

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 9
 Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

UNIT V GLOBAL ISSUES 8
 Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility.

TOTAL: 45 PERIODS

OUTCOME:

- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

TEXT BOOKS:

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.
2. Mike W. Martin and Roland Schinzinger, “Ethics in Engineering”, Tata McGraw Hill, New Delhi, 2003.

REFERENCES:

1. Charles B. Fleddermann, “Engineering Ethics”, Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, “Engineering Ethics – Concepts and Cases”, Cengage Learning, 2009.
3. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, Oxford, 2001.
4. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, New Delhi, 2003
5. Laura P. Hartman and Joe Desjardins, “Business Ethics: Decision Making for Personal Integrity and Social Responsibility” Mc Graw Hill education, India Pvt. Ltd., New Delhi, 2013.
6. World Community Service Centre, ‘ Value Education’, Vethathiri publications, Erode, 2011.

Web sources:

1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org

MG8091	ENTREPRENEURSHIP DEVELOPMENT	L	T	P	C
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OBJECTIVE:

- To develop and strengthen entrepreneurial quality and motivation in students and to impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.

UNIT I ENTREPRENEURSHIP 9
 Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.

UNIT II MOTIVATION 9
Major Motives Influencing an Entrepreneur – Achievement Motivation Training, Self Rating, Business Games, Thematic Apperception Test – Stress Management, Entrepreneurship Development Programs – Need, Objectives.

UNIT III BUSINESS 9
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, Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.

UNIT IV FINANCING AND ACCOUNTING 9
Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working Capital, Costing, Break Even Analysis, Taxation – Income Tax, Excise Duty – Sales Tax.

UNIT V SUPPORT TO ENTREPRENEURS 9
Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures - Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting.

TOTAL : 45 PERIODS

OUTCOME:

- Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully.

TEXT BOOKS :

1. Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", 9th Edition, Cengage Learning, 2014.
2. Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.

REFERENCES :

1. EDII "Faulty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development", Institute of India, Ahmadabad, 1986.
2. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill, 2013.
3. Mathew J Manimala, "Entrepreneurship theory at cross roads: paradigms and praxis" 2nd Edition Dream tech, 2005.
4. Rajeev Roy, "Entrepreneurship" 2nd Edition, Oxford University Press, 2011.

OBJECTIVES:

1. To provide knowledge of semiconductors and solid mechanics to fabricate MEMS devices.
2. To educate on the rudiments of Micro fabrication techniques.
3. To introduce various sensors and actuators
4. To introduce different materials used for MEMS
5. To educate on the applications of MEMS to disciplines beyond Electrical and Mechanical engineering.

UNIT I INTRODUCTION**9**

Intrinsic Characteristics of MEMS – Energy Domains and Transducers- Sensors and Actuators – Introduction to Micro fabrication - Silicon based MEMS processes – New Materials – Review of Electrical and Mechanical concepts in MEMS – Semiconductor devices – Stress and strain analysis – Flexural beam bending- Torsional deflection.

UNIT II SENSORS AND ACTUATORS-I**9**

Electrostatic sensors – Parallel plate capacitors – Applications – Interdigitated Finger capacitor – Comb drive devices – Micro Grippers – Micro Motors - Thermal Sensing and Actuation – Thermal expansion – Thermal couples – Thermal resistors – Thermal Bimorph - Applications – Magnetic Actuators – Micromagnetic components – Case studies of MEMS in magnetic actuators- Actuation using Shape Memory Alloys

UNIT III SENSORS AND ACTUATORS-II**9**

Piezoresistive sensors – Piezoresistive sensor materials - Stress analysis of mechanical elements – Applications to Inertia, Pressure, Tactile and Flow sensors – Piezoelectric sensors and actuators – piezoelectric effects – piezoelectric materials – Applications to Inertia , Acoustic, Tactile and Flow sensors.

UNIT IV MICROMACHINING**9**

Silicon Anisotropic Etching – Anisotropic Wet Etching – Dry Etching of Silicon – Plasma Etching – Deep Reaction Ion Etching (DRIE) – Isotropic Wet Etching – Gas Phase Etchants – Case studies - Basic surface micro machining processes – Structural and Sacrificial Materials – Acceleration of sacrificial Etch – Striction and Antistriction methods – LIGA Process - Assembly of 3D MEMS – Foundry process.

UNIT V POLYMER AND OPTICAL MEMS**9**

Polymers in MEMS– Polimide - SU-8 - Liquid Crystal Polymer (LCP) – PDMS – PMMA – Parylene – Fluorocarbon - Application to Acceleration, Pressure, Flow and Tactile sensors- Optical MEMS – Lenses and Mirrors – Actuators for Active Optical MEMS.

TOTAL : 45 PERIODS**OUTCOMES:**

- Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.
- Ability to understand and analyse, linear and digital electronic circuits.

TEXT BOOKS:

1. Chang Liu, "Foundations of MEMS", Pearson Education Inc., 2006.
2. Stephen D Senturia, "Microsystem Design", Springer Publication, 2000.
3. Tai Ran Hsu, "MEMS & Micro systems Design and Manufacture" Tata McGraw Hill, New Delhi, 2002.

REFERENCES:

1. James J.Allen, "Micro Electro Mechanical System Design", CRC Press Publisher, 2010
2. Julian w. Gardner, Vijay K. Varadan, Osama O. Awadelkarim, "Micro Sensors MEMS and Smart Devices", John Wiley & Son LTD,2002
3. Mohamed Gad-el-Hak, editor, " The MEMS Handbook", CRC press Baco Raton, 2000
4. Nadim Maluf," An Introduction to Micro Electro Mechanical System Design", Artech House, 2000.
5. Thomas M.Adams and Richard A.Layton, "Introduction MEMS, Fabrication and Application," Springer 2012.

AT8091**MANUFACTURING OF AUTOMOTIVE COMPONENTS****L T P C**
3 0 0 3**OBJECTIVE:**

- To impart knowledge on basic principle and production methods of automotive components.

UNIT I CASTED ENGINE COMPONENTS 9

Material selection and Manufacturing methods for Piston, Piston rings, Cylinder block, wet and dry liners, Engine head, Oil pan, Carburetors. Thermal barrier coating of Engine head and valves.

UNIT II FORGED ENGINE COMPONENTS 8

Material selection and Manufacturing methods for Crank shaft, Connecting rod, Cam shaft, valve, Piston pin, Push rod, Rocker arm, tappets, spark plug.

UNIT III TRANSMISSION SYSTEM 10

Material selection and Manufacturing methods for Clutch – Clutch lining – Gear Box – Gear – Propeller Shaft – Differential – Axle Shaft – Bearing – fasteners – Wheel drum.
Methods of Gear manufacture – Gear hobbing and gear shaping machines - gear generation - gear finishing and shaving – Grinding and lapping of hobs and shaping cutters – gear honing – gear broaching.

UNIT IV VEHICLE CHASSIS 8

Material selection and manufacturing methods for chassis, dead axle, leaf spring, coil spring and shock absorbers – wheel housing – steering system, Brake shoes, wheel rim, Tyres. Heat treatment procedures.

UNIT V RECENT DEVELOPMENTS 10

Surface treatment – Plastics – Plastics in Automobile vehicles – Processing of plastics - Emission control system – catalytic converter – Hydro forming of exhaust manifold and lamp housing – stretch forming of Auto body panels – MMC liners –Selection of materials for Auto components. Use of Robots in Body weldment.

TOTAL : 45 PERIODS**OUTCOME:**

- Upon completion of this course the student can able to use the basic principle and production methods of automotive components

TEXT BOOK:

1. Heldt.P.M, "High speed combustion engines", Oxford publishing Co., New York, 1990.

REFERENCES:

1. Kirpal Singh, 'Automobile Engineering', Vol. I & II, Standard Publishers, New Delhi, 1997.
2. Newton and steels, the motor vehicle, ELBS, 1990
3. Serope Kalpakjian and Steven R. Schmid, "Manufacturing Processes for Engineering Materials", Fourth Edition, Pearson Education publications – 2003
4. Gupta K.M. "Automobile Engineering" Vol.I & II, Umesh Publishers, 2000.

RO8092**LEAN MANUFACTURING****L T P C
3 0 0 3****OBJECTIVES:**

- To introduce the students the lean manufacturing concepts
- To understand group technology and use of it for part identification
- To understand value stream mapping in lean manufacturing.
- To teach the tools and method used in lean manufacturing
- To introduce concept of Total Productive Maintenance and other system

UNIT I INTRODUCTION:**14**

Origins and objectives of lean manufacturing – lean process, 3M concept key principles and implications of lean manufacturing – traditional Vs lean manufacturing characteristics – roadmap for lean implementation and lean benefits - study of Ford and Toyota production systems - JIT manufacturing, Lean building blocks. LEAN MANUFACTURING CONCEPTS: Value creation and waste elimination – seven types of waste – pull production-different models of pull production -the Kanban system-continuous flow-the continuous improvement process / Kaizen-Worker involvement. Design of Kanban quantities – Leveled production - tools for continuous improvement.

UNIT II GROUP TECHNOLOGY AND CELLULAR LAYOUT**7**

JIT with cell manufacturing – part families- production flow analysis – Composite part concept – machine cell design – quantitative analysis – case studies – single piece flow

UNIT III VALUE STREAM MAPPING**7**

The value stream– benefits mapping process - the current state map–mapping icons - mapping steps.VSM exercises - Takt time calculations.

UNIT IV LEAN MANUFACTURING TOOLS AND METHODOLOGIES**7**

Standardized work–standard work sequence timing and working progress .Quality at source – Autonomation /Jidoka, Visual management system, Mistake proofing / Poka-Yoke. 5S technique – Elements and waste elimination through 5S, advantages and benefits - 5S-audit - visual control aids for improvement, flexible work force

UNIT V TOTAL PRODUCTIVE MAINTENANCE**10**

Goals and benefits – Hidden factory, the six big losses, types of maintenance. Overall equipment effectiveness - pillars of TPM and implementation. Change over and set up timer education techniques. Temple of quality, OEE calculations. RECONCILING LEAN WITH OTHER SYSTEMS: Study of lean Six-sigma and lean design – lean and ERP- lean with ISO9001:2000 - administrative lean.

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to implement lean manufacturing concepts in industries
- Ability to group the parts in manufacturing
- Ability to apply value stream in mapping.
- Ability to use the lean manufacturing tools and method
- Ability to apply total productive maintenance concepts in industries.

TEXT BOOKS:

1. Micheal Wader, “Lean Tools: A Pocket guide to Implementing Lean Practices”, Productivity and Quality Publishing, 2002.
2. William M Feld, “Lean Manufacturing: Tools, Techniques and How to use them”, APICS, 2001
3. Dennis P Hobbs, “Lean Manufacturing Implementation” ,Narosa Publications, 2004
4. Gopalakrishnan N, “Simplified Lean Manufacture”, PHI Learning Pvt Ltd, 2010

REFERENCES:

1. Richard B Chase“ Production and Operations Management”, McGraw Hill, 2003
2. Taiichi Ohno, “Toyota Production Systems: Beyond Large Scale Production”, Productivity Press, 1988.
3. Askin R G and Goldberg J B,“ Design and Analysis of Lean Production Systems”, John Wiley and Sons, 2003.
4. Mahadevan B, “Operations Management”, Pearson,2010

MS8002

INDUSTRIAL PSYCHOLOGY AND WORK ETHICS

L T P C
3 0 0 3

OBJECTIVES:

- To understand the behaviour of self others and society.
- To understand the global work standards and ethical practices.

UNIT I INTRODUCTION TO INDUSTRIAL PSYCHOLOGY: 9
Definitions and Scope. Major influences on industrial Psychology. Performance Management : Training and Development.

UNIT II INDIVIDUAL IN WORKPLACE: 9
Motivation and Job satisfaction, stress management. Organizational culture, Leadership and group dynamics.

WORK ENVIRONMENT AND ENGINEERING PSYCHOLOGY-FATIGUE:
Boredom, accidents and safety. Job Analysis, Recruitment and Selection – Reliability & Validity of recruitment tests

UNIT III SOCIOLOGY: 9
A general over view scope of industrial sociology, industry and education, industry and family, industry and social stratification.
INTRODUCTION TO ETHICS:
History and evolution of values and ethics in social work.

UNIT IV PROFESSIONAL STANDARDS 9
Team work, communication, organizational skills and time management

LEGAL REQUIREMENTS:

Considerations for each jurisdiction that registers, certifies or licenses social workers

UNIT V ETHICAL PRACTICE AND SOCIETY 9

Professional values and self-awareness about ethical professional behavior, ethical decision making processes and dilemma examples

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to develop and demonstrate good inter personal relationship in an organisation.
- Ability to handle human resources efficiently
- Understanding the sociology, professional work standards and work ethics.

TEXT BOOKS:

1. Miner J B "Industrial/Organizational Psychology" McGraw Hill Inc., New York, 1992
2. Reamer F G, "Social Work Values and Ethics". Second Edition, Columbia University Press, New York, 1999

REFERENCES:

1. Blum and Naylor, "Industrial Psychology. Its Theoretical and Social Foundations" CBS Publication, 1982.
2. Aamodt M G "Industrial/Organizational Psychology : An Applied Approach" Fifth Edition, Wadsworth/Thompson:Belmont, C.A., 2007.
3. Aswathappa K, "Human Resource Management" Fifth Edition, Tata McGraw Hill, New Delhi, 2008.

www.AllAbtEngg.com

GE8074

HUMAN RIGHTS

**L T P C
3 0 0 3**

OBJECTIVE:

- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I 9

Human Rights – Meaning, origin and Development. Notion and classification of Rights – Natural, Moral and Legal Rights. Civil and Political Rights, Economic, Social and Cultural Rights; collective / Solidarity Rights.

UNIT II 9

Evolution of the concept of Human Rights Magana carta – Geneva convention of 1864. Universal Declaration of Human Rights, 1948. Theories of Human Rights.

UNIT III 9

Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV 9

Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V 9

Human Rights of Disadvantaged People – Women, Children, Displaced persons and Disabled persons, including Aged and HIV Infected People. Implementation of Human Rights – National and State Human Rights Commission – Judiciary – Role of NGO’s, Media, Educational Institutions, Social Movements.

TOTAL : 45 PERIODS

OUTCOME :

- Engineering students will acquire the basic knowledge of human rights.

REFERENCES:

1. Kapoor S.K., "Human Rights under International law and Indian Laws", Central Law Agency, Allahabad, 2014.
2. Chandra U., "Human Rights", Allahabad Law Agency, Allahabad, 2014.
3. Upendra Baxi, The Future of Human Rights, Oxford University Press, New Delhi.

MS8003

SOCIOLOGY AND GLOBAL ISSUES

L T P C
3 0 0 3

OBJECTIVE:

- To understand the human behaviour in societal context and to know the conceptual tools and methodology for the same.

UNIT I SOCIOLOGICAL PERSPECTIVE

12

Social facts, causes, imagination, science, common sense and levels of organization. Interaction and social organization - frame work, statuses and roles, interaction process, social exchange, network and structure of society.

INDIVIDUAL AND SOCIETY:

Elements of culture, culture interaction and diversity. Dynamics of socialization, social class, agents, and secondary socialization

UNIT II SOCIAL GROUPS

12

Characteristics, dynamics, types, individual commitment and group survival, techniques of formal organization. The effects of urbanization and community, population and society, dynamics of population change. Politics, the state and war, the economy, business and work, social systems, social institution – the family, marriage, education goals, values and dilemmas. Transformation of society - Science and technology, growth, role, process of science, society and technologies. Collective behavior and social movement

UNIT III GLOBAL ISSUES – ENERGY

7

The energy crisis, the effect of the energy crisis in less developed nations, climate change, the energy transition, nuclear power

UNIT IV GLOBAL ISSUES – THE ENVIRONMENT

7

Awakening, the air, the water, the workplace, the use of natural resources.

UNIT V GLOBAL ISSUES – THE TECHNOLOGY

7

Benefits of technology, short term and long term benefits, unanticipated consequences on the use of technology. Inappropriate use of technology, the threat of nuclear weapons.

TOTAL : 45 PERIODS

OUTCOMES:

- Able to study the interactions of people in society
- Understanding the effects of societal history, group behavior studies on families etc
- Relating the sociology with global issues like energy crisis, environmental pollution etc.