



TAKSHASHILA UNIVERSITY

(Tamil Nadu State Private University)
ONGUR, TINDIVANAM TK, VILLUPURAM DT

FACULTY OF ENGINEERING AND TECHNOLOGY SCHOOL OF COMPUTATIONAL ENGINEERING

Department of Computer Science and Engineering

REGULATION 2025NEP CURRICULUM & SYLLABI

B.Tech - IT

Semester – I



VISION AND MISSION OF UNIVERSITY

VISION:

To create change makers and world leaders similar to the ancient Takshashila University

MISSION:

The brightest minds and the best resources are used to nurture and develop the leaders of tomorrow, where they are encouraged to be eternally curious and ethically sound.

DEPARTMENT VISION AND MISSION

VISION:

To be a center of excellence in Computer Science and Engineering through quality education, innovation, and research, producing ethical professionals to meet global and societal needs

MISSION:

M1: Quality Education	Deliver quality education through outcome-based learning and modern teaching practices.
M2: Innovation and Research	Foster innovation, research, and industry collaboration to solve real-world problems.
M3: Career Development	Enhance employability and entrepreneurship through skill development and experiential learning.
M4: Ethics and Social Responsibility	Promote professionalism, ethical values, leadership, and lifelong learning.

PROGRAMME OUTCOMES (POs)

PO1: Engineering knowledge

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis

Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**PEO1: Career Excellence**

Build successful careers in industry, academia, research, or entrepreneurship.

PEO2: Innovation

Develop innovative and sustainable computing solutions.

PEO3: Professionalism

Demonstrate ethics, leadership, teamwork, and effective communication.

PEO4: Lifelong Learning

Adapt to emerging technologies through continuous learning.

PROGRAM SPECIFIC OUTCOMES (PSOs)**PSO1: Software Development**

Design and develop efficient software solutions using modern computing techniques.

PSO2: Emerging Technologies

Apply emerging computing technologies and modern tools to develop intelligent and scalable solutions for real-world problems.

PSO3: Professional Practice

Demonstrate innovation, technical competence, ethical responsibility, and effective communication.



**TAKSHASHILA
UNIVERSITY**

(Established Under Tamil Nadu State Private Universities Act 2019 &
Recognized by UGC w/e 2(f) of the UGC Act, 1956)

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Faculty of Engineering and Technology

B.Tech. in Information Technology

(REGULATION 2025NEP)

SEMESTER – I

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Hrs.	Max. Marks								
				L	T	P			CAT Best of Two	Assign	MCQ	ATT	SEM	P	CAM	ESM	Total
1	U25EN02T	Communicative English	HS	3	0	0	3	45	20	5	5	5	5	-	40	60	100
2	U25MA01T	Calculus and Linear Algebra	BS	3	1	0	4	60	20	5	5	5	5	-	40	60	100
3	U25PH02B	Quantum Mechanics for Engineers	BS	3	0	2	4	75	20	5	5	5	5	10	50	50	100
4	U25GE02T	Design Thinking	ES	3	0	0	3	45	20	5	5	5	5	-	40	60	100
5	U25CE01B	Python Programming	PC	3	0	2	4	75	20	5	5	5	5	10	50	50	100
6	U25GE01P	Engineering Graphics	ES	0	0	4	2	60	20	5	5	5	5	10	50	50	100
Total:							20	360							270	330	600
7	U25VA02P	Physical Wellness and Yoga	VAC	0	0	2	1	30	-	-	-	-	-	-	100	-	100
Total:							1	30							100		100
Semester Total:							21	390							370	330	700

Note:

L - Lecture

ATT - Attendance

CAT - Continuous Assessment Test

ESM - End Semester Exam Marks

ASS - Assignment

P - Practical

SEM - Seminar

T - Tutorial

CAM - Continuous Assessment Marks

PW - Project

[Signature]
BoS Chairman

U25EN02T	Communicative English	L	T	P	C	Total
		1	0	2	2	45

COURSE OBJECTIVES:

To develop an understanding of the fundamentals of effective communication
To enhance listening and reading skills using appropriate comprehension strategies
To improve speaking skills for effective interpersonal and professional communication
To develop students' reading strategies, comprehension skills, and ability to summarize or paraphrase texts
To develop writing skills for academic, professional, and workplace communication

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Explain the fundamentals and principles of effective communication.
CO2 :	Apply listening and reading strategies to comprehend and interpret spoken and written texts.
CO3 :	Demonstrate effective speaking skills with appropriate fluency, pronunciation, and vocabulary.
CO4 :	Students will be able to apply varied reading techniques, infer meanings, and construct precise summaries and paraphrases.
CO5 :	Produce clear and coherent written documents for academic and professional purposes.

UNIT I: Foundations of Language and Communication	9 Hrs.
Introduction to Communication: Definition, process, importance, types (verbal, non-verbal, formal, informal) - 7 Cs of effective communication - Barriers to Communication: Semantic, psychological, physical, cultural, and how to overcome barriers.	

UNIT II: Receptive Skills I: Listening	9 Hrs.
Listening Skills: Importance of active listening - Types of listening - Intensive, Extensive, Attentive - Strategies for listening comprehension - Listening for gist, specific information, inference - Listening to short talks, news snippets and simple conversations - Note-taking.	

UNIT III: Productive Skills I: Speaking	9 Hrs.
Intrapersonal and Interpersonal Communication and Differences - Speaking sub-skills: Fluency, Accuracy, Vocabulary and Pronunciation - Factors influencing Speaking Skills: Performance conditions, Affective factors, Listening Skill, Feedback, Linguistic Components and Speaking – Form, Content and Use.	

UNIT IV: Receptive Skills II: Reading	9 Hrs.
Reading Skills: Types of reading - skimming, scanning, intensive, extensive - Strategies for reading comprehension - Identifying main ideas, topic sentences, supporting details, inferencing - Summarizing and paraphrasing short passages.	

UNIT V - Productive Skills II: Writing	9 Hrs.
Paragraph Writing: Elements of a good paragraph (topic sentence, supporting sentences, concluding sentence) - Cohesion and coherence; Types of paragraphs (descriptive, narrative, persuasive - basic) - Letter Writing: Formal letters (application for leave, complaint letter, simple inquiry letter) - Informal letters (personal letter to a friend/relative). Resume/CV Writing: Crafting compelling resumes/CVs - Cover Letter Writing: Composing persuasive cover - Job Search Correspondence: Writing effective follow-up emails, thank-you notes and enquiry letters.	

Total Hours: 45

TEXT BOOKS :	
1.	Adler, Ronald B., et al. Understanding Human Communication. 13th ed., Oxford University Press, 2013.
2.	C.Richards, Jack and Theodore S.Rodgers. Approaches and Methods in Language Teaching. 2nd Edition. Cambridge: Cambridge University Press, 2010.
3.	Hacker, Diana, and Nancy Sommers. A Writer's Reference. 9th ed., Bedford/St. Martin's, 2018.
4.	H.H, Stern. Fundamental Concepts of Language Teaching. New York: Oxford University Press, 2015.

REFERENCE BOOKS :	
1.	Raman, Meenakshi & Sharma, Sangeeta, Technical Communication Principles and Practice. 4th Edition. Oxford University Press, 2022.

2.	Esther Rani, Panuganti B, LSRW Skills for English Learners, LAP LAMBERT Academic Publishing, 2020.
3.	Kumar, Sanja & Lata Pushp, English Language and Communication Skills for Engineers, AICTE Edition, Oxford University Press, 2018.

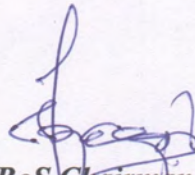
WEB REFERENCES :

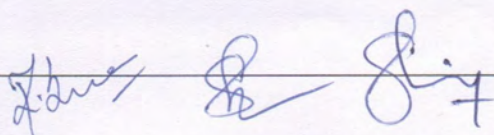
1.	https://www.manage.gov.in/studymaterial/ec.pdf
2.	https://in.indeed.com/career-advice/career-development/active-listening-skills
3.	https://www.scribd.com/document/825761181/Complete-Notes-Module-1-to-5-Communicative-English-BENGK106
4.	https://tefl-tesol-certification.com/blog/types-of-reading
5.	https://www.slideshare.net/slideshow/unit41paragraph-writing/239345788

COs/POs/PSOs Mapping :

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	-	-	-	-	-	-	-	-	3	-	2	1	-	-	3
2	-	-	-	-	-	-	-	-	3	-	-	-	-	-	3
3	-	-	-	-	-	-	-	-	3	-	2	3	-	-	3
4	-	-	-	-	-	-	-	-	3	-	-	-	-	-	3
5	-	-	-	-	-	-	-	-	3	-	2	2	-	-	3

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BoS Chairman



U25MA01T	Calculus and Linear Algebra	L	T	P	C	Total
		3	1	0	4	60

COURSE OBJECTIVES:

To develop the ability to transform complex systems into simplified diagonal structures for easier computation and analysis
To understand the consistency of a matrix
To learn linear differential equations of higher order with constant coefficients
To understand the concept of partial differentiation
To introduce the concepts of curl, divergence and integration of vectors in vector calculus

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Enable the transformation of higher-dimensional linear systems into computationally efficient forms for easier analysis and interpretation.
CO2 :	Develop the ability to examine whether a given set of equations representing a physical system possesses a valid solution, and classify the nature of such solutions.
CO3 :	Acquire techniques to solve equations that describe time-dependent phenomena, such as oscillations, growth, and decay in engineering systems.
CO4 :	Extend calculus principles to functions involving several variables, enabling the identification of optimal points under given constraints.
CO5 :	Build a foundation to understand how quantities like flow, rotation, and expansion behave in space, and connect localized behavior to overall system properties.

UNIT I: Matrices	12 Hrs.
Characteristic equation - Eigen values and Eigen vectors of a real matrix - Properties of Eigen values and Eigen vectors - Diagonalization of matrices.	

UNIT II: Consistency of Matrix	12 Hrs.
Cayley - Hamilton Theorem (without proof) Problems Only - Rank of a Matrix - Consistency of system of linear equations.	

UNIT III: Differential Equations	12 Hrs.
Linear differential equations of higher order with constant coefficients - The Operator D - Method of variation of parameter.	

UNIT IV: Partial Differential Equations	12 Hrs.
Partial Derivatives - Partial differential equations of higher order with constant coefficients - Maxima and Minima of two variables - Lagrangian Multiplier.	

UNIT V: Vector Calculus	12 Hrs.
Gradient - Divergence and Curl - Directional Derivative - Irrotational and Solenoidal vector fields - Gauss Divergence Theorem (without proof) - Stoke's Theorem (without proof).	

Total Hours: 60

TEXT BOOKS:	
1.	B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 45th edition, 2024.
2.	Erwin Kreyszig, Advanced Engineering Mathematics, 11th Edition, John Wiley & Sons, 2021.

REFERENCE BOOKS:	
1.	B. V. Ramana, Higher Engineering Mathematics, 2nd Edition (Reprint), McGraw Hill Education, 2022.
2.	Dennis G. Zill, Advanced Engineering Mathematics, 8th Edition, Jones & Bartlett Learning, 2023.
3.	R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 5th Edition, Narosa Publishing, 2021.
4.	H. K. Dass, Advanced Engineering Mathematics, 22nd Edition, S. Chand Publishing, New Delhi, 2023.
5.	C W. Evans, "Engineering Mathematics", A Programmed Approach, 3rd Edition, 2019.

WEB REFERENCES:	
1.	http://www.digimat.in/nptel/courses/video/111105121/L49.html
2.	http://www.digimat.in/nptel/courses/video/111108157/L41.html
3.	https://www.youtube.com/watch?v=f7LTcC8-XbY
4.	https://nptel.ac.in/courses/111105121
5.	https://nptel.ac.in/courses/111105122

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COs/POs/PSOs Mapping :

Cos	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	1	2	2	-	-	-	-	-	-	1	2	3	1
2	3	3	2	2	2	-	-	-	-	-	-	1	2	2	1
3	3	3	2	2	1	-	-	-	-	-	-	2	2	3	1
4	3	3	3	2	2	-	-	-	-	-	-	2	2	3	1
5	3	3	2	3	3	-	-	-	-	-	-	2	3	3	2

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation

Shankar

K.V.
BoS Chairman

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U25PH02B	Quantum Mechanics for Engineers	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

To establish limitations of classical physics and why quantum physics becomes necessary for quantum particles
To introduce a formal structure in quantum physics by introducing the concepts of wave function
To enable students to apply the Schrödinger wave equation for different potentials
To introduce molecular bonding and molecular orbital theory of electrons
To enable students to gain knowledge on free electron theory and band theory of solids

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Explain the failure of classical physics and interpret fundamental quantum phenomena.
CO2:	Interpret the wave nature of matter and formulate Schrödinger wave equations.
CO3:	Apply Schrödinger wave equations to various potential forms.
CO4:	Understand Molecular orbital theory and electron states.
CO5:	Utilize principles of free electron theory and band theory of solids to describe electron behavior in periodic potential.

UNIT I: Origin of Quantum Mechanics	9 Hrs.
Limitations of Classical Physics - Black – Body Radiation Photoelectric Effect - Specific Heat of Solids – Planck’s Quantum Hypothesis - Compton Effect - Quantum theory of Specific Heat-Bohr Atom Model of Hydrogen Atom - Inadequacy of (Old) Quantum Theory - Young’s double slit experiment.	

UNIT II: Wave Nature of Particle and Schrödinger Equation	9 Hrs.
Wave nature of particles - Time-dependent and time - independent Schrödinger equation for wave function, Expectation values - Free - particle wave function and wave – packets - Uncertainty principle.	

UNIT III: Applications of Schrödinger Equation	9 Hrs.
Particle in a box - square – well potential. Schrödinger equation for one-dimensional problem for different potentials - Scanning Tunneling microscope - Particle in three-dimensional box and related examples - Angular momentum operator - Rigid Rotor - Schrödinger equation for spherically symmetric potentials.	
UNIT IV: Introduction To Molecular Bonding	9 Hrs.
Particle in double delta – function potential - molecules [hydrogen molecule - valence bond and molecular orbitals picture] - singlet / triplet states - chemical bonding - hybridization.	
UNIT V: Introduction To Solids	9 Hrs.
Free electron theory of metals - Fermi level - density of states - application to white dwarfs and neutron stars - Bloch's theorem for particles in a periodic potential - Kronig - Penney model and origin of energy bands Numerical solution for energy in one – dimensional periodic lattice by mixing plane waves.	

Total Hours: 45

List of Experiments

1. Determine the Thickness of the given thin wire by using Air Wedge.
2. Determine the Refractive index of a solid prism by using Spectrometer.
3. Determine the wavelength of the mercury spectrum using spectrometer grating.
4. Determine the i-d curve for a given prism and calculated the refractive index of the material of the prism.
5. Young's Modulus q of the material of a beam- By non-uniform bending using Pin and Microscope.
6. Young's Modulus q of the material of a beam- By uniform bending using Pin and Microscope.
7. Rigidity Modulus n of the material of a wire -Torsion Pendulum.
8. Determine the acceptance angle and Numerical aperture of the given optical fibre.
9. To determine the particle size of the given lycopodium powder using laser diffraction method.
10. Determine the wavelength of the given laser light using the grating.

Total Hours: 30

TEXT BOOKS :

1.	Aithal, P. S., & Ravindra, H. J., "Textbook of Engineering Physics". Acme Learning Pvt. Limited, 1st edition, 2011.
2.	Eisberg, R. & Resnick, R. (2022). "Quantum physics of atoms, molecules, solids, nuclei and particles". Wiley India Reprint, 2nd edition, 2022,
3.	Beiser, Arthur. "Concepts of modern physics". McGraw-Hill, 6th edition, 1995.
4.	Pillai, S. O. (2006). "Solid state physics". New Age International, 6th edition, 2005.
5.	Avadhanulu, M. N. (2008). "A textbook of engineering physics". S. Chand Publishing, 22nd edition, 2014.

REFERENCE BOOKS :

1.	David J. Griffiths & Darrell F. Schroeter, "Introduction to Quantum Mechanics", Cambridge University Press, 3rd edition, 2020.
2.	Walter Greiner, "Quantum Mechanics: An Introduction", Springer, 2nd edition, 2021.
3.	Charles Kittel, "Introduction to solid state physics", Wiley India Reprint, 9th edition, 2023.
4.	Zettili, N. "Quantum mechanics: concepts and applications". Wiley, 2nd edition, 2009, Wiltshire.
5.	Sakurai, J. J., & Napolitano, J. "Modern quantum mechanics". Cambridge university press, 2nd edition, 2011.

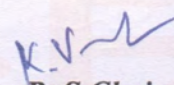
WEB REFERENCES:

1.	https://learn.mit.edu/search?q=Introduction+to+Solid+State+Chemistry&resource=3923&resource_title=quantum-physics-i&utm
2.	https://learn.mit.edu/video/10607/lecture-4-expectations-momentum-and-uncertainty?utm=&playlist=10603
3.	https://ocw.mit.edu/courses/5-111sc-principles-of-chemical-science-fall-2014/resources/lecture-13-molecular-orbital-theory/?utm
4.	https://alan.ece.gatech.edu/ECE6451/Lectures/StudentLectures/King_Notes_Density_of_States_2D1D0D.pdf?utm
5.	https://www.homepages.ucl.ac.uk/~ucapahh/teaching/3C25/Lecture14s.pdf?utm

COs/POs/PSOs Mapping:

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	-	-	-	-	2	-	-	-	-	-	-	1	1
2	3	3	1	2	1	-	2	-	-	-	-	-	-	2	1
3	3	3	2	2	2	-	2	-	-	-	-	1	1	2	1
4	2	2	1	1	-	-	2	-	-	-	-	-	-	2	1
5	3	3	2	2	2	-	2	-	-	1	-	1	1	3	1

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BoS Chairman

U25GE02T	Design Thinking	L	T	P	C	Total
		3	0	0	3	45

COURSE OBJECTIVES:

• To Understand the Fundamentals of Design Thinking
• To Develop Empathy and Divergent Thinking Skills
• To Learn the Design Thinking Tools
• To Explore and Apply Design Thinking Processes
• To Integrate Design Thinking in Product Design

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Understand the fundamental knowledge of the concepts of design thinking and its uses.
CO2 :	Compare and classify the various learning styles and memory techniques.
CO3 :	Learn various tools for design thinking and choose them for a specific problem.
CO4 :	Understand the design thinking processes and apply them for problem solving.
CO5 :	Apply the process for developing innovative products using design thinking approach.

UNIT I : Design Thinking Background	9 Hrs.
Design Thinking Background – Definition of Design Thinking – Business uses of Design Thinking – Variety within the Design Thinking Discipline – Design Thinking Mind-set	

UNIT II : Fundamental Concepts	9 Hrs.
Empathy – Ethnography – Divergent Thinking – Convergent Thinking – Visual Thinking – Assumption Testing – Prototyping – Time for Learning and Validation	

UNIT III : Design Thinking Tools	9 Hrs.
Visualization – Journey Mapping – Value Chain Analysis – Mind Mapping – Rapid Concept Development – Co-Creation – Learning Launches – Story Telling – Case Study.	

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UNIT IV : Design Thinking Processes	9 Hrs.
Numerous Approaches – Double Diamond Process – 5-Stage school Process – Designing for Growth Process – Role of Project Management	

UNIT V - Process Of Product Design	9 Hrs.
Process of Engineering Product Design – Design Thinking Approach – Stages of Product Design – Examples of best product designs and functions.	

Total Hours: 45

TEXT BOOKS :	
1.	E. Balaguruswamy, "Developing Thinking Skills (The Way to Success)", Khanna Publications, First Edition, 2022.
2.	Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
3.	Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

REFERENCE BOOKS :	
1.	Yousef Haik and Tamer M.Shahin, "Engineering Design Process", CengageLearning, Second Edition, 2011.
2.	Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).
3.	Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, 2009.
4.	John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design",Cengage learning (International edition) Second Edition, 2013.

WEB REFERENCES:

1.	https://nptel.ac.in/courses/110106124
2.	https://onlinecourses.swayam2.ac.in/e-learning/preview/aic23_ge17
3.	https://elearn.nptel.ac.in/category/all-products
4.	https://elearn.nptel.ac.in/product-page/design-thinking-plus-ai-building-innovative-human-centered-solutions
5.	https://nptel.ac.in/courses/110106124

COs/POs/PSOs Mapping :

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	2	2	-	-	1	2	1	1	1	1	2	1	1	2
CO2	1	2	2	1	-	1	2	1	1	-	2	2	1	1	2
CO3	2	3	3	2	2	1	2	2	2	1	2	3	2	2	3
CO4	2	3	3	2	2	1	2	2	2	1	2	3	2	2	3
CO5	2	3	3	2	2	2	2	3	2	2	3	3	2	2	3

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation

S. Mangayath
BoS Chairman

U25CE01B	Python Programming	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

• To introduce the fundamental concepts of Python, its data types, control flow, and basic operations
• To impart knowledge of object-oriented programming principles using Python
• To develop skills in modular programming using functions and Python's standard modules
• To teach file handling mechanisms and exception handling techniques in Python
• To provide an understanding of searching, sorting, and hashing algorithms using Python

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Write simple Python programs using variables, operators, control statements, and basic data collections.
CO2 :	Design and implement Python classes with inheritance, polymorphism, and exception handling.
CO3 :	Create reusable functions, apply lambda expressions, and use built-in modules effectively.
CO4 :	Perform file operations and handle multiple runtime errors using Python's exception model.
CO5 :	Implement searching, sorting, and hashing techniques to solve computational problems efficiently.

UNIT I: Introduction to Python Programming Language	9 Hrs.
Introduction to Python Language: Strengths and Weaknesses and IDLE – Primitive Data Types – Lists – Tuples – Sets – Dictionaries – Sorting Dictionaries and Copying Collections – Dynamic Types – Naming Conventions and String Values – String Operations and String Slices – Storing Operators and Numeric Data Types – Conversions and Built-in Functions. Data Collections and Language Component: Control Flow and Syntax and Indenting – if Statement – while Loop – for Loop – break and continue – Operators.	

UNIT II: Object and Classes	9 Hrs.
Classes in Python and Principles of Object Orientation – Creating Classes and Instance Methods – File Organization and Special Methods – Class Variables and Inheritance – Polymorphism and Custom Exception Classes – Type Identification.	
UNIT III: Functions and Modules	9 Hrs.
Introduction: Defining Functions and Parameters – Function Documentation – Keyword – Optional Parameters – Passing Collections to a Function – Variable Number of Arguments – Scope and Functions – Passing argument to a function – Mapping Functions in a Dictionary – Lambda – Modules: sys – math – time – The dir function.	
UNIT IV: I/O and Error Handling in Python	9 Hrs.
Introduction: Data Streams – Creating Data Streams – Access Modes – Writing Data to a File – Reading Data From a File – Additional File Methods – Using Pipes as Data Streams – Handling IO Exceptions: Working with Directories – Metadata – Errors – Run Time Errors The Exception Model – Exception Hierarchy – Handling Multiple Exceptions.	
UNIT V: Simple Algorithms and Data Structures	9 Hrs.
Searching Algorithms: Linear Search – Binary Search – Sorting Algorithms: Bubble Sort – Selection Sort – Insertion Sort – Merge Sort – Quick Sort – Introduction to Hashing: Keys and Values – Hash Function – Hash Table – Collision Resolution Techniques: Separate Chaining – Open Addressing: Linear Probing – Quadratic Probing – Double Hashing.	

Total Hours: 45

List of Exercises

1. Case Study: In which cases python is preferable among all other programming languages
2. Write a program to implement string functions
3. Write a program to implement functions and methods of LIST
4. Flatten a nested list structure. Example: if list1 = [1, [2, 3], [4, 5, 6,]] then try to convert it in 1-dimensional [1, 2, 3, 4, 5, 6, 7].
5. Write a program to eliminate duplicate values from LIST
6. Write a Python program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings. Sample List : ['abc', 'xyz', 'aba', '1221']
Expected Result : 2
7. Write python program to check whether the given list is palindrome or not

8. Write a program to find the prime number in a specific range using filter
9. Write python program to make sum of particular range using reduce
10. Write python program to find Armstrong number in a specific range using map
11. Write a program to find multiple items of a tuple.
12. Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
13. Write a Python program to remove a key from a dictionary.
14. Write a Python program to check if all dictionaries in a list are empty or not
15. Write a python program to read the text file using read (), readlines() and readline() methods.
16. Implement the concept of class method, static method and instance method.
17. Implement the concept of class variable, instance variable and local variable
18. Implement the concept of operator overloading for any three operator.
19. Implement the concept of multiple exceptions handling (IO Error, Name error, Value error).
20. Develop programs for data structure algorithms using python – searching, sorting and hash Tables.

Total Hours: 30

TEXT BOOKS :

1.	ReemaThareja, "Python Programming using problem solving approach", Oxford University Press, First Edition, 2017.
2.	Dr. R. NageswaraRao, "Core Python Programming", Dream tech Publishers, First Edition, 2017.
3.	Guttag, J. V., Introduction to Computation and Programming Using Python, MIT Press, 3rd Edition, 2021.

REFERENCE BOOKS :

1.	Vamsi Kurama, Python Programming: A Modern Approach, Pearson Education India, First Edition, 2021.
2.	Mark Lutz, Learning Python, O'Reilly Media, 5th Edition, 2013.
3.	Adam Stewart, Python Programming, Independently Published, First Edition, 2020.
4.	Fabio Nelli, Python Data Analytics: Data Analysis and Science Using Pandas, Matplotlib and the Python Programming Language, Apress, First Edition, 2015.

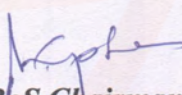
WEB REFERENCES:

1.	https://www.programiz.com/python-programming
2.	https://www.guru99.com/python-tutorials.html
3.	https://www.w3schools.com/python/python_intro.asp
4.	https://www.geeksforgeeks.org/python-programming-language/
5.	https://en.wikipedia.org/wiki/Python_(programming_language)

COs/POs/PSOs Mapping :

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	2	1	2	-	1	-	1	-	-	1	3	2	1
2	3	3	3	2	2	-	1	-	1	-	1	2	3	2	2
3	3	3	3	2	3	-	1	-	1	-	1	2	3	3	2
4	3	3	3	2	3	1	1	-	1	-	1	2	3	3	2
5	3	3	3	3	3	-	2	-	1	-	1	2	3	3	2

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BbS Chairman

U25GE01P	Engineering Graphics	L	T	P	C	Total
		0	0	4	2	60

COURSE OBJECTIVES:

To understand the basic Concept of Drawings, Curves used in Engineering and the dimensioning
To enable students to visualize and represent points, lines, and planes inclined to both principal planes
To develop the ability to interpret and convert pictorial views into orthographic multi-view drawings and project solids
To equip students with the skills to visualize and draw sectional views of solids and develop their surfaces for practical applications
To develop the ability to create isometric and perspective projections of objects and introduce the application of CAD tools in engineering drawing

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1 :	Apply BIS standards to perform basic geometric constructions and dimensioning in engineering drawing.
CO2 :	Construct projections of points, lines, and planes inclined to principal planes.
CO3 :	Generate multi-view and orthographic projections of solids.
CO4 :	Create sectional views and develop true shapes and surfaces of solids for design applications.
CO5 :	Develop isometric and perspective projections and utilize CAD software for engineering drawings.

UNIT I : Basic Geometric Constructions and Dimensioning	12 Hrs.
Importance of engineering drawing - drawing practice as per BIS code - drawing instruments: drawing board, mini drafter, drawing sheets, drawing pencils, set squares, etc. Bisect a straight line, an arc and an angle – divide a straight line and circle into a number of equal divisions - Perpendicular to a Line – construct an arc touching two straight lines at any angle – construct an arc touching two arcs- Construction of Regular Polygons - Construction of a geometric curves (ellipse, parabola , Hyperbola by eccentricity method, Involute of square and Involute of circle)- Dimensioning- need for dimensioning - terms and notations as per BIS.	

UNIT II : Projection of Points, Lines and Plane Surface	12 Hrs.
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Principal Planes- Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by Reference line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by Reference plane method.

UNIT III : Visualization Concepts and Projection of Solids	12 Hrs.
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Orthographic projection- Pictorial View and Multi-View - Multi-View Drawing - Features of First Angle Projection and Third Angle Projection - General Preparation for Multi-View Drawings - Conversion of Pictorial View into Orthographic Views - Classification of solids- Projections of Solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.

UNIT IV : Sections of Solids and Development of Surfaces	12 Hrs.
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Section Planes and its types- Sectioning of simple solids in simple vertical position when the cutting plane is inclined to one of the principal plane and perpendicular to the other plane- obtaining true shape of section. Classification of Surfaces- Methods of Development – Development of Lateral Surfaces of simple solids – Applications.

UNIT V - : Isometric Projections, Perspective Projections and Computer Aided Design (CAD)	12 Hrs.
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Principle of Isometric Projection - Isometric View of Planes - Four Centre Method to Draw Ellipse and Elliptical Arcs - Conversion of Orthographic Views into Isometric Views -isometric projections of simple solids- Perspective projections and its Applications -Perspective projections of simple solids by visual ray method- Applications of AutoCAD in Engineering Drawing.

Total Hours: 60

TEXT BOOKS :	
1.	N.D. Bhatt – Engineering Drawing, Publisher: Charotar Publishing House.
2.	K. R. Gopalakrishna – Engineering Drawing (Vol. I & II), Publisher: Subhas Publications

REFERENCE BOOKS :

1.	Dhananjay A. Jolhe – Engineering Drawing with an Introduction to AutoCAD Publisher: Tata McGraw Hill Combines manual drawing techniques with CAD applications.
2.	Basant Agrawal and C.M. Agrawal – Engineering Drawing Publisher: Tata McGraw Hill Covers projections, developments, sections, and CAD tools with illustrations and practice problems.
3.	K. Venugopal & V. Prabhu Raja – Engineering Graphics Publisher: New Age International

WEB REFERENCES :

1.	https://www.autodesk.com/learning
2.	https://www.mycadsite.com/
3.	https://drawwithrob.com (basic visualization)
4.	https://www.cadtutor.net (AutoCAD help and tutorials)

COs/POs/PSOs Mapping :

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	2	-	2	1	1	-	2	-	-	-	2	1	1
2	2	3	3	1	2	-	1	-	2	-	-	-	2	2	1
3	2	3	3	1	3	-	1	-	2	-	-	1	3	2	1
4	2	3	3	2	3	-	1	-	2	-	-	1	3	2	1
5	2	3	3	2	3	1	2	1	2	1	1	2	3	3	2

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation

P. Mangayath
BoS Chairman

U25VA02P	Physical Wellness and Yoga	L	T	P	C	Total
		0	0	2	1	30

COURSE OBJECTIVES:

• To learn how to movement all the joints in our body
• To understand the principles and practices of each asana & pranayama
• To will get some pint of about each asana, pranayama, relaxation technique
• To aware of the demonstrate each practice skillfully
• To learn how to movement all the joints in our body

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Explain the structure and movement of the major joints of the human body and their role in physical activities and yoga practices.
CO2:	Demonstrate the principles, techniques, and benefits of various asanas and pranayama practices.
CO3:	Analyze the purpose, benefits, precautions, and therapeutic applications of different asanas, pranayama, and relaxation techniques.
CO4:	Perform and demonstrate various yoga practices with correct posture, breathing techniques, alignment, and safety measures.
CO5:	Apply appropriate mudras and relaxation techniques to promote relaxation, concentration, and overall wellness.

UNIT I : Loosening Exercises and Surya Namaskar	6 Hrs.
Loosening Exercise Loosening the joints, Joint freeing series, Surya Namaskar: (Bihar school of yoga 12 Steps) – Prayer, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contraindication, and Benefits.	

UNIT II : Asanas and Their Practice	6 Hrs.
Asana: Name – Meaning – Definition – Guidelines – Procedure - Breathing technique – Awareness - Contra-indication – Benefits - Type and Category of each asana. Standing : Ardachakrasana –	

Padhahastasana – Trikonasana - Ekapadasana. Sitting: Padmasana – vajrasana – Ustrasana - Patchimotasana. Supine: Utthanapadasana – Arthahalasana - Savasana. Prone: Bhujangasana - Shalabasana - Makrasana.

UNIT III : Pranayama And Breathing Practices

6 Hrs.

Pranayama: Name – Meaning – Definition – Guidelines – Procedure - Breathing technique – Awareness - Contra-indication – Benefits - Type and Category of each one Pranayama: Surya nadi - Chandra nadi - surya bhedhana - Chandra bhedhana - Nadisudhi.

UNIT IV : Yogic Kriyas And Bandhas

6 Hrs.

Kriyas and Bandha: Name – Meaning – Definition – Guidelines – Procedure - Breathing technique – Awareness - Contra-indication - Benefits - Type and Category of each one Kriya – Kapalapathi - Vamana dhauti. Bandha: Jalandira Bandha - Moola Bandha.

UNIT V : Mudras And Relaxation Techniques

6 Hrs.

Mudra and Relaxation Technique: Name - Meaning - Definition - Guidelines - Procedure - Breathing technique - Awareness - Contra-indication - Benefits - Type and Category of each one Mudras: Chin mudra - chinmaya mudra - adi mudra - Brahma mudra - Bhairava mudra - Bhairavi mudra. Relaxation Technique: Instant Relaxation Technique - Quick Relaxation Technique.

Total Hours: 30

REFERENCE BOOKS :

1.	Iyengar B.K.S (1976) Light on =Yoga, London, Unwin paper packs.
2.	Sivananda Sarawathi Swamy (1934) Yoga Asanas Madras: My magazine of India.
3.	Satyananda Sarawari swami (2008) Asana, Pranayama, Mudra, Bandha, munger: Yoga Publications trust.
4.	Iyengar B.K.S (2008) Light on pranayama, New Delhi: Haper Collins publishers India
5.	Chandrasekaran K (1999) Sound Health Through Yoga, Sedapatti: Prem kalia publications
6.	Vishnu Devananda Swami (19720 The complete Illustrated book of yoga, New York: Pocket Books.
7.	Yogeshwaran and Saraswathi Swami (1975) First steps to higher yoga, Gangothari: Yoga niketan trust.

8.	Coulter, H David (2001) Anatomy and Hatha Yoga, USA: Body and Breatha Inc.
9.	Lirk Martin (2006) Hatha Yoha Illustrated Champaign: Humenkinetics.
10.	Gharote (2004) Applied Yoga, Lonvla: Kaivalyadhama.

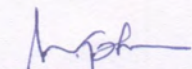
WEB REFERENCES :

1.	https://www.ayush.gov.in
2.	https://yogaportal.nic.in
3.	https://www.svyasa.edu.in
4.	https://www.yogaalliance.org

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COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
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2	-	-	-	-	-	2	2	1	1	-	3	3	-	-	2
3	-	-	-	-	-	3	2	1	1	-	3	3	-	-	2
4	-	-	-	-	-	3	2	1	1	-	3	3	-	-	2
5	-	-	-	-	-	3	3	2	1	-	3	3	-	-	3

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BoS Chairman

