AE331 Aircraft Structures I **3 1 0 100**

1 . STATICALLY DETERMINATE BEAMS **13**

Double integration and moment area methods, Conjugate beam method, Principle of superposition, Beams of constant strength, Compositebeams.

2 . STATICALLY INDETERMINATE BEAMS AND FRAMES **13**

Clapeyron's three moment equation method, Moment distribution method.

3 . ENERGY METHODS **13**

Castigliano's theorem, Maxwells ' reciprocal theorem, Unit load method, Application to beams, trusses, frames, rings, etc.

4 . COLUMNS **13**

Columns with various end conditions, column curves, Columns with initial curvature, with eccentric loading, South well plot, short column formulae like Rankine's Johnsons, etc. Energy method.

5 . BEAM COLUMNS **8**

Various loading and end conditions.

Total No of periods: 60

AE331 Aircraft Structures I **3** **1** **0** **100**

References:

1. Timoshenko, S., " Strength of Materials " , Vols, I and II, Princeton D.Von Nostrand Co., 1988.
2. Donaldson, B.K., " Analysis of Aircraft Structures - An Introduction ", McGraw Hill, 1993.

AE333 Aircraft Performance **3 0 0 100**

1 . GENERAL **5**

Streamlined and bluff bodies, Aerofoil Characteristics, Pressure distribution round circular cylinder and aerofoils, Aerofoil classification.

2 . DRAG OF BODIES **8**

Types of drag, Effects of Reynold's number on skin friction and pressure drag, Drag reduction of airplanes. Momentum theory of finite wings, Induced drag, Chrodwise and spanwise pressure distributions. Aspect ratio, Camber and planform characteristics drag polar.

3 . STEADY FLIGHT **8**

Steady level flight, Thrust/power, available and required with altiltude Estimation of maximum level flight speed, conditions for minimum drag and minimum power required.

4 . GLIDING AND CLIMBING FLIGHT **6**

Maximum range, Minimum rate of skin a glide, Shallow angles of climb, Rates of climb, time to climb and ceilings, Glide hodograph.

5 . SPECIAL PERFORMANCE PROBLEMS **6**

Range and endurance of jet and propeller type of airplanes. Estimation of take-off and landing distances. High lift devices, Use of thrust augmentation and reverse thrust.

6 . TURINING PERFORMANCE **5**

Bank angle and load factor, Limitations on turn, Pull up and push over, the v-n diagram.

7 . PROPELLERS **7**

Froude momentum and blade element theories, Propeller co-efficients, use of propeller charts, Performance of fixed and variable pitch propellers.

Total No of periods: 45

AE333 Aircraft Performance **3** **0** **0** **100**

References:

1. Houghton, E.L., and Carruthers, N.B, " Aerodynamics for engineering students ", Edward Arnold Publishers, 1988.
2. Kuethe, A.M., and Chow, C.Y., " Foundations of Aerodynamics ", John Wiley & sons, 1982.
3. J.J.Bertin, " Aerodynamics for engineers ", Prentice-Hall, 1988.
4. L.J. Clancey, " Aerodynamics ", Pitman, 1986.
5. Schlichting, E., " Aerodynamics of the Airplane ", McGraw-Hill, 1979.

AE334 Propulsion I **3 1 0 100**

1 . FUNDAMENTALS OF GAS TURBINE ENGINES **10**

Illustration of working of gas turbine engine - The thrust equation - Factors affecting thrust - Effect of pressure, velocity and temperature changes of air entering compressor - Methods of thrust augmentation - Characteristics of turboprop, turbofan and turbojet - Performance characteristics.

2 . SUBSONIC AND SUPERSONIC INLETS FOR JET ENGINES **13**

Internal flow and Stall in Subsonic inlets - Boundary layer separation - Major features of external flow near a subsonic inlet - Relation between minimum area ratio and eternal deceleration ratio - Diffuser performance - Supersonic inlets - Starting problem in supersonic inlets - Shock swallowing by area variation - External deceleration - Modes of inlet operation.

3 . COMBUSTION CHAMBERS **10**

Classification of combustion chambers - Important factors affecting combustion chamber design - Combustion process - Combustion chamber performance - effect of operating variables on performance - Flame tube cooling - Flame stabilization - Use of flame holders - Numerical problems.

4 . NOZZLES **11**

Theory of flow in isentropic nozzles - Convergent nozzles and nozzle choking - Nozzle throat conditions - Nozzle efficiency - Losses in nozzles - Over expanded and under-expanded nozzles - Ejector and variable area nozzles - Interaction of nozzle flow with adjacent surfaces - Thrust reversal.

5 . COMPRESSORS **16**

Principal of operation of centrifugal compressor - Work done and pressure rise - Velocity diagrams - Diffuser vane design considerations - Concept of prewhirl - Rotating stall - Elementary theory of axial flow compressor - Velocity triangles - degree of reaction - Three dimensional flow - Air angle distributions for free vortex and constant reaction designs - Compressor blade design - Centrifugal and Axial compressor performance characteristics.

.

Total No of periods: 60

AE334 Propulsion I **3 1 0 100**

References:

1. Cohen, H.Rogers, G.F.C. and Saravanamuttoo, H.I.H. " Gas Turbine Theory ", Longman, 1989.
2. Rolls-Royce, " Jet engine ", 3rd edition , 1983.
3. Mathur, M.L., and Sharma, R.P.," Gas Turbine ", " Jet and Rocket Propulsion ", Standard Publishers and Distributors, Delhi, 1988.
4. Oates, G.C. " Aerothermodynamics of Aircraft Engine Components ", AIAA Eduction Series, New York, 1985.

AE338	**Design and Drafting**	**0**	**0**	**4**	**100**

1 . ANALYSIS AND DESIGN OF TRUSSES **9**

Statically determinate Plane and Space trusses, estimation of forces and design of members.

2 . LANDING GEAR DESIGN **5**

Basic elements of landing gear system.

3 . DESIGN OF JOINTS **9**

Bolted , rivetted, bonded and welded. Standard specifications.

4 . LAYOUT OF TYPICAL WING AND FUSELAGE **13**

Drafting of typical wing structural elements, Types of wing structures. Drafting of typical fuselage structural elements, Types of fuselage structures.

5 . MODELLING AND DRAFTING **24**

Computer aided modelling and drafting of Aircraft components using software packages.

Total No of periods: 60

AE338 Design and Drafting **0 0 4 100**

References:

1. *Peery, D.J., and Azar, J.j., " Aircraft structure ", McGraw Hill, 1993.*
2. *Dowty, G.H., " Structural Principles and Data ", The New Era Publishing Co.,1980.*
3. *Bruhn E.H. " Analysis and Design of Flight Vehicle Structures " Tri State Off Set Company, USA, 1965.*
4. *Meeta Gandhi, Tilak Shetty & Rajiv Shah, " The 'C' Odyssey, C++ & Graphics - The Future of C ", BPB Publications, New Delhi,1992.*

AE339	**Structures Laboratory I**	**0**	**0**	**4**	**100**

. 60

1.Tensile testing using Universal Testing Mahcine, Mechanical and optical extensometers, Stress Strain curves and strength tests for various engineering materials.
2. Bending tests, Stress and deflections of beams for various end conditions, verification of Maxwell's and Castiglianos theorems, Influence coefficients.
3. Compression tests on long and short columns, Critical buckling loads, South well plot.
4. Tests on riveted and bolted jounts.
5. Test uning NDT inspection methods.

Total No of periods: 60

AE340 Aircraft Stability and Control **3 1 0 100**

1 . GENERAL **4**

Degrees of freedom of a system, Static and dynamic stability, Need for stability in an airplane, Purpose of controls, Inherently and marginally stable airplanes.

2 . STATIC LONGITUDINAL STABILITY **19**

Stick Fixed:Basic equations of equilibrium, Stability criterion, Wing and tail moments, Effects of fuselage and nacelles, Effects of c.g.location, Power effects, Stabiliser setting and c.g.location, Elevator effects, Stick fixed neutral point. Stick Free: Hinge moment coefficients, Stick free neutral point symmetric maneuvers, Stick force gradients and stick force per g.Aerodynamic balancing of control surfaces.

3 . STATIC LATERAL STABILITY **8**

Dihedral effect, Coupling between rolling moment and yawing moment, Adverse yaw, Aileron power, Aileron reversal.

4 . STATIC DIRECTIONAL STABILITY **8**

Weathercocking effect, Rudder requirements. One engine inoperative conditions, Rudder lock.

5 . DYNAMIC LONGITUDINAL STABILITY **11**

Equations of motion, Stability derivatives, Routh's discriminant, solving the stability quartic, Phugoid motion, Factors affecting the period and damping.

6 . DYNAMIC LATERAL AND DIRECTIONAL STABILITY **10**

Dutch roll and spiral instability Auto rotation and spin, Two control airplane.

Total No of periods: 60

AE340 Aircraft Stability and Control **3** **1** **0** **100**

REFERENCES:

1. Perkins C.D., & Hage, R.E. " Airplane perofrmance, stability and control ", Wiley Toppan 1974.
2. Babister, A.W. " Aircraft stability and response ", Pergamon Press, 1980.
3. McCormic, B.W., " Aerodynamic, Aeronautics and Flight Mechanics ", John Wiely, 1995.
4. Nelson, R.C. " Fligh Stability & Automatic Contro ", McGraw Hill, 1989.

AE341 Aircraft Structures II **3 0 0 100**

1 . UNSYMMETRICAL BENDING **6**

Stresses in beams of unsymmetric sections

2 . SHEAR FLOW IN OPEN SECTIONS **12**

Thin walled beams, Concept of shear flow, shear centre, Elastic axis. With one axis of symmetry, with wall effect and ineffective in bending, unsymmetrical beam sections.

3 . SHEAR FLOW IN CLOSED SECTIONS **12**

Bredt - Batho formula, Single and multi-cell structures. Approximate methods. Shear flow in single and multicell structures under torsion. Shear flow in single and multicell under bending with walls effective and ineffective.

4 . BUCKLING OF PLATES **8**

Rectangular sheets under compression, Local buckling stress of thin walled sections, Crippling stresses by Needham's and Gerard's methods, Thin walled column strength. Sheet stiffener panels. Effective width, Inter rivet and sheet wrinkling failures.

5 . STRESS ANALYSIS OF WING AND FUSELAGE **7**

Procedure - Shear and bending moment distribution for semicantilever and other types of wings and fuselage, thin webbed beam. With parallel and non parallel flanges, Shear resistant web beams, Tension field web beams (Wagner's).

Total No of periods: 45

AE341 Aircraft Structures II **3 0 0 100**

REFERENCES:

1. Megson, T.M.G., " Aircraft Structures for Engineering Students ", Edward Arnold, 1985.
2. Bruhn. E.H, " Analysis and Design of Flight vehicles Structures ", Tri-state off set company, USA, 1965.
3. Peery, D.J., and Azar, J.J, " Aircraft Structures ", 2nd edition, Mcgraw-Hill, N.Y., 1993.
4. Rivello, R.M., " Theory and Analysis of Flight Structures ", McGraw Hill, 1993.

AE342 Propulsion II **3 0 0 100**

1 . AIRCRAFT GAS TURBINES: **12**

Impulse and reaction blading of gas turbines - Velocity triangles and power output - Elementary theory - Vortex theory - Choice of balde profile, pitch and chord - Estimation of stage performance - Limiting factors in gas turbine design - Overall turbine performance - Methods of blade cooling - Matching of turbine and compressor - Numerical problems.

2 . RAMJET PROPULSION **10**

Operating principle - Subcritical, critical and supercritical operation - Combustion in ramjet engine - Ramjet performance - Sample ramjet design calculations - Introduction to scramjet - Preliminary concepts in supersonic combustion - Integral ram - rocket - Numerical problems.

3 . FUNDAMENTALS OF ROCKET PROPULSION **8**

Operating principle - Specific impulse of a rocket - internal ballistics - Rocket nozzle classifications - Rocket performance considerations - Numerical problems.

4 . CHEMICAL ROCKETS: **10**

Solid propellant rockets - Selection criteria of solid propellants - Important hardware components of solid rockets - Propellant grain design considerations - Liquid propellant rockets - Selection of liquid propellants - Thrust control in liquid rockets - Cooling in liquid rockets - Limitations of hybrid rockets - Relative advantages of liquid rockets over solid rockets - Numerical problems.

5 . ADVANCED PROPULSION TECHNIQUES **5**

Electric rocket propulsion - Ion propulsion techniques - Nuclear rocket - Types -Solar sail - Preliminary Concepts in nozzleless propulsion.

Total No of periods: 45

AE342 Propulsion II **3 0 0 100**

REFERENCES:

1. Sutton, G.P., " Rocket Propulsion Elements ", John Wiley & Sons Inc., New York, 5th Edn., 1993.
2. Cohen, H., Rogers, G.F.C. and Saravanamuttoo, H.I.H., " Gas Turbine Theory ", Longman Co., ELBS Ed., 1989.
3. Mathur, M., and Sharma, R.P., " Gas Turbines and Jet and Rocket Propulsion ", Standard Publishers, New Delhi, 1988.
4. Gorden, C.V., " Aerothermodynamics of Gas Turbine and Rocket Propulsion ", AIAA Education Series, New York, 1986.

AE345 Experimental Stress Analysis **3 0 0 100**

1 . MEASUREMENTS **4**

Principles of measurements, Accuracy, Sensitivity and range of mesurements.

2 . EXTENSOMETERS **6**

Mechanical, Optical Acoustical and Electrical extensometers and their uses, Advantages and disadvantages.

3 . ELECTRICAL RESISTANCE STRAIN GAUGES **10**

Principle of operation and requirements, Types and their uses, Materials for strain gauge. Calibration and temperature compensation, cross sensitivity, Rosette analysis, Wheatstone bridge and potentiometer circuits for static and dynamic strain measurements, strain indicators.

4 . PHOTOELASTICITY **10**

Two dimensional photoelasticity, Concepts of light-photo-elastic effects, stress optic law, Interpretation of fringe pattern, Compensation and separation techniques, Photoelastic materials. Introduction to three dimensional photoelasticity.

5 . NON-DESTRUCTIVE TESTING **15**

Fundamentation of NDT, Radiography, ultrasonics, Magnetic particle inspection, Fluorescent penetrant technique, Eddy current testing, Acoustic Emission Technique, Fundamentals of brittle coating methods, Introdcution to Moire techniques, Holography, ultrasonic C-Scan, Thermography, Fibre-optic Sensors.

Total No of periods: 45

AE345 Experimental Stress Analysis **3 0 0 100**

REFERENCES :

1. Dally, J.W., and Riley, W.F., " Experimental Stress Analysis ", McGraw Hill Inc., New York, 1978.
2. Hetyenyi, M., " Hand Book of Experimental Stress Analysis ", John Wiley and Sons Inc., New York, 1972.
3. Srinath, L.S., Raghava, M.R., Lingaiah, K.Gargesha, G.Pant B., and Ramachandra, K., " Experimental Stress Analysis ", Tata
McGraw Hill, New Delhi, 1984.
4. Pollock A.A., " Acoustic Emission in Acoustics and Vibrations progress ", ed. by Stephens R.W.B., Chapman and Hall, 1983.

AE346 Aerodynamics Laboratory I	**0**	**0**	**4**	**100**

. **60**

1. Fluid flow studies using a blower
2. Drags of different bodies
3. Lift of flat and curved plates and wings
4. Experiments in a small low speed wind tunnel
5. Pressure distribution studies on two-dimensional models.
6. Pressure distribution studies in Swept wings.
7. Calibration of subsonic wind tunnel

Total No of periods: 60

AE348 Aircraft Design Project I	**0**	**0**	**4**	**100**

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Each student is assigned the design of an Airplane (or Helicopter or any other flight vehicle), to a given preliminary specifications. The following are the assignments to be carried out:

1. Comparative studies of different types of airplanes and their specifications and performance details.
2. Preliminary weight estimations, selection of main parameters, Power plant selection, Aerofoil selection, Wing, tail and control surfaces.
3. Preparation of lay outs of balance diagram and three view drawings.
4. Drag estimation, Detailed performance, Calculations and stability estimates. V-n diagram.

Total No of periods: 60

AE431 Rockets and Missiles	**3**	**0**	**0**	**100**

1 . ROCKETS SYSTEM **10**

Ignition system in rockets - Types of igniters - Igniter design considerations - Design consideration of liquid rocket combustion chamber, injector propellant feed lines, valves, Propellant tanks outlet and helium Pressurized and turbine feed systems - Propellant slosh and propellant hammer - Elimination of geysering effect in missiles - Combustion system of solid rockets.

2 . AERODYNAMICS OF ROCKETS AND MISSILES **13**

Airframe components of rockets and missiles - Forces acting on a missile while passing through atmosphere - Classification of missiles - Method of describing aerodynamic forces and moments - Lateral aerodynamic moment - Lateral Damping moment and longitudinal moment of a rocket - Lift and drag forces - Drag estimation - body upwash and downwash in missiles - rocket dispersion - Numerical problems.

3 . ROCKET MOTION IN FREE SPACE AND GRAVITATIONAL FIELD **10**

One dimensional and two dimensional rocket motions in free space and homogeneous gravitational fields - Description of vertical, inclined and gravity turn trajectories - Determination of range and altitude Simple approximations to burnout velocity.

4 . STAGING AND CONTROL OF ROCKETS AND MISSILES **7**

Rocket vector control - Methods - Thrust termination - SITVC - Multistaging of rockets - Vehicle optimization - Stage separation dynamics - Separation techniques.

5 . MATERIALS FOR ROCKETS AND MISSILES **5**

Selection of materials - Special requirements of materials to perform under adverse conditions.

Total No of periods: 45

AE431 Rockets and Missiles **3 0 0 100**

REFERENCES:

1. Sutton, G.P., et al., " Rocket Propulsion Elements " John Wiley & Sons Inc., NewYork, 1993.
2. Mathur, M., and Sharma, R.P., " Gas Turbines and Jet and Rocket Propulsion ", Standard Publishers, New Delhi, 1998.
3. Cornelisse, J.W.., " Rocket Propulsion and Space Dynamics ", J.W., Freeman & Co., Ltd., London, 1982.
4. Parket, E.R., " Materials for Missiles and Spacecraft ", McGraw Hill Book Co., Inc., 1982.

CE071 Principles of Environmental Science and Engineering 3 0 0 100

1 . COMPONENTS OF ENVIRONMENT 9

Components - Water, air and land - Inter-relationship between components - Subcomponents; Ecosystem - Structure and functional components of ecosystem - Development and evolution of ecosystem - Energy flow and material cycling in ecosystem - Natural and man made impacts on water, air and land; Environment and development - Concept of sustainable development.

2 . SCIENCE OF ENVIRONMENT 9

Chemistry, Physics and biology of water, air and land; Stress on the Chemistry, Physics and Biology of water, air and land owing to the impacts; Environmental quality objective and goals - Policies on development projects and their impacts, with emphasis on the branch of engineering of the student.

3 . CURRENT ENVIRONMENTAL ISSUES 9

Current Environmental issues at Country level - management of municipal sewage, municipal solid waste, Hazardous waste and Bio-medical waste - Air pollution due to industries and vehicles; Global issues - Biodiversity, Climatic change, Ozone layer depletion.

4 . ENGINEERING INTERVENTIONS TO REDUCE THE ENVIRONMENTAL STRESSES 9

Minimisation of Stress - Principles of Physics, chemistry and biology in engineering interventions such as waste treatment - Flow sheets of engineering interventions relevant to the Engineering discipline of the student - Waste minimisation techniques - Clean technology options - Standards of performance of the interventions.

5 . 9

(A) TOOLS FOR ENVIRONMENTAL MANAGEMENT 6

Environmental impact assessment; Precautionary Principle and Polluter Pays Principle; Constitutional provisions, Legal and economic instruments in Environmental Management; Role of Non-government organisations - Community participation environmental management works; International conventions and protocols; Pollution Control Boards and Pollution Control Acts.

(B) FIELD STUDY 3

In-depth study of environmental issues at least one environmentally sensitive site relevant to the discipline of the student and preparation of a report thereupon.

Total No of periods: 45

CE071 Principles of Environmental Science and Engineering 3 0 0 100

Text Books:

1. *G.M.Masters, " Introduction to Environmental Engineering & Science ", Prentice Hall, New Delhi, 1997*
2. *J.G. Henry and G. W. Heike, " Environmental Science & Engineering ", Prentice Hall International Inc., New Jersy, 1996.*

References:

1. *S. K. Dhameja, Environmental Engineering and Management, S. K. Kataria and Sons, New Delhi, 1999.*
2. *State of India's Environment - A Citizen's Report, Centre for Science and Environment and Others, 1999.*
3. *Shyam Divan and Armin Rosancranz, Environmental Law and Policy in India, Cases, Materials and Statutes, Oxford University Press, 2001.*

GE035 Professional Ethics **3 0 0 100**

1 . ENGINEERING ETHICS **9**

Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - kohlberg's theory -giligan's theory - consensus and controversy - professions and professionalism - professional ideals and virtues - theories about right action - self-interest-customs and religion - uses of ethical theories

2 . ENGINEERING AS SOCIAL EXPERIMENTATION **9**

Engineering as experimentation - engineers as responsible experimenters - codes of ethics-a balanced outlook on law-the challenger case study

3 . ENGINEER'S RESPONSIBILITY FOR SAFETY **9**

Safety and risk - assessment of stafety and risk - risk benefit analysis-reducing risk-the three mile island and chernobyI case studies.

4 . RESPONSIBILITIES AND RIGHTS **9**

Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - intellectual property rights (ipr)-discrimination.

5 . GLOBAL ISSUES **9**

Multinational corporations - environmental ethics-computer ethics-weapons development-engineers as managers-consulting engineers-engineers as expert witnesses and advisors-moral leadership-sample code of conduct.

Total No of periods: 45

GE035 Professional Ethics **3 0 0 100**

Text Book:

1. Mike Martin and roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York 1996.

References :

1. Charles D.Fleddermann, "Engineering Ethics", prentice Hall, New Mexico, 1999.
2. Laura Schlesinger, "How Could You Do That: The Abdication of Character, Courage, and Conscience", Harper Collins, New York, 1996.
3. Stephen Carter, "Integrity", Basic Books, New York, 1996.
4. Tom Rusk, "The Power of Ethical Persuasion: From Conflict to Partership at Work and in Private Life", Viking, New York, 1993.

PR431 Management Sciences **3 0 0 100**

1 . ORGANISATIONS **8**

General Principles-Management concepts-Schools of management thoughts-Scientific and japanese Management Trends-Management Functions.
Organisations- Types-Properties-Comparison.

2 . PRODUCTION AND OPERATION MANAGEMENT **18**

Plant location-Layout-Methods of Study-Time study-Inventory-Types and control-Maintenance & Replacement-Quality control-Inspection-Acceptance Sampling and Statistical Quality control charts-Quantitative Techniques-Linear programming-Transportation and Assignment Problems-Sequencing and Routing-Queuing theory-Network Techniques-CPM and PERT,Role of EDI in inventory control

3 . PERSONNEL MANAGEMENT **8**

Functions-Recruitment and Training Appraisal-Counselling-Leadership and Motivation-Organisational Communication-Conflict and Change,Industrial Relations-Trade Union Disputes

4 . FINANCIAL MANAGEMENT **6**

Capital-Types-Sources-Managerial Economics-Supply and Demand-Savings-Investment-Consumption-Demand and Price Elasticities-Production function-Costing-Types-Break even analysis-Financial Statements

5 . MARKETING MANAGEMENT **5**

Product Life Cycle-Design-Forecasting-Sales and Marketing-Strategies

Total No of periods: 45

PR431 Management Sciences **3 0 0 100**

References:

1. Carl R.Andersation, " Management " -Allyn and Bacon Inc.,Boston,1988

2. Levin R.Quantitative " Approaches to Management ",McGraw Hill Book Co.,1986

3. Koontz and O"Donnel, " Essentials of Management " ,McGraw Hill Book Co.,1992

4. Besterfield D.H, " Quality Control ",Prentice Hall of India,1995

5. Pandey,I.M., " Financial Management ",Vikas Publishing Co.,1979

6. Philip Kotler, " Principles of Marketing ", Prentice Hall of India,1984

GE406 TOTAL QUALITY MANAGEMENT 3 0 0 100

1. INTRODUCTION 9

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

2. TQM PRINCIPLES 9

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

3. STATISTICAL PROCESS CONTROL (SPC) 9

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

4. TQM TOOLS 9

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

5. QUALITY SYSTEMS 9

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14000 – Concept, Requirements and Benefits.

TEXT BOOK:

1. Dale H.Besterfiled, et at., Total Quality Management, Pearson Education Asia, 1999. (Indian reprint 2002).

REFERENCES:

1. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management, McGraw-Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth – Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.
5. Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.