



**VEL TECH MULTI TECH  
Dr RANGARAJAN Dr.SAKUNTHALA  
ENGINEERING COLLEGE**

(An ISO 9001: 2008 Certified Institution)  
(Owned by 'VEL Shree R. Rangarajan  
Dr. Sakunthala Rangarajan Educational Academy)  
(Approved by AICTE, New Delhi &  
Govt. of Tamil Nadu and affiliated to Anna University)



**SYLLABUS**

**WEEKLY SCHEDULE**

**VIII SEMESTER**

**2015-16**

**DEPARTMENT OF MECHANICAL**

**IV YEAR DEGREE COURSE**

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## **Programme Educational Objectives**

The PEO of the Mechanical Engineering programme is to enable the students to:

- I. Graduates will apply their knowledge and skills, to solve the problems in the field of Mechanical Engineering occurring in industries and transportation
- II. Graduates of the programme will employment as Mechanical engineers in engineering and business or will be admitted for higher studies
- III. Graduates of the programme will solve problem with professionalism
- IV. Graduates will be taught and exposed to the emerging technologies to cope up with technological obsolescence

## **Programme Outcomes**

- a. Graduates will demonstrate knowledge of engineering mathematics, physics, chemistry and mechanical engineering
- b. Graduates will demonstrate the ability to design and analyze machine elements and mechanisms
- c. Graduates will demonstrate the ability to design and analyze thermal systems
- d. Graduates will demonstrate the ability to manufacture automobile components and related system
- e. Graduates will demonstrate skills to use latest CAD/CAM/CAE software and sophisticated equipments for analyzing and solving mechanical engineering problems
- f. Graduates will acquire leadership, entrepreneurship qualities and demonstrate knowledge of professional practice and team-work
- g. Graduates will demonstrate an ability to effectively communicate technical information in speech, presentation and in writing
- h. Graduates will acquire skills and ability for life-long learning
- i. Graduates will be able to participate and succeed in competitive examinations like IES, GATE etc.

## **Department's Vision**

“To emerge as a department for mechanical engineering nurturing, excellence in education and in the emerging areas of mechanical, thermal, manufacturing and automobile disciplines.”

## **Department's Mission**

“To build a centre for renewable energy with generation and utilization.”

“To nurture the creativity and innovation of young minds”.

“To provide consultancy to industries, and take up joint projects with industry.”

“To establish Research and Development centers with emphasis on minimization of carbon foot prints”.

“To develop the center of excellence for technology transfer in industrial automation”.

**WEEKLY SCHEDULE**  
**ACADEMIC YEAR: 2015-16**

<b>Sl.No</b>	<b>WEEKS</b>	<b>DATE</b>	
		<b>FROM</b>	<b>TO</b>
1	WEEK1	18.01.16	23.01.16
2	WEEK2	25.01.16	30.01.16
3	WEEK3	01.02.16	06.02.16
4	WEEK4	08.02.16	13.02.16
5	WEEK5	15.02.16	20.02.16
6	WEEK6	22.02.16	27.02.16
7	WEEK7	29.02.16	05.03.16
8	WEEK8	07.03.16	12.03.16
9	WEEK9	16.03.16	20.03.16
10	WEEK10	22.03.16	26.03.16
11	WEEK11	27.03.16	02.04.16
12	WEEK12	03.04.16	09.04.16
13	WEEK13	11.04.16	16.04.16
14	WEEK14	18.04.16	23.04.16
15	WEEK 15	25.04.16	30.04.16

## SUBJECT CONTENTS

<b>SL.NO</b>	<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>
<b>THEORY</b>		
1	ME 2035	Entrepreneurship Development
2	ME2041	Advanced I.C Engines
3	MG2451	Engineering Economics And Cost Analysis
<b>PRACTICAL</b>		
4	ME2452	Comprehension
5	ME2453	Project Work

## TEST SCHEDULE

SL.NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	PRE MODEL EXAM	MODEL EXAM
1	ME 2035	Entrepreneurship Development	01.02.16	15.02.16	29.02.06	01.04.16
2	ME2041	Advanced I.C Engines	02.02.16	16.02.16	01.03.16	04.04.16
3	MG2451	Engineering Economics And Cost Analysis	03.02.16	17.02.16	02.03.16	06.04.16

### **MG2451 ENGINEERING ECONOMICS AND COST ANALYSIS**

#### **WEEK :1 INTRODUCTION TO ECONOMICS(UNIT 1)**

Introduction to Economics- Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio. Elementary economic Analysis – Material selection for product Design selection for a product

#### **WEEK: 2 UNIT TEST I**

#### **WEEK: 3 VALUE ENGINEERING (UNIT 2)**

Make or buy decision, Value engineering – Function, aims, Value engineering procedure. Interest formulae and their applications –Time value of money,

**WEEK: 4**

Single payment compound amount factor, Single payment present worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factor- equal payment series capital recovery factor.

**WEEK: 5**

Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.

**WEEK: 6 UNIT TEST II**

**WEEK: 7 CASH FLOW (UNIT 3)**

Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram).

**WEEK: 8**

Annual equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.

**WEEK: 9 UNIT TEST III**

**WEEK: 10 REPLACEMENT AND MAINTENANCE ANALYSIS (UNIT 4)**

Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset.

**WEEK: 11**

Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely.

**WEEK: 12 UNIT TEST IV**

**WEEK: 13 DEPRECIATION (UNIT 5)**

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the years digits method of depreciation.

**WEEK: 14**

Sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions. Procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAM**

**WEEK: 17 MODEL EXAM**

**TEXT BOOKS:**

1. Panneer Selvam, R, “Engineering Economics”, Prentice Hall of India Ltd, New Delhi, 2001.
2. Suma Damodaran, “ Managerial economics”, Oxford university press 2006.

## **ME2035 ENTREPRENEURSHIP DEVELOPMENT**

### **WEEK: 1 - (UNIT I) ENTREPRENEURSHIP**

Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur – Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.

### **WEEK: 2 UNIT TEST I**

### **WEEK: 3 (Unit II) WORK STUDY**

Major Motives Influencing an Entrepreneur – Achievement Motivation Training, self Rating, Business Game,

### **WEEK: 4**

Thematic Apperception Test – Stress management

### **WEEK: 5**

Entrepreneurship Development Programs – Need, Objectives.

### **WEEK: 6 UNIT TEST II**

### **WEEK: 7 (Unit III) BUSINESS**

Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business opportunity, Market Survey and Research

### **WEEK: 8**

Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.

### **WEEK: 9 UNIT TEST III**

### **WEEK: 10 – (Unit IV) FINANCING AND ACCOUNTING**

Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, management of working Capital, Costing, Break Even Analysis, Network Analysis

### **WEEK: 11**

Techniques of PERT/CPM – Taxation – Income Tax, Excise Duty – Sales Tax

### **WEEK: 12 UNIT TEST IV**

### **WEEK: 13 (UNIT V) SUPPORT TO ENTREPRENEURS**



Sickness in small Business – Concept, Magnitude, causes and consequences, Corrective Measures – Government Policy for Small Scale Enterprises

**WEEK: 14**

Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting. TOTA

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAM**

**WEEK: 17 MODEL EXAM**

**TEXT BOOKS:**

1. S.S.Khanka “Entrepreneurial Development” S.Chand & Co. Ltd. Ram Nagar New Delhi, 1999.
2. Kuratko & Hodgetts, “Enterprenuership – Theory, process and practices”, Thomson learning 6th edition.

## **ME2041 ADVANCED I.C ENGINES**

**WEEK: 1 - (UNIT I) SPARK IGNITION ENGINES**

Air-Fuel ratio requirements, Design of carburetor-Fuel jet size and venturi size, stages of combustion, normal and abnormal Combustion, factors affecting knock, combustion chambers, Introduction to thermodynamic analysis of SI Engine combustion process

**WEEK: 2 UNIT TEST I**

**WEEK: 3 (UNIT II) COMPRESSION IGNITION ENGINES**

Stages of combustion-Normal and abnormal combustion-

**WEEK: 4**

Factors affecting knock, Direct and indirect injection systems,

**WEEK: 5**

Turbo charging, CI engine combustion process

**WEEK: 6 UNIT TEST II**

**WEEK: 7 (UNIT III) ENGINE EXHAUST EMISSION CONTROL**

Formation of NO<sub>x</sub>, HC/CO Mechanism, smoke and particulate emissions, Green house effect

**WEEK: 8**

Three way catalytic converter and particulate trap, smoke and particulate measurement, Emission norms

**WEEK: 9 UNIT TEST III**

**WEEK: 10 – (UNIT IV) ALTERNATE FUELS**

Alcohols, Vegetable oils and bio diesel, Bio gas, Liquefied petroleum gas, Hydrogen properties, Suitability, Engine modifications.

**WEEK: 11**

Engine Performance Combustion and Emission characteristics of SI and CI Engines using these alternate fuels, four valve and overhead cams

**WEEK: 12 UNIT TEST IV**

**WEEK: 13 (UNIT V) RECENT TRENDS**

Homogeneous charge compression ignition engine, Lean burn engine, stratified charge engine, surface ignition engine, Electronic Engine Management. Common rail Direct

**WEEK: 14**

Injection Diesel Engine, Gasoline direct injection engine, Charge amplifier PC for combustion and Heat release analysis in Engines.

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAM**

**WEEK: 17 MODEL EXAM**

**TEXT BOOK:**

1. Heinz Heisler, ‘Advanced Engine Technology,’ SAE International Publications, USA, 1998
2. Ganesan V..” Internal Combustion Engines” , Third Edition, Tata Mcgraw-Hill ,2007

## **ME2453 PROJECT WORK**

### **OBJECTIVES:**

- The objective of the project work is to enable the students in convenient groups of not more than 4 members on a project involving theoretical and experimental studies related to the branch of study.
- Every project work shall have a guide who is the member of the faculty of the institution.
- Six periods per week shall be allotted in the time table and this time shall be utilized by the students to receive the directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars on the progress made in the project.
- The aim of the project work is to deepen comprehension of principles by applying them to a new problem which may be the design and manufacture of a device, a research investigation, a computer or management project or a design problem.
- The progress of the project is evaluated based on a minimum of three reviews.
- The review committee may be constituted by the Head of the Department.
- Each student shall finally produce a comprehensive report covering background information, literature survey, problem statement, project work details and conclusion.
- This final report shall be typewritten form as specified in the guidelines.
- The continuous assessment shall be made as prescribed in the regulations (vide clause 10.3 of Regulations 2004 for B.E., B.Tech. programmes)

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