TECHNO INDIA UNIVERSITY
W E S T B E N G A L

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

4-Year Bachelor of Technology (B.Tech.) Curriculum and Syllabus for Civil Engineering (CE)
First Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
Theory					
TIUFY-101	Career Advancement - Skill Development-I	3	1	0	4
TIUFY-102	English for Communication	3	0	0	3
TIUFY-103	Mathematics – I	3	1	0	4
TIUFY-104	Physics	3	1	0	4
TIUFY-105	IT Tools and Applications	3	1	0	4
Practical					
TIUFY-194	Physics Lab	0	0	3	2
TIUFY-195	IT Tools and Applications Lab	0	0	3	2
TIUFY-196	Engineering Drawing & Graphics	0	0	3	2
Sessional					
TIUFY-181	Entrepreneurship Skill Development-I	0	0	4	3
Total Credits					**28**

Approved By:

External Expert   VC   Registrar   Dean of Academics   Mentor of the Dept.   HOD

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Syllabus

ENGLISH FOR COMMUNICATION
TIUFY-102

L-T-P: 3-0-0   **Credit : 3**

The aim of this foundational course is to help the second language learners acquire fluency in both spoken and written English to communicate messages with clarity, precision and confidence in the workplace. The course will have three components: Language, Speaking and Writing. The skills required in these areas will be imparted through Lectures and Sessional. While lectures will introduce learners to the basic concepts in communication, sessional will provide hands-on experience. It is hoped that after commanding the skills required in spoken and written English, learners will be able to communicate better.

Section A (Lecture topics) Introduction to communication, Language and grammar skills, speaking skills, Writing skills.

Section B (Sessional) Building Vocabulary, Building sentences, Grammar, Pronunciation drills, Phonetics, vowels, Diphthongs, consonants, Stress, Rhythm and intonation, Conversational skills, Meta Language, the writing process, Writing with a thesis, Writing topic sentences, Writing a paragraph, linking paragraph.

Recommended Books:

Main Reading:
1. Rizvi Ashraf, Effective Technical Communication, Tata McGraw-Hill

Supplementary Reading:
1. Viswamohan Aysha, English for Technical Communication, Tata McGraw-Hill.

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MATHEMATICS-I
TIUFY-103

L-T-P: 3-1-0   **Credit: 4**

Differential Calculus (**Functions of one variable**): Rolle's theorem, Cauchy's mean value theorem (Lagrange's mean value theorem as a special case), Taylor's and Maclaurin's theorems with remainders, indeterminate forms, concavity and convexity of a curve, points of inflexion, asymptotes and curvature.

Differential Calculus (Functions of several variables): Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, derivatives of higher order and their commutatively, Euler's theorem on homogeneous functions, harmonic functions, Taylor's expansion of functions of several variables, maxima and minima of functions of several variables – Lagrange's method of multipliers.

Ordinary Differential Equations: First order differential equations - exact, linear and Bernoulli's form, second order differential equations with constant coefficients, method of variation of parameters, general linear differential equations with constant coefficients, Euler's equations, system of differential equations.

Sequences and Series: Sequences and their limits, Convergence of series, Comparison test, Ratio test, Root test, Absolute and conditional convergence, Alternating series, Power series. Complex Variables: Limit, Continuity, Differentiability and analyticity of functions, Cauchy-Riemann equations, Line integrals in complex plane, Cauchy's integral theorem, Independence of path, existence of indefinite integral, Cauchy s integral formula, Derivatives of analytic functions, Taylor's series, Laurent's series, Zeros and singularities, Residue theorem, Evaluation of real integrals.

<u>**Recommended Books:**</u>

Main Reading:

1. B.V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill.

Supplementary Reading:

2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley Eastern Ltd.
3. S. Pal and S. Bhunia, Engineering Mathematics, Oxford University Press
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers

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PHYSICS
TIUFY-104

L-T-P: 3-1-0   **Credit: 4**

Introduction: Overview of vibrations with emphasis on damped and forced oscillations, resonance, coupled oscillations, normal modes.

Wave Motion: Longitudinal and transverse waves, wave equation, plane waves, phase velocity, superposition wave packets and group velocity, two and three dimensional waves, polarization.

Electromagnetic Waves: Maxwell's equations, wave equation, plane electromagnetic waves, energy-momentum, Poynting's theorem, electromagnetic boundary conditions, reflection and refraction, interference, Young's experiment, interferometers, diffraction, Frounhofer diffraction (single slit), dispersion, radiation.

Wave Mechanics: Failure of classical physics, qualitative review of relevant experiments, de Broglie waves, uncertainty principle, wave function and Schrodinger equation, probability interpretation, particle on a chain, potential barrier and quantum tunneling, potential well, qualitative summary of simple harmonic oscillator and Hydrogen atom. Occupation probability and examples.

Recommended Books:

Main Reading:
1.   Giambattista, Alan, Physics Vol 1 &Vol 2, McGraw-Hill

Supplementary Reading:
1.   Malik, K Hitendra, AK Singh,Engineering Physics, Tata McGraw-Hill
2.   V.Rajendran, Engineering Physics, Tata McGraw-Hill

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IT Tools and Applications
TIUFY-105

L-T-P: 3-1-0   **Credit: 4**

Computer Appreciation

Characteristics of Computers, Input, Output, Storage Units, CPU, Computer System, Binary Number System Binary to Decimal Conversion, Decimal to Binary Conversion, Binary Coded Decimal (BCD) Code, ASCII Code.

Computer Organization

Central Processing Unit: Control Unit, Arithmetic Unit, Instruction Set, Register, Processor Speed.
Memory: Main Memory: Storage Evaluation Criteria, Memory Organization, Capacity, RAM, Read Only Memories, Secondary Storage Devices: Magnetic Disks, Floppy and Hard Disks, Optical Disks CD-ROM, Mass Storage Devices.
Input Devices: Keyboard, Mouse, Trackball, Joystick, Scanner, OMR, Bar-Code reader, MICR Digitizer, Card Reader, Voice Recognition Web Cam, Video Cameras.
Output Devices: Monitors, Printers: Dot matrix, inkjet, laser, Plotters, Computer Output Micro Film (COM), Multimedia Projector, Speech synthesizer, Dumb, smart and intelligent terminal.
Multimedia: What is Multimedia, text, graphics, Animation, Audio, Images, Video, Multimedia Application in Education, Entertainment, Marketing.
Computer Software: Relationship between Hardware and Software, System Software, Application Software, Compiler, Name of some high level languages, free domain software.

Operating Systems

Introduction.
Disk Operating Systems: Simple DOS Commands, Simple File Operations, Directory Related Commands.
Microsoft Windows: An overview of different versions of Widows, Basic Windows elements, File management through Windows, Using essential accessories: Systems tools - Disk cleanup, Disk defragmenter, Entertainment, Games, Calculator, Imaging - Fax, Notepad, Paint, WordPad. **Linux**: An overview of Linux, Basic Linux elements: System Features, Software Features, File Structure, File handling in Linux, Installation of Linux: H/W, S/W requirements, Preliminary steps before installation, Specifics on Hard drive repartitioning and booting a Linux System.

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Word Processing

Word processing concepts: Saving, Closing, Opening an existing document, selecting text, editing text, Finding and replacing text, Printing documents, Creating and Printing Merged Documents, Character and paragraph Formatting, Page Design and Layout.

Editing and Proofing Tools: Checking and correcting spellings, Handling Graphics, Creating Tables and Charts, Document Templates and Wizards.

Spreadsheet Package

Spreadsheet Concepts: Creating, Saving and Editing a Workbook, Inserting, Deleting Work Sheets, Entering data a cell/ formula Copying and Moving data from selected cells, handling operators in Formulae, Functions: Mathematical, Logical, Statistical, Text, Financial, Date and time functions, Using Function Wizard.

Formatting a Worksheet: Formatting Cells: Changing data alignment, Changing date, number, character, or currency format, Changing font, Adding borders and colors, Printing worksheets, Charts and Graphics: Creating, Previewing, Modifying.

Integrating word processor, spread sheets, web pages

Presentation Package

Creating, Opening and Saving Presentations, Creating the look of your Presentation, Working in different views, Working with Slides, Adding and Formatting Text, Formatting Paragraphs, Checking Spelling and Correcting with Objects, Adding Clip Art and Other Pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations.

Information Technology and Society

Application of Information technology in Railways, Airlines, Banking, Insurance, Inventory control, Financial Systems, Hotel Management, Education, video games, Telephone exchanges, Mobile Phones, Information kiosks, special effects in Movies.

Recommended Books:

Main Reading:
1. P.K. Sinha and P. Sinha, Foundation of Computing, First Edition, 2002, BPB Publication.
2. S. Sagman, Microsoft Office 2000 for Windows, Second Indian Print, 2001, Pearson Education.
3. Ravi Kant Taxali, Computer Course, McGraw Hill Education.

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Supplementary Reading:

1. Turban, Mclean and Wetherbe, Information Technology and Management, Second Edition, 2001, John Wiley & Sons.
2. Anita Goel, "Computer Fundamentals",Pearson Education India.

PHYSICS LABORATORY
TIUFY-194

L-T-P: 0-0-3   **Credit: 2**

Suggested Experiments: 1.Oscillation in potential well 2.Normal modes of coupled oscillators 3.Measurement of velocity of acoustic waves 4.Newton's rings 5.Specific rotation of an optically active source 6.Diffraction with laser 7.Dispersive power of a prism 8.Fresnel bi-prism 9.Franck Hertz experiment 10.Photoelectric effect 11.Measurement of band gap in semiconductors 12.Measurement of Hall Effect.

Recommended Book:

1. Physics of Everyday Phenomena, Written By Griffith, W. Thomas, McGraw-Hill.

IT Tools and Applications Lab
TIUFY-195

L-T-P: 0-0-3   **Credit: 2**

Introduction to IT Tools and Applications

Computer Organization: a) Central Processing Unit, b) Memory, c) Input Devices d) Output Devices, e) Multimedia, f) Computer Software

Operating Systems: a) Disk Operating Systems (DOS), b) Microsoft Windows, c) Linux

Word Processing: a) Word processing concepts, b) Editing and Proofing Tools

Spreadsheet Package: a) Spreadsheet Concepts, b) Formatting a Worksheet, c) Integrating word processor, spread sheets, web pages

Presentation Package

Information Technology and Society

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Recommended Books:

Main Reading:
1. P.K. Sinha and P. Sinha, Foundation of Computing, First Edition, 2002, BPB Publication.
2. S. Sagman, Microsoft Office 2000 for Windows, Second Indian Print, 2001, Pearson Education.
3. Ravi Kant Taxali, Computer Course, McGraw Hill Education.

Supplementary Reading:
1. Turban, Mclean and Wetherbe, Information Technology and Management, Second Edition, 2001, John Wiley & Sons.
2. Anita Goel, "Computer Fundamentals", Pearson Education India.

ENGINEERING DRAWING AND GRAPHICS
TIUFY-196

L-T-P: 0-0-3   **Credit: 2**

Introduction to IS code of drawing; Conics and Engineering Curves – ellipse, parabola, hyperbola, cycloid, trochoid, involute; Projection of lines – traces, true length; Projection of planes and solids; sold objects – cube, prism, pyramid, cylinder, cone and sphere; Projection on Auxiliary planes; Isometric projection, isometric scale; Section of solids – true shape of section; Introduction to CAD tools – basics; Introduction of Development and Intersection of surfaces.

Recommended Book:

Main Reading:
1. Jolhe, Dhananjay A, Engineering Drawing an introduction to AutoCAD, Tata McGraw-Hill.

Supplementary Reading:
1. N.D. Bhatt, Engineering Drawing, Charotar Publishing House Pvt. Ltd.

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