DIAT (DU) Pune

MASTER OF TECHNOLOGY IN MATERIALS SCIENCE AND TECHNOLOGY

Semester I (650 Marks)

Subject Code	Subject Name	Contact Hrs			Marks
		L	T	P	
MS 602	Physical & Mechanical Metallurgy	03	00	00	100
MS 603	Materials Characterization	03	00	00	100
MS 609	Design and Selection of Materials	03	00	00	100
AM 601	Essential Advance Mathematics	03	00	00	100
MS 611	Materials for Defence Applications	03	00	00	100
	Elective I	03	00	00	100
MS 620	Metallography Laboratory	00	00	04	50

Elective Subjects –

(i) Materials Processing I (MS 606)
(ii) Explosive, Propellants and Pyrotechnics (AC 601)
(iii) Chemistry and Technology of High Energy Materials (AC 606)

Semester II (600 Marks)

Subject Code	Subject Name	Contact Hrs			Marks
		L	T	P	
MS 605	Polymers, Ceramics and Composites	03	00	00	100
MS 608	Fatigue, Fracture and Failure Analysis	03	00	00	100
MS 610	Non Destructive Evaluations	03	00	00	100
MS 614	Advanced Functional Materials	03	00	00	100
MS 612	Materials for High Temp. Applications	03	00	00	100
	Elective II	03	00	00	100

Elective Subjects –

(i) Materials Processing II (MS 613)
(ii) Nano Technology (AP 608)
(iii) Materials Science and Technology (MS 601)
(iv) Combustion of High energy Materials (AC 617)
(v) Computational techniques for performance evaluation of explosives and propellants (AC 612)

Semester III (500 Marks)

Subject Code	Subject Name	Contact Hrs			Marks
		L	T	P	
MS 607	Heat-treatment	03	00	00	100
MS 604	Corrosion and Control	03	00	00	100
AE 620	Systems Engineering	03	00	00	100
MS 651	Dissertation Project	20			200

Semester IV (500 Marks)

Subject Code	Subject Name	Contact Hrs			Marks
		L	T	P	
PG 601	Project Management	03	00	00	100
MS 652	Dissertation Project	20			400

SYLLABUS

SEMESTER I (650 Marks)

CORE SUBJECTS (05)

PHYSICAL & MECHANICAL METALLURGY (MS 602)
Structure of metals, Lattice imperfections, Diffusions in metals, Solidification of metals Phase rule, diagram and solid solutions, Iron-Carbon diagram, Recovery, Recrystallization & Grain growth, Elastic and plastic behavior of metals, Theory of plasticity and dislocation, Yield Point Phenomena, Strain Ageing, Deformation mechanisms, Strengthening mechanisms. *Metallurgical Thermodynamics.*

References

Introduction to Physical Metallurgy, S H Avner, TATA Mc-Graw Hill, New Delhi, 2001.
Physical foundations of materials science, G. Gottstein, Berlin Springer Verlag; 2004.
Mechanical Metallurgy, 3rd Ed, George E Dieter, Mc-Graw Hill, New York, 1986.

MATERIALS CHARACTERIZATION (MS 603)
Tension test, Compression test, Hardness test, Impact test, Creep Test, X-ray Diffraction, Electron Diffraction, X-ray Texture Goniometer, Optical Microscope, Electron Microscope, Spectroscopy, Electrical Property Measurement, TG-DTA-DSC, Magnetic characterization

References

Mechanical Metallurgy, 3rd Ed, G. E Dieter, Mc-Graw Hill, New York, 1986.
Physical foundations of materials science, G. Gottstein, Berlin Springer Verlag; 2004.
Elements of X-ray diffraction, B. D. Cullity, S. R. Stock, Prentice Hall, 2001.
Physics of Materials, Characterization of Materials, IAEA, Vienna, 1980.

DESIGN & SELECTION OF MATERIALS (MS 609)
Philosophy of the metallurgical design of steel, strengthening mechanism in steel, Low carbon mild steels, High strength low alloy structural steels, Medium high carbon ferritic-pearlitic steels, Bainitic steels, Ultrahigh strength steels, Stainless steel, Controlled transformation stainless steel, Design & Processing of Al Alloys, Mg Alloys, Ti Alloys and Cu Alloys. Case study on metals, ceramics, polymers and composites.

References

Physical Metallurgy and the Design of Steels, FB Pickering, Applied Science Publisher Ltd., London, 1978.
Engineering Materials, M F Ashby, Pergamon Press, Oxford, 1980.
Metallurgy for Engineers-EC Rollason, 4th Ed, Edward Arnold, UK, 1973.

ESSENTIAL ADVANCE MATHEMATICS (AM 601)
Elementary numerical techniques
Solutions of non linear equations: Bisection, Secant, Newton-Raphson, Fixed point iteration method, Linear Bairstow methods.

Interpolation and polynomial approximation: Lagrange and Newton interpolation. Cubic splines, Bezier curves, Least square polynomial, Nonlinear curve fitting. Gaussian quadrature

Advanced numerical techniques

Numerical differentiation and integration: Differentiation based on interpolation, Newton-Cotes integration.

Solution of differential equations: Euler, Modified Euler, Runge-Kutta methods, Multistep methods, Predictor corrector methods.

Solution of PDE: Parabolic, Hyperbolic and Elliptic Equations using finite difference method.

Eigen values and eigen vectors: Power method and shift method.

Essential transform techniques

Transform techniques: Overview of Laplace transform, overview of Fourier transform, overview of z transform, Continuous wavelet transform, DWT, FWT, Applications of WT, Wavelet packets, Multi-resolution analysis.

References

Numerical Methods for Scientific and Engineering Computation,5th Ed. 2008, M. K. Jain, S.R.K. Iyengar, R.K. Jain., New Age International Ltd.

Numerical Analysis for Engineers, 2006, D. V. Griffiths, Ian Moffat Smith, CRC Press.

Numerical Solutions of Partial Differential Equations: An Introduction,2nd Ed. 2005, KW Morton & DF Mayers, Cambridge University Press.

Numerical Methods, 2001, S Arumugam A., A. Thangapandi Isaac & A. Somasundaram, Scitech.

Digital Signal Processing, 2001, S Salivahanan, A.Vallavaraj, Tata McGraw Hill.

Elementary Numerical Analysis, 3rd Ed, 2008,Samuel D Conte and Carl de Boor, Tata McGraw Hill.

Conceptual Wavelets in Digital Signal Processing, 2009,D. Lee Fugal, Space & Signals Technical Publishing

MATERIALS FOR DEFENCE APPLICATIONS (MS 611)

Classification of Materials, Selection of materials, Metals, Structure and Properties of metals, Alloys, Steels, Titanium alloys, Nickel alloys, Cobalt alloys, Magnesium alloys, Aluminum alloys, Applications of metals and alloys in defence.

Polymers, Types of polymers, Thermosets, Thermoplastics, Speciality polymers, Engineering polymers, structural polymers, High performing polymers, Applications of polymeric materials in defence.

Ceramics, Engineering ceramics, Electronic ceramics, Applications of ceramic materials in defence.

Composites, Types of composites, Reinforcing additives in composites, Manufacturing of composite materials, Applications of composite materials in defence.

Corrosion, Types of corrosions and their prevention.

References

Military Metallurgy, Alistair Doig, 1998, London Maney.
Indian Defence Technology Materials, DMRL, 1997, Hyderabad.
Handbook of Engineering polymeric materials by Nicolas P. Cheremisinoff, 1997
Polymer Science by V. R. Gowarikar, New age international
Ceramic Materials: Science and Engineering by C. Barry Carter, M. Grant Norton, Springer
Corrosion Engineering by Mars G. Fontana, McGRAW-HILLInternational Edition

ELECTIVE SUBJECTS (ANY ONE)

MATERIAL PROCESSING I (MS 606)
Casting, Hot Working, Warm Working, Cold Working, Rolling, Forging, Extrusion, Wire, Rod, Tube Drawing, Sheet Metal Forming, Joining Techniques, Powder Metallurgy.

References

Mechanical Metallurgy, 3rd Ed, George E Dieter, Mc-Graw Hill, New York, 1986.
Manufacturing Processes and Materials for Engineers, L. E. Doyle, 1975.
Powder Metallurgy, Applications, Advantages and Limitations, Klar, Erhard, ASM, 1983, Ohio.

EXPLOSIVES, PROPELLANTS & PYROTECHNICS (AC 601)
Explosives: Introduction, Classification, Nature of Explosives, Burning, Deflagration & Detonation; Initiation theories of explosives; Techniques of Initiation of Explosives, Thermochemistry of explosives and various performance parameters of explosives, HE filling techniques, HE applications in different warheads, Recent trends

Propellants: Introduction, Rocket Propellant: Classification and manufacture, Propellants Ingredients & their properties, Solid Rocket Propellant: Processing Techniques, Insulation, Liners /Inhibition Systems, Performance parameters of Rocket Propellant, Ignition systems / Igniters, Recent Trends

Pyrotechnics: Definition, classification, Ingredient, Various compositions, Performance parameters of pyro-stores, Manufacture of pyro-stores, Applications like color, smoke, sound, heat, etc., Recent Trends

References

Introduction to Technology of explosives, 1996,Paul Cooper, McGraw Hill, NY.
Science & Technology of Solid rocket Propellant, 2005, Haridwar Singh & Himanshu Shekhar.
Chemistry of Pyrotechnics, 1986, J.A. Conkling.

CHEMISTRY AND TECHNOLOGY OF HIGH EXPLOSIVES AND PROPELLANTS (AC 606)

Explosives: Introduction, Classification, Nature of Explosives
Energy release mechanism of explosives: Deflagration, Detonation & DDT.
Initiation theories & Initiation techniques, Various Types of detonators, Performance parameters of explosives, Manufacture of Primary & Secondary explosives, Filling techniques of high explosives, Application in different warhead, Special classes of explosives: Heat resistant explosives, Plastic Bonded Explosives (PBXs), Sheet explosives , Recent trends in High explosives.
Detonics: Shock waves, Hydrodynamic theory of detonation , RH Equation & curves, its significance, CJ conditions & its significance.

References

Chemistry of explosives. J. Akhavan, Cambridge Royal Society of Chemistry, 1998
Explosive Engineering, Paul Cooper, 1996
Theory of detonation, Y.P. Zeldovich and A.S. Kompameets, Academic Press, New York, 1960

METALLOGRAPGY LABORATORY (MS 620)

SEMESTER II (600 Marks)

CORE SUBJECTS (05)

POLYMER, CERAMIC & COMPOSITE (MS 605)
Polymer, Types of Polymer, Different techniques of polymerization, Kinetics of polymerization, Thermoplastic, Thermoset, Engineering and specialty polymers, Basics of blends/alloys, Applications of polymers, blends and alloys in Defence.
Ceramics & various defects in ceramics, manufacture and properties of engineering ceramics, Applications of ceramics.
Composites, Metal Matrix Composites, Carbon and Carbon-Carbon Composites, Ceramic Matrix Composites, Intermetallic Matrix Composites and Polymer Matrix Composites. Applications of composites. *Mechanics of fibre reinforced composites.*

References

Handbook of Engineering polymeric materials by Nicolas P. Cheremisinoff, 1997.
Science and technology of polymers and advanced materials by James E. Mark, Zakya H. Kafafi,1998.
Polymer Blends L.A. Utracki, 2002.
Plastics Engineering (Marcel Dekker), 52, 2001.
Materials for High Temp. Engg. Applications, G. W. Meetham and M.H. Van de Voorde, Springer, 2000, Berlin.

FATIGUE, FRACTURE & FAILURE ANALYSIS (MS 608)
Stress cycles, Interpretation of Fatigue Data. Endurance Limit, Effect of Mean Stress on Fatigue, Cyclic Stress-Strain Curve, Low Cycle Fatigue, Plastic Strain & Fatigue Life, Effect of Structural Features, Fatigue Crack Propagation, Stress Concentration & Fatigue, Size & Surface Effect, Effect of Metallurgical Variables & Enhancement of Fatigue Life, Classification of Fracture, Theoretical Strength of Metals, Griffith Theory of Brittle Fracture, Metallographic

features of Fracture, Fractography, Dislocation Theory of Brittle Fracture, Effect of Tri-axial Stress, Strain Energy Release Rate, Stress Intensity Factor, Fracture Toughness & Design, K_{IC} , CTOD, J-Integral, R-Curve, Toughness of Metals & Alloys.

References

Mechanical Metallurgy, 3rd Ed, George E Dieter, Mc-Graw Hill, New York, 1986.
Elementary engineering fracture mechanics By David Broek Noordhoff International 1974.
Fatigue and Fracture of Metals, W. M. Murray, John Wiley, 1952.

NONDESTRUCTIVE EVALUATIONS (MS 610)
Visual Inspection, Liquid Penetrant Testing, Magnetic Particle Testing, Eddy Current Testing, Ultrasonic Testing, Acoustic Emission Technique, Radiography Technique, Residual Stress Analysis, In-situ Metallography, Automation and Robot in NDT, Case study: Grain Size, Weldment and other Structural Components.

References

Non-destructive Testing of welds, Baldev Raj, C.V. Subramanian and T. Jayakumar, Narosa Publishing House, 2000, Delhi.
International Advances in non-destructive testing, (Ed.) W. J. Mcgonnagle, Gordon and Breach Science Publishers, 1981, NY.
Non-destructive Testing, Views, Reviews, Previews, (Ed.) L.L.Alston, Oxford University Press, 1970, UK.

ADVANCED FUNCTIONAL MATERIALS (MS 614)
Various types of magnetism, Origin of magnetic anisotropy and stability of domains; Applications of magnetic materials: Soft and permanent magnets, Shape memory alloys (Magnetic and non-magnetic) and their applications, Ni-Ti, Ni-Al and Ni_2MnGa alloys.
Dielectric, Ferroelectric, piezoelectric materials and their applications.
Materials for biomedical applications: Property requirement of biomaterials; Concept of biocompatibility; Assessment of biocomatibility of biomaterials, important biometallic alloys; Ti-based, stainless steels, Co-Cr-Mo alloys.
Bioceramic materials: Processing and properties of different bioceramic materials; synthesis of biocompatible coatings on structural implant materials. Bio-degradable polymers.

References

Physical Principles of Magnetism, F. Brailsford, 1966.
Smart Materials and Structures, Brian Culshaw, 1996.
Physical Metallurgy of Ti-Ni-based shape memory alloys, K. Otsuka and X. Ren Progress in Materials Science, 50, 511, 2005..
Shape Memory Ferromagnets, A. N. Vasil, 19, 2003.
An Introduction to Microelectromechanical Systems Engineering, Nadim Maluf and Kirt Williams, 2004.

MATERIALS FOR HIGH TEMPERATURE APPLICATIONS (MS 612)
Melt processing of Superalloy, Single crystal Superalloy, Processing of Superalloy, Alloying effect, Hot Deformation, Powder Metallurgy and Oxide Dispersion Processing, Oxide Dispersion Strengthened Alloy, Fiber Reinforced Composite Superalloy, Processing and properties of Structural Ceramics

References

Superalloys, supercomposites and super ceramics, ed. J. K Tien and T. Caulfield, Academic Press, 1989, Boston.
High temperature structural materials, R. W. Cahn, Chapman and Hall, 1996, London.
Materials for High Temp. Engg. Applications, G. W. Meetham and M.H. Van de Voorde, Springer, 2000, Berlin.

ELECTIVES (ANY ONE)

MATERIALS PROCESSING II (MS 613)
Polymerization principles and processes, Compounding, Compression moulding, Extrusion, Injection moulding, Blown film extrusion, Laser welding, Reaction injection moulding, Rotational moulding, Resin transfer moulding, pultrusion, gas injection moulding, calendaring, printing,

References

Plastics Processing Data Handbook (2nd Edition), Rosato, Dominick, 1997.
Title Plastic Injection Molding: Manufacturing by Douglas M. Bryce, 2007.
Concise encyclopedia of plastics, Rosato, Marlene G, 2005
Extrusion: the definitive processing guide and handbook, Giles, Harold F.; Wagner, John R.; Mount, Eldridge M, 2005.
Welding of Plastics, J. Alex Neumann and Frank J. Bockoff, 1984.

NANO TECHNOLOGY (AP 608)
Physics of solid state: Size dependence of properties, Crystalline structure- bulk and surface, Crystal diffraction techniques, Reciprocal lattice, Quasi-crystalline structure, Energy bands in conductors, semiconductors and insulators, Fermi surfaces, donors, acceptors and deep traps, Excitons and Plasmons.

Introduction to nanoscale: Properties of nanometer scale materials, Physics of low dimensional systems, Quantum nature of nanoworld, Density of states for quantum wells, wires and dots.

Microscopy techniques: Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Field electron microscopy (FEM), Field ion microscopy (FIM), 3D atom Probe, Scanning probe microscopy, Spectroscopy methods, Infrared and Raman spectroscopy, X-ray (ultra-violet) Photoelectron spectroscopy (XPS)/ UPS.

Nanofabrication Methods for synthesis of nanomaterials: Bottom up and top down approaches, Patterning, Mask and photolithography, Metallic, semiconducting and molecular clusters, Carbon nanostructures- Carbon clusters (C_{60} and C_{70}) and Carbon nanotubes, their properties and applications, Self assembly of materials and catalysis, Self assembled monolayers (SAMs), Porous materials, Colloids, Biological materials-biological building blocks, Nucleic acids, DNA double nanowire, Genetic code and protein synthesis, Biological nanostructures.

Applications of Quantum Technologies: Micro-electro-mechanical systems (MEMS), nano-electro-mechanical systems (NEMS), Molecular electronics. Current advancements in the field of Nanotechnology.

References

Introduction to Nanotechnology, Charles Poole Jr and Frank J Owens, Wiley India, New Delhi (2006)
Nanophysics and Nanotechnology, Edward L Wolf, Wiley-VCH, Verlag (2006)
Nanotechnology: a gentle introduction to the next big idea, Mark Ratner, Daniel Ratner, Pearson Education, New Jersey, USA (2003)
Solid state Physics 8th Ed, Charles Kittle, Wiley (2005)
Nanoscience, Claire Dupas, Philippe Houdy, Marcel Lahmani (Eds.), Springer, 2007

MATERIALS SCIENCE AND TECHNOLOGY (MS 601)

Materials structure and properties: Atomic structure, Lattice structures and Imperfections, Dependence of property on microstructure, Plastic deformation mechanisms, Dislocation theories, Work hardening, Recovery, Recrystalization and grain growth, Yield point phenomena, Deformation mechanism maps.
Strengthening Mechanism: Solid solution strengthening, Strain ageing, Age hardening, Dispersion hardening, Work hardening.
Fracture Mechanics: Classification of fracture failure, Micro-mechanisms and Fractography of brittle fracture, Griffith theory, Linear elastic fracture mechanics and Application of fracture mechanics in designing structure.
Advanced Materials and Techniques: Materials for high temperature and low temperature applications, Ultra high strength materials, Smart materials, Nanocrystalline materials-properties and applications, Materials for aircraft and missile structures, Gas turbines, Aero engines, Marine structures, Bearing and tools.
Polymer Chemistry: Definition, Classification and characteristics of polymers, Thermoplastic and thermosetting polymers, Condensation and addition polymers, Kinetics and mechanism of free radical, step growth and copolymerization, Cationic and anionic polymerization, Molecular weight and its determination, Effect of molecular weight, Crystallinity, Crosslinking on polymer properties, Tg and Tm of polymers.
Preparation, Properties and Applications of:
(a)Elastomers/Rubbers: Natural, derivatised, synthetic, rubber composites.
(b) Thermoplastics: Polyester, polyamides, polyurethanes, PEEK, PPO,PPS, Polysulfones, Heat resistant polymers, speciality polymers, polyamides, liquid crystalline polymers, Polyethers.
(c) Thermosets: Phenol formaldehyde, Urea formaldehyde, Malamin formaldehyde resin, Epoxy resin, Unsaturated polyester resin.
(d) Composites: Concept of reinforcement in composites, Cord reinforced elastomers, Fiber and matrix parameters, Carbon, Glass and Aramide fiber reinforced plastics, Metal matrix composites, Nanocomposites.
(e) Recent advancement in polymers and their applications: Smart polymers, stimuli sensitive polymers, hydrogels, smart polymers as sensors, conducting polymers.

References

Metallurgy for Engineers-EC Rollason, 1973, 4th Ed, Edward Arnold, UK.
Mechanical metallurgy, 1986, 3rd Ed, George E Dieter, Mc-Graw Hill, New York.
Engineering Materials, 1980, MF Ashby, Pergamon Press, Oxford.
Creep and Fatigue in high temperature alloys, 1981, Ed, Bressers J., Alied Science Publisher, London.
Text book of polymer science, 1971, 2nd edn, Billmeyer(jr), F.W., John Wily and Sons
Polymer chemistry and physics of modern materials iner texts/references 1973, Cowie, J. M. G, Aylesbury Books.

Comprehensive composite materials 2000, Vol. 1-5, Carl Zweben, Kelly, A. Eds Elsevier Science Ltd (UK).

COMBUSTION FOR HIGH ENERGY MATERIALS (AC 617)

Combustion: An introduction, thermodynamics of combustion chemistry

- Combustion chemistry, combustion chemistry modeling
- Chain reaction, specific reactions: Hydrogen-oxygen, carbon monoxide oxidation, hydrocarbon oxidation
- Ignition module and Flammability limits, flash point,
- Flame temperature, properties, structure, instability, Ionization in flame, acceleration and burning velocity
- Classification of flames
- Gas phase diffusion flame, single droplet combustion, laminar and turbulent diffusion flame
- Premix flames, turbulent premixed flames
- Combustion of liquid propellants, combustion instability, combustion efficiencies
- Polymer combustion: Thermal decomposition, flaming and non-flaming combustion, mechanism of decomposition
- Controlling factors of polymer combustion and combustion inhibition

References

Propellants & Explosives: Thermochemical aspects of combustion, N.Kubota,Wisley VCH, 2002.
Rocket –Combustion, N.Kubota , Nikhan Kogyo Press, 1995

COMPUTATIONAL TECHNIQUES FOR PERFORMANCE EVALUATION OF HIGH ENERGY MATERIALS (AC 612)

a) Conventional computational Techniques (Methods) for performance evaluation of explosives and propellants and their limitations.
b) Performance evaluation of Explosives & Propellants by different computer softwares / programmes.

References

Explosive engineering "Paul Cooper", 1996
Rocket Propulsion elements, G.P. Sutton, John Wiley, 1972
Energetic and Propellant chemistry, Siegel. B., John Wiley, 1964

SEMESTER III (500 Marks)

HEAT-TREATMENT (MS 607)

Steel Heat-Treatment, Annealing, Normalizing, Quenching, Hardening, Case hardening, Tempering, Process Annealing of Aluminium, Titanium and Magnesium Alloys.

References

Heat Treatment Principles & Techniques, TV Rajan, CP Sharma & Ashok Sharma Prntice Hall of India, New Delhi, 2007.
Metallurgy for Engineers-EC Rollason, 4th Ed, Edward Arnold, UK, 1973.

Physical foundations of materials science, G. Gottstein, Berlin Springer Verlag; 2004.
Engineering Physical Metallurgy by Yuri Lakhtin, Moscow, MIR Publishers, 1963.
Grain boundary migration in metals: thermodynamics, kinetics, applications, G. Gottstein & L. Shvindlerman, Boca Raton (FL), CRC, 1999.

CORROSION & CONTROL (MS 604)

Galvanic Cell, Types of Corrosion cells, Electrode Potentials, Standard Electrode Potentials, Nernst Equation, Pourbaix Diagram, Galvanic Series in Sea Water, Polarization, Causes of Polarization, Passivation, Pitting Corrosion, General Methods of Corrosion Prevention, Cathodic Protection, Metallic and Non Metallic Coatings, Corrosion Prevention by Alloying, Stress Corrosion Cracking.

References

Corrosion of metals, C. W. Borgmann, ASM, Cleveland, 1958.
Metallic corrosion passivity and protection, U. R. Evans, Earnold, London, 1948.
Symposium on stress corrosion cracking, ASTM, Phildelphia, 1945.

SYSTEMS ENGINEERING (AE 620)

Systems definitions and concepts. Conceptual system design; Introduction to engineering design and decision making; Requirements capture; Quality Function Deployment; Queuing theory; Design options; Monte Carlo modeling; Engineering microelectronics; Utility theory; Forecasting. Engineering systems modeling. Analysis of system: Reliability; Maintainabiliiity; Serviceability; Disposability and Affordability. Cost and benefit analysis. Methods of decision analysis; State transition matrix models; Modeling the research and development process; Information, System life-cycle modeling and optimization. Game theory; Management of engineering systems design and operation; Programme management with case studies.

References

George,A. Hazelrigg, Systems Engineering: An Approach to Information-Based Design, Prentice Hall NJ, 1996.
Benjamin, A., Blanchard, and Walter,J. Fabrycky, Systems Engineering and Analysis, 3rd Ed., Prentice Hall International Series, Industrial & Systems Engg., 1998

DISSERTATION PROJECT

SEMESTER IV (500 Marks)

PROJECT MANAGEMENT (PG 601)

Leading and Building Effective Teams, Feasibility studies and project selection, Judgment-Uncertainty-Decisions and Data Analysis, Project Scheduling techniques, Decision-Making under uncertainty, Decision Trees, Strategic Risk Management Planning, Team Performance Management, Deliverable work breakdown structure (DWBS), Cost Estimation and Control, Costs Categorization, Pricing Process, Resource Allocation and Leveling, Project Reporting and Communication, Planning Fundamentals, Advanced Project Network Analysis and Scheduling, Project Quality management, Managing Risk in Project, Project execution and control, Resource allocation.

DISSERTATION PROJECT