Adikavi Nannaya University, Andhra Pradesh B.E./B.Tech CIVIL Sem 1 syllabus

MATHEMATICS I

UNIT-I

Differential Equations of first order and first degree
Linear and Bernoulli's Equation Exact, Reducible to Exact, Orthogonal Trajectories
Applications: Newton's law of cooling, Law of natural growth and decay;

UNIT-II

Linear Differential Equations of Higher Order
Non-Homogeneous equations of higher order with constant coefficients of R.H.S terms of the type
e
ax, sin ax, cos ax, polynomials in x, eaxV(x) and x V(x); Method of Variation of parameters:
Legendre's equation, Cauchy-Euler equation.

UNIT-III

Partial Differentiation
Introduction, Partial Differentiation, Homogeneous functions, Euler's Theorem; Total derivative,
Chain Rule, Jacobian, Taylor's and Maclaurin's series expansion of function of two variables;
Functional dependence & independence.
Applications: Maxima and minima of functions of two variables without constraints and Lagrange's
method with constraints.

UNIT-IV

Differential Calculus
Mean value Theorems: Rolle's Theorem, Lagrange's Mean value

theorem, Taylor's and Maclaurin
Theorems with Reminders, indeterminate forms and L'Hospital's Rule; Maxima and Minima.

Text Books:

1. Dr. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 43rd Edition.
2. Dr. S.K.Vali, Dr.G.Venkata Rao, Engineering Mathematics- I, Cengage Publications.

Reference Books:

1. N.P.Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications,
Reprint, 2008.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint,
2010.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. G.B.Thomas and R.L.Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint,
2002.

English - 1

UNIT-I

Listening: Listening to short audio texts and identify the topic and supporting ideas
Speaking: Self introduction
Reading: Skimming and Scanning
Writing: Paragraph Structure and types
Grammar: Content words and function words, basic sentence structure, wh-questions, word order in
sentences
Vocabulary: Introduction to word formation
Poem: Once upon a time by Gabriel Okara

UNIT-II

Listening Listening for comprehension and summarizing what is listened to.
Speaking: Group Discussions
Reading: Identifying the structure of the text, transition words and

linkers
Writing: Punctuation, use of phrases and clauses in sentences
Grammar: Articles, use of prepositions
Vocabulary: Root words from other languages
Short Story: A Horse and Two Goats by R.K. Narayan

UNIT III

Listening: Making predictions while listening to conversations
Speaking: Role plays – asking for and giving information/ directions
Reading: Intensive Reading / Detailed reading – recognizing, inferring and interpreting specific contexts;
strategies to use text clues for reading comprehension
Writing: Principles of Good Writing, Introduction to Essay Writing
Grammar: Verb – tenses, subject-verb agreement
Vocabulary: Prefixes and Suffixes
Speech: Fringe Benefits of failure by JK Rowling

UNIT IV

Listening: Identifying key terms and concepts
Speaking: Formal oral presentations on topics from academic contexts – without PPT
Reading: Use of graphic elements in text, understanding patterns
Writing: Types of essays – paragraph organisation, creating coherence, summarization/ précis writing
Grammar: Noun –pronoun agreement, subject – verb agreement
Vocabulary: Synonyms, antonyms
Letter: On saving Time by Seneca

REFERENCE BOOKS:

1. Krishna Swamy N., Modern English Grammar, MacMillan India Ltd.
2. Oxford Advanced Learner’s Dictionary of Current English,8th ed. Oxford: Oxford UP,2010
3. Bailey, Stephen, Academic Writing: A handbook for international students, Routledge, 2014
4. Chase, Becky Tarver, Pathways: Listening, Speaking and Critical Thinking, Heinley ELT; 2nd
Edition, 2018

Physics

BSC-CE103: PHYSICS

Credits: 4

UNIT I

Electro Magnetism and Magnetic materials:

Introduction - Gauss and Stokes Theorems- Fundamental laws of Electromagnetism: Gauss law of Electrostatics-Gauss law of M agneto statics- Faraday's law- Ampere's law, Modified form of Ampere's law- Maxwell's equations, Applications.

Magnetic Permeability- Magnetization- Origin of Magnetic moment- Classification of Magnetic materials- Dia, Para, Ferro, Anti ferro and Ferri magnetic materials- Hysterisis curve, Applications.

UNIT II

Coherent waves and Optics in Communication

Interference: Introduction-Interference due to reflected light rays - Newton's rings expt - Michelson's Interferometer.

Diffraction: Fraunhofer Diffraction due to single slit- The Rayleigh criterion for resolution- Diffraction gratings and their resolving power.

Polarization and Geometric properties : reflection and refraction, Brewster's angle, Malus law, Double refraction, Nicol Prism and Total internal reflection,

LASERS: Introduction- Coherence, Principle and working of Laser, amplification of light by population inversion, different types of lasers: gas lasers (He-Ne), solid-state lasers(ruby). Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, applications of lasers in science, engineering and medicine.

Fiber Optics: Introduction-Principle of Optical fibre, Acceptance angle, Acceptance cone, Numerical aperture, Block diagram of Optical fiber communication. Applications of optical fibres

UNIT III

Wave nature of particles and the Schrodinger's equation

Quantum Mechanics:Introduction to Quantum Mechanics- Wave nature of particles, de-Broglie's hypothesis - Time-dependent and time- independent Scrodinger's wave equations for wave function, Particle in a one- dimensional box. Band Theory of Solids: Free electron theory of metals- Fermi level- Density of states- Bloch' theorem for particles in periodic potential, Kronig- Penney Model - origin of energy bands in solids.

UNIT IV

Semiconductor physics

Intrinsic and Extrinsic Semiconductors- Carrier concentration- equation of conductivity- Drift and Diffusion currents, Hall Effect, p-n junction diode, LED: device structure, materials, characteristics, and figures of merit. Photo diode, Solar cell.

Text books:

1. Physics by David Halliday and Robert Resnick – Part I and Part II - Wiley Halliday and Resnick, Physics
2. A text book of Engineering Physics by M.N. Avadhanulu and P.G. Kshirasagar (S. Chand Publications)
3. Solid State Physics by A.J. Dekker (Mc Millan India Ltd).
4. Engineering Physics by M.R. Srinivasan (New age International Publishers)

Engineering Graphics

UNIT – I

Introduction: Lines, Lettering and Dimensioning.
Polygons: Constructing regular polygons by general methods, inscribing and describing polygons
on circles.
Curves: Parabola, Ellipse and Hyperbola by general and special methods, tangents & normal for
the curves.

UNIT – II

Scales: Plain scales, diagonal scales and vernier scales
Orthographic Projections: Horizontal plane, vertical plane, profile plane, importance of reference
lines, projections of points in various quadrants, projections of lines, lines parallel either two of the
reference planes (HP,VP or PP)

UNIT – III

Projections of Straight Lines: Projections of straight lines inclined to both the planes,
determination of true lengths, angle of inclination and traces- HT, VT
Projections of Planes: Regular planes perpendicular/parallel to one plane and inclined to the other
reference plane; inclined to both the reference planes.

UNIT – IV

Projections of Solids: Projections of Solids – Prisms, Pyramids, Cones

and Cylinders with the
axis inclined to one of the planes.
Isometric Views: Introduction to Isometric projection, Isometric scale and Isometric view.
Isometric views of simple planes. Isometric view of Prisms, Pyramids, cylinder and cone.
Isometric view of an object when projections are given.

Text Book:

1. Elementary Engineering Drawing by N.D.Bhatt, Charotar Publishing House.

Reference Books:

1. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers
2. Engineering Drawing 2nd Edition– K .Venugopal, V. Prabhu Raja, New Age

Environmental Science

UNIT – I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance –
Sustainability: Stockholm and Rio Summit–Global Environmental Challenges: Global warming and
climate change, acid rains, ozone layer depletion, population growth and explosion, effects. Role of
information Technology in Environment and human health.
Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers,
consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains,
food webs and ecological pyramids. - Types, characteristic features, structure and function of Forest
ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems.

UNIT – II

Natural Resources: Natural resources and associated problems, Forest resources: Use and over –
exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal
people, Water resources: Use and over utilization of surface and ground water – Floods, drought,

conflicts over water, dams – benefits and problems. Mineral resources: Use and exploitation,
environmental effects of extracting and using mineral resources. Food resources: World food

problems, changes caused by non-agriculture activities-effects of modern agriculture, fertilizer-
pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable

and non-renewable energy sources use of alternate energy sources. Land resources: Land as a
resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and
desertification. Individual's role in conservation of natural resources.

UNIT – III

Biodiversity and its conservation:
Definition & classification: genetic, species and ecosystem diversity-classification - Value of
biodiversity: consumptive use, productive use, Biodiversity at national and local levels. India as a
mega-diversity nation - Hot-sports of biodiversity, Threats to biodiversity: habitat loss, man-wildlife
conflicts. - Endangered and endemic species of India – Conservation of biodiversity: conservation of
biodiversity.

UNIT – IV

Social Issues and the Environment: Urban problems related to energy - Water conservation, rain
water harvesting-Resettlement and rehabilitation of people; its problems and concerns.
Environmental ethics: Issues and possible Solutions. Public awareness.
Environmental Management: Impact Assessment and its significance various stages of EIA,
preparation of EMP and EIS, Environmental audit. Ecotourism.

Text Books:

1. Environmental Studies by R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.
2. A Textbook of Environmental Studies by Shaashi Chawla, TMH,

New Delhi.
3. Environmental Studies by P.N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani;
Pearson Education, Chennai.

Reference Books:

1. Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.