



**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**

**VI SEMESTER                      2015-16**

**DEPARTMENT OF MECHANICAL**

**IV YEAR DEGREE COURSE**

42, Avadi – Alamathi Road,  
Chennai – 600062  
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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

SL.NO	SUBJECT CODE	SUBJECT NAME
<b>THEORY</b>		
1	MG6851	Principles of Management
2	ME6601	Design of Transmission Systems
3	ME6602	Automobile Engineering
4	ME6603	Finite Element Analysis
5	ME6604	Gas Dynamics and Jet Propulsion
6	ME6004	Unconventional Machining Processes
<b>PRACTICAL</b>		
7	ME6611	CAD/CAM Lab
8	ME6612	Design & Fabrication Project
9	GE6563	Communication Skills Lab

## TEST SCHEDULE

<b>SL.NO</b>	<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>	<b>UNIT TEST I</b>	<b>UNIT TEST II</b>	<b>PRE MODEL EXAM</b>	<b>MODEL EXAM</b>
1	MG6851	Principles of Management	01.02.16	15.02.16	29.02.06	01.04.16
2	ME6601	Design of Transmission Systems	02.02.16	16.02.16	01.03.16	04.04.16
3	ME6602	Automobile Engineering	03.02.16	17.02.16	02.03.16	06.04.16
4	ME6603	Finite Element Analysis	04.02.16	18.02.16	03.03.16	08.04.16
5	ME6604	Gas Dynamics and Jet Propulsion	05.02.16	19.02.16	04.03.16	11.04.16
6	ME6004	Unconventional Machining Processes	06.02.15	20.02.16	05.03.16	13.04.16

## **MG6851 PRINCIPLES OF MANAGEMENT**

### **WEEK: 1 - UNIT I INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS**

Definition of Management – Science or Art – Manager Vs Entrepreneur - types of managers -managerial roles and skills – Evolution of Management – Scientific, human relations , system and contingency approaches

**WEEK: 2** Types of Business organization - Sole proprietorship, partnership, company-public and private sector enterprises - Organization culture and Environment – Current trends and issues in Management.

### **WEEK: 3 – UNIT TEST I**

### **UNIT II PLANNING**

Nature and purpose of planning – planning process – types of planning – objectives – setting objectives – policies

### **WEEK: 4**

Planning premises – Strategic Management – Planning Tools and Techniques

### **WEEK: 5**

Decision making steps and process

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

### **WEEK: 6 – UNIT III ORGANISING**

Nature and purpose – Formal and informal organization – organization chart – organization structure – types –

### **WEEK: 7**

Line and staff authority – departmentalization – delegation of authority – centralization and decentralization –

### **WEEK: 8**

Job Design - Human Resource Management – HR Planning, Recruitment, selection, Training and Development, Performance Management , Career planning and management

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

### **WEEK: 10 - UNIT IV DIRECTING**

Foundations of individual and group behaviour – motivation – motivation theories – motivational techniques – job satisfaction – job enrichment – leadership – types and theories of leadership –communication

### **WEEK: 11**

Process of communication – barrier in communication – effective communication –communication and IT

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

### **WEEK: 13 - UNIT V CONTROLLING**

System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control

**WEEK: 14**

Productivity problems and management – control and performance – direct and preventive control – reporting

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAMS**

**WEEK: 17 MODEL EXAMS**

**TEXT BOOKS:**

1. Stephen P. Robbins & Mary Coulter, “Management”, Prentice Hall (India) Pvt. Ltd., 10th Edition, 2009.
2. JAF Stoner, Freeman R.E and Daniel R Gilbert “Management”, 6th Edition, Pearson Education, 2004.

**REFERENCES:**

1. Stephen A. Robbins & David A. Decenzo & Mary Coulter, “Fundamentals of Management” 7th Edition, Pearson Education, 2011.
2. Robert Kreitner & Mamata Mohapatra, “Management”, Biztantra, 2008.
3. Harold Koontz & Heinz Weihrich, “Essentials of Management”, Tata McGraw Hill, 1998.
4. Tripathy PC & Reddy PN, “Principles of Management”, Tata McGraw Hill, 1999

**ME6601 DESIGN OF TRANSMISSION SYSTEMS**

**WEEK: 1 - UNIT I DESIGN OF FLEXIBLE ELEMENTS**

Design of Flat belts and pulleys - Selection of V belts and pulleys – Selection of hoisting wire ropes and pulleys

**WEEK: 2** Design of Transmission chains and Sprockets

**WEEK: 3 – UNIT TEST I**

**UNIT II SPUR GEARS AND PARALLEL AXIS HELICAL GEARS**

Speed ratios and number of teeth-Force analysis -Tooth stresses

**WEEK: 4**

Tooth stresses - Dynamic effects – Fatigue strength - Factor of safety - Gear materials – Design of straight tooth spur & helical gears based on strength and wear considerations

**WEEK: 5**

Pressure angle in the normal and transverse plane- Equivalent number of teeth-forces for helical gears

**WEEK: 6 UNIT TEST II**

**WEEK: 6 – UNIT III BEVEL, WORM AND CROSS HELICAL GEARS**

Straight bevel gear: Tooth terminology, tooth forces and stresses, equivalent number of teeth. Estimating the dimensions of pair of straight bevel gears. Worm Gear: Merits and demerits- terminology.

**WEEK: 7**

Thermal capacity, materials-forces and stresses, efficiency, estimating the size of the worm gear pair.

**WEEK: 8**

Cross helical: Terminology-helix angles-Estimating the size of the pair of cross helical gears

**WEEK: 9 UNIT TEST III**

**WEEK: 10 - UNIT IV GEAR BOXES**

Geometric progression - Standard step ratio - Ray diagram, kinematics layout - Design of sliding mesh gear box - Design of multi speed gear box for machine tool applications - Constant mesh gear box - Speed reducer unit

**WEEK: 11**

Variable speed gear box, Fluid Couplings, Torque Converters for automotive applications

**WEEK: 12 UNIT TEST IV**

**WEEK: 13 - UNIT V CAMS, CLUTCHES AND BRAKES**

Cam Design: Types-pressure angle and under cutting base circle determination-forces and surface stresses. Design of plate clutches –axial clutches-cone clutches-internal expanding rim clutches- Electromagnetic clutches

**WEEK: 14**

Band and Block brakes - external shoe brakes – Internal expanding shoe brake

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAMS**

**WEEK: 17 MODEL EXAMS**

**TEXT BOOKS:**

1. Bhandari V, “Design of Machine Elements”, 3rd Edition, Tata McGraw-Hill Book Co, 2010.
2. Joseph Shigley, Charles Mischke, Richard Budynas and Keith Nisbett “Mechanical Engineering Design”, 8th Edition, Tata McGraw-Hill, 2008.

**REFERENCES:**

1. Sundararamoorthy T. V, Shanmugam .N, “Machine Design”, Anuradha Publications, Chennai, 2003.
2. Gitin Maitra, L. Prasad “Hand book of Mechanical Design”, 2nd Edition, Tata McGraw-Hill, 2001.
3. Prabhu. T.J., “Design of Transmission Elements”, Mani Offset, Chennai, 2000.



4. C.S.Sharma, Kamlesh Purohit, "Design of Machine Elements", Prentice Hall of India, Pvt. Ltd., 2003.
5. Bernard Hamrock, Steven Schmid, Bo Jacobson, "Fundamentals of Machine Elements", 2nd Edition, Tata McGraw-Hill Book Co., 2006.
6. Robert C. Juvinall and Kurt M. Marshek, "Fundamentals of Machine Design", 4th Edition, Wiley, 2005
7. Alfred Hall, Halowenko, A and Laughlin, H., "Machine Design", Tata McGraw-Hill BookCo.(Schaum"s Outline), 2010
8. Orthwein W, "Machine Component Design", Jaico Publishing Co, 2003.
9. Ansel Ugural, "Mechanical Design – An Integral Approach", 1st Edition, Tata McGraw-Hill Book Co, 2003.
10. Merhyle F. Spotts, Terry E. Shoup and Lee E. Hornberger, "Design of Machine Elements" 8th Edition, Printice Hall, 2003.
11. U.C.Jindal : Machine Design, "Design of Transmission System", Dorling Kindersley, 2010

## **ME6602 AUTOMOBILE ENGINEERING**

### **WEEK: 1- UNIT I VEHICLE STRUCTURE AND ENGINES**

Types of automobiles, vehicle construction and different layouts, chassis, frame and body

**WEEK: 2** Vehicle aerodynamics (various resistances and moments involved), IC engines –components-functions and materials, variable valve timing (VVT).

### **UNIT TEST I**

### **WEEK: 3 UNIT II ENGINE AUXILIARY SYSTEMS**

Electronically controlled gasoline injection system for SI engines, Electronically controlled diesel injection system (Unit injector system, Rotary distributor type and common rail direct injection system)

### **WEEK: 4**

Electronic ignition system (Transistorized coil ignition system, capacitive discharge ignition system),

### **WEEK: 5**

Turbo chargers (WGT, VGT), Engine emission control by three way catalytic converter system, Emission norms (Euro and BS)

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

### **WEEK: 7 UNIT III TRANSMISSION SYSTEMS**

Clutch-types and construction, gear boxes- manual and automatic, gear shift mechanisms

### **WEEK: 8**

Over drive, transfer box, fluid flywheel, torque converter, propeller shaft, slip joints, universal joints ,Differential and rear axle, Hotchkiss Drive and Torque Tube Drive

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

### **WEEK: 10 - UNIT IV STEERING, BRAKES AND SUSPENSION SYSTEMS**

Steering geometry and types of steering gear box-Power Steering, Types of Front Axle

### **WEEK: 11**

Types of Suspension Systems, Pneumatic and Hydraulic Braking Systems, Antilock Braking System (ABS), electronic brake force distribution (EBD) and Traction Control

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

### **WEEK: 13- UNIT V ALTERNATIVE ENERGY SOURCES**

Use of Natural Gas, Liquefied Petroleum Gas, Bio-diesel, Bio-ethanol, Gasohol and Hydrogen in Automobiles- Engine modifications required –Performance, Combustion and Emission

### **WEEK: 14**

Characteristics of SI and CI engines with these alternate fuels - Electric and Hybrid Vehicles, Fuel Cell Note: Practical Training in dismantling and assembling of Engine parts and Transmission Systems should be given to the students.

### **WEEK: 15 UNIT TEST V**

### **WEEK: 16 MODEL EXAMS**

### **WEEK: 17 MODEL EXAMS**

### **TEXT BOOKS:**

1. Kirpal Singh, “Automobile Engineering”, Vol 1 & 2, Seventh Edition, Standard Publishers, New Delhi, 1997.
2. Jain K.K. and Asthana .R.B, “Automobile Engineering” Tata McGraw Hill Publishers, New Delhi, 2002.

### **REFERENCES:**

1. Newton ,Steeds and Garet, “Motor Vehicles”, Butterworth Publishers,1989.
2. Joseph Heitner, “Automotive Mechanics,” Second Edition, East-West Press, 1999.
3. Martin W, Stockel and Martin T Stockle , “Automotive Mechanics Fundamentals,” The Good heart –Will Cox Company Inc, USA ,1978.
4. Heinz Heisler, “Advanced Engine Technology,” SAE International Publications USA, 1998.
5. Ganesan V. “Internal Combustion Engines”, Third Edition, Tata McGraw-Hill, 2007.

# **ME 6603 FINITE ELEMENT ANALYSIS**

## **WEEK: 1- UNIT I INTRODUCTION**

Historical Background – Mathematical Modeling of field problems in Engineering – Governing Equations – Discrete and continuous models – Boundary, Initial and Eigen Value problems– Weighted Residual Methods

**WEEK: 2** Variational Formulation of Boundary Value Problems – Ritz Technique – Basic concepts of the Finite Element Method

## **UNIT TEST I**

## **WEEK: 3 UNIT II ONE-DIMENSIONAL PROBLEMS**

One Dimensional Second Order Equations – Discretization – Element types- Linear and Higher order Elements

## **WEEK: 4**

Derivation of Shape functions and Stiffness matrices and force vectors- Assembly of Matrices - **WEEK: 5**

Solution of problems from solid mechanics and heat transfer. Longitudinal vibration frequencies and mode shapes. Fourth Order Beam Equation – Transverse deflections and Natural frequencies of beams.

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

**WEEK: 7 UNIT III TWO DIMENSIONAL SCALAR VARIABLE PROBLEMS** Second Order 2D Equations involving Scalar Variable Functions – Variational formulation –Finite Element formulation – Triangular elements

## **WEEK: 8**

Shape functions and element matrices and vectors. Application to Field Problems - Thermal problems – Torsion of Non circular shafts –Quadrilateral elements – Higher Order Elements

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

**WEEK: 10 - UNIT IV TWO DIMENSIONAL VECTOR VARIABLE PROBLEMS**

Equations of elasticity – Plane stress, plane strain and axisymmetric problems

## **WEEK: 11**

Body forces and temperature effects – Stress calculations - Plate and shell elements

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

**WEEK: 13 - UNIT V ISOPARAMETRIC FORMULATION**

Natural co-ordinate systems – Isoparametric elements – Shape functions for isoparametric elements – One and two dimensions – Serendipity elements

## **WEEK: 14**

Numerical integration and application to plane stress problems - Matrix solution techniques – Solutions Techniques to Dynamic problems – Introduction to Analysis Software

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAMS**

**WEEK: 17 MODEL EXAMS**

**TEXT BOOK:**

1. Reddy. J.N., “An Introduction to the Finite Element Method”, 3rd Edition, Tata McGraw-Hill, 2005
2. Seshu, P, “Text Book of Finite Element Analysis”, Prentice-Hall of India Pvt. Ltd., New Delhi, 2007.

**REFERENCES:**

1. Rao, S.S., “The Finite Element Method in Engineering”, 3rd Edition, Butterworth Heinemann, 2004
2. Logan, D.L., “A first course in Finite Element Method”, Thomson Asia Pvt. Ltd., 2002
3. Robert D. Cook, David S. Malkus, Michael E. Plesha, Robert J. Witt, “Concepts and Applications of Finite Element Analysis”, 4th Edition, Wiley Student Edition, 2002.
4. Chandrupatla & Belagundu, “Introduction to Finite Elements in Engineering”, 3rd Edition, Prentice Hall College Div, 1990
5. Bhatti Asghar M, "Fundamental Finite Element Analysis and Applications", John Wiley & Sons, 2005 (Indian Reprint 2013)\*

## **ME 6604 GAS DYNAMICS AND JET PROPULSION**

**WEEK: 1- UNIT I BASIC CONCEPTS AND ISENTROPIC FLOWS**

Energy and momentum equations of compressible fluid flows – Stagnation states, Mach waves and Mach cone –

**WEEK: 2** Effect of Mach number on compressibility – Isentropic flow through variable ducts – Nozzle and Diffusers

**UNIT TEST I**

**WEEK: 3 UNIT II FLOW THROUGH DUCTS**

Flows through constant area ducts with heat transfer (Rayleigh flow)

**WEEK: 4**

Friction (Fanno flow)

**WEEK: 5**

variation of flow properties

**WEEK: 6 UNIT TEST II**

**WEEK: 7 – UNIT III NORMAL AND OBLIQUE SHOCKS**

Governing equations – Variation of flow parameters across the normal and oblique shocks

## **WEEK: 8**

Prandtl – Meyer relations – Applications

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

## **WEEK: 10- UNIT IV JET PROPULSION**

Theory of jet propulsion – Thrust equation – Thrust power and propulsive efficiency – Operating principle

## **WEEK: 11**

Cycle analysis and use of stagnation state performance of ram jet, turbojet, turbofan and turbo prop engines.

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

## **WEEK: 13 - ALTERNATIVE ENERGY SOURCES (UNIT 5)**

Types of rocket engines – Propellants-feeding systems – Ignition and combustion – Theory of rocket propulsion – Performance study

## **WEEK: 14**

Staging – Terminal and characteristic velocity – Applications – space flights

## **WEEK: 15 UNIT TEST V**

## **WEEK: 16 MODEL EXAMS**

## **WEEK: 17 MODEL EXAMS**

### **TEXT BOOKS:**

1. Anderson, J.D., "Modern Compressible flow", 3rd Edition, McGraw Hill, 2003.
2. Yahya, S.M. "Fundamentals of Compressible Flow", New Age International (P) Limited, New Delhi, 1996

### **REFERENCES:**

1. Hill. P. and C. Peterson, "Mechanics and Thermodynamics of Propulsion", Addison – Wesley Publishing company, 1992.
2. Zucrow. N.J., "Aircraft and Missile Propulsion", Vol.1 & II, John Wiley, 1975.
3. Zucrow. N.J., "Principles of Jet Propulsion and Gas Turbines", John Wiley, New York, 1970.
4. Sutton. G.P., "Rocket Propulsion Elements", John wiley, New York,1986,.
5. Shapiro. A.H., " Dynamics and Thermodynamics of Compressible fluid Flow", John wiley, New York, 1953.
6. Ganesan. V., "Gas Turbines", Tata McGraw Hill Publishing Co., New Delhi, 1999.
7. Somasundaram. PR.S.L., "Gas Dynamics and Jet Propulsions", New Age International Publishers, 1996.

8. Babu. V., "Fundamentals of Gas Dynamics", ANE Books India, 2008.
9. Cohen. H., G.E.C. Rogers and Saravanamutto, "Gas Turbine Theory", Longman Group Ltd., 1980.

## **ME 6004 UNCONVENTIONAL MANUFACTURING PROCESSES**

### **WEEK: 1- UNIT I-INTRODUCTION**

Unconventional machining Process – Need, Classification – Brief overview of all techniques

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

### **WEEK: 3 – UNIT II-MECHANICAL ENERGY BASED PROCESSES**

Abrasive Jet Machining – Water Jet Machining – Abrasive Water Jet Machining

### **WEEK: 4**

Ultrasonic Machining.(AJM, WJM, AWJM and USM). Working Principles

### **WEEK: 5**

Equipment used – Process parameters – MRR- Applications

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

### **WEEK: 7– UNIT III ELECTRICAL ENERGY BASED PROCESSES**

Electric Discharge Machining (EDM)- working Principles-equipments-Process Parameters

### **WEEK: 8**

MRR- electrode / Tool – Power Circuits-Tool Wear – Dielectric – Flushing – Wire cut EDM - surface finish – Applications

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

### **WEEK: 10 - UNIT IV CHEMICAL AND ELECTRO-CHEMICAL ENERGY BASED PROCESSES**

Chemical machining and Electro-Chemical machining (CHM and ECM) Etchants-maskant-techniques of applying maskants

### **WEEK: 11**

Process Parameters -surface finish -- MRR-Applications Principles of ECM-equipments-MRR-Electrical circuit-Surface roughness-Process Parameters-ECG and ECH Applications

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

### **WEEK:13 - UNIT V THERMAL ENERGY BASED PROCESSES**

Laser Beam machining and drilling (LBM), plasma Arc machining (PAM)

### **WEEK:14**

Electron Beam Machining (EBM). Principles – Equipment –Types - Beam control techniques – Applications

**WEEK: 15 UNIT TEST V**

**WEEK: 16 MODEL EXAMS**

**WEEK: 17 MODEL EXAMS**

**TEXT BOOK:**

1. Vijay.K. Jain “Advanced Machining Processes” Allied Publishers Pvt. Ltd., NewDelhi, 2007
2. Pandey P.C. and Shan H.S. “Modern Machining Processes” Tata McGraw-Hill, New Delhi, 2007

**REFERENCES:**

1. Benedict. G.F. “Nontraditional Manufacturing Processes”, Marcel Dekker Inc., New York, 1987.
2. Mc Geough, “Advanced Methods of Machining”, Chapman and Hall, London, 1998.
3. Paul De Garmo, J.T.Black, and Ronald.A.Kohser, “Material and Processes in Manufacturing” Prentice Hall of India Pvt. Ltd., 8thEdition, New Delhi , 2001.

**ME6611 CAD / CAM LABORATORY**

**LIST OF EXPERIMENTS**

**1. 3D GEOMETRIC MODELLING**

**List of Experiments**

1. Introduction of 3D Modelling software

**Creation of 3D assembly model of following machine elements using 3D Modelling software**

2. Flange Coupling
3. Plummer Block
4. Screw Jack
5. Lathe Tailstock
6. Universal Joint
7. Machine Vice
8. Stuffing box
9. Crosshead
- 10.Safety Valves
- 11.Non-return valves
- 12.Connecting rod
- 13.Piston
- 14.Crankshaft

\* Students may also be trained in manual drawing of some of the above components

**2. Manual Part Programming.**

**(i) Part Programming - CNC Machining Centre**

- a) Linear Cutting.
- b) Circular cutting.
- c) Cutter Radius Compensation.
- d) Canned Cycle Operations.

**(ii) Part Programming - CNC Turning Centre**

- a) Straight, Taper and Radius Turning.
- b) Thread Cutting
- c) Rough and Finish Turning Cycle.
- d) Drilling and Tapping Cycle.

**3. Computer Aided Part Programming**

- e) CL Data and Post process generation using CAM packages.
- f) Application of CAPP in Machining and Turning Centre.

## **ME6612 DESIGN AND FABRICATION PROJECT**

The objective of this project is to provide opportunity for the students to implement their skills acquired in the previous semesters to practical problems. The students in convenient groups of not more than 4 members have to take one small item for design and fabrication. Every project work shall have a guide who is the member of the faculty of the institution and if possible with an industry guide also.

The item chosen may be small machine elements (Example-screw jack, coupling, machine vice, cam and follower, governor etc), attachment to machine tools, tooling (jigs, fixtures etc), small gear box, automotive appliances, agricultural implements, simple heat exchangers, small pumps, hydraulic /pneumatic devices etc.

The students are required to design and fabricate the chosen item in the college and demonstrate its working apart from submitting the project report. The report should contain assembly drawing, parts drawings, process charts relating to fabrication.

## **GE6563 COMMUNICATION SKILLS – LABORATORY BASED**

**UNIT I LISTENING / VIEWING**

**10**

Listening and note-taking – Listening to telephonic conversations – Ted talks – Inspiring Speeches – Watching documentaries on personalities, places, socio-



cultural events, TV news programmes and discussions to answer different kinds questions, viz., identifying key idea and comprehension questions... so on.

**UNIT II SPEAKING** **12**

Conversation practice – Interview – Group Discussion – Introducing oneself and others – Role play – Debate – Presentation – Panel discussion – Neutral accent.

**UNIT III READING** **10**

Different genres of text (literature, media, technical) for comprehension – Reading strategies like note-making – reading graphs, charts and graphic organizer – Sequencing sentences – reading online sources like e-books, e-journals and e-newspapers.

**UNIT IV WRITING** **12**

Blogs – Tweets – Online resume/ – e-mails – SMS and Online texting – Report writing – Describing charts and tables – Writing for media on current events.

**UNIT V VOCABULARY** **8**

Idioms and Phrases – Proverbs – Collocations – Chunks of language

**UNIT VI GRAMMAR** **8**

Sentence structures – Subject-Verb agreement – Pronoun-Antecedent agreement – Tense forms – Active and passive voices – Direct and Indirect speeches – Cohesive devices..

**REFERENCES:**

1. Barker, A. “**Improve Your Communication Skills**”, New Delhi: Kogan Page India Pvt. Ltd., 2006.
2. Craven, Miles. “**Listening Extra – A resource book of multi-level skills activities**”, Cambridge University Press, 2004.
3. Gammidge, Mick, “**Speaking Extra - A resource book of multi-level skills activities**”, Cambridge University Press, 2004.
4. Hartley, Peter. “**Group Communication**”, London: Routledge, 2004.
5. John Seely, “**The Oxford Guide to Writing and Speaking**”, New Delhi: Oxford University Press, 2004.
6. Naterop, Jean & Rod Revell, “**Telephoning in English**”, Cambridge University Press, 1987.
7. Ramesh, Gopalswamy and Mahadevan Ramesh, “**The ACE of Soft Skills**”. New Delhi: Pearson, 2010.

**Web Sources:**

[www.humanresources.about.com](http://www.humanresources.about.com)

[www.careerride.com](http://www.careerride.com)

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