PLASTINDIA INTERNATIONAL UNIVERSITY

(Sponsored by Plastindia Foundation)

Dungra, GIDC, Vapi, Dist. Valsad -
396193, Gujarat, India

(Established under Gujarat Government Private Universities Act, 2016)

School of Engineering

Syllabus Structure For

B. Tech (Computer Science and Engineering)

(w.e.f. Academic Year 2025-26 onwards)

BATCH 2025-2029

FY B. Tech (Computer Science and Engineering)

Course Category	Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks							Credits			
			Theory	Practical	Contact Hr/Week	ISE-I	ISE - II	TA	ESE	TW	PR/OR	TOTAL	TH	TW/PR	TOTAL	In Line With UGC
Semester - I																
BSC	BSC101	Calculus -I	3	-	3	15	15	20	50	-	-	100	3	-	3	√
BSC	BSC102	Engineering Physics	3	-	3	15	15	20	50	-	-	100	3	-	3	√
ESC	ESC121	Introduction to Computer Programming using C	3	-	3	15	15	20	50	-	-	100	3	-	3	√
ESC	ESC122	Integrated Electrical and Electronics Engineering	3	-	3	15	15	20	50	-	-	100	3	-	3	√
HSSM	HSSM131	Universal Human Values	2	-	2	15	15	20	-	-	-	50	2	-	2	
BSC	BSC141	Lab: Engineering Physics Laboratory	-	2	2	-	-	-	-	-	25	25	-	1	1	√
ESC	ESC142	Lab: Introduction to Computer Programming using C	-	2	2	-	-	-	-	25	-	25	-	1	1	√
ESC	ESC143	Lab: Integrated Electrical and Electronics Engineering Laboratory	-	2	2	-	-	-	-	-	25	25	-	1	1	√
HSSM	HSSM132	English Language and Communication	2	-	2	Non- Credit Mandatory Course										
HSSM	HSSM133	Yoga and Meditation	2	-	2	Non- Credit Mandatory Course										
		Total	18	6	24	75	75	100	200	25	50	525	14	3	17	

BSC: Basic Science courses, **ESC**: Engineering Science Courses including workshop, drawing, basics of electrical/mechanical/computer etc.
HSMEC: Humanities and Social Sciences including Management & Environment Courses, **PCC**: Professional Core Courses,
OEC: Open subjects – Electives from other technical and/or emerging subjects, **PSI**: Project, Seminar, and Internship, **IKS**: Indian Knowledge System,
VSEC: Vocational and Skill Enhancement Course, **ISE-I**: In Sem Examination -I, **ISE-II**: In Sem Examination -II, **ESE**: End term Examination
L: Lecture, **TH**: Theory, **TUT**: Tutorial, **TW**: Term work, **PR**: Practical, **TA**: Teacher's Assessment, **TW**: Team Work

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Detailed Content of Syllabus of

FY B. Tech (Computer Science and Engineering),

Semester-I

Course Category	Course Code	Course Name	Teaching Scheme (Hours/Week)			Examination Scheme and Marks							Credits			
			Theory	Practical	Contact Hr/Week	ISE-I	ISE - II	TA	ESE	TW	PR/OR	TOTAL	TH	TW/PR	TOTAL	In Line with NEP
Semester - II																
BSC	BSC201	Calculus-II	3	-	3	15	15	20	50	-	-	100	3	-	3	√
ESC	BSC 202	Engineering Graphics and Design	3	-	3	15	15	20	50	-	-	100	3	-	3	√
ESC	ESC212	Material Science for Engineers	3	-	3	15	15	20	50	-	-	100	3	-	3	√
ESC	ESC213	Programming for Problem-solving	3	-	3	15	15	20	50	-	-	100	3	-	3	√
HSSM	HSSM221	Environmental Studies	2	-	2	-	-	25	-	25	-	50	2	-	2	
ESC	ESC241	Lab: Engineering Graphics and Design	-	2	2	-	-	-	-	25	-	25	-	1	1	
ESC	ESC242	Lab: Manufacturing Practices	-	2	2	-	-	-	-	-	25	25	-	1	1	
ESC	ESC243	Lab: Programming for Problem-solving	-	2	2	-	-	-	-	-	25	25	-	1	1	√
HSSM	HSSM222	Professional Communication	2	-	2	Non-Credit Mandatory Course										
HSSM	HSSM245	Indian Knowledge System: Concepts and Applications in Engineering	2	-	2	Non-Credit Mandatory Course										
PSI	PSI235	Social Internship	After Semester II, 15 days internship preferably in a rural area													
		Total	**18**	**6**	**23**	**60**	**60**	**125**	**100**	**50**	**50**	**525**	**14**	**3**	**17**	

Total of credits of FY B. Tech (CSE) = 38

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Year, Program, Semester	F.Y. B. Tech in Computer Science Engineering, Semester-I						
Course Code	BSC101						
Course Category	BSC (Basic Sciences and Humanities Courses)						
Course title	**Calculus – I**						
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**	**Total Credits**		
	03	-	-	03	03		
Evaluation Scheme	**ISE-I**	**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	15	15	50	20	-	-	100
Pre-requisites (if any)	• Basic Knowledge of Differential Equation, Algebra, Trigonometry						
Course Objectives	• To study the properties of matrix algebra and apply them to solve the system of algebraic equations. • Able to formulate and solve various engineering problems using differential and integral calculus and ability to work with advanced engineering mathematics. • Summarize concept of calculus to enhance ability of analyzing mathematical problems. • Comprehend the concept of vector space and solve problem using linear transformations.						
Course Outcomes	• CO 1: Recall the concepts involved across the field of calculus and algebra. (Remember) • CO 2: Understand the conceptual variations to apply it in a various problem. (Understand) • CO 3: Apply appropriate technique to solve engineering problem. (Apply) • CO 4: Analyze engineering problems effectively with appropriate method. (Analyze)						

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Unit No.	Course Content	Hours
I	**Matrix Algebra** Introduction to determinant and matrices, System of linear equations. Rank of Matrix, Eigen values, Eigen Vector, Cayley-Hamilton Theorem, Inverse of a matrix, Gauss elimination, Gauss-Jordan elimination.	6
II	**Differential Calculus** Limit, Continuity, Types of discontinuity, Successive differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	6
III	**Integral Calculus** Definite and improper integrals, Beta-Gamma function and its properties, double-triple integral, change of variables, applications.	6
IV	**Ordinary Differential Equations** First order ODEs, Formation of differential equations, Exact, Linear, and Bernoulli's equations, ODEs of higher order, Homogeneous linear ODEs of higher order, Homogeneous linear ODEs with constant coefficients, Nonhomogeneous ODEs, Rules for finding C.F. and P.I., Method of Variation of Parameters.	6
V	**Partial Differential Equations** Formation of first and second order equations, Solution of first and second order linear and non-linear equations, Homogeneous linear PDEs of higher order with constant coefficients, Heat and Wave equation, Euler's Theorem, Jacobian.	6
VI	**Vector Space and Linear Transformation** Vector Space, Subspace, Linear Combination, LI – LD Set, basis, dimension, Linear transformations (maps), range and kernel of a linear map, Dimension Theorem, Inverse of a linear transformation.	6

Text Books

1. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi (1965)
2. Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons. (1962)
3. B. V. Ramana, "Higher Engineering Mathematics", Tata McGraw-Hill, New Delhi. (2007)

Reference Books

1. C. R. Wylie, "Advanced Engineering Mathematics", McGraw Hill Publication, New Delhi. (2003)

2.	Shanti Narayan. "Differential Calculus" S. Chand and company, New Delhi. (1942)
3.	H. K. Dass, "Advanced Engineering Mathematics", S. Chand Publishing. (2007)
4.	M. D. Greenberg, "Advanced Engineering Mathematics", Pearson Education. (1998)

Web Links and Video Lectures (E-Resources)

1. NPTEL Course on Basic Calculus https://archive.nptel.ac.in/courses/111/106/111106146
2. NPTEL Course on Integral and Vector Calculus
   https://archive.nptel.ac.in/courses/111/105/111105122/

Activity Based Learning (Suggested Activities in Class)

1. Flipped Classroom
2. Online Interactive Tool
3. Collaborative and Individual Problem based learning.
4. Quizzes/Assignment

Year, Program, Semester	**First Year B. Tech in Computer Science and Engineering, Semester-I**							
Course Code	BSC102							
Course Category	BSC (Basic Science Course)							
Course title	**Engineering Physics (Theory)**							
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**		**Total Credits**		
	03	-	00	03		03		
Evaluation Scheme	**ISE-I**		**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	15		15	50	20	-	-	100
Pre-requisites (if any)	10+2 level Physics							
Course Objectives	• Understand the fundamental concepts of crystal structure and learn the properties of superconducting materials. • Understand properties of electric and magnetic fields in the presence of static charge and current distributions. • To understand principles of ultrasounds and their applications • Students will learn the concepts related to Newton's laws of mechanics and their application to many particle systems, small oscillations • Understand the fundamental concepts of waves and classical optics with reference to the phenomena of interference and diffraction • Understand key concepts in Nanotechnology							
Course Outcomes	• CO1: Recall the fundamental principles of solid-state physics, electromagnetism, quantum mechanics, ultrasound, photonics, and nanomaterials. (Remember) • CO2: Understand the basics of semiconductors, magnetism, super conductivity, nano materials and their applications in engineering. (Understand) • CO3: Apply appropriate physical laws and mathematical models to solve problems in semiconductors, electromagnetism, quantum systems, optics, and nanoscale systems. (Apply)							

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	▪ CO4: Analyze the underlying mechanisms involved in Hall effect, electromagnetic induction, light propagation in fibres, and quantum confinement in nanomaterials (Analyze)

Unit No.	Course Content	Hours
I	**Solid State Physics** Crystal structure of solids. Cubic crystals, Semiconductor Physics, Classification of solids, Types of semiconductors, effect of doping, mobility of charge carriers, conductivity, Hall effect.	6
II	**Electromagnetism and Superconductivity** Electricity and magnetism including Coulomb's Law, Continuity Equation, electric field, Gauss' Law, electric potential, Ohm's law, magnetic field, Ampere's Law, Faraday's Law and electromagnetic waves, The Meissner effect, perfect diamagnetic behaviour of superconductors. Superconducting magnetic energy storage, electromagnets.	6
III	**Ultrasound** Introduction, Production of Ultrasonic Waves, Magnetostriction Effect, Piezoelectric Effect, Piezoelectric Oscillator, Properties, measurement of velocity & Applications of Ultrasound	6
IV	**Quantum Mechanics** Introduction to quantum physics. Wave function and its physical admissibility, normalization of wave functions, Debroglie wavelength, wave particle duality-Davisson-Germer experiment. Heisenberg uncertainty principle. Schrodinger's equation and its application to free particle, particle in one dimensional box	6
V	**Fundamentals of Photonics** **Laser:** Interaction of radiation with matter. Einstein's coefficients A & B. Pumping, population inversion with Boltzmann equation, metastable state, optical cavity, characteristics of the laser, Applications of the laser. **Fibre Optics:** Principle of light transmission in optical fibre, its types. Numerical aperture, acceptance cone, Optical fibre communication system, and advantages.	6
VI	**Physics of Nanoparticles**	6

	Nanoscale, quantum confinement, surface to volume ratio, bottom-up fabrication, sol-gel, precipitation, combustion methods, top-down fabrication: ball milling, physical vapor deposition (PVD), Properties of nanoparticles (optical, electrical, mechanical, magnetic), applications of nanotechnology: Electronics (GMR effect and its application in read-write head of HDD), automobiles, environmental & energy, medical field (targeted drug delivery), Quantum Sensors and Applications in Computer Science and Engineering.	

Text Books/Reference Books:

1.	M. N. Avadhanulu and P. G. Kshirsagar (2004), Engineering Physics, S. Chand Publication.
2.	R. K. Gaur and Gupta S. L. (2012), Engineering Physics, Dhanapat Rai and Sons Publication.
3.	V. Rajendran (2011), Engineering Physics, Tata McGraw Hill Company Ltd, New Delhi
4.	Malik and Singh (2018), Engineering Physics, Tata Mc Graw Hill Company Ltd, New Delhi
5.	C. Kittel (20050, Introduction to Solid State Physics, Wiley and Sons.
6.	N.K Bajaj (2021), The Physics of waves and Oscillations, Tata McGraw Hill Company Ltd, New Delhi
7.	Sulabha K. Kulkarni (2015), Nanotechnology: Principles and Practices, 3rd Edition, Springer, New York

e-Books

1. Feynman Lecture series: https://www.feynmanlectures.caltech.edu/
2. Concepts of Modern Physics, Arthur Beiser:
   https://nitsri.ac.in/Department/PHYSICS/Beiser_Modern_Physics.pdf

MOOC / NPTEL/YouTube Links:

Lectures by Walter Lewin: https://www.youtube.com/channel/UCiICIIVhv0SI3MpP75Ibz3Shqw

Quantum Mechanics Lecture Series by Prof. H. C. Verma:

https://www.youtube.com/playlist?list=PLWwcJWdB_GulSnGkAaIMpzzDBvTTUqH2A1

nptel.ac.in

HyperPhysics Concepts

The Physics Classroom

Virtual Labs | Physical Sciences

Activity Based Learning (Suggested Activities in Class):

1. Flipped Classroom

2. Online Interactive Tool

3. Collaborative and Individual Problem based learning.

4. Quizzes/Assignment

Year, Program, Semester	First Year B. Tech in Computer Science and Engineering, Semester-I						
Course Code	ESC121						
Course Category	Engineering Science Course						
Course title	Introduction to Computer Programming using C (Theory)						
Teaching Scheme and Credits	L	T	P	Total Contact Hours	Total Credits		
	03	-	-	05	03		
Evaluation Scheme	ISE-I	ISE-II	ESE	TA	TW	PR/OR	Total
	15	15	50	20	-	-	100
Pre-requisites (if any)	• Basics of Computers, Basic Mathematics						
Course Objectives	• To understand the fundamental Concepts of C Programming • To acquire knowledge and Compare usage of Operators and Expressions in C Programming • To apply Control Flow structures in C Programming for Problem solving • To design a solution using Arrays, Character and String Arrays in C programming • To design a develop solution for simple computational problems using User Defined Functions and structures in C Programming						
Course Outcomes	• CO1: To design algorithms for simple computational problems. • CO2: To use mathematical, Logical Operators and Expressions. • CO3: To apply Control Flow structures for decision making. • CO4: To design a solution using Arrays, Character and String Arrays. • CO5: To Design and apply user defined functions and structures.						

Unit No.	Course Content	Hours
I	**Introduction to Program Planning & C Programming:** Overview of C: History and importance C, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables, Storage Class, Assigning Values to variables, Defining Symbolic Constants, declaring a Variable as Constant, Declaring a Variable as Volatile.	6

II	**Operators and Expressions:** Operators and Expressions: Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Operator Precedence and Associativity, Mathematical Functions.	6
III	**Control Flow:** **Decision Making and Branching:** Simple If Statement, If-Else, Else-If, Switch Statement, Goto Statement **Decision Making and Looping:** While Statement, Do-While, For Statement, Break and Continue	6
IV	**Arrays:** **Arrays:** One Dimensional Arrays, Declaration of One-dimensional Arrays, Initialization of One- dimensional Arrays, Two –dimensional Arrays, Initialization of Two- dimensional Arrays. **Character Arrays and Strings**: Declaration and Initialization String Variables, Reading Strings from Terminal, Writing Strings to Screen, Putting Strings Together, Comparison of Two Strings, Introduction to String handling Functions	6
V	**User Defined Functions:** Need for User-defined Functions, A Multi-Function Program, Elements of User defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but No Return Values, Arguments with Return values, No Arguments but Returns a Value, Functions that Return Multiple Values, Nesting of Functions, Recursion	8
IV	**Structures:** What is a Structure? Structure Type Declarations, Structure Declarations, Referencing Structure Members, Referencing Whole Structures, Initialization of Structures.	4

Text Books/Reference Books

1. E. Balagurusamy (2019), Programming in ANSIC, 9th Edition, McGraw Publishers
2. B. S. Gottfried (1996), Programming with C (Schaum's Outline Series), 2nd Edition, McGraw-Hill, 1996.

3.	S. C. Kochan (2004). Programming in C, Sams Publishing, 3rd Edition
4.	B. W. Kernighan and D. M. Ritchie (1988), The C Programming Language, 2 nd ed. UK: Prentice Hall
5.	W. Kernighan and B. Pike (1999), The Practice of Programming, UK: Addison-Wesley
6.	H. M. Deitel and P. J. Deitel, C (2015), How to program. 8 th ed. Pearson Education
7.	P. Prinz & T. Crawford, C in a Nutshell (2016). The Definitive Reference. 2nd ed., O'Reilly Media, 2016

MOOC / NPTEL/YouTube Links

1. https://onlinecourses.nptel.ac.in/noc22_cs48/preview
2. https://onlinecourses.nptel.ac.in/noc23_cs53/preview

Activity Based Learning (Suggested Activities in Class):

1. Flipped Classroom
2. Online Interactive Tool
3. Collaborative and Individual Problem based learning.
4. Quizzes/Assignment

Year, Program, Semester	**First Year B. Tech in Computer Science and Engineering, Semester-1**							
Course Code	ESC122							
Course Category	ESC (Engineering Science Course)							
Course title	**Integrated Electrical and Electronics Engineering (Theory)**							
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**		**Total Credits**		
	03	-	00	03		03		
Evaluation Scheme	**ISE-I**		**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	15		15	50	20	-	-	100
Pre-requisites (if any)	Knowledge of physics and mathematics taught at higher secondary level.							
Course Objectives	• To introduce the basics of electric circuits and analysis • To impart knowledge in the basics of working principles and application of electrical machines • To introduce and familiarize yourself with diodes and transistors analog devices and their characteristics. • To educate on the fundamental concepts of digital electronics • Prepare for next-level learning in design aspect							
Course Outcomes	• Draw and Analyse AC & DC circuits. • Solve the problems based on the working principle of DC & AC machines with its applications. • Explain the construction, working principle and application of diodes, transistors. Compare number systems and explain the working of digital circuits using basic gates and flip flops.							

Unit No.	Course Content	Hours
I	**Electrical Circuit Analysis** Energy sources :- Voltage and current sources, Current Division, Voltage Division. Star-Delta transformation. DC circuits analysis using mesh, Thevenin's & superposition theorem. Concept of Phase and Phase Difference. Phasor Representation. Rectangular and Polar representation of phasor. Analysis of single-phase series AC circuits consisting of RL, RC, RLC combinations Concept of	6

	impedance, concept of active, reactive, apparent, complex power and power factor. Numerical, 3-phase balanced and unbalanced supply, star, and delta connections.	
II	**Electric Machines** Laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, EMF equation, transformation ratio, voltage regulation, losses, and efficiency. Constructional details of DC machine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3-Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Single phase AC machines - Types, Principle and working.	6
III	**Sources of Electrical Power** Introduction to Wind, Solar, Fuel cell, Tidal, Geothermal, Hydroelectric, Thermal-steam, diesel, gas, nuclear power plants; Concept of cogeneration, and distributed generation	6
IV	**Electronic Components and Circuits** Introduction to semiconductors devices, Diodes, V-I characteristics, Bipolar junction transistors (BJT) and their working. CC, CB & CE transistor configurations, modes of operation of BJT, DC biasing of BJT. Characteristics of operation amplifiers (OP-AMP) - application of Op Amps (inverting, non-inverting)	6
V	**Digital Electronics** Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, AND, OR, NOT, NOR, NAND, EX-NOR EX-OR gates and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flip flop.	6
VI	**Sensors and Communication Systems** Classification of sensors: Active /Passive Sensors, Selection Criteria/Characteristics of sensor, Motion Sensors (LVDT), Temperature Sensors	6

	(Thermocouple, RTD), Mechanical Sensors (Strain Gauge), Biosensors. Block diagram of IoT based Data Acquisition and Automation System.	

Text Books

1.	Nagrath I.J. and D. P. Kothari (2001). Basic Electrical Engineering, Tata McGraw Hill.
2.	Hayt and Kimberly, Engineering Circuit Analysis, Tata McGraw Hill.
3.	Smarajit Ghosh (2015) Electrical Machines, Pearson Education, New Delhi.
4.	Kulshreshtha D.C. (2009), Basic Electrical Engineering, Tata McGraw Hill.
5.	Rajendra Prasad (2009), Fundamentals of Electrical Engineering, Prentice Hall, India
6.	V. N. Mittal and Arvind Mittal (2019). Basic Electrical Engineering" McGraw Hill
7.	Vincent DelToro (2011) Electrical engineering Fundamentals, PHI
8.	R P. Jain (2010), Modern Digital Electronics, 4th Edition, Tata McGraw Hill.
9.	Thomas. L. Floyd (2015), Electronics Devices, 9th Edition, Pearson
10.	S. Soloman (2015), Sensors Handbook, 2nd Edition, McGraw-Hill Professional

NPTEL/SWAYAM Course

Sr. No.	NPTEL Course Name	Instructor	Host Institute
1	Basic Electric Circuits	Prof. Ankush Sharma	IIT Kanpur
2	Basic Electrical Circuits	Prof. Nagendra Krishnapura	IITM, Chennai
3	Fundamentals of Electrical Engineering	Prof. Debapriya Das	IIT, Kharagpur

1. https://nptel.ac.in/courses/117103063
2. https://nptel.ac.in/courses/117103064
3. https://archive.nptel.ac.in/courses/106/105/106105166/

Web Links and Video Lectures (E-Resources)

1. https://nptel.ac.in/courses/108108076
2. https://archive.nptel.ac.in/courses/108/105/108105155/
3. https://nptel.ac.in/courses/108/101/108101091/
4. http://www.youtube.com/watch?v=Kp-jS6NHsB8
5. E-Book: . https://www.pearson.com/en-us/subject-catalog/p/electronic-devices-electron-flow version/P200000001048

Activity Based Learning (Suggested Activities in Class):

1. Flipped Classroom
2. Online Interactive Tool
3. Collaborative and Individual Problem based learning.
4. Quizzes/Assignment

Year, Program, Semester	S.Y. B. Tech in Computer Science and Engineering, Semester-I						
Course Code	HSSM131						
Course Category	HSSM (Humanities and Social Sciences including Management Courses)						
Course title	**Universal Human Values (Theory)**						
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**	**Total Credits**		
	02	-	-	02	02		
Evaluation Scheme	**ISE-I**	**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	-	-	50	20	-	-	50
Pre-requisites (if any)	• Environmental Science or General Studies • English • Chemistry, Physics and Mathematics						
Course Objectives	• To introduce the need, purpose, and significance of value education for holistic human development. • To enable students to understand the harmony in the self, family, society, and nature. • To develop sensitivity towards ethical human conduct, universal human values, and sustainable living. • To encourage self-exploration and reflection as tools for personal growth and responsible decision-making. • To foster awareness of the relationship between individual well-being and societal harmony.						
Course Outcomes	• CO1: Recall key concepts related to human values, harmony, and ethical living. (Remember) • CO2: Describe the fundamental human aspirations and the concept of value-based living. (Understand) • CO3: Illustrate the interdependence between self, relationships, society, and nature for achieving harmony. (Understand) • CO4: Apply self-reflection to make responsible choices in personal and professional life. (Apply)						

Unit No.	Course Content	Hours

I	**Introduction to Value Education** Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity - the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations	4
II	**Harmony in the Human Being** Understanding Human Being as the Co-existence of the Self and the Body, distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to Ensure Self-regulation and Health	4
III	**Harmony in the Family and Society** Harmony in the Family - the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Other Feelings, Justice in Human-to-Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order	4
IV	**Harmony in the Nature/Existence** Understanding Harmony in the Nature, Interconnectedness, Self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence	4
V	**Implications of the Holistic Understanding – a Look at Professional Ethics** Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics	4
VI	**Holistic Technologies and Value-Based Transition** Holistic Technologies, Production Systems and Management Models – Typical Case Studies, Strategies for Transition towards Value-based Life and Profession	4

Text Books	
1	A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
2	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2
Reference Books	
1	Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999
2	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3	The Story of My Experiments with Truth, M.K. Gandhi, Navajivan Publishing House, Ahmedabad, 1927.
3	Small is Beautiful, E.F. Schumacher, Blond & Briggs, London, 1973.
4	Slow is Beautiful, Cecile Andrews, New Society Publishers, Gabriola Island (British Columbia), 2006.
5	The Economy of Permanence, J.C. Kumarappa, Sarva Seva Sangh Prakashan, Varanasi, 1945.
6	Bharat Mein Angreji Raj, Pandit Sunderlal, Onkar Press, Allahabad, 1929.
7	Rediscovering India, Dharampal, SIDH (Society for Integrated Development of Himalayas), Mussoorie, 2003.
8	Hind Swaraj or Indian Home Rule, M.K. Gandhi, Navajivan Publishing House, Ahmedabad, 1938.
9	India Wins Freedom, Maulana Abul Kalam Azad, Sangam Books, Hyderabad, 1959.
10	Vivekananda: A Biography, Romain Rolland, Advaita Ashrama, Kolkata, 1931.

Year, Program, Semester	First Year B. Tech in Computer Science and Engineering, Semester-1						
Course Code	BSC141						
Course Category	BSC (Basic Science Course)						
Course title	**Engineering Physics (Lab.)**						
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**	**Total Credits**		
	-	-	2	02	01		
Evaluation Scheme	**ISE-I**	**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	-	-	-	-	-	25	25
Pre-requisites (if any)	Physics Practical at Graduation level						
Course Objectives	• Conduct experiments to measure and analyze the properties of materials using ultrasonic and dielectric techniques • Investigate the behavior and characteristics of light through laser diffraction and fiber optics experiments. • Examine the photoelectric effect and semiconductor properties using photodiodes, LEDs, and laser diodes. • Employ various methods such as the four-probe technique and B-H curve tracing to study magnetic and electrical properties.						
Course Outcomes	• CO1: Recall principles and functions of instruments used in modern physics experiments. (Remember) • CO2. Explain the physical concepts demonstrated through optical, electronic, and semiconductor experiments. (Understand) • CO3: Conduct experiments and determine key physical parameters using appropriate techniques. (Apply). • CO4: Analyze and interpret experimental data to compare device behaviour and material properties. (Analyze)						

Sr. No.	Name of Experiments
I	To find velocity of sound in liquid medium using Ultrasonic Interferometer
II	To determine wavelength of the given source
III	To determine the value of Planck 's Constant using Light Emitting Diodes (LEDs).

IV	To determine Dielectric Constant of given samples
V	To measure the Numerical aperture /Acceptance angle to measure attenuation
VI	a) To Study I-V characteristics in forward bias b). To Study I-V characteristics under no illumination / different illuminations (intensities) in reverse bias
VII	To determine the Energy Band Gap of a Semiconductor by using PN Junction Diode
VIII	To Study I-V characteristics of LED and Diode Laser. To Study P-I characteristics of LED and Diode Laser.
IX	To determine the Fermi energy of copper.
X	To determine the value of Boltzmann Constant using a semiconductor diode

Reference Books	
1	Donald A. Neamen, Semiconductor Physics and Devices: Basic Principles,4th Edition, McGraw Hill, 2027
2	K K Sharma, Optics, Principles and Applications, Elsevier, Academic Press. 2006
3	by M Born and E Wolf, Principles of Optics, 7th Edition, Cambridge Press, 2013
4	Satya Prakash and Vinay Dua, Oscillations and Waves, Pragati Publishers, 2010

Year, Program, Semester	First Year B. Tech in Computer Science and Engineering, Semester-I						
Course Code	ESC142						
Course Category	Engineering Science Course						
Course title	**Introduction to Computer Programming using C (Lab.)**						
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**	**Total Credits**		
	-	-	02	02	01		
Evaluation Scheme	**ISE-I**	**ISE-II**	**ESE**	**TA**	**TW**	**PR/OR**	**Total**
	-	-	-	-	25	-	25
Pre-requisites (if any)	Basics of Computers and Basic Mathematics						
Course Objectives	• To understand the fundamental Concepts of C Programming • To acquire knowledge and Compare usage of Operators and Expressions in C Programming • To apply Control Flow structures in C Programming for Problem solving • To design a solution using Arrays, Character and String Arrays in C programming • To design a develop solution for simple computational problems using User Defined Functions and structures in C Programming						
Course Outcomes	• CO1: To Design algorithms for simple computational problems. • CO2: To Use mathematical, Logical Operators and Expressions. • CO3: To apply Control Flow structures for decision making. • CO4: To design a solution using Arrays, Character and String Arrays. • CO5: To Design and apply user defined functions and structures.						

List of Experiments

1. To accept the number and Compute a) square root of number, b) Square of number, c) Cube of number d) check for prime, d) factorial of number e) prime factors.
2. Write a Program to convert Fahrenheit to Celsius.
3. Write a program to calculate simple and compound interests.
4. Write a program to develop an arithmetic calculator. Add the modulus (%) operator and provision of negative numbers.
5. Write a program to calculate the electricity bill for the given MODCLEs.

6. Write a program in C to swap two numbers using a function. (use call by value and call by reference)
7. Write a program to perform matrix operations – Add, transpose and multiplication.
8. Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard A triangle is valid if the sum of all the three angles is equal to 180 degrees.
9. To accept from user the number of Fibonacci numbers to be generated and print the Fibonacci series.
10. In array do the following. a). Find given element in array b) Find Max and Min element c). Find frequency of given element in array d) Find Average of elements in Array
11. To accept a student's marks for five subjects. compute his/her result. Student is passing if he/she scores marks equal to and above 40 in each course. If student scores aggregate greater than 75%, then the grade is distinguished. If aggregate is 60>= and = and = and
12. Write a program to print all prime numbers from 1 to n. (use nested loop, break and continue)

Text Books/Reference Books	
1	E. Balagurusamy (2019). Programming in ANSIC, 9th Edition, McGraw Publishers
2	B. S. Gottfried (1996). Programming with C (Schaum's Outline Series). 2nd Edition. McGraw-Hill. 1996.
3	S. C. Kochan (2004). Programming in C, Sams Publishing. 3rd Edition
4	B. W. Kernighan and D. M. Ritchie (1988), The C Programming Language, 2 nd ed. UK: Prentice Hall
5	W. Kernighan and B Pike (1999), The Practice of Programming. UK: Addison-Wesley
6	H. M. Deitel and P. J. Deitel. C (2015), How to program, 8 th ed. Pearson Education
7	P. Prinz & T. Crawford, C in a Nutshell (2016), The Definitive Reference, 2nd ed., O'Reilly Media, 2016

MOOC / NPTEL/YouTube Links

1. https://onlinecourses.nptel.ac.in/noc22_cs48/preview
2. https://onlinecourses.nptel.ac.in/noc23_cs53/preview
3. https://www-personal.acfr.usyd.edu.au/thaley/ctext/ctext.pdf 2
4. https://karadev.net/anoci/files/pdf/files-of%20book%20on%20c.pdf
5. https://www.geeksforgeeks.org/c-programming-language/
6. https://www.freecodecamp.org/new

Year, Program, Semester	First Year B. Tech in Computer Science and Engineering, Semester-I						
Course Code	ESC143						
Course Category	ESC (Engineering Science Course)						
Course title	Integrated Electrical and Electronics Engineering (Lab.)						
Teaching Scheme and Credits	L	T	P	Total Contact Hours	Total Credits		
	-	-	2	02	01		
Evaluation Scheme	ISE-I	ISE-II	ESE	TA	TW	PR/OR	Total
	-	-	-	-	-	25	25
Pre-requisites (if any)	• Knowledge of physics and mathematics taught at higher secondary level.						
Course Objectives	• To analyse AC and DC circuits • To understand the construction and working of various electrical machines and perform load tests to find its efficiency. • To Implement analog and digital circuits.						
Course Outcomes	• CO 1: Measure electrical parameters and waveforms of machines and components using appropriate test equipment. (Understand) • CO 2: Verify fundamental circuit theorems and analyze the steady-state behavior of AC and DC electrical circuits. (Apply) • CO 3: Demonstrate the working principles of basic electronic and digital logic circuits using datasheets and truth tables. (Apply) • CO 4: Determine performance characteristics of electrical machines and transformers under varying load conditions. (Analyze)						

List of Experiments

1. To verify KVL and Superposition theorem and Thevenin's theorem.
2. To measure steady state response of series RL and RC circuits on AC supply and observations of voltage and current waveforms on storage oscilloscope
3. To derive resonance frequency and analyse resonance in series RLC circuit.
4. Speed control of DC shunt motor by armature voltage and flux control method.
5. Load test on three phase induction motor

6. Direct Load test on single phase transformer.
7. V-I characteristics of:
   a) P-N Junction Diode (Study the datasheet of typical PN junction diode 1N 400X)
   b) Zener Diode (Study the datasheet of typical Zener diode 1N 4148)
8. Test and verify the truth tables of:

a) Basic and Universal Gates (Study the data sheet of respective IC's)

b) Half / Full Adder

c) RS/JK/T/D flip flop

Suggested Learning Resources (Text / Reference Books)	
1.	L. S. Bobrow (2011), Fundamentals of Electrical Engineering. Oxford University Press
2	Edward Hughes (2016), Electrical Technology", ELBS, Pearson Education
3	Nagrath I.J. and D. P. Kothari (2001), Basic Electrical Engineering. Tata McGraw Hill.
4.	Smarajit Ghosh (2015) Electrical Machines, Pearson Education, New Delhi.
5.	Kulshreshtha D.C. (2009), Basic Electrical Engineering. Tata McGraw Hill.
6	Rajendra Prasad (2009), Fundamentals of Electrical Engineering, Prentice Hall, India
7	Hayt and Kimberly. Engineering Circuit Analysis, Tata McGraw Hill.
8.	Smarajit Ghosh (2015) Electrical Machines, Pearson Education, New Delhi.
9.	Vincent DelToro (2011) Electrical engineering Fundamentals, PHI
10.	R.P. Jain (2010), Modern Digital Electronics, 4th Edition, Tata McGraw Hill.
11.	Thomas. L. Floyd (2015), Electronics Devices, 9th Edition, Pearson
12.	S. Soloman (2015), Sensors Handbook, 2nd Edition. McGraw-Hill Professional

Web Links and Video Lectures (E-Resources)
3. https://nptel.ac.in/courses/108105076
4. https://archive.nptel.ac.in/courses/108/105/108105155/
5. https://nptel.ac.in/courses/108/101/108101091/
6. http://www.youtube.com/watch?v=Kp-jS6NHsB8

Activity Based Learning (Suggested Activities in Class)
1. Flipped Classroom
2. Online Interactive Tool
3. Collaborative and Individual Problem based learning.

Plastindia International University

Year, Program, Semester	F.Y. B. Tech in Computer Science and Engineering, Semester-I						
Course Code	HSSM132						
Course Category	HSSM (Humanities, Social Sciences including Management Course)						
Course Title	English Language and Communication						
Teaching Scheme and Credits	L	T	P	Total Contact Hours	Total Credits		
	-	-	-	-	-		
Evaluation Scheme	ISE-I	ISE-II	ESE	TA	TW	PR/OR	Total
	-	-	-	-	-	-	-
Pre-requisites (if any)	• Basic knowledge of English language acquired at the foundational level						
Course Objectives	• Enhance pronunciation, listening, vocabulary, and grammar using CALL tools, and strengthen spoken and written communication through ICS-based practice						
Course Outcomes	• CO1: Recall basic listening and speaking skills in English for effective communication (Remember) • CO2: Interpret grammar and vocabulary through structured laboratory activities (Understand) • CO3: Utilize phonetic principles and pronunciation techniques to enhance spoken English. (Apply) • CO4: Examine spoken and written communication scenarios to identify errors and suggest improvements. (Analyse)						

Sr. No.	List of Experiments
1	To practice spoken English in structured oral tasks.
2	To reinforce understanding and correct usage of common grammar rules.
3	To enhance vocabulary knowledge and contextual application.
4	To improve articulation and intonation through dialogue practice.
5	To develop attentive listening and accurate transcription skills.
6	To build critical reading and comprehension abilities.
7	To strengthen listening and critical thinking via multimedia analysis.

8	To learn structured formats for professional written communication.
9	To improve paragraph writing with emphasis on coherence and clarity.
10	To enhance conversational skills through dialogue writing and role-play.
11	To introduce fundamentals of group discussions and effective communication.
12	To develop oral presentation skills on assigned grammar topics.
	Text Books
1	Meenakshi Raman and Sangita Sharma's Technical Communication: Principles and Practice. 3rd Edition, Oxford University Press. 2017. replacing the 2nd Edition, 2011.
2	J.D.O Connor, "Better English Pronunciation", 2nd by Cambridge University Press, 1980
3	Wren and Martin, "High School English Grammar and Composition", S Chand and Company Ltd – 2015.
4	Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
	Reference Books
1	Gajendra Singh Chauhan and Et al. "Technical Communication", Cengage learning India Pvt Limited, 019.
2	M Ashraf Rizvi's Effective Technical Communication. 2nd Edition, McGraw Hill Education (India), 2018
3	Word Power Made Easy by Norman Lewis. Goyal Publishers, 2020.
4	Randolph Quirk and S Greenbaum," A University Grammar of English Latest", Pearson 2007
5	Sanjay Kumar and Pushpalata Communication Skills", Oxford University Press India Pvt Ltd - 2019
6	Practical English Usage by Michael Swan, Oxford University Press – 2016
7	Functional English (As per AICTE 2018 Model Curriculum). Cengage Learning India Pvt Limited, Latest Revised Edition, 2020.
8	D Praveen Sam, KN Shoba, "A Course in Technical English", Cambridge University Press – 2020.

Year, Program, Semester	**First Year B. Tech in Computer Science and Engineering, Semester-I**				
Course Code	HSSM133				
Course Category	HSSM (Humanities, Social Science including Management Courses)				
Course title	**Yoga and Meditation**				
Teaching Scheme and Credits	**L**	**T**	**P**	**Total Contact Hours**	**Total Credits**
	2	-	-	02	-
Pre-requisites (if any)	Basic physical fitness and flexibility for yoga postures (asanas) and meditation practices. Open-mindedness, willingness to learn, and a commitment to regular practice and self-reflection are essential.				
Course Objectives	• Gain a comprehensive understanding of yoga and meditation principles and practices for holistic well-being. • Develop practical skills to incorporate yoga and meditation into daily life for stress reduction and emotional balance. • Explore the scientific basis and applications of yoga and meditation in diverse contexts. • Foster personal growth and self-awareness through regular practice, integrating yoga and meditation as a lifelong journey.				
Course Outcomes	• CO 1: Develop a strong foundation in yoga and meditation techniques and principles. • CO 2: Cultivate mindfulness and self-awareness through regular practice. • CO 3: Enhance physical flexibility, strength, and overall well-being. • CO 4: Apply yoga and meditation practices to reduce stress and promote mental and emotional balance.				

Unit No.	Course Content	Hours
I	Introduction to Yoga and Meditation: a) Overview of yoga and its origins b) Introduction to meditation techniques and benefits	2
II	Foundations of Yoga Practice: a) Understanding yoga asanas (poses) and their alignment b) Pranayama techniques for breath control and energy regulation	2
III	Exploring Meditation Techniques:	2

	a) Mindfulness meditation and its practice b) Guided visualization and relaxation techniques	
IV	Yoga for Physical Health and Well-being: a) Yoga for flexibility and strength b) Yoga for stress reduction and relaxation	2
V	Yoga Philosophy and Lifestyle: a) Introduction to the philosophy of yoga b) Applying yoga principles to daily life and relationships	2
VI	Advanced Practices and Integration: a) Advanced yoga asanas and sequences b) Integrating yoga and meditation into a holistic lifestyle	2

	Reference Books
1	Iyengar, B.K.S. Light on Yoga. The Bible of Modern Yoga. HarperCollins, 2001.
2	Khalsa, Gurucharan Singh. Kundalini Yoga: The Flow of Eternal Power. TarcherPerigee, 1999.
3	Lasater, Judith Hanson. Relax and Renew: Restful Yoga for Stressful Times. Rodmell Press. 2011.
4	Saraswati, Swami Satyananda. Asana, Pranayama, Mudra, Bandha. Bihar School of Yoga, 2008.
5	Satchidananda, Swami. The Yoga Sutras of Patanjali. Integral Yoga Publications, 2012.
6	Zinn, Jon Kabat. Wherever You Go, There You Are: Mindfulness Meditation in Everyday Life. Hyperion, 2005.

	Important web links
1.	Yoga Journal: www.yogajournal.com
2.	Headspace: www.headspace.com
3.	The International Sivananda Yoga Vedanta Centres: www.sivananda.org
4.	Insight Timer: www.insighttimer.com