

## **B.Tech. Polymer Science**

### **Paper code: MA 101 MATHEMATICS 1**

1. Advanced engineering mathematics: Alan Jeffery; Academic Press
2. Calculus and analytic geometry: Thomas/Finney; Narosa.
3. Advanced engineering mathematics: Taneja; IK international
4. Advanced engineering mathematics: Jain/Iyenger; Narosa.
5. Advanced engineering mathematics: Kreyszig; Wiley.

### **Paper Code: HU 102 Communication skills**

1. Raman Meenakshi and Sharma Sangeeta, technical communication : Principles & Practices, OUP, New Delhi 2005.
2. Weiss,Edmond H.Writing Remedies: Practical Exercise for Technical Writing. University Press.
3. Hamp-Lyons, Liz and Ben heasley, Study Writing, A course Written in English for academic and professional purposes, Cambridge University Press, Cambridge 1987.
4. Goatly, Andrew, Critical reading And writing, London, Routledge, 2000.
5. Balasubramanian, T., A Textbook of English Phonetics, Macmillan,2007.

### **Paper Code: AP 103 Applied Physics - 1**

1. Physics of vibrations and waves by H.J.Pain
2. Vibrations and waves by A.P.French
3. Perspective of Modern Physics by Authors Beiser
4. Optics by A. Ghatak
5. Berkley Physics Course Vol. I

### **Paper Code: AC 104 Applied Chemistry**

1. T.Hatakeyama, F.X.Quinn, Thermal Analysis; Wiley
2. A.I.Vogel, Inorganic Quantitative Analysis
3. Skoog D.A., Instrumental method of Analysis; HR W International
4. P.T.Anastas & J.C.Warner, Green Chemistry: Theory & Practice, Oxford Univ Press
5. Billimeyer, Polymer Science and Technology, John Wiley

### **Paper Code: EL 105 Electrical Science**

1. C.L. Wadhwa, Basic Electrical Engineering,4<sup>th</sup>
2. Fitzereld, Higgenhothan and Gabel, Basic Electrical Engineering, McGraw Hill International
3. Vincent Deltoro, Electrical Engineering Fundamentals, PHI
4. Relevant Indian Electricity Supply rules and BIS codes

### **Paper Code: IT 106 Fundamental Technology**

1. Using Information Technology: A Practical Introduction to Computers and Communications by William Sawyer and Hutchinson, Pub: Tata MCGraw Hill
2. Introduction to Computers by Peter Norton Tata MCGraw Hill VI Edition.
3. Rajaraman, Introduction to Computers, PHI
4. Nelson, data Compression, BPB

5. CIS Tems, Internet, An Introduction, Tata McGraw hill.
6. Leon & Leon, Fundamentals of Information Technology, Vikas
7. Lehngart, internet 101, Addison Wesley

## **II Semester Examinaton**

### **Paper Code: MA 111 MATHEMATICS II**

1. Advanced engineering mathematics: Greenberg; Pearson Education
2. Advanced engineering mathematics: Kreyszig; Wiley.
3. Advanced engineering mathematics: Taneja; I K international
4. Advanced engineering mathematics: Jain/Iyenger; Narosa.

### **Paper Code: EN 112 ENVIRONMENTAL SCIENCE**

1. De Anil Kumar & De Arnab Kumar, Environmental Studies, New Age International (P) Ltd.
2. Basak Anindita, Environmental Studies, Person Education South Asia.
3. Subramanian. V., A Text Book of Environmental Science, Narosa Publishing House.
4. Rana. S.V.S., Essentials of Ecology & Environment Science, PHI Publications.

### **Paper Code: AP 113 APPLIED PHYSICS-II**

1. Nuclear Physics: Erwin Kaplan.
2. Concept of Nuclear Physics: Cohen.
3. Electrodynamics: Griffith.
4. Electricity & magnetism: Rangawala & Mahajan.
5. Perspective of Modern Physics: Arthur Beiser.

### **Paper Code: AP/AC 114 ENGINEERING MATERIALS PART-A (PHYSICS)**

1. Kittel, Solid State Physics, 7<sup>th</sup> edition, J. W & Sons Publication
2. Wahab M.A. Solid State Physics @ Narosa Publishing House.
3. Ali OmerM, Elementry Solid State Physics, Person Education (Singapore) pvt. Ltd. India branch, New delhi.
4. Kenneth G. Budinski, Budinshi, Engineering Materials; Properties and Selection, 7<sup>th</sup> edition, Person Singapor (Prentice Hall).
5. Pillai S.O. Solid State Physics, New Age International Publication.

### **PART-B (CHEMISTRY)**

1. Donald R. Askeland, Pradeep P. Phule, Essentials of Material Science and Engineering;Thomson.
2. R.W.Dyson, Speciality Polymers; USA: Chapman and Hall, New York
3. A.P.Gupta, M.C.Gupta, Polymer composites; New Age publication.
4. R.N.Goyal, H.Goel, Engineering Chemistry; Ane Books India.
5. S.S.Dara, Engineering Chemistry; S.Chand
6. Raghupati Mukhopadhyay, Sriparna Datta, Engineering Chemistry; New Age International

**Paper Code: ME 115 BASIC MECHANICAL ENGINEERING**

1. Engineering Thermodynamics by P.K. Nag.
2. Fundamentals of Classical Thermodynamics by G.J.Van Wyle and R.E.Santag.
3. Introduction to Fluid Mechanics and Fluid Machines by S.K. Som and G. Biswas.
4. Fluid Mechanics by V.L. Streeter and E.B. Wyle.
5. Fluid Mechanics and Hydraulic Machines by R.K. Bansal.
6. Manufacturing Processes : Kalpakjian
7. Fluid Mechanics : Modi and Seth,
8. Workshop Practics: A.K.Hazara Chowdhary
9. Workshop Technology : W.A.J> Chapman
10. Production Engineering : P.C. Sharma
11. Production Engineering : R.K.Jain

**Paper Code: CO 116 PROGRAMMING FUNDAMENTALS**

1. Jeri R. Hanly, Elliot B. Koffman, "Problem Solving and Program Design in C", Person Addison-Wesely, 2006.
2. Behrouz A.Forouzan, Richard F. Gilberg, "A Structured Programming Approach Using C", Thomson Computer Science- Third Edition [India Edition], 2007.
3. Schildt Herbert, "C++: The Complete Reference", Wiley DreamTech, 2005.
4. E. Balagurusamy, "Object Oriented Programming using C++", TMH.R. Lafore, "Object Oriented Programming Using C++", BPB Publications 2004.
5. D . Parsons, "Object Oriented Programming with C++", BPB Publication, 1999.
6. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication, 2002.

**Paper Code: ME 117 ENGINEERING GRAPHICS**

1. Narayana, K.L. and Kannaiah, P., "Engineering Graphics", Tata McGraw Hill, New Delhi, 1988.
2. Bhatt N.D., "Elementary Engineering Drawing". Charotar Book Stall, Anand, 1998.
3. Lakshminarayanan, V. and Vaish Wanar, R.S., "Engineering Graphics", Jain Brothers, New Delhi, 1998.
4. Chandra, A.M. and Chandra Satish,"Engineering Graphics", Narosa, 1998.

**III Semester Examination****Paper Code: PT 201 POLYMER CHEMISTRY**

1. Textbook of Polymer Science, F.W.Billmeyer, John Wiley
2. Polymer Science, V.R.Gowarikar, New Age International
3. Polymer Science & Technology, J.A. Fried, Prentice Hall
4. Polymer Chemistry, Stevens, Oxford University Press
5. Principal of Polymerization, G Odian, Wiley

**Paper Code: Pt 202 BASIC ELECTRONICS ENGINEERING**

1. By Electronics Communication Engg. ;Department

**Paper Code: PT 203 POLYMER STRUCTURE & PROPERTIES**

1. Polymer Science & Technology, P.Ghosh, Tata McGraw Hill
2. Plastic Materials, J.Brydson, Elsevier
3. Thermal Analysis of Polymeric Materials, Wunderlich, Springer
4. Introduction to Polymers, Young & Lovell, Nelson Thoms
5. Polymer Science, Mishra & Ahluwalia, CRC Press

**Paper Code: PT 204 RUBBER TECHNOLOGY**

1. The Science & Technology of Rubber, Erman & Eirich, Elsevier Academic Press
2. Handbook of Rubber Technology, R.Schuster, Wiley Interscience
3. Handbook of Rubber Technology, Martin & Smith, CBS Publishers
4. Rubber Materials, R Kothandaraman, CRC Press
5. Rubber Compounding, Rodgers, CRC Press

**Paper Code: PT 205 ELEMENTS OF CHEMICAL ENGINEERING**

1. Chemical Engineering, VOI. 1 & 2, Richardson, Elsevier
2. Outlines of Chemical Technology, C.E. Dryden, East West Press
3. Encyclopedia of Chemical Technology, Kirk-Othmer, Wiley
4. Principles of Unit Operations, Foust, Wiley India
5. Chemical Engineering, E. Galan, Wiley-VCH

**Paper Code: PT 206 POLYMERS & ENVIRONMENT**

1. Plastics & Environment, Andrady, Wiley-Blackwell
2. Theory and practice of water & Wastewater Treatment, Droste, Wiley India
3. Introduction to Environmental Engineering & Science, Masters, Pearson Education
4. Polymers, the Environment & Sustainable Development, Azapagic, John wiley.
5. Biodegradable polymers for industrial Application, R Smith, CRC

**Paper Code: PT 211 PROCESS EQUIPMENT DESIGN**

1. Process Equipment Design, Brownwell, Wiley India
2. Process Equipment Design, S.D. Dawande, Central Techno Publications
3. Process Equipment Design, Joshi & Mahajan, McMillan India
4. Product & Process Design Principles, Seider, Wiley India
5. Ullmans Chemical Engineering & Plant Design, Willey-VCH

**Paper code: PT 212 POLYMER TECHNOLOGY**

1. Principles of polymerization, G. Odion, Wiley Interscience
2. Polymer Synthesis, Braun, Springer International
3. Synthetic polymers, Feldman & Barbalate, Chapman & Hall
4. Synthesis of Polymers, D. Schluter, Wiley VCH
5. Polymer Synthesis: theory & Practices, Braun, Springer International

**Paper Code: PT 213 POLYMER PROCESSIGN I**

1. Handbook of Plastic Processes, Harper, Wiley Interscience
2. Principles of Polymer Processing, Tadmor & Gogos, Wiley

3. Plastics Engineering R J Crawford, Butterworths
4. Handbook of Plastic Technology, Allen & Baker, CBS Publications
5. Blow Molding Handbook, Rosato, Hanser.

**Paper Code: PT 214 POLYMER TESTING & SPECIFICATION**

1. Handbook of Plastic Testing & Failure Analysis, Vishu Shah, Wiley Interscience
2. Polymer Testing & Evaluation of Plastics, Mathu & Bhardwaj, Allied Publishers
3. Handbook of plastics Technology, Allen & Baker, CBS Publishers
4. Introduction to Plastics & Composites, E. Miller, Marcel Dekker
5. Fatigue, Testing & Analysis, Lee, Elsevier.

**Paper Code: 215 HEAT TRANSFER**

1. Fundamentals of Heat & Mass Transfer, Incropera, Wiley India
2. Principles of Heat Transfer, Kreith, Thomson Learning
3. Heat Transfer : Principles & Applications, Dutta, Prentice Hall
4. Process Heat Transfer, S K Das, Narosa
5. Process Heat Transfer, Kern, Mc Graw Hill

**Paper Code: PT 216 ENGINEERING ECONOMICS**

1. G.j Thuesen, & W.J Fabrycky. Engineering Economy. Prentice-Hall of India Private Limited, New Delhi
2. William G. Sullivan, James A. Bontadelli & Elin M. Wicks, Engineering Economy, Person Education Asia, First Indian reprint
3. Donald G. Newnan, Jerome P. Lavelle & ted G. Eschenbach . Engineering Economic Analysis Engineering Press, Austin, Texas
4. Seema Singh. Economics for Engineering Student, IK International Publishing House Pvt. Ltd

**Paper Code: PT 301 CHEMICAL PROCESS TECHNOLOGY**

1. Elementary Principles of Chemical Processes, Felder, Academic Press
2. Chemical Process Technology, Moulijn, John Wiley
3. Chemical Process Design & Integration, Smith John Wiley
4. Encyclopedia of Chemical Processing, Lee, Taylor & Francis
5. Chemical Process Industry, Shreve, Mc Graw Hill

**Paper Code: PT 302 Instrumentation & Control**

1. Chemical Process Control, George Stephanopolus, Prentice Hall Indai
2. Instrumentation for Process measurement & Control, Norman A Anderson, CRC Press
3. Process Control, Martin T E, McGraw Hill
4. Process Control, P. Harriot, McGraw Hill.
5. Process Dynamics & Control, Seborg, Edgar & Mellichamp, John Wiley

**Paper Code: PT 303 Industrial Organization & Management**

1. Organizational Theory, Jones G.R., Addison – Wesley
2. Essentials of Management, Koontz & O'Donnell, Tata McGraw Hill

3. Managerial Economics, Thomas & Mauvil, Tata McGraw Hill
4. Marketing Management, Kotler, Prentice Hall
5. Consumer Behaviour, Schiffman & Kanuk, Prentice Hall

**Paper Code: PT 304 Fibre Technology**

1. Man Made Fibers, R.W.Moncrieff, Butterworth Scientific Publication
2. Introduction to Fibre Science & Technology, SP Mishra, New Age Publication
3. Progress in Textile Science & Technology, Vol I & II, V.K. Kothari, Chapman & Hall
4. Manufactured Fibre Technology, V.B. Gupta, Chapman & Hall
5. Handbook of Fibre Chemistry, M. Lewin, CRC Press

**Paper Code: PT 305 Polymer Processing II**

1. Injection Molding, Potech & Michaeli, Hanser
2. Blow Molding Handbook, Rosato, Hanser
3. Polymer Processing: Principles & Design, Baird, John Wiley
4. Handbook of Plastic Process, Harper, Wiley Interscience
5. Injection Molds, Hans Gastrow, Amazon.com

**Paper Code: 311 Chemical Reaction Engineering**

1. Elements of Chemical Reaction Engineering, H.S.Fogler, Prentice-Hall
2. Chemical Reaction Engineering, Levenspiel, Wiley India
3. The Engineering of Chemical Reactions, Schmidt, Oxford University Press
4. Elements of Reaction Engineering, RPS Srivastava, Khanna Publishers
5. Handbook of Polymer Reaction Engineering, T.Meyer, Wiley-VCH

**Paper Code: PT 312 Packaging Technology**

1. Materials for Advanced packaging, LU, Springer
2. Encyclopedia of Packaging Technology, Brody, John Wiley
3. Plastics Packaging, Piringer & Bauer, Wiley Interscience
4. Plastics Packaging, Selke, Hanser
5. Nano packaging, Morris Springer

**Paper Code: 313 Mass Transfer**

1. Chemical Engineering Vol. 1, Fluid Flow, Heat Transfer & Mass Transfer, Richardson, Elsevier
2. Mass Transfer Operations, Robert E. Treyball, McGraw Hill
3. Principles of Mass Transfer, Sharma, Prentice Hall of India
4. Principles of Mass transfer & Separation Process, Dutta, Prentice Hall of India
5. Elements of Mass Transfer, Anantharaman & Sheriffa Begum, Prentice Hall of India

**Paper Code: 314 Polymer Product Design**

1. Plastics Design Handbook, Rosato, Springer India
2. Industrial Design of Plastic Products, Gordon, John Wiley
3. Plastic Product Design, R.D.Buck, Van Nostrand Reinhold

4. Product Design & Manufacturing, Prentice Hall
5. Handbook of Plastics process, CA Harper, Wiley Interscience

**Paper Code: 315 Special Polymers & Elastomers**

1. Speciality Polymers, R.W.Dyson, Blackie Academic
2. Functional Polymers, bergbrieeter & Martin, Plenum
3. Functionalized Polymers & their Applications, Akelah & Moet, Chapman & Hall
4. Handbook of Conducting Polymers, Skotheim & Reynolds, CRC Press
5. Conductive Electroactive Polymers, Wallace-et-al, CRC

**VII Semester Examination\**

**Paper Code: PT 401 Polymer Blends & Composites**

1. Polymer Blends, Vol. I & II, D.R. Paul, Academic Press
2. Composite Materials: Science & Engineering, Chawla, Springer India
3. Polymer Blends & Composites, L.H.Sperling, Hanser
4. Polymer composites, Friedrich, Springer
5. Polymer Composites, Gupta & Gupta, New Age

**Paper Code: PT 402 Plant Engineering & Process Economics**

1. Ullmann's Chemical Engineering & Plants Design, 2 volsat,, Ullmann, John Wiley
2. Plant Design & Economics for Chemical Engineers, Peters et al, McGraw Hill
3. Chemical Engineering Design: Principle, Practice & Economics of Plant and Process Design, Towler & sinnot, Elsevier
4. Process Engineering Economic, J.R Couper, Chemical Industries Publisher
5. Project Management, Burke Willey India

**Elective I Paper Code: PT 403 (a) Inorganic Polymers**

1. Inorganic Polymers, A.J.Barry, Academic Press
2. Inorganic Polymer Chemistry, F. Gimblett, Butterworth
3. Inorganic Polymers, Mark, Allcock & West, Oxford University press
4. Inorganic Polymers, Chatwal & Arora, Himalaya Publishing House
5. Boron-Containing Polymers, ASA Aziz, Wiley-Blackwell

**Elective I Paper Code: PT 403 (b) Footwear Technology**

1. Polymers & Footwear Technology, P.Singh, Kumar Dhawan Publications
2. Footwear Materials & Process Technology, A..J; Harvey, Shoe Trades Publishers
3. Modern footwear materials & Process, W E Cohn, Fairchild Publications
4. Introduction to Modern Footwear Technology, B. Venkatappaiah, B. Sita Publishers.
5. Materials Analysis & Testing Amazon.com

**Elective I Paper Code: PT 403 (c) Chemical Toxicology**

1. A textbook of Modern Toxicology, Hodson, Wiley-Blackwell
2. Encyclopedia of Toxicology, 3 Vol. Set, Wexler, Elsevir Science

3. Introduction to Toxicology & Risk Assessment, H. Greim, Wiley Interscience
4. Toxicology, Marquaardt, Elsevier Science
5. Handbook of Toxicology, P.R.Rose, Amazon.com

**Elective I Paper Code; PT 403 (d) Polymer Coatings & Adhesives**

1. Coatings Technology Handbook, Tracton, CRC Press
2. Organic Coatings, Wicks, Wiley-Blackwell
3. Additives for Coatings, Bieleman, Wiley-Blackwell
4. Handbook of Adhesives Technology, Pizzi & Mittal, Marcel-Dekker
5. Coatings Technology, Langmuir, CRC Press

**Open Elective I Paper Code: PT 404 (a) Biosensor Technology**

1. Biosensors, R.Comeaux, Nova Science Publisher Inc
2. Biosensing, J.Schultz, Springer
3. Sensor Materials, P.T.Moseley, Institute of Physics Publishing
4. Handbook of Biosensors & Biochip, R.S.Marks, Wiley-Blackwell
5. Nanomaterial for Biosensors, C.S.S.R. Kumar, Wiley-VCH

**Open Elective I Paper Code: PT 404 (b) Environment Impact Assessment**

1. Environmental Impact Assessment, Lawrence, Wiley-Blackwell
2. Handbook of Environmental Impact Assessment, Vol. I & II, Petts, Blackwell
3. Environmental Impact Statementals, Eccleston, John Wiley
4. Environment Impact Assessment, W.C.Larry, McGraw Hill
5. Nanotechnology: Environmental Impact & Solutions, Theodore, Wiley

**Open Elective I Paper Code: PT 404 (c) Management Concepts for Engineers**

1. Organizational theory, Jones G.R., Addison-Wesley.
2. Essentials of management, Koontz & O Donnell, Tata McGraw Hill.
3. Managerial Economics, Thomas & Mauvil, Tata McGraw Hill.
4. Marketing Management, Kotler, Prentice Hall.
5. Consumer Behaviour, Schiffman & Kanuk, Prentice Hall.

**Open Elective I Paper Code: PT 404 (d) Material Science & Technology**

1. Materials Science & Engineering, Callister, Wiley-India
2. Materials Science & engineering, V Raghavan, Prentice Hall of India.
3. Engineering Materials, Bhargava, Prentice Hall of India.
4. Engineering Materials, Budinski & Budinski, prentice Hall.
5. Introduction to Materials Science for Engineering, James f.Shackelford, Macmillan.

**VIII Semester Examination**

**Paper Code:PT 411 Mould and Design**

1. Handbook of Plastic Technology, Vol. I, Allen & Baker
2. Handbook of plastic Process, C.A. Harper, Wiley Interscience
3. Mold Enginnering, H.Rees, Hanser



4. Injection Molding of Plastic Components, J.Brown, Mc Graw Hill.
5. Plastic Design Handbook, Rosato, Springer India

**Elective II Paper Code: PT 412 (b) Tyre Technology**

1. Tyer Technology, S.N.Chakravarty, Indian Rubber Institute
2. Tires. Encyclopedia of Chemical Technology, Kirk & Othmer
3. Pneumatic Tyre Design, E.C.Wood, Cambridge
4. Tire Engineering, Kovac & Rodgers, Goodyear Tire Rubber Co., Ohio
5. Handbook of Rubber Technology, R.Schuster, Wiley Interscience

**Elective II Paper Code: PT 412 (c) Biochemical Engineering**

1. Ullman's Biotechnology & Biochemical Engineering, Wiley-VCH
2. Biochemical Engineering, Doble & Gummadi, Prentice Hall
3. New Trends & Developments in Biochemical Engineering, Scheper, Springer
4. Chemical Engineering, Vol. 3: Chemical & Biochemical reactors & Process Control, Richardson, Elsevier
5. Handbook of Enzyme biotechnology, Wiseman, Wiley India

**Elective II Paper Code: PT 412 (d) Polymer Degradation**

1. Polymer Degradation, W.Schnabel, Hanser
2. Chemistry of High Polymer degradation process, N. Grassie
3. Aspects of Degradation & Stabilization of Polymers, Jellinek, Elsevier
4. Elements of polymer Degradation, Reich & Stivala, McGraw Hill
5. Biodegradability of Synthetic polymers, Pottseral, Plenum

**Elective III Paper Code: PT 413 (a) Industrial Waste Management**

1. Handbook of Industrial Waste treatment, Woodard, Elsevier Science
2. Biological Waste water treatment, 2 Vol. set, Sperling, Elsevier Science
3. Industrial Waste Management, Eckenfelder
4. Encyclopedia of Chemical Technology, Kirk & Othmer, John Wiley
5. Encyclopedia of Industrial Chemical Technology, Snell, Wiley India

**Elective III Paper Code: PT 413 (b) Membrane Technology**

1. Basic Principles of Membrane Technology, J. Mulder, Springer International
2. Handbook of Membranes, Winston & Sirkar, Chapman & Hall
3. Synthetic Polymer Membranes, Khulbe, Springer
4. Membrane Technology & Applications, Baker, Wiley Blackwell
5. Synthetic membranes & Membrane Separation Process, T.Matsuura, CRC Press

**Elective III Paper Code: PT 413 (c) Energy Conservation & recycling**

1. Renewable Energy, Boyle, Oxford University Press
2. Energy Science, Andrews, Oxford University Press
3. Energy Conservation, Successes & Failures. Ed. John C.Sawhill, Richard Cotton; Bookings Institution.
4. The Economics Feasibility of Recycling, T.R. Questa Online
5. Energy, Environment & Sustainable Development, Dincer, Roser, Elsevier.

**Elective III Paper Code: PT 413 (d) Microprocessors & Applications**

1. Microprocessor & Interfacing, D.V. Hall, TMH
2. Micro Computer Systems; The 8086/8088 family, Architecture, Programming & Design, Liu & Gibson, Prentice Hall
3. Microprocess & Micro computers, Ed. R.J. Tocci, prentice Hall
4. Introduction to Microprocess, A P Mathur, Tata McGraw Hill
5. Microprocessor & Applications, B. Ram, Adobe Acrobat