

**HU101: COMMUNICATION SKILLS**  
(Code: HU101                      Credit: 03                      L-T-P: 3-0-0)

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**Grammar:**

Correction of sentence, Vocabulary / word formation, Single word for a group of words, Fill in the blank, transformation of sentences, Structure of sentences – Active / Passive Voice – Direct / Indirect.

**Narration:**

Essay – Descriptive – Comparative – Argumentative – Thesis statement- Structure of opening / concluding paragraphs – Body of the essay.

**Reading Comprehension:**

Global – Contextual – Inferential – Select passages from recommended text.

**Business Correspondence:**

Letter Writing – Formal. Drafting. Bio-data- Resume - Curriculum Vitae.

**Report Writing:**

Structure , Types of report – Practice Writing.

**Communication and Public Speaking Skills:** Communication Process-meaning, principles of effective communication (barriers and solutions), Introduction to the sounds of English, Features of effective speech, verbal-nonverbal.

**Group Discussion:**

Principle – practice.

**References / Books:**

1. S R Inthira & V Saraswathi “ Enrich your English – a) Communication skills b) Academic skills “ Publisher CIEFL & OUP
2. R.C. Sharma and K.Mohan , “Business Correspondence and Report Writing”, Tata McGraw Hill , New Delhi , 1994
3. L.Gartside , “Model Business Letters” , Pitman , London , 1992
4. Longman , “Longman Dictionary of Contemporary English” ( or ‘Oxford Advanced Learner’s Dictionary of Current English’ , OUP , 1998.
5. Maxwell Nurnberg and Rosenblum Morris , “All About Words” , General Book Depot, New Delhi , 1995
6. Written Communication in English by Sara-Freeman – Orient Longman
7. English skills for Technical Students by British Council
8. Communicating at Work by Alder & Elmhorst – McGraw-Hills International
9. Art of Effective Communication – Charles J Margerison, EXCEL BOOKS
10. Communication Skill For Effective Management – A.Ghanekar.EPH
11. Communication Skill for Technical Students – Faratullah, Orient Longman
12. English Online – Jayasree Mohan Raj, Orient Longman

**ES101: ENVIRONMENTAL AND SAFETY ENGINEERING**  
(Code: ES101                      Credit: 04                      L-T-P: 3-1-0)

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**Environment:** Basic ideas of environment, basic concepts related to environment al perspective, man, Society and environment, their inter relationship. Mathematics of population growth and associated problems, definition of resource, types of resource, renewable, nonrenewable, and potentially renewable. Pollutant and contaminants. Environmental impact assessment.

**Ecology:** Ecosystem, biotic and a biotic component. Open system, close system, species, population, community. Ecological balance and consequence of change, Effect of a biotic factor on population, flow chart of different cycles with only elementary reaction and food chain [definition and one example of each food chain].

**Air Pollution and control:** Atmospheric Composition; Troposphere, stratosphere, mesosphere, thermosphere. Energy Balance, Conductive and convective heat transfer, radiation heat transfer, simple global temperature modal.

**Green-House Effects:** Definition, impact of greenhouse gasses on the global climate and consequently on sea water level, agriculture and marine food. Global warming and its consequence. Adiabatic lapse rate, atmospheric stability, temperature inversion, radiation inversion.

**Source and Effect of Air Pollutions:** Toxic chemicals in the environment, toxic chemicals in air, suspended particulate matter, carbon dioxide, sulphur dioxide, nitric oxide, lead, carbon monoxide. Primary and secondary pollutants, Emission standard, criteria pollutant, oxides of carbon, oxide of nitrogen, oxide of sulphur, particulate, etc.

**Depletion Ozone Layer:** CFC, destruction of ozone layer by CFC, impact of other greenhouse gasses, effect of ozone modification.

**Standards and Control Measures:** Industrial, commercial and residential air quality standard, Control measure (ESP, Cyclone separator, bag house, catalytic converter, scrubber ventury Statement with brief reference).

**Water Pollution and Control:** Hydrosphere; Hydrological cycle. Natural water pollutants: their origin and effects Oxygen demanding wastes, pathogens, nutrients, salts, thermal application, heavy metals, pesticides, volatile organic compounds. River/ lake/ ground water pollution. Waste water standard [BOD, COD, Oil, Grease], Water treatment system [coagulation and flocculation, sedimentation and filtration, disinfection, hardness and alkalinity, softening], wastewater treatment, primary treatment, secondary and tertiary treatments.

**Waste and Waste Management:** Municipal, industrial, commercial, agricultural, hazardous solid wastes. Recovery and conversion method, Land filling, incineration, composting.

**Noise Pollution:** Definition of noise, effect of noise pollution, noise classification, transport noise occupational noise, neighborhood noise, definition of noise intensity, noise threshold limit value.

#### References Books:

1. Masters, G.M., "Introduction to Environmental Engineering and Science" Prentice – Hall of India Pvt. Ltd., 1991.
2. Basak: Environmental Engineering TMH
3. Nebel, B.J., "Environmental Science", Prentice – Hall Inc., 1987
4. Odum, E.P., "Ecology: The link between the natural and social Sciences", IBH Publishing Com., Delhi.
5. Environmental Management – N.K. Uberoi, EXCELL BOOKS.
6. Fundamentals of Environmental Studies by D.K. Sinha, & A.D. Mukherjee.
7. Introduction to Environmental Engineering Sc. By G. M. masters.
8. Environmental Chemistry by A. K. De, New Age International.
9. Environmental Management- Mukherjee, Vikas.
10. Water Pollution and Management – Varshney C.K., New Age International.
11. Water chemistry – Venkateswarlu K.S., New Age International.
12. Water Pollution: Causes, Effects & Control – Goel P.K., New Age International
13. Environmental Pollution Control Engineering – Rao C.S., New Age International
14. Land Treatment of Waste Water – Goghil M.B., New Age International
15. Environmental Pollution Analysis – Khopkar S.M., New Age International
16. Soil Erosion & Conservation – Tripathi R.P., New Age International
17. Invironmental Impact Assessments – Barthwal R.R., New Age International

### MA101: ENGINEERING MATHEMATICS-I

[Code: MA101 Credit: 04 L-T-P: 3-1-0]

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#### Infinite Series:

Sequence, Convergence and Divergence of Infinite series and typical examples of convergent and divergent series. Comparison test (statement only) and related problems. Ratio test (statement only) and related problems. Cauchy's root test (statement only) and related problems. Alternating series, Leibnitz's theorem (without proof), absolute convergence and related problems.

#### Differential Calculus:

Successive derivatives, Leibniz's theorem, tangent and normal, derivative of arc length (Cartesian & Polar), Taylor's Series and Maclaurin's Series, expansion of functions, Asymptotes, curvature, curve tracing, Functions of two or more variables, Partial derivatives, Homogeneous function (Definition).

#### Integral Calculus:

Reduction formulae for indefinite integrals involving power of circular functions of x and Product of Sin mx Cos nx; Deduction of;

$$\int_0^{\pi/2} \sin^n x dx \quad ; \quad \int_0^{\pi/2} \cos^n x dx \quad ; \quad \int_0^{\pi/2} \sin^n x \cos^n x dx$$

Length of plane curves (Cartesian & Polar), Areas under Plane curves (Cartesian & Polar), Volume and surface area of solids of revolution of plane curves.

#### Ordinary differential equations of first order:

Formation of differential equations; Separable equations, equations reducible to separable form, exact equations; integrating factors; linear first order equations; Bernoulli equation; Orthogonal Trajectories.

**Ordinary linear differential equations of higher order:**

Homogenous linear equations of arbitrary order with constant coefficients – non homogenous linear equations with constant coefficients, Euler and Cauchy's equations. Method of variation of parameters; system of linear differential equations.

**Three Dimensional Geometry (Cartesian):**

Direction Cosine, Direction Ratio; Equation of a Plane (general form, normal form and intercept form); Equation of a Straight Line passing through one point and two points; Pair of intersecting planes representing a straight line. Elementary ideas of surfaces like sphere, Right Circular Cone and Right Circular Cylinder (through Geometrical configuration) and equations in standard forms.

**Texts/ references:**

1. *Differential Calculus, B.C. Das & B.N. Mukhejee.*
2. *A Text book of Engineering Maths, N.P Bali, Dr. N. Ch. Narayan Iyenger*
3. *Higher Algebra, Bernard & Child*
4. *Differential Calculus, Maity & Ghosh*
5. *Integral Calculus, Maity & Ghosh*
6. *Calculus of One Variable – Pandey G.S. (New Age International)*
7. *Differential Calculus – Dhami H.S. (New Age International)*
8. *Integral Calculus – Dhami H.S. (New Age International)*

**PH101: ENGINEERING PHYSICS**

[Code: PH101

Credit: 04

L-T-P: 3-1-0]

**General Physics:** Angular momentum, relation between torque and angular momentum, elasticity, relation between the elastic constants, Energy of strained body, torsional balance, bending of beam and cantilever, Poisson's formula, Stokes law, Bernoulli's equation.

**Heat and thermodynamics:** 1<sup>st</sup> and 2<sup>nd</sup> laws of thermodynamics, Isothermal and adiabatic changes, Carnot engine, Otto cycle, Carnot theorem, reversible and irreversible process, entropy, entropy of perfect gas and steam, thermodynamic temperature scale, Black body radiation, Stefan's law, pyrometer.

**Optics:** Aberration in lenses, spherical aberration, remedy, chromatic aberration, achromatism, interference, Fresnel Bi-prism.

**Simple Harmonic Motion:** Simple harmonic motion- its expression and differential equation and solution, Superposition of two linear SHMs (with same frequency), Lissajous figures.

**Vibration and Wave:** Damped vibration-its differential equation and solution, Forced Vibration, Amplitude and Velocity resonance, Sharpness of resonance and quality factor, Progressive wave equation- its differential form, difference between elastic (Mechanical) and electromagnetic waves.

**Electricity and magnetism:** Gauss's theorem and its application, Poisson's and Laplace's equation, Lorentz force, Biot Savart Law & Ampere's law, their application, L-C-R Circuit, Dia-, Para-, & Ferromagnetism, hysteresis.

**Electromagnetism:** Faraday's laws of electromagnetic induction in integral form and conversion to differential form, Maxwell's field equations, concept of displacement current, Maxwell's wave equation and its solution for free space.

**Laser:** Characteristics, Basic Principles, uses.

**Mathematical Physics:** Vector and Scalar field, grad, divergence, curl, line integral, surface integral, volume integral, physical examples in the context of electricity and magnetism, stokes theorem, gauss theorem(No proof) , Expression of grad, div, curl and Laplacian in spherical and cylindrical coordinates.

**Text and Reference Books:**

1. *Arthur Beiser, Concepts of Modern Physics (Sixth Edition), Tata McGraw-Hill Publication, New Delhi (1988).*
2. *Kenneth S Krane, Modern Physics (Second Edition), Wiley International Edition (1998).*
3. *B.G. Streetman, Solid state Electronics Devices, Prentice Hall of India Ltd., New Delhi (1981).*
4. *Jacob Phillip-A text Book of Engineering Physics, Educational Publishers and distributors 2002*
5. *A. S. Vasudeva-Modern Engineering Physics, S. Chand & Co.*
6. *M. R. Sreenivasan-Physics for Engineers-New Age International.*

## CS101: INTRODUCTION TO COMPUTER PROGRAMMING

[Code: CS101

Credit: 04

L-T-P: 3-1-0]

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### **Fundamentals of Computer:**

History of Computer, Generation of Computer, Classification of Computers, Basic Anatomy of Computer System, Primary & Secondary Memory, Processing Unit, Input & Output devices.

Binary & Allied number systems representation of signed and unsigned numbers, BCD, ASCII, Binary. Arithmetic & logic gates. Assembly language, High level language, compiler and assembler (basic concepts)

Basic concepts of operating systems like MS DOS, MS WINDOW, UNIX, Algorithm & flow chart.

### **C Fundamentals:**

The C character set, identifiers and keywords, data type & sizes, variable names, declaration, statements.

### **Operators & Expressions:**

Arithmetic operators, relational and logical operators, type conversion, increment and decrement operators, bitwise operators, assignment operators and expressions, precedence and order of evaluation.

Input and Output: Standard input and output, formatted output – printf, formatted input scanf.

### **Flow of Control:**

Statement and blocks, if-else, switch, loops – while, for, do while, break and continue, goto and labels.

### **Fundamentals and Program Structures:**

Basic of functions, function types, functions returning values, functions not returning values, auto, external, static and register variables, scope rules, recursion, function prototypes, C preprocessor, command line arguments.

### **Arrays and Pointers:**

One dimensional arrays, pointers and functions, multidimensional arrays.

### **Structures, Unions and Files:**

Basic of structure, structures and functions, arrays of structures, bit fields, formatted and unformatted files.

### **Recommended reference Books:**

1. Kernighan, B.W. *The Elements of Programming Style*.
2. Yourdon, E. *Techniques of Program Structures and Design*.
3. Schied F.S. *Theory and Problems of Computers and Programming*.
4. Gottfried. *Programming with C. Schaum*.
5. Kernighan B.W. & Ritchie D.M. *The C Programming Language*
6. Rajaraman V. *Fundamental of Computers*.
7. Balaguruswamy. *Programming in C*.
8. Kanetkar Y. *Let us C*.
9. M.M. Oka. *Computer Fundamentals, EPH*
10. Leon. *Introduction to Computers, Vikas*
11. Leon. *Fundamental of Information Technology, Vikas*
12. Ram B. *Computer Fundamentals, New Age International*
13. Ravichandran D. *Programming in C, New Age International*