami Chincholi Tal- Daund Dist- Pune has successfully completed the summer internship project entitled "MARKETING STRATIGIES OF MICRONUTRIENT FERTILIZERS" in our organization from date

10<sup>th</sup> October 2021 to 30<sup>th</sup> November 2021.

Certificate is issued as per his / her request.

We wish him / her all the best for her future endeavors.

  
Mr. Udamales.S.

(Territory Manager)

Date:- 19/05/2022

Place:- Shrigonda





# CERTIFICATE

TO WHOM IT MAY CONCERN

**"A STUDY ON ANALYSIS OF MUTUAL FUND AND SYSTEMATIC INVESTMENT PLAN"**

This is to certify that **Mr. Shubham Kishor Pardeshi**, a Student of MBA Finance III Semester from Dattakala Group of institution Faculty of Management has Successfully Completed **"A STUDY ON ANALYSIS OF MUTUAL FUND AND SYSTEMATIC INVESTMENT PLAN"** Internship Program At This Branch/Company. During The Period three Months (form 1st December, 2021to 28 February, 2022). In his Internship Programme with us he was found Punctual, Hardworking and Inquisitive.

**Senior Head -  
Human  
Resources  
PRIYANKA MITRA**

*Priyanka*



**Manager-  
Human  
Resources  
SAGAR BABAR**

