Acharya Nagarjuna University, Andhra Pradesh B.E./B.Tech CSE Sem 1 syllabus

MATHEMATICS I

Unit I:Matrix Operations and Solving Systems of Linear Equations

Rank of a matrix by echelon form, solving system of homogeneous and non-homogeneous
equations linear equations. Eigen values and Eigen vectors and their properties, Cayley-Hamilton
theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem,
diagonalisation of a matrix, quadratic forms and nature of the quadratic forms, reduction of
quadratic form to canonical forms by orthogonal transformation.

Unit II: Mean Value Theorems

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and
Maclaurin theorems with remainders (without proof);

Unit III: Multivariable calculus

Partial derivatives, total derivatives, chain rule, change of variables, Jacobians, maxima and
minima of functions of two variables, method of Lagrange multipliers.

Unit IV: Double Integrals

Double integrals, change of order of integration, double integration in polar coordinates, areas
enclosed by plane curves.

Unit V: Multiple Integrals and Special Functions

Evaluation of triple integrals, change of variables between Cartesian,

cylindrical and spherical
polar co-ordinates, Beta and Gamma functions and their properties, relation between beta and
gamma functions.

Textbooks:
1. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.
2. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
References:
1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science
International Ltd., 2002.
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson
Publishers, 2013.
3. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 201.

Communicative English I

UNIT-1: 6 Hrs.
1. Reading: Reading Comprehension (Skimming, Scanning & Inference)
2. Writing: Paragraph Writing
3. Grammar: Common Errors in Nouns- Pronoun Agreement
4. Vocabulary Building: Content and Functional word list -100

UNIT- II: 6 Hrs.
1. Reading: Jumbled Sentences
2. Writing: Proposal Writing
3. Grammar: Correction of Errors in Subject- Verb Agreement
4. Vocabulary Building: Sign Post, Transition signals

UNIT - III: 6 Hrs.
1. Reading: Article Review
2. Writing: Note Making, Note Taking
3. Grammar: Correction of in Tense Usage
4. Vocabulary Building: Synonyms and Antonyms

UNIT - IV: 6 Hrs.
1. Reading: Story Reflection
2. Writing: Pictorial Description
3. Grammar: Correction of Errors in Adjectives, Articles, Prepositions
4. Vocabulary Building: Root Words (200)

UNIT - V: 6 Hrs.
1. Reading: Mind Mapping
2. Writing: Information Transfer
3. Grammar: Correction of Errors in Wh- questions, Question Tags
4. Vocabulary Building: One Word Substitutes

REFERENCE BOOKS:
1. Bailey, Stephen. Academic writing: A handbook for International Students. Routledge,
2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT;
2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B10), Macmillan Educational.
4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.
5. Michael Swan. Practical English Usage, OUP. 1995.
6. F.T. Wood. Remedial English Grammar, Macmillan.2007
7. William Zinsser. On Writing Well. Harper Resource Book. 2001
8. Liz Hamp-Lyons and Ben Heasly. Study Writing, Cambridge University Press. 2006.
9. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad.
10. Sharon J.Gerson, Steven M.Gerson, Technical Writing, New Delhi: Pearson education,
2007.
11. Sanjay Kumar and Pushp Lata, Communication Skills, Noida: Oxford University Press,
2012.
12. Dr. Shalini Verma, Word Power Made Handy, S.Chand & Co Ltd., 2009.

Programming for Problem Solving

UNIT-1
Computer Basics: The Computer System, Generations of Computer, Classification of

Computer, Block diagram of digital Computer, Inside the Computer-Processor,
Memory, External Ports, PCI Card, Formatting Hard disk, Understanding BIOS,
BIOS Commands, Algorithm, Flowchart, Programming Paradigms.
C-Basics: C-character set, Data types, Constants, Expressions, Structure of C
program, Operators and their precedence & associatively, Simple programs in C using all the
operators, Type casting ,type coercion.

UNIT-II

Control Structures, Basic input and output statements, Preprocessor directives.
Functions: Concept of a function, passing the parameters, automatic variables,
scope and extent of variables, storage classes, recursion, iteration vs recursion,
types of recursion, Simple recursive and non recursive programs, Towers of Hanoi
problem.

UNIT-III

Arrays: Single and multidimensional Arrays, Character array as a string, string
functions, Programs using arrays and string manipulation.
Pointers: Pointers declarations, Pointer expressions, Pointer parameters to
functions. Pointers, Pointers and array, Pointer arithmetic.

UNIT-IV

Structures: Declaring and using structures, operations on structures, structures and
arrays, user defined data types, pointers to structures.Command line arguments.
Files: Introduction, file structure, file handling functions, file types, file error handling,
Programs using file functions.

Text Books:

1. Programming with C-Gottfried-Schaums Outline Series-TMH
2. C Programming – Anitha Goel/Ajay Mittal/E.Sreenivasa Reddy-Pearson India

References :

1. Problem Solving with C- Somasekharan-PHI.
2. C Programming- Behrouz A forouzan – CENGAGE Learning
2. Test your c skills-Yaswanth kanithker

3. Let us C- Yaswanth kanithker

Engineering Chemistry

UNIT-I: WATER TECHNOLOGY

Various impurities of Water, WHO guidelines, Hardness unit sand determination by EDTA method, water
treatment for drinking purpose-sedimentation, coagulation, filtration (slow sand filter), various methods of
chlorination, breakpoint chlorination.
Water treatment for industrial purpose: Boiler troubles, scales, sludges, caustic embrittlement, boiler
Corrosion, priming and foaming- causes and prevention, Internal conditioning -Phosphate, Calgon and Carbonate treatment, External conditioning-Lime Soda process (simple problems), softening by ion-Exchange process, Desalination of Brackish water by Electro dialysis and Reverse osmosis.

UNIT-II: POLYMER CHEMISTRY

Introduction to polymers, Functionality of monomers, chain growth and step growth polymerization, Co-
polymerization (Stereo specific polymerization) with specific examples and mechanisms of polymer formation.
PLASTICS: Thermoplastics and Thermosetting, preparation, properties and applications of Bakelite,
Elastomers, Preparation, properties and applications of BUNA-S and BUNA-N Rubbers.
Conducting Polymers- Introduction, examples, general applications and mechanism of Conduction on
Polyacetylene.
Chemistry of Nano materials: Introduction to nano chemistry, preparation of nano materials - carbon
nanotubes and fullerenes and their engineering applications.

UNIT-III: ELECTRO CHEMISTRY AND APPLICATIONS

Electrodes-concepts, types of cells, electro chemical series, Nernst equation.
BATTERIES: Primary cell (Dry cell), Secondary cell (Lead-acid), Lithium batteries and their advantages,
Fuel cell (H2-O2 cell).

Corrosion:
Types of corrosions- chemical corrosion, dry corrosion, electro chemical corrosion and wet corrosion,
galvanic series, pitting and differential aeration of corrosion, factors affecting corrosion.
Corrosion control: Cathodic protection, Corrosion Inhibitors, Electro plating (Au) & (Ni).

UNIT-IV: INSTRUMENTAL METHODS

Electromagnetic spectrum-Absorption of Radiation: Beer-Lambert's law-Principle and applications of Ultra-Violet, Infra-Red and Nuclear Magnetic Resonance Spectroscopy. Principle and applications of Gas Chromatography and HPLC Techniques.

UNIT-V:

(i) Cement and Concrete Chemistry
Introduction to Building Materials, Portland Cement, Constituents, Manufacturing Process, Setting and
Hardening Cement.
(ii) Organic reactions and synthesis of a drug molecule:
Introduction to reactions involving substitution (SN1 and SN2), elimination reactions (E1 and E2), Synthesis of commonly used drug molecule – Aspirin and Paracetmol.

Prescribed Text Books

1. Engineering Chemistry, P.C. Jain and M. Jain - Dhanapathi Rai & Sons, Delhi
2. A text book of Engineering Chemistry, S.S. Dara - S. Chand & Co. New Delhi
3. Engineering Chemistry, B.K. Sharma - Krishna Prakashan, Meerut
4. Shashi chawla,A text book of engineering chemistry,3rd Edition,Dhanpat rai & co new delhi,2007.
5. Gurudeep raj & chatwal anand , "Instrumental methods of analysis ", 7th edition,CBS
publications,1986.
6. Quantitative analysis by day&underwood.
7. A Text book of Instrumental methods by Skoog and West.
8. H.W. Wilard and demerit, "Instrumental methods of analysis ", 7th edition,CBS publications,1986.

9. Text book of Nano Science and Nano technology, B.S. Murthy and P. Shankar, University
press.