



**Bansilal Ramnath Agarwal Charitable Trust's**

# **Vishwakarma Institute of Technology**

*(An Autonomous Institute affiliated to Savitribai Phule Pune University formerly  
University of Pune)*

**Structure and Syllabus of**

## **B.Tech. (Mechanical - Sandwich)**

**Pattern 'E11'**

**Effective from Academic Year 2015-16**

**(Final Year B. Tech.)**

**Prepared by: - Board of Studies in Mechanical Engineering**

**Approved by: - Academic Board, Vishwakarma Institute of Technology,  
Pune**

**Signed by**

**Chairman – BOS**

**Chairman – Academic Board**

Structure and syllabus of Final Year B.Tech. Mechanical Sandwich Pattern E-11, A.Y.  
2015-16

## **Vision, Mission and PEOs of B. Tech. Mechanical Engineering**

### **Vision**

To be recognized as one of the preeminent Mechanical Engineering Programs

### **Mission**

- To be recognized as a leading Mechanical Engineering Department in the field of Knowledge, Skill and Research
- To prepare students competent to make their careers in Mechanical Engineering
- To strengthen collaborations with Industries, Academia and Research Organizations to enrich learning environment and to enhance Research Culture
- To provide value education to students to make them responsible citizen

### **Program Educational Objectives**

To achieve the mission of the program, Mechanical Engineering graduates will be able:

1. To acquire and develop careers in industries, Research organizations, academia and demonstrate entrepreneurial skill
2. To work independently as well as in team to formulate, design, execute solutions for engineering problems and also analyze, synthesize technical data for application to product, process, system design & development
3. To develop expertise towards use of modern engineering tools, instruments, programming languages and software's
4. To understand & contribute towards social, environmental issues, following professional ethics and codes of conduct and embrace lifelong learning for continuous improvement

**STRUCTURE MODULE VII**

Subject No.	Subject Code	Subject Name	Teaching Scheme (Hrs/week)			Credits
			Lect.	Tutorial	Practical	
S1	ME42101 ME42103 ME42105 ME42117	*Elective Group I Kinematic Analysis & Synthesis Tribology Mechanics of Composite Materials Industrial Fluid Power	3	0	0	3
S2	ME42109 ME42111 ME42113 ME42115	**Elective Group II Heat Exchange Devices Turbo machines Thermal Power Plants Energy Conservation and Management	3	0	0	3
S3	ME40101	Design of Mechanical Systems	3	0	0	3
S4	ME40103	CAD/CAM/CAE	3	0	0	3
S5	ME40106	Vibration Analysis	3	0	0	3
T1	ME42201 ME42203 ME42205 ME42217	*Elective Group I Kinematic Analysis & Synthesis Tribology Mechanics of Composite Materials Industrial Fluid Power	0	1	0	1
T2	ME42209 ME42211 ME42213 ME42215	**Elective Group II Heat Exchange Devices Turbo machines Thermal Power Plants Energy Conservation and Management	0	1	0	1
P1	ME41301	Design of Mechanical Systems	0	0	2	1
P2	ME40303	CAD/CAM/CAE	0	0	2	1
P3	ME40306	Vibration Analysis	0	0	2	1
<b>Total</b>			<b>12</b>	<b>2</b>	<b>10</b>	<b>20</b>

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**STRUCTURE MODULE VIII**

Subject No.	Subject Code	Subject Name	Teaching Scheme (Hrs/week)			Credits
			Lect.	Tutorial	Practical	
PS1	ME47308	Project				10
PS2	ME47310	Seminar				2
PS3	ME47306	Industrial Inplant Training				10
		<b>Total</b>				<b>22</b>

Remarks:

Module	Remarks
3	Same as Mechanical Module 3 (Pattern E11)
4	Same as Mechanical Module 4 (Pattern E11)
5	Same as Mechanical Module 5 (Pattern E11Revised)
6	Same as Mechanical Module 6 (Pattern E11Revised)

## ME47308 :: PROJECT

**Credits: 10**

**Teaching Scheme: .... Hours / Week**

**Project:**

Students shall take up suitable project suggested by industry. The scope of the project shall be such as to complete it within time schedule.

**Project may be of the following types:**

1. Manufacturing/Fabrication of proto-type machine including selection, concept, design, material, manufacturing the components, assembly of components. Testing and performance evaluation.
2. Improvement of existing machine/equipment/process.
3. Design and fabrication of Jigs and fixtures, dies, tools, special purpose equipment. Inspection gauges, measuring instruments for automats.
4. Computer aided design, analysis of components such as stress analysis.
5. Problems related Productivity improvements.
6. Problems related value engineering.
7. Problems related material handling systems.
8. Energy audit of a departmental or section in an organization/plant, Industrial waste and its control.
9. Design of a test rig for performance evaluation of machine device.
10. Product design and development.
11. Detail cost estimation of products.
12. Analytical evaluation and experimental verification of any mechanical engineering problems encountered.
13. Quality systems and management.
14. Low cost automation.

Students shall submit a detailed report based on his project work.

**Course outcomes:**

1. Students will be able to study and solve a problem in an industry by applying the theoretical knowledge.
2. Students will demonstrate ability to communicate effectively with written and oral means.

**ME47310 :: SEMINAR****Credits: 2****The seminar topic may be**

- Mechanical Engineering.
- Based on Interdisciplinary subjects.
- Recent Trends in Engineering Field.

The topics should be based on recent research paper published in International Conference/ Reviewed Engineering Journals of International Repute in print media.

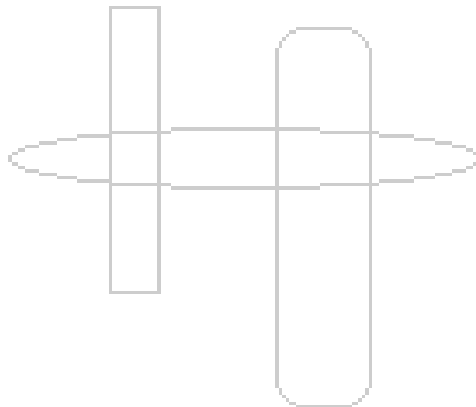
**Each student should have different seminar topic** and its presentation. In case more than one student is working on the same topic, then their scope of seminar must be distinct.

**Instructions for Seminar Report Writing**

1. Prepare minimum one copy of manuscript of Seminar report for the submission. The report should be printed on both sides of the paper, except the cover page, front page and Certificate.
2. The manuscript of the seminar report should be preferably 15-20 pages.
3. The Seminar report must be spiral bound.
4. Following will be the order of the report-
  - Cover page and front page as per the standard specimen (**as described by the Department**) on separate sheet.
  - Certificate from the institute as per the standard specimen (**as described by the Department**).
  - Acknowledgement
  - Table of Contents
  - Abstract (A brief abstract of the report not more than 250 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 conclusion in the Abstract)
  - List of Figures
  - List of Tables
  - Nomenclature (**Symbols and abbreviations** used in the manuscript should be included in Nomenclature section)
  - Chapters: Introduction, Theory/Literature Review, Theoretical Analysis, Design Methodology, Experimental/Numerical scheme, Manufacturing and Experimental details (if any), Results and Discussion, Conclusions.
  - References.

**Course outcomes:**

1. Students will be able to perform literature survey with the available resources.
2. Students will demonstrate effective presentation and technical writing skills.



**ME47308 :: INDUSTRIAL INPLANT TRAINING****Credits::10****Industrial Inplant Training**

Students shall undergo industrial in-plant Training for the period of 6 months in an industrial establishment and spend about 8 weeks for observational training and solving minimum 3 assignments given by the organization. The remaining period shall be utilized for Project.

Students are expected to analyze the problems systematically and offer suggestions or concluding remarks.

**The training/assignments may be related to following areas:**

1. Machines/process diagnostics.
2. Quality Assurance, quality improvement management.
3. Production planning and control, productivity improvement.
4. Costing and cost control, value engineering study.
5. Material inspection and movement, material management and control.
6. Inventory control, stores, facility planning.
7. Improvement in tool layout, tool selection, machine selection.
8. Maintenance of m/s and maintenance of plants, housekeeping, safety precaution.
9. Plant layout, machine layout for minimum travel of the job, man and machine movement study time and motion study problems.
10. Computer based information study for stores, purchase, wastage of material, in process material planning and scheduling, assembly, storage of finish products, dispatch etc.
11. Placing a purchase order for inland/foreign goods.
12. Import-export procedures.
13. Improvement of human skills, productivity.
14. Incentive schemes, labour laws, factory acts.

**Course outcomes:**

1. Demonstrate an understanding of the industry/business environment in which the student has undergone training.
2. Students will be able to apply the theoretical knowledge for solving the problems in an industry.