Course Code	Title		
U24AM202	DATA STRUCTURES & ALGORITHMS		
Semester: II	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective	To understand the concepts of ADTs To design linear data structures – lists, stacks, and queues
Course Category	Professional Core Course
Development Needs	Global
Course Description	This course introduces the students to fundamental concepts in data structures and algorithms, providing the foundation for solving computational problems efficiently. The focus is on the design, analysis, and implementation of data structures such as arrays, linked lists, stacks, queues, trees, graphs, and hash tables, as well as algorithms for searching, sorting, and graph traversal.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Explain abstract data types	Video Lectures	Group Discussion
CO 2	Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications	Tutorial	Assignment
CO 3	Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting	Flipped Classroom	Seminar
CO 4	Model problems as graph problems and implement efficient graph algorithms to solve them	Tutorial / Case Studies	Quiz
CO 5	Solve the problems using tree and graph structure	Video Lectures	Flip Test

Offered by

Course Content — **Instructional Hours / Week :3**

Unit	Description	Text Book	Chapters
I	**ABSTRACT DATA TYPES -** Abstract Data Types (ADTs) – ADTs and classes – introduction to OOP – classes in Python – inheritance – namespaces – shallow and deep copying Introduction to analysis of algorithms – asymptotic notations – divide & conquer – recursion – analyzing recursive algorithms	1	1,2
		Instructional Hours	**09**
Suggested Learning Methods: Video Lectures			
II	**LINEAR STRUCTURES -** List ADT – array-based implementations – linked list implementations – singly linked lists – circularly linked lists – doubly linked lists – Stack ADT – Queue ADT – double ended queues – applications	I	3,4
		Instructional Hours	**15**
Suggested Learning Methods :Group Discussion			

III	**SORTING AND SEARCHING -** Bubble sort – selection sort – insertion sort – merge sort – quick sort – analysis of sorting algorithms – linear search – binary search – hashing – hash functions – collision handling – load factors, rehashing, and efficiency	1	5,6
		Instructional Hours	**15**
Suggested Learning Methods : Worked examples			
IV	**TREE STRUCTURES -** Tree ADT – Binary Tree ADT – tree traversals – binary search trees – AVL trees – heaps – multiway search trees	1	7,8
		Instructional Hours	**15**
Suggested Learning Methods : Problem Based Learning			
V	**GRAPH STRUCTURES -** Graph ADT – representations of graph – graph traversals – DAG – topological ordering – greedy algorithms – dynamic programming – shortest paths – minimum spanning trees – introduction to complexity classes and intractability	1	9,10
		Instructional Hours	**15**
Suggested Learning Methods : Collaborative Learning			
		Total Hours	**60 Hrs**

Text Books	1.Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, "Data Structures & Algorithms in Python", An Indian Adaptation, John Wiley & Sons Inc., 2021
Reference Books	1. Lee, Kent D., Hubbard, Steve, "Data Structures and Algorithms with Python" Springer Edition 2015 2. Rance D. Necaise, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011 3. Aho, Hopcroft, and Ullman, "Data Structures and Algorithms", Pearson Education, 1983. 4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002. 5. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Fourth Edition, Pearson Education, 2014
Web. URLs	https://www.mygreatlearning.com/blog/data-structures-using-java/

Tools for Assessment (40 Marks)

CIA I	CIA II	CIA III	Assignment/ Seminar/ Case Study	Attendance	Total
10	10	10	5	5	40

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H	H	L	L	L	L	L	L	L	M	M	H	M
CO2	M	L	L	H	M	L	L	L	M	M	L	M	M	M
CO3	H	M	L	M	M	L	L	L	M	L	L	M	L	H
CO4	H	M	H	M	M	L	L	L	H	H	H	M	M	L
CO5	H	L	M	H	H	L	L	L	M	M	M	M	H	L

H-High; M-Medium; L-Low	
Course designed by	**Verified by**

Course Code	Title		
U24MA201	STATISTICS AND NUMERICAL METHODS		
Semester: II	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective	This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology
Course Category	Basic Science Course (BSC)
Development Needs	Global / National
Course Description	Numerical methods are techniques by which mathematical problems are formulated so that they can be solved with arithmetic operations. They invariably involve large numbers of tedious arithmetic calculations and with the development of fast, efficient digital computers, the role of numerical methods in solving engineering problems has increased

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	Video Lectures	Group Discussion
CO 2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.	Tutorial	Assignment
CO 3	Remember the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems	Flipped Classroom	Seminar
CO 4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.	Tutorial / Case Studies	Quiz
CO 5	Analyze the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering Applications	Video Lectures	Flip Test

Offered by	

Course Content — **Instructional Hours / Week :4**

Unit	Description	Text Book	Chapters
I	**TESTING OF HYPOTHESIS:** Introduction, procedure for testing of hypothesis, level of significance – Large sample test based on Normal distribution for single mean and difference of means - Small sample tests based on t and F distributions for testing means, variance – Contingency table (Test for Independency) – Chi square test for goodness of fit –– Independence of attributes.	1	1,2

		Instructional Hours	**09**
Suggested Learning Methods: Video Lectures			
II	**DESIGN OF EXPERIMENTS:** Analysis of variance: One way and two way classifications – Completely randomized design(CRD) – Randomized block design(RBD) – Latin square design(LSD).	I	3,4
		Instructional Hours	**09**
Suggested Learning Methods :Group Discussion			
III	**SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS:** Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations – Direct methods: Gauss elimination and Gauss Jordan – Pivoting – Iterative methods: Gauss Jacobi and Gauss Seidel – Dominant Eigenvalues of a matrix by Power method.	1	5,6
		Instructional Hours	**09**
Suggested Learning Methods : Worked examples			
IV	**INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION**: Interpolation with unequal intervals: Lagrange's and Newton's divided difference interpolations – Interpolation with equal intervals: Newton's forward and backward difference interpolation – Approximation of derivatives using interpolation polynomials – Numerical integration: Trapezoidal and Simpson's 1/3 rules (single and double integrals).	1	7,8
		Instructional Hours	**09**
Suggested Learning Methods : Problem Based Learning			
V	**NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS:** Single step methods: Taylor's series method – Euler's method – Modified Euler's method – Fourth order Runge-Kutta method for solving first order differential equations. Multi step methods: Milne's and Adams – Bash forth predictor corrector methods for solving first order differential equations.	1	9,10
		Instructional Hours	**09**
Suggested Learning Methods : Collaborative Learning			
		Total Hours	**45 Hrs**

Text Books	1. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015. 2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015

Reference Books	1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016. 2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014. 3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007. 4. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics", Tata McGraw Hill Edition, 4th Edition, 2012. 5. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.
Web. URLs	https://www.enggtree.com/ma3151-matrices-and-calculus-lecture-notes-2021-regulation/

Tools for Assessment (40 Marks)

CIA I	CIA II	CIA III	Assignment/ Seminar/ Case Study	Attendance	Total
10	10	10	5	5	40

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	M	M	L	-	-	-	L	-	L	-	L	M	M
CO2	M	M	M	L	-	-	-	L	-	L	-	L	M	M
CO3	M	M	M	L	-	-	-	L	-	L	-	L	M	M
CO4	M	M	M	L	-	-	-	L	-	L	-	L	M	M
CO5	M	M	M	L	-	-	-	L	-	L	-	L	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
U24AM203	DIGITAL LOGIC & MICROPROCESSORS		
Semester: II	Credits: 3	CIA: 50 Marks	ESE: 50 Marks

Course Objective	To present the Digital fundamentals, Boolean algebra and its applications in digital systems To familiarize with the design of various combinational digital circuits using logic gates
Course Category	Professional Core Course
Development Needs	Global
Course Description	This course introduces the fundamental principles of digital logic design and microprocessor architecture, bridging theoretical concepts with hands-on applications. Students will explore combinational/sequential logic, memory systems, and the internal organization of microprocessors, culminating in the design and interfacing of embedded systems

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	State the fundamental operating concepts behind digital logic circuits and microprocessors	Video Lectures	Group Discussion
CO 2	Recognize the use of various digital logic circuitsand sub units in microprocessors.	Tutorial	Assignment
CO 3	Sketch the digital logic circuits and the architectures of microprocessors	Flipped Classroom	Seminar
CO 4	Design the DLC and Microprocessor for the standard applications.	Tutorial / Case Studies	Quiz
CO 5	Create the circuits using DLC and Microprocessor for given applications	Video Lectures	Flip Test

Offered by

Course Content — **Instructional Hours / Week :3**

Unit	Description	Text Book	Chapters
I	**DIGITAL FUNDAMENTALS** Number Systems – Decimal, Binary, Octal, Hexadecimal, 1‘s and 2‘s complements, Codes – Binary, BCD, Excess 3, Gray, Alphanumeric codes, Boolean theorems, Logic gates, Universal gates, Sum of products and product of sums, Minterms and Maxterms, Karnaugh map Minimization and Quine-McCluskey method of minimization.	1	1,2
		Instructional Hours	**09**

Suggested Learning Methods: Video Lectures

II	**COMBINATIONAL & SYNCHRONOUS SEQUENTIAL CIRCUITS** Design of Half and Full Adders, Half and Full Subtractors, Binary Parallel Adder -Multiplexer, Demultiplexer, Decoder, Priority Encoder. Flip flops – SR, JK, T, D, design of clocked sequential circuits – Design of Counters- Shift registers, Universal Shift Register	I	3,4
		Instructional Hours	**09**
Suggested Learning Methods :Group Discussion			
III	**ASYNCHRONOUS SEQUENTIAL CIRCUITS AND MEMORY DEVICES** Stable and Unstable states, output specifications, cycles and races, state reduction, race free assignments, Hazards, Essential Hazards, Pulse mode sequential circuits, Design of Hazard free circuits. Basic memory structure – ROM -PROM – EPROM – EEPROM –EAPROM, RAM – Static and dynamic RAM - Programmable Logic Devices – Programmable Logic Array (PLA) - Programmable Array Logic (PAL) – Field Programmable Gate Arrays (FPGA).	1	5,6
		Instructional Hours	**09**
Suggested Learning Methods : Worked examples			
IV	**8085 PROCESSOR** Hardware Architecture, pin diagram – Functional Building Blocks of Processor – Memory organization – I/O ports and data transfer concepts– Timing Diagram – Interrupts	1	7,8
		Instructional Hours	**09**
Suggested Learning Methods : Problem Based Learning			
V	**PROGRAMMING PROCESSOR** Instruction - format and addressing modes – Assembly language format – Data transfer, data manipulation& control instructions – Programming: Loop structure with counting & Indexing – Look up table - Subroutine instructions – stack - 8255 architecture and operating modes	1	9,10
		Instructional Hours	**09**
Suggested Learning Methods : Collaborative Learning			
		Total Hours	**45 Hrs**
List of Experiments			

1.Verification of gates
2.Half/Full Adder/Subtractor
3.Parallel Adder/Subtractor
4.Excess 3 to BCD & Vice versa
5.Binary-Grey & Grey-Binary Convertor
6.Write a program using 8085 Microprocessor for Decimal, Hexadecimal addition and subtraction of two Numbers
7.Write a program using 8085 Microprocessor for addition and subtraction of two BCD numbers.
8. To perform multiplication and division of two 8 bit numbers using 8085.
9. To find the largest and smallest number in an array of data using 8085 instruction set.

Total periods 30

Total periods 75

Text Books	1.M. Morris Mano and Michael D. Ciletti, "Digital Design", 5th Edition, Pearson, 2014. 2. Krishna Kant, "Microprocessor and Microcontrollers", Eastern Company Edition, Prentice Hall of India, New Delhi, 2007.
Reference Books	1.Charles H.Roth. "Fundamentals of Logic Design", 6th Edition, Thomson Learning, 2013. 2. Thomas L. Floyd, "Digital Fundamentals", 10th Edition, Pearson Education Inc, 2011 3. Muhammad Ali Mazidi & Janice Gilli Mazidi, R.D.Kinely 'The 8051 Micro Controller and Embedded Systems', PHI Pearson Education, 5th Indian reprint, 2003. 4. R.S. Gaonkar, 'Microprocessor Architecture Programming and Application', with 8085, Wiley Eastern Ltd., New Delhi, 2013
Web. URLs	https://www.tutorialspoint.com/microprocessor/microprocessor_overview.htm

Tools for Assessment – Theory

CIA I	CIA II	CIA III	Assignment/ Seminar/ Case Study	Attendance	Total
10	10	10	5	5	40

Tools for Assessment – Practical

Model Exam I	Model Exam II	Total
50	50	100

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	M	L	L		L						L	H	H
CO2	H	M	L	L		L						L	H	H
CO3	H	M	L	L		L						L	H	H
CO4	H	M	L	L		L						L	H	H
CO5	H	M	L	L		L						L	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by

	Title		
U24AM204	**FUNDAMENTALS OF AI & MACHINE LEARNING**		
Semester: II	**Credits: 3**	**CIA: 50 Marks**	**ESE: 50 Marks**

Course Objective	Acquaint with fundamentals of artificial intelligence and machine learning. Learn feature extraction and selection techniques for processing data set.
Course Category	Professional Core Course
Development Needs	Global
Course Description	This course provides a comprehensive introduction to the core principles, algorithms, and applications of Artificial Intelligence (AI) and Machine Learning (ML). Students will explore the theoretical foundations of AI/ML while gaining hands-on experience in building, training, and evaluating predictive models.

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Demonstrate fundamentals of artificial intelligence and machine learning	Video Lectures	Group Discussion
CO 2	Apply feature extraction and selection techniques.	Tutorial	Assignment
CO 3	Apply machine learning algorithms for classification and regression problems.	Flipped Classroom	Seminar
CO 4	Devise and develop a machine learning model using various steps.	Tutorial / Case Studies	Quiz
CO 5	Explain concepts of reinforced and deep learning.	Video Lectures	Flip Test

Offered by

Course Content — **Instructional Hours / Week :3**

Unit	Description	Text Book	Chapters
I	**Introduction to AI & ML** History of AI, Comparison of AI with Data Science, Need of AI in Mechanical Engineering, Introduction to Machine Learning. Basics: Reasoning, problem solving, Knowledge representation, Planning, Learning, Perception, Motion and manipulation. Approaches to AI: Cybernetics and brain simulation, Symbolic, Sub-symbolic, Statistical. Approaches to ML: Supervised learning, Unsupervised learning, Reinforcement learning.	1	1,2
	Instructional Hours		**09**
Suggested Learning Methods: Video Lectures			
II	**Feature Extraction and Selection** Feature extraction: Statistical features, Principal Component Analysis. Feature selection: Ranking, Decision tree - Entropy reduction and information gain, Exhaustive, best first, Greedy forward & backward, Applications of feature extraction and selection algorithms	I	3,4
	Instructional Hours		**09**
Suggested Learning Methods :Group Discussion			

III	**Classification & Regression** Classification: Decision tree, Random forest, Naive Bayes, Support vector machine. Regression: Logistic Regression, Support Vector Regression. Regression trees: Decision tree, random forest, K-Means, K-Nearest Neighbor (KNN). Applications of classification and regression algorithms	1	5,6
		Instructional Hours	**09**
Suggested Learning Methods : Worked examples			
IV	**Development of ML Model** Problem identification: classification, clustering, regression, ranking. Steps in ML modeling, Data Collection, Data pre-processing, Model Selection, Model training (Training, Testing, K-fold Cross Validation), Model evaluation (understanding and interpretation of confusion matrix, Accuracy, Precision, Recall, True positive, false positive etc.), Hyper parameter Tuning, Predictions.	1	7,8
		Instructional Hours	**09**
Suggested Learning Methods : Problem Based Learning			
V	**Applications** Human Machine Interaction, Predictive Maintenance and Health Management, Fault Detection, Dynamic System Order Reduction, Image based part classification, Process Optimization, Material Inspection, Tuning of control algorithms.	1	9,10
		Instructional Hours	**09**
Suggested Learning Methods : Collaborative Learning			
		Total Hours	**45 Hrs**

List of Experiments

1.To study supervised/unsupervised/Reinforcement learning approach.
2. To acquire, visualize and analyze the data set (from time-domain/ frequency-domain/ etc.) .
3. To extract features from given data set and establish training data.
4. To select relevant features using suitable technique.
5.To use PCA for dimensionality reduction.
6. To classify features/To develop classification model and evaluate its performance (any one classifier).
7. To develop regression model and evaluate its performance (any one algorithm).
8. Markov process for modelling manufacturing processes.

Total periods 30

Total periods 75

Text Books	1.Deisenroth, Faisal, Ong, Mathematics for Machine Learning, Cambridge University Press, 2020. 2. B Joshi, Machine Learning and Artificial Intelligence, Springer, 2020. 3. Parag 3.Kulkarni and Prachi Joshi, “Artificial Intelligence – Building Intelligent Systems”, PHI learning Pvt. Ltd., ISBN – 978-81-203-5046-5, 2015 4. Stuart Russell and Peter Norvig (1995), “Artificial Intelligence: A Modern Approach,” Third edition, Pearson, 2003.

Reference Books	1.Solanki, Kumar, Nayyar, Emerging Trends and Applications of Machine Learning, IGI Global, 2018. 2. Mohri, Rostamizdeh, Talwalkar, Foundations of Machine Learning, MIT Press, 2018. 3. Kumar, Zindani, Davim, Artificial Intelligence in Mechanical and Industrial Engineering, CRC Press, 2021. 4. Zsolt Nagy - Artificial Intelligenc and Machine Learning Fundamentals-Apress (2018) 5. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH
Web. URLs	1. http://nptel.ac.in/courses/111101003/ 2. https://nptel.ac.in/courses/106/106/106106202/ 3. https://nptel.ac.in/courses/112/103/112103280/

Tools for Assessment – Theory

CIA I	CIA II	CIA III	Assignment/ Seminar/ Case Study	Attendance	Total
10	10	10	5	5	40

Tools for Assessment – Practical

Model Exam I	Model Exam II	Total
50	50	100

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	M	L	M	L	M	L	L	L	L	L	M	L	M
CO2	M	H	M	M	H	L	M	L	M	L	L	M	M	M
CO3	M	H	M	M	H	L	L	L	M	M	L	M	M	M
CO4	L	M	L	L	M	M	L	L	L	M	L	M	L	M
CO5	L	H	M	H	M	H	M	M	H	H	M	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Code	Title		
U24AM205	MEDICAL IMAGING FUNDAMENTALS		
Semester: II	Credits: 3	CIA: 50 Marks	ESE: 50 Marks

Course Objective	Develop hands-on skills to operate imaging equipment and optimize acquisition parameters for diagnostic quality. Apply image processing techniques (e.g., segmentation, noise reduction) using software tools like MATLAB or Python.
Course Category	Professional Core Course
Development Needs	Global
Course Description	This course provides a comprehensive introduction to the principles, technologies, and clinical applications of modern medical imaging systems. Students will explore the physics behind X-ray, CT, MRI, ultrasound, and nuclear imaging modalities, while gaining hands-on experience with image acquisition, processing, and analysis techniques.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Explain core physics principles of medical imaging modalities	Video Lectures	Group Discussion
CO 2	Operate imaging equipment/simulators to optimize parameters and troubleshoot artifacts.	Tutorial	Assignment
CO 3	Process medical images using software (Python, MATLAB) for analysis and AI applications.	Flipped Classroom	Seminar
CO 4	Apply safety protocols (radiation, MRI) and ethical guidelines in AI-assisted diagnostics.	Tutorial / Case Studies	Quiz
CO 5	Interpret clinical imaging findings and evaluate emerging technologies in radiology research.	Video Lectures	Flip Test

Offered by

Course Content — **Instructional Hours / Week :3**

Unit	Description	Text Book	Chapters
I	**Introduction to Medical Imaging** Overview of medical imaging modalities (X-ray, CT, MRI, Ultrasound, PET/SPECT). Clinical applications and comparative analysis (spatial resolution, contrast, safety). Image formation basics: pixels, voxels, grayscale, and color mapping.	1	1,2
	Instructional Hours		**09**

Suggested Learning Methods: Video Lectures

II	**X-ray & Computed Tomography (CT)** Physics of X-rays: production, attenuation, and detection. Radiography vs. Fluoroscopy. CT principles: sinograms, Hounsfield units, and reconstruction (FBP, iterative methods). Radiation safety and dose reduction.	I	3,4
		Instructional Hours	**09**
Suggested Learning Methods :Group Discussion			
III	**Magnetic Resonance Imaging (MRI)** Nuclear magnetism: spin, precession, and relaxation (T1/T2). Pulse sequences: spin echo, gradient echo, and functional MRI. K-space and image reconstruction. Safety: contraindications (metallic implants, SAR limits).	1	5,6
		Instructional Hours	**09**
Suggested Learning Methods : Worked examples			
IV	**Ultrasound & Nuclear Imaging** Ultrasound physics: piezoelectric effect, Doppler imaging. Modes: A-mode, B-mode, and elastography. Nuclear imaging: PET/SPECT, radiotracers, and gamma cameras.Hybrid systems (PET-CT, SPECT-CT).	1	7,8
		Instructional Hours	**09**
Suggested Learning Methods : Problem Based Learning			
V	**Emerging Trends & Image Analysis** AI in medical imaging: CAD (Computer-Aided Diagnosis), deep learning for segmentation. 3D/4D imaging and volumetric analysis. Ethical considerations: data privacy, bias in AI models.	1	9,10
		Instructional Hours	**09**
Suggested Learning Methods : Collaborative Learning			
		2.Total Hours	**45 Hrs**

List of Experiments

1. X-ray Image Acquisition & Contrast Study
2. Aluminum Wedge Test
3. Geometric Unsharpness
4. CT Hounsfield Unit Calibration
5. Artifact Analysis
6. T1/T2 Relaxation Measurement
7. K-space Sampling
8. Diffusion-Weighted Imaging (DWI)
9. Beam Profile Mapping
10. Doppler Flow Imaging

Total periods 30

Total periods 75

Text Books	1. The Essential Physics of Medical Imaging, Jerrold T. Bushberg, J. Anthony Seibert, Edwin M. Leidholdt Jr., John M. Boone 2. Medical Imaging: Signals and Systems, Jerry L. Prince, Jonathan M. Links

Reference Books	3. Physics of Diagnostic Radiology, Perry Sprawls 4. MRI: From Picture to Proton, Donald W. McRobbie, Elizabeth A. Moore, Martin J. Graves, Martin R. Prince
Web. URLs	https://www.radiologyinfo.org

Tools for Assessment – Theory

CIA I	CIA II	CIA III	Assignment/ Seminar/ Case Study	Attendance	Total
10	10	10	5	5	40

Tools for Assessment – Practical

Model Exam I	Model Exam II	Total
50	50	100

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	M	L	M	L	M	L	L	L	L	L	M	L	M
CO2	M	H	M	M	H	L	M	L	M	L	L	M	M	M
CO3	M	H	M	M	H	L	L	L	M	M	L	M	M	M
CO4	L	M	L	L	M	M	H	H	L	M	L	M	L	M
CO5	L	H	M	H	M	H	M	M	H	H	M	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
U24AM206	DATA STRUCTURES & ALGORITHMS LABORATORY		
Semester: II	Credits: 1	CIA: 60 Marks	ESE: 40 Marks

Course Objective	To understand the concepts of ADTs To design linear data structures – lists, stacks, and queues
Course Category	Engineering Science Course (ESC)
Development Needs	Global / National
Course Description	This course introduces the students to fundamental concepts in data structures and algorithms, providing the foundation for solving computational problems efficiently. The focus is on the design, analysis, and implementation of data structures such as arrays, linked lists, stacks, queues, trees, graphs, and hash tables, as well as algorithms for searching, sorting, and graph traversal.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Explain abstract data types	Video Lectures	Group Discussion
CO 2	Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications	Tutorial	Assignment
CO 3	Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting	Flipped Classroom	Seminar
CO 4	Model problems as graph problems and implement efficient graph algorithms to solve them	Tutorial / Case Studies	Quiz
CO 5	Solve the problems using tree and graph structure	Video Lectures	Flip Test

Offered by	

Course Content — **Instructional Hours / Week :2**

List of Experiments

1. mplement simple ADTs as Python classes
2. Implement recursive algorithms in Python
3. Implement List ADT using Python arrays
4. Linked list implementations of List
5. Implementation of Stack and Queue ADTs
6. Applications of List, Stack and Queue ADTs
7. Implementation of sorting and searching algorithms
8. Implementation of Hash tables
9. Tree representation and traversal algorithms
10. Implementation of Binary Search Trees
11. Implementation of Heaps
12. Graph representation and Traversal algorithms
13. Implementation of single source shortest path algorithm
14. Implementation of minimum spanning tree algorithms

Total periods 30

Text Books	Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, “Data Structures & Algorithms in Python”, An Indian Adaptation, John Wiley & Sons Inc., 2021

Reference Books	1.Lee, Kent D., Hubbard, Steve, "Data Structures and Algorithms with Python" Springer Edition 2015 1. Rnce D. Necaise, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011 2. Aho, Hopcroft, and Ullman, "Data Structures and Algorithms", Pearson Education, 1983. 3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002. 4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Fourth Edition,Pearson Education, 2014
Web. URLs	https://www.mygreatlearning.com/blog/data-structures-using-java/

Tools for Assessment

Preparation	Conduct of Experiments	Calculations & Result	Viva-Voce	Total
20	30	40	10	100

Tools for Assessment

Model Exam I	Model Exam II	Total
50	50	100

CO \ PO	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	M	M	M	L	-	-	L	L	L	-	L		
CO2	H	M	M	H	M	-	-	L	L	L	-	L		
CO3	H	H	M	H	M	-	-	L	L	L	-	L		
CO4	H	H	M	M	M	-	-	L	L	L	-	L		
CO5	M	M	M	M	H	-	-	L	L	L	-	L		

H-High; M-Medium; L-Low

Course designed by	Verified by

P. K. DAS INSTITUTE OF SOCIAL SCIENCES AND TECHNOLOGY
(Deemed to be University under Distinct Category)
Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

Syllabus
BACHELOR OF TECHNOLOGY – AVIONICS AND DRONE TECHNOLOGY
Programme Code: UADE
(Applicable to the students admitted during the year 2024-2025)

Course Code	Title					
25UADE101	Fundamentals of Physics					
Semester: I	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	3	0	0	3		

Unit	Description	
I	**PROPERTIES OF MATTER:** Introduction - Elasticity - Stress-strain diagram and its uses - Factors affecting elastic modulus - Torsional stress and deformations - Torsional pendulum: theory and experiment - Bending of beams - Bending moment - Cantilever: theory and experiment - Uniform and non-uniform bending: theory and experiment - I-shaped girders - Applications.	
	Contact Periods	**09**
II	**LASER AND FIBER OPTICS:** Introduction – Spontaneous and stimulated emission. Population inversion, pumping methods- Einstein's A and B coefficients: derivation. Types of lasers - Nd-YAG, CO_2 - Industrial Applications of Lasers -Fiber Optics: Principle and propagation of light - Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) - Temperature and displacement sensors.	
	Contact Periods	**09**
III	**ULTRASONICS AND THERMAL PHYSICS**: Introduction - Piezoelectric effect - piezoelectric generator - Velocity measurement - Acoustic grating - Medical applications. Introduction to heat - Transfer of heat energy: Thermal conduction, convection, and radiation - Thermal conductivity - Forbe's and Lee's disc method: theory and experiment - Applications: heat exchangers, refrigerators, ovens, and solar water heaters.	
	Contact Periods	**09**
IV	**QUANTUM PHYSICS:** Introduction - Black body radiation - Planck's theory - Deduction of Wien's displacement law and Rayleigh-Jeans' Law from Planck's theory - Compton effect: Theory and experimental verification - Matter waves - Physical significance of wave function - Schrödinger's wave equation: Time independent and time dependent equations - Particle in a one-dimensional box- Microscope: Scanning Tunnelling microscope.	
	Contact Periods	**09**
V	**CRYSTAL PHYSICS:** Introduction - Lattice - Unit cell - Bravais lattice - Lattice planes -Miller indices - 'd' spacing in cubic lattice - Calculation of number of atoms per unit cell - Atomic radius - Coordination number - Packing factor for SC, BCC, FCC, and HCP structures -	

	Diamond and graphite structures - Polymorphism and allotropy - Crystal defects - Point, line, and surface defects.
Contact Periods	**09**
Total Periods	**45**
Text Books	1. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015. 2. Gaur, R.K. & Gupta, S.L. "Engineering Physics". Dhanpat Rai Publishers, 2012. 3. Pandey, B.K. & Chaturvedi, S. "Engineering Physics". Cengage Learning India, 2012. 4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGraw-Hill (Indian Edition), 2020.
Reference Books	1. Halliday, D., Resnick, R. & Walker, J. "Principles of Physics." Wiley, 2015. 2. Serway, R.A. & Jewett, J.W. "Physics for Scientists and Engineers." Cengage Learning, 2010. 3. Palanisamy P.K. "Engineering Physics." SCITECH Publications, 2011. 4. Kittle, C, "Introduction to solid state Physics," Wiley, 2005. 5. Mani P. "Engineering Physics I." Dhanam Publications, 2011. 6. Senthilkumar G. "Engineering Physics I." VRB Publishers, 2011.

	Title					
25UADE102	Engineering Chemistry for UAV Applications					
Semester: I	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	3	0	0	3		

Unit	Description
I	**WATER TECHNOLOGY:** Introduction - Sources of water - Impurities in water - Types of water - Water Quality Standards - Hardness of water - Expression of hardness - Units of hardness - Estimation of hardness of water by EDTA method - Disadvantages of using hard water - Boiler troubles - Scale and sludge. Softening of water - External treatment method - Demineralization process - Internal treatment method - Sodium Aluminate, Phosphate and Calgon conditioning - Desalination of Brackish water by reverse osmosis method.
	Contact Periods 09
II	**ELECTROCHEMISTRY:** Introduction - Cells - Representation of a galvanic cell - Reversible and irreversible cells - Electrode potential - Nernst equation - Reference electrode - Standard hydrogen electrode - Glass electrode - Electrochemical series and its applications. **Battery**: Introduction, Types of batteries - Primary Battery: alkaline battery, Secondary Battery : lead storage battery and lithium ion battery, Flow Battery : H_2-O_2 fuel cell - Super Capacitors, E-Vehicle.
	Contact Periods 09
III	**CORROSION AND ITS CONTROL:** Corrosion: Introduction - Types of corrosion: Chemical and Electrochemical - Factors influencing rate of corrosion. Corrosion control - material selection and design aspects - Electrochemical protection - sacrificial anode method and impressed current cathodic method. Paints - constituents and function. Electroplating of Copper and electroless plating of nickel.
	Contact Periods 09
IV	**FUELS AND COMBUSTION:** Fuels: Introduction - Requirements of a good fuel - Classification of fuels - Solid fuels - Coal - Proximate analysis of coal - Manufacture of Metallurgical coke - Otto-Hoffman byproduct oven - Liquid fuel - Manufacture of synthetic petrol by Bergius method. Knocking - Octane number - Cetane number - Power alcohol and biodiesel - Gaseous fuel - LPG, CNG. **Combustion** - Principle of combustion - Calorific value - Gross and net calorific values - Explosive range - Spontaneous ignition temperature – Flue gas analysis-ORSAT method.
	Contact Periods 09
V	**ADVANCED ENGINEERING MATERIALS**: Introduction to Polymers - Thermoplastic and Thermosetting. Properties of polymers: Tg, Tacticity, & Molecular weight. Composites - Fibre-reinforced composites and its applications. Abrasives - Moh's scale of hardness - types - natural [Diamond] - synthetic [SiC]; Refractories - characteristics - classifications [Acidic, basic and

	neutral refractories] - properties - refractoriness - RUL - porosity - thermal spalling; Lubricants - definition - function - characteristics - properties - viscosity index, flash and fire points, cloud and pour points, oiliness; Nano materials - CNT- synthesis [laser evaporation] - applications.
Contact Periods	**09**
Total Periods	**45**
Text Books	1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018. 2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008. 3. S.S. Dara, "A Text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.
Reference Books	1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, "Textbook of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018. 2. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017. 3. Friedrich Emich, "Engineering Chemistry", Scientific International PVT, LTD, New Delhi, 2014. 4. Shikha Agarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019. 5. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013. 6. Gowariker V.R., Viswanathan N.V., and Jayadev Sreedhar, "Polymer Science", New Age International P (Ltd.,), Chennai, 2022.

Course Code	Title					
25UADE103	CALCULUS AND MATRICES					
Semester: I	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	3	1	0	4		

Unit	Description	
I	**MATRICES:** Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley – Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications: Stretching of an elastic membrane.	
	Contact Periods	**12**
II	**DIFFERENTIAL CALCULUS:** Representation of functions – Limit of a function – Continuity – Derivatives – Differentiation rules (sum, product, quotient, chain rules) – Implicit differentiation – Logarithmic differentiation – Applications : Maxima and Minima of functions of one variable.	
	Contact Periods	**12**
III	**FUNCTIONS OF SEVERAL VARIABLES:** Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Applications : Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.	
	Contact Periods	**12**
IV	**INTEGRAL CALCULUS:** Definite and Indefinite integrals – Substitution rule – Techniques of Integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals – Applications : Hydrostatic force and pressure, moments and centres of mass.	
	Contact Periods	**12**
V	**MULTIPLE INTEGRALS:** Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications : Moments and centres of mass, moment of inertia.	
	Contact Periods	**12**

Text Books	1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley, 10th Edition,2020. 2. Grewal.B.S., “Higher Engineering Mathematics”, Khanna Publishers, New Delhi, 44th Edition, 2018. 3. James Stewart, "Calculus: Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015.
Reference Books	1. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition 2. Bali. N., Goyal. M. and Watkins. C., “Advanced Engineering Mathematics”,Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi,7th Edition, 2009. 3. Jain. R.K. and Iyengar. S.R.K., “Advanced Engineering Mathematics”, Narosa Publications, New Delhi, 5th Edition, 2016. 4. Narayanan. S. and Manica II, S.Viswanathan Publishers Pvt. Ltd., Chennai, 2009.

Course Code	Title					
25UADE104	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING					
Semester: II	L	T	P	Credits	CIA: 50 Marks	ESE: 50 Marks
	2	0	2	3		

Unit	Description	
I	**DC CIRCUIT ANALYSIS AND THEOREMS:** Basic Components of electric Circuits, Basic Laws - Ohms Law, Kirchhoff's Current Law, Kirchhoff's voltage law. Series and Parallel Connected active and passive elements. Network Theorems for DC Circuits - Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer, Star Delta Conversion.	
	Contact Periods	**06**
II	**SINUSOIDAL STEADY STATE AND TRANSIENTS ANALYSIS**: Characteristics of Sinusoids-Response of RC, RL and RLC Circuits for sinusoidal excitations. AC Circuit Power Analysis – Instantaneous Power, Average Power, apparent Power and Power Factor, Transient response of RC, RL and RLC circuits to excitation by Step Signal. Resonance -Frequency Response of Series and Parallel RLC circuit, Q-factor.	
	Contact Periods	**06**
II	**SEMICONDUCTORS AND TRANSPORT DEVICES:** Fundamental of Semiconductors - Carrier concentration in intrinsic semiconductors - Extrinsic semiconductors – Carrier concentration in N-type & P type semiconductors - Variation of carrier concentration with temperature - PN junction diode - Zener diode.	
	Contact Periods	**06**
IV	**FIELD EFFECT TRANSISTORS:** Junction Field Effect Transistor: construction, operation, Drain and Transfer characteristics - MOSFET: Enhancement MOSFET, Depletion MOSFET, Drain and Transfer characteristics, Biasing of FET.	
	Contact Periods	**06**
V	**SPECIAL SEMICONDUCTOR DEVICES:** Construction, operation, and V-I characteristics:LED - Organic LED - SCR – DIAC - TRIAC - Photo diode -Laser diode -Photo Transistor.	
	Contact Periods	**06**
	LIST OF EXPERIMENTS	
	Contact Periods	**30**

1. Verifications of KVL & KCL.
2. Verifications of Thevenin & Norton theorem.
3. Verification of Superposition Theorem.
4. Verification of maximum power transfer Theorem.
5. Characteristics of PN and Zener diodes.
6. Half wave and Full wave rectifier.
7. Input Output Characteristics of BJT – Common Emitter configuration.

8. Input Output Characteristics of MOSFET. 9. Frequency response of CE - BJT amplifiers. **10.** Frequency response of CS amplifiers.	
Total Periods	**60**
Text Books	1. Hayt Jack Kemmerly, Steven Durbin, "Engineering Circuit Analysis", McGrawHill education, 9th Edition, 2018. 2. Charles K. Alexander & Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", McGraw- Hill, 2nd Edition, 2003. 3. Joseph Edminister and Mahmood Nahvi, ―Electric Circuits, Schaum‘s Outline Series, Tata McGraw Hill Publishing Company, New Delhi, Fifth Edition Reprint 4. 2016. 5. Robert L. Boylestad and Louis Nasheresky, “Electronic Devices and Circuit Theory”, 11th Edition, Pearson Education / PHI, 2017. 6. Adel .S. Sedra, Kenneth C. Smith, "Micro Electronic Circuits", Oxford University Press, 7th Edition, 2014. 7. David Bell, "Fundamentals of Electric Circuits", Oxford University press, 7th Edition, 2009.
Reference Books	1. Robert.L. Boylestead, "Introductory Circuit Analysis", Pearson Education India,12th Edition, 2014. 2. John O Mallay, Schaum’s Outlines "Basic Circuit Analysis", The McGraw Hill companies, 2nd Edition, 2011. 3. Allan H. Robbins, Wilhelm C. Miller, “Circuit Analysis Theory and Practice", Cengage Learning, Fifth Edition, 1st Indian Reprint 2013. 4. MillmanJ ,Halkias C and Parikh C “Integrated Electronics”, Mc Graw Hill, 2017. 5. Donald Schilling and Charles BeloveElectronic Circuits, 3rd Edition, Mc-Graw Hill,2002. 6. L. Umanand, Power Electronics, Essentials and Applications, John Wiley India Pvt.Ltd, 2009. 7. Dr. P. S. Bimbhra, ―Power Electronics‖, Khanna Publishers, Delhi, 2012.

Course Code	Title					
25UADE106	COMPUTER PROGRAMMING AND APPLICATIONS					
Semester: I	L	T	P	Credits	CIA: 50 Marks	ESE: 50 Marks
	2	0	2	3		

Unit		
I	**PROBLEM SOLVING:** Problem Solving: Introduction to computer-based problem solving, Program design and implementation issues, Algorithms for problem solving: Simple problems based on numerical methods, Operations on ordered set of elements, Solving quadratic equations, Operations on matrices.	
	Contact Periods	**06**
II	**OVERVIEW OF C:** Basic Data types, Modifying the Basic Datatypes, Identificr-Names, Variables, Type Qualifiers, Constants, Operators, Expressions, Selection, Iteration and Jump Statements. Introduction to Arrays: Declaration, Initialization -One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy - Selection sort, linear and binary search.	
	Contact Periods	**06**
III	**FUNCTIONS AND POINTERS:** Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) -Recursion, Binary Search using recursive functions -Pointers - Pointer operators - Pointer arithmetic Arrays and pointers - Array of pointers -Parameter passing: Pass by value, Pass by reference.	
	Contact Periods	**06**
IV	**STRUCTURES AND UNIONS:** Structure - Nested structures - Pointer and Structures Array of structures - Self-referential structures - Dynamic memory allocation - Singly linked list - typedef- Union - Storage classes and Visibility.	
	Contact Periods	**06**
V	FILE PROCESSING: Files - Types of file processing: Sequential access, Random access Sequential access file - Random access file - Command line arguments.	
	Contact Periods	**06**
LIST OF EXPERIMENTS		
	Contact Periods	**30**

1. Decision-making constructs: if-else, goto, switch-case, break-continue
2. Loops: for, while, do-while
3. Arrays: 1D and 2D, Multi-dimensional arrays, traversal, Sorting and Searching
4. Strings: opcrations
5. Functions: call, return, passing parameters by (value, reference), passing arrays to function.
6. Recursion
7. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers
8. Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions.
9. Files: reading and writing, File pointers, file operations, random access, processor directives.

10. C Program for Gauss Elimination Method l1.C Program for Sum of Taylor Series Program 12. C Program for Trapezoidal Method 13.C Program for Gauss-Jordan Method 14. C Program for Simpson 1/3 Rule 15.C program for operations on Matrices 16. Mini Project	
Total Periods	**60**
Text Books	1. 1. Yashwant Kanetkar, Let Us C: Authentic guide to C programming language 19th Edition Paperback - December 2022. 2. 2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
Reference Books	1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018. 2. HarshaPriya, R. Ranjeet, Programming and Problem Solving Through C"Language, lst Edition, Fire Wall Media, 2015. 3. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C",Second Edition, Oxford University Press, 2013. 4. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C'", Ist Edition, Pearson Education, 2013. 5. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.

Course Code	Title					
25UADE105	Introduction to Engineering Practices					
Semester: I	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	2	0	2	3		

Unit		
I	**Engineering Safety and Materials:** Safety protocols in workshops and labs, Engineering materials and their properties, Introduction to manufacturing processes, Measurement techniques and instruments, Basics of fastening and joining methods, Environmental and ethical considerations in engineering	
	Contact Periods	**09**
II	**Mechanical Workshop Practices:** Basics of fitting and sheet metal work, Lathe, milling, and drilling operations, Introduction to welding techniques, CNC machining basics, 3D printing and additive manufacturing, Maintenance and troubleshooting of mechanical systems	
	Contact Periods	**09**
III	**Electrical and Electronics Workshop Practices:** Electrical wiring and circuit design, Basics of PCB design and soldering, Introduction to electrical motors and power supplies, Use of oscilloscopes and multimeters, Troubleshooting electrical circuits, Renewable energy applications in engineering	
	Contact Periods	**09**
IV	**Computer Programming Basics:** Introduction to programming languages (C/Python), Basic algorithms and flowcharting, Control structures and functions, Debugging techniques and IDEs Hands-on coding exercises	
	Contact Periods	**09**
V	**Project-Based Learning:** Teamwork and project management techniques, Mini-projects integrating mechanical, electrical, and coding skills, Introduction to Arduino and IoT, Documentation and report writing, Engineering ethics in practice, Presentation and communication skills	
	Contact Periods	**09**
LIST OF EXPERIMENTS		
	Contact Periods	**45**

Text Books	1.K. Venkat, "Workshop Practice," Oxford University Press, 2019. 2.S.K. Hajra Choudhury, "Elements of Workshop Technology," Media Promoters &

	Publishers, 2018. 3.R. S. Sedha, "A Textbook of Applied Electronics," S. Chand, 2020.
Reference Books	1. A. Bhattacharya, "Electrical and Electronic Engineering Workshop Practice," New Age International, 2017. 2. Yashavant Kanetkar, "Let Us C," BPB Publications, 2021.

Course Code	Title					
25UADE201	NUMERICAL METHODS AND COMPLEX FUNCTIONS					
Semester: II	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	2	2	0	3		

Unit		
I	**VECTOR CALCULUS:** Introduction of Gradient and directional derivative – Divergence and curl - Vector identities – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface integral - Area of a curved surface - Volume integral – Green's, Gauss divergence and Stoke's theorems (excluding proofs) – Verification and application in evaluating line, surface and volume integrals.	
	Contact Periods	**09**
II	**SOLUTION OF LINEAR EQUATIONS AND EIGENVALUE PROBLEMS:** Solution of algebraic and transcendental equations – Fixed point iteration method – Newton Raphson method – Solution of linear system of equations – Direct methods: Gauss elimination method – Gauss Jordan method – Pivoting – Iterative methods of Gauss Jacobi and Gauss Seidel – Dominant Eigenvalues of a matrix by Power method.	
	Contact Periods	**09**
III	**INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION:** Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivatives using interpolation polynomials – Single and double numerical integrations using Trapezoidal and Simpson's 1/3 rules.	
	Contact Periods	**09**
IV	**ANALYTIC FUNCTIONS:** Analytic functions – Necessary and sufficient conditions for analyticity in Cartesian and polar coordinates – Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions $w=z+c$, az, $1/z$, z^2- Bilinear transformation**.**	
	Contact Periods	**09**
V	**COMPLEX INTEGRATION:** Line integration – Cauchy's integral theorem and Cauchy's integral formula – Taylor's and Laurent's series expansions – Singularity – Residues – Cauchy's residue theorem – Evaluation of real definite integrals as contour integrals around unit circle (excluding poles on the real axis).	

	Contact Periods	**09**
	Total Periods	**45**
Text Books	1. Veerarajan T, Engineering Mathematics for first year, 3rd edition, Tata McGraw Hill Education Pvt. Ltd, New Delhi, 2019. 2. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2017. 3. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.	
Reference Books	1. Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016. 2. Ramana. B.V., "Higher Engineering Mathematics", 1st Edition, Tata McGraw Hill Education Pvt. Ltd, New Delhi, 2017. 3. Srimantha Pal and Bhunia. S.C, "Engineering Mathematics" Oxford University Press, 2015.	

Course Code	Title					
25UADE203	Sensors, Measurements and Instrumentations					
Semester: II	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	2	0	1	3		

Unit	Description	
I	**SENSORS & TRANSDUCER:** Definition, Classification & selection of sensors, Measurement of displacement using Potentiometer, LVDT & Optical Encoder, Measurement of force using strain gauge, Measurement of pressure using LVDT based diaphragm & piezoelectric sensor.	
	Contact Periods	**09**
II	Thermocouple & RTD, Concept of thermal imaging, Measurement of position using Hall effect sensors, Proximity sensors: Inductive & Capacitive, Use of proximity sensor as accelerometer and vibration sensor, Flow Sensors: Ultrasonic & Laser, Level Sensors: Ultrasonic & Capacitive.	
	Contact Periods	**09**
III	**VIRTUAL INSTRUMENTATION:** Graphical programming techniques, Data types, Advantage of Virtual Instrumentation techniques, Concept of WHILE & FOR loops, Arrays, Clusters & graphs, Structures: Case, Sequence & Formula nodes, Need of software based instruments for industrial automation.	
	Contact Periods	**09**
IV	**DATA ACQUISITION METHODS:** Basic block diagram, Analog and Digital IO, Counters, Timers, Types of ADC: successive approximation and sigma-delta, Types of DAC: Weighted Resistor and R-2R Ladder type, Use of Data Sockets for Networked Communication.	
	Contact Periods	**09**
V	**INTELLIGENT SENSORS:** General Structure of smart sensors & its components, Characteristic of smart sensors: Self calibration, Selftesting & self-communicating, Application of smart sensors: Automatic robot control & automobile engine control.	
	Contact Periods	**09**
	Total Periods	**45**

Text Books	1. 1. DVS Murthy, Transducers and Instrumentation, PHI 2nd Edition 2013 2. 2. D Patranabis, Sensors and Transducers, PHI 2nd Edition 2013. 3. 3. S. Gupta, J.P. Gupta / PC interfacing for Data Acquisition & Process Control, 2nd ED / Instrument Society of America, 1994. 4. 4. Gary Johnson / Lab VIEW Graphical Programing II Edition / McGraw Hill 1997.
Reference Books	1. 1. Arun K. Ghosh, Introduction to measurements and Instrumentation, PHI, 4th Edition 2012. 2. 2. A.D. Helfrick and W.D. cooper,Modern Electronic Instrumentation & Measurement Techniques, PHI – 2001 3. 3. Hermann K.P. Neubert, “Instrument Transducers” 2nd Edition 2012, Oxford

	University Press.

Course Code	Title					
25UADE206	Analog Electronics					
Semester: II	L	T	P	Credits	CIA: 50 Marks	ESE: 50 Marks
	2	2	0	3		

Unit	Description	
I	**TRANSISTOR AMPLIFIERS:** Load line, operating point, biasing methods: Voltage divider bias, BJT small signal model – Analysis of CE, CC amplifiers- Gain and frequency response – MOSFET small signal model– Analysis of CS, Source follower, Differential amplifier.	
	Contact Periods	**06**
II	**FEEDBACK AMPLIFIERS:** General Feedback Structure – Properties of negative feedback – Basic Feedback Topologies – Feedback amplifiers: Voltage Series, Voltage Shunt, Current Series, Current Shunt– Stability analysis of feedback amplifier – Frequency Compensation.	
	Contact Periods	**06**
II	**OSCILLATORS AND MULTIVIBRATOR:** Classification, Barkhausen Criterion - Mechanism for start of oscillation and stabilization of amplitude, Types of Oscillators: Hartley, Colpitts, Phase shift, Wien bridge – Multivibrator: Astable and Monostable multivibrator.	
	Contact Periods	**06**
IV	**BASICS OF OPERATIONAL AMPLIFIERS:** Basic information about op-amps – Ideal Operational Amplifier – General operational amplifier stages – Internal circuit diagrams of IC741, DC and AC performance characteristics, slew rate, Open and closed loop configurations	
	Contact Periods	**06**
IV	**APPLICATIONS OF OPERATIONAL AMPLIFIERS:** Adder, Subtractor, Integrator, Differentiator, Comparators, Instrumentation amplifier, Schmitt trigger, Precision rectifier, Clipper and Clamper – Active filters: Low-pass, High-pass filters.	
	Contact Periods	**06**
	LIST OF EXPERIMENTS	
	Contact Periods	**30**
	1. Frequency response of CE - BJT amplifiers. 2. Frequency response of CS amplifiers. 3. CMRR measurement of Differential amplifier. 4. Design and Simulation of Oscillator 5. Design and Simulation of Multivibrator. 6. Inverting and Non-Inverting Amplifier using Op-Amp.	
	Total Periods	**60**

Text Books	1. David A. Bell, "Electronic Devices and Circuits", Oxford Higher Education Edition, 2010. 2. Robert L. Boylestad and Louis Nasheresky, “Electronic Devices and Circuit 11th Edition, Pearson Education / PHI, 2017. 3. Adel .S. Sedra, Kenneth C. Smith, "Micro Electronic Circuits", Oxford University Press, 7th Edition, 2014. 4. D.Roy Choudhry, Shail Jain, “Linear Integrated Circuits”, New Age International Pvt. Ltd.,2018, Fifth Edition. 5. Sergio Franco, “Design with Operational Amplifiers and Analog Integrated Circuits”, 4th Edition, Tata McGraw-Hill, 2016.
Reference Books	1. MillmanJ ,Halkias C and Parikh C “Integrated Electronics”, Mc Graw Hill, 2017. 2. Donald Schilling and Charles BeloveElectronic Circuits, 3rd Edition, Mc-Graw Hill, 2002. 3. L. Umanand, Power Electronics, Essentials and Applications, John Wiley India Pvt.Ltd, 2009. 4. Ramakant A. Gayakwad, “OP-AMP and Linear ICs”, 4th Edition, Prentice Hall / Pearson Education, 2015. 5. Robert F.Coughlin, Frederick F.Driscoll, “Operational Amplifiers and Linear Integrated Circuits”, Sixth Edition, PHI, 2001.

Course Code	Title					
25UADE205	Engineering Graphics					
Semester: II	L	T	P	Credits	CIA: 50 Marks	ESE: 50 Marks
	2	2	0	3		

Unit	Description	
I	**PLANE CURVES** Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.	
	Contact Periods	**09**
II	**PROJECTION OFPOINTS, LINES AND PLANE SURFACE** Orthographic projection- principles-Principal planes-First angle projection-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 rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.	
	Contact Periods	**09**
III	**PROJECTION OF SOLIDS AND FREEHAND SKETCHING** Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software	
	Contact Periods	**09**
IV	**PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES** Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones. Practicing three dimensional modeling of simple objects by CAD Software	
	Contact Periods	**09**
V	**ISOMETRIC AND PERSPECTIVE PROJECTIONS** Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method. Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)	
	Contact Periods	**09**
	Total Periods	**45**

Text Books	1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019. 2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018. 3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015
Reference Books	1. BasantAgarwal and Agarwal C.M.,"Engineering Drawing", McGraw Hill, 2nd Edition, 2019. 2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27thEdition, 2017. 3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005. 4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015. 5. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009. 6. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008. Publication of Bureau of Indian Standards: 1. IS10711 — 2001: Technical products Documentation — Size and layout of drawing sheets. 2. IS 9609 (Parts 0 & 1) — 2001: Technical products Documentation —Lettering. 3. IS 10714 (Part 20) — 2001 & SP 46 — 2003: Lines for technical drawings. 4. IS 11669 — 1986 & SP 46 —2003: Dimensioning of Technical Drawings. 5. IS 15021 (Parts 1 to 4) — 2001: Technical drawings — Projection Methods.

Course Code	Title					
25UADE202	Principles of Flight Mechanics					
Semester: II	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	2	0	1	3		

Unit	Description	
I	**Introduction to Aerodynamics:** Definition and significance of aerodynamics, Properties of air and atmospheric layers, Basic fluid mechanics principles, Concept of pressure, temperature, and density, Streamlines and flow patterns, Introduction to aerodynamic forces	
	Instructional Hours	9
II	**Fundamentals of Fluid Flow:** Types of fluid flow: Laminar vs. turbulent, Continuity equation and mass conservation, Bernoulli's principle and its applications, Viscosity and boundary layer concepts, Flow separation and stall basics, Wind tunnels and experimental aerodynamics	
	Instructional Hours	9
III	**Airfoil and Wing Characteristics:** Airfoil nomenclature and terminology, Lift and drag forces on an airfoil, Angle of attack and its effects, Reynolds number and aerodynamic efficiency, Basics of wing design and planform, Importance of aspect ratio and wing loading	
	Instructional Hours	9
IV	**Basics of Lift and Drag:** Generation of lift and Newton's laws, Pressure distribution over an airfoil, Drag types: Parasite and induced drag, Lift-to-drag ratio and aerodynamic efficiency, Effects of flaps and slats on lift, Introduction to high-lift devices	
	Instructional Hours	9
V	**Applications of Aerodynamics:** Role of aerodynamics in aviation and UAVs, Basics of propeller and jet propulsion, Effects of aerodynamics in automobiles, Wind energy and turbine aerodynamics, Computational tools for aerodynamics, Future trends in aerodynamics research	
	Instructional Hours	9
	Total Hours	**45**

Text Books	1. J. D. Anderson, "Introduction to Flight," McGraw Hill, 2020. 2. Houghton & Carpenter, "Aerodynamics for Engineering Students," Butterworth-Heinemann, 2016. 3. E. L. Houghton, "Aerodynamics for Engineers," Pearson, 2015
Reference Books	1. S. A. Brandt, "Introduction to Aerodynamics," Wiley, 2019. 2. A. Pope, "Low-Speed Aerodynamics," Cambridge University Press, 2017.

Course Code	Title

25UADE204	Introduction to UAV Systems and Components					
Semester: II	L	T	P	Credits	CIA: 40 Marks	ESE: 60 Marks
	3	0	0	3		

Unit	Description	
I	**Introduction to UAVs:** Definition and classification of UAVs, History and evolution of UAV technology, Civil and military applications of UAVs, Advantages and limitations of UAVs, Types of UAV configurations (fixed-wing, rotary-wing, hybrid), Overview of UAV regulations and safety considerations	
	Instructional Hours	09
II	**UAV Structural Components:** Airframe structures and materials used in UAVs, UAV weight classification and payload capacity, UAV wings and fuselage, Landing gear types and functions, Importance of aerodynamics in UAV structure, Assembly and integration of UAV components	
	Instructional Hours	09
III	**UAV Power and Propulsion Systems:** UAV power sources: Batteries, fuel cells, solar power Electric propulsion systems: BLDC motors and ESCs, Internal combustion engines for UAVs, Propeller types and selection criteria, UAV thrust and power management, Efficiency and endurance factors in UAV propulsion	
	Instructional Hours	09
IV	**UAV Sensors and Avionics**: Introduction to UAV avionics systems, Types of sensors: IMU, GPS, barometer, magnetometer, Flight control systems and autopilot fundamentals, UAV communication systems and data links, Payload sensors: Cameras, LiDAR, thermal imaging, Integration of sensors for autonomous navigation	
	Instructional Hours	09
V	**UAV Applications and Future Trends:** UAV applications in agriculture, surveillance, and delivery, Role of UAVs in disaster management and search & rescue, Swarm UAV technology and cooperative UAV operations, Artificial intelligence and machine learning in UAVs, Future trends in UAV technology and urban air mobility, Ethical and legal considerations in UAV deployment	
	Instructional Hours	09
	Total Hours	45 Hrs

Text Books	1.Paul G. Fahlstrom, Thomas J. Gleason, "Introduction to UAV Systems," Wiley, 2022. 2.Reg Austin, "Unmanned Aircraft Systems: UAVS Design, Development, and Deployment," Wiley, 2019. 3.Kimon P. Valavanis, George J. Vachtsevanos, "Handbook of Unmanned Aerial Vehicles," Springer, 2015.
Reference Books	1.Randal W. Beard, Timothy W. McLain, "Small Unmanned Aircraft: Theory and Practice," Princeton University Press, 2012. 2.A. R. Jha, "Theory, Design, and Applications of Unmanned Aerial Vehicles," CRC Press, 2016.

P. K. DAS INSTITUTE OF SOCIAL SCIENCES AND TECHNOLOGY
(Deemed to be University under Distinct Category)
Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

Scheme of Examination
BACHELOR OF PERFORMING ARTS
Programme Code: UEN
(Applicable to the students admitted during the year 2024-2025)

I Year													
Semester I													
SEMESTER	**Part**	**Course Code**	**Name of the Course**	**Instruction Hours / Week**				**Examination Marks**				**Credits**
				L	T	P	**Total**	**Duration Hours**	**CIA**	**ESE**	**Total**	
I	I	24UPAC101	**DSC1:** Evolution of Indian Theatre	3	1	-	**4**	3	25	75	100	**4**
	I	24UPAC102	**DSC2:** Fundamentals of Acting	4	-	-	**4**	3	25	75	100	**4**
	I	24UPAC103	**DSC3:** Dance History & Appreciation	-	-	6	**6**	3	25	75	100	**3**
	III	24UPAG101 24UPAG102 24UPAG103	**GEC1:** Psychology of Performance Cultural Anthropology Literature & Theatre	3	1	-	**4**	3	25	75	100	**3**
	IV	24UPAA101/ 24UPAA102	**AEC1(E):** ENGLISH I	2	1	-	**3**	3	20	30	50	**2**
	IV	24UPAA103 24UPAA104 24UPAA105 24UPAA106 24UPAA107	**AEC3(L):** Tamil I Malayalam I Hindi I French I Sanskrit I	2	1	-	**3**	3	20	30	50	**2**
	V	24UPAS101	**SEC1(Practical):** Self-Grooming and Personal Makeup	-	-	4	**4**	3	25	75	100	**2**
	VI	24UPAV101	**VAC1:** Environmental Studies	2	-	-	**2**	-	50	-	50	**2**
	-		Extension Activities -Outreach Programmes (Panchayat, Municipality)	-	-	-	-	**Grade**				
	DTC - I - Additional Credit Courses (SWAYAM- NPTEL or Any other courses certified by Statutory Bodies)											
	Outreach Programmes - Community Engagement and Services											
							30				**650**	**22**

I Year												
Semester II												
	Part	**Course Code**	**Name of the Course**	**Instruction Hours / Week**				**Examination Marks**				**Credits**
				L	T	P	**Total**	**Duration Hours**	**CIA**	**ESE**	**Total**	
II	I	24UPAC204	**DSC4:** Music Theory	3	-	2	5	3	25	75	100	4
	I	24UPAC205	**DSC5:** Stage Craft & Technical Production	3	-	2	5	3	25	75	100	4
	I	24UPAC206	**DSC6**(Practical): Ear Training	-	-	6	6	3	25	75	100	3
	I	24UPAC207	**DSC7**	-	-	4	4	3	25	50	75	2
	III	24UENG204 24UPAG205 24UPAG206	**GEC1:** Generic Elective Course	3	1	-	4	3	25	75	100	3
	IV	24UPAA208 / 24UPAA209	**AEC2(E):** ENGLISH II	2	1	-	3	3	20	30	50	2
	IV	24UPAA210 24UPAA211 24UPAA212 24UPAA213 24UPAA214	**AEC4(L):** Tamil II Malayalam II Hindi II French II Sanskrit II	2	1	-	3	3	20	30	50	2
	VII	24UPAI201	**SEC2(Practical)**: Day-to-Night Makeup Techniques	-	-	-	-	3	25	75	100	2
	-	24UPAD201	**Addon Course –** Industry Institute Linkage - Python	-	-	-	-	**Grade**				
	-		IKS Project (External)	-	-	-	-	**Grade**				
	DTC - II - Additional Credit Courses ((SWAYAM- NPTEL or Any other courses certified by Statutory Bodies)											
	Outreach Programmes - Community Engagement and Services											
							30				**675**	**22**

II Year												
Semester III												
III	I	24UPAC308	**DSC8:** History of Music	3	-	2	**5**	3	25	75	100	**4**
	I	24UPAC309	**DSC9:** Voice & Speech for Performers	3	-	2	**5**	3	25	75	100	**4**
	I	24UPAC310	**DSC10:** Creative Writing	-	-	6	**6**	3	25	75	100	**3**
	II	24UPAE301	**DSE1**: Script Writing Western Dance Portfolio Management	4	-	-	**4**	3	25	75	100	**4**
	III	24UPAG307 24UPAG308 24UPAG309	**GEC3:** Digital Media Skills Dance and Physiology Sociology of Performance Spaces	3	1	-	**4**	3	25	75	100	**3**
	V	24UPAS302	**SEC3:** Event Management Digital Narration	-	-	4	**4**	3	20	30	50	**2**
	VI	24UPAV302	**Yoga for Human Excellence**	2	-	-	**2**	-	50	-	50	**2**
							30				**600**	**22**
II Year												
Semester IV												
IV	I	24UPAC411	**DSC11:** Improvisation & Creative Expression	2	-	4	**6**	3	25	75	100	**4**
	I	24UPAC412	**DSC12:** Fundamentals of Set Design	1	-	2	**5**	3	25	75	100	**3**
	I	24UPAC413	**DSC13:** Basics of Costume Design	-	-	4	**4**	3	25	50	75	**2**
	II	24UPAE402	**DSE2:** Music Composition Theatre Direction Dance Ethnography	3	-	2	**5**	3	25	75	100	**4**
	III	24UPAG404 /405/406	**GEC4:** Spoken French/German	3	1	-	**4**	3	25	75	100	**3**
	V	24UPAS403	**SEC4:** Business in Arts Management Advanced Makeup Technique	-	-	4	**4**	3	20	30	50	**2**
	VI	24UPAV403 24UPAV404 24UPAV405	Human Rights & Constitution of India Women's Rights Indian Culture & Heritage	2	-	-	**2**	-	50	-	50	**2**
	VII	24UPAI402	SDG Survey & Project/ Industrial Visit	-	-	-	**-**		25	75	100	**2**

							30				**675**	**22**

III Year												
Semester V												
V	I	24UPAC514	**DSC14:** Digital media in Performing Arts	2	-	4	**6**	3	25	75	100	**4**
	I	24UPAC515	**DSC15:** Ensemble Performance	2	-	4	**6**	3	25	75	100	**4**
	I	24UPAC516	**DSC16**: Advanced Acting Techniques	-	-	8	**8** 6+2	3	25	75	100	**4**
	II	24UPAE503	**DSE3:** Voice over & Audio Performance Dance in World Cultures Cultural & Folk Dance	4	-	-	**4**	3	25	75	100	**4**
	II	24UPAE504	**DSE4:** Circus Arts Puppettary Classical Acting Style	4	-	-	**4**	3	25	75	100	**4**
	V	24UPAS504	**SEC5**: Applied Theatre in Community Settings Street Play	-	-	4	**4**	3	20	30	50	2
	-	24UPAD202	Addon Course – Industry Institute Linkage – AI & ML	-	-	-	**-**	**Grade**				
							30				**550**	**22**
III Year												
Semester VI												
VI	I	24UPAC617	**DSC17:**Advanced Dance Techniques	2	-	4	**6**	3	25	75	100	**4**
	I	24UPAC618	**DSC18:**Intermediate Music Theory & Analysis	2	-	4	**6**	3	25	75	100	**4**
	II	24UPAE605	**DSE5: Diction for Singers** Opera in Film&Multimedia Opera Performance	4	-	-	**4**	3	25	75	100	**4**
	II	24UPAE606	**DSE6:** Dialects & Accents for Actors Kinesiology for Actors Opera and Society	4	-	-	**4**	3	25	75	100	**4**
	V	24UPAS605	**SEC6(Practical):** Dance Theraphy & Wellness Comedic Acting Techniques	-	-	4	**4**	3	20	30	50	**2**
	V	24UPAS606	**SEC6(Practical):** Professional Development in Performing Arts Capstone Project in Performing Arts	-	-	4	**4**	3	20	30	50	**2**
	VI	24UPAV606	Gandhian Thoughts	2	-	-	**2**	-	50	-	50	**2**

		24UPAV607 24UPAV608	Waste Management Consumer Affairs									
							30				**550**	**22**

IV Year												
Semester VII												
VII	I	24UPAC719	**DSC19:** Contemporary Theatre Practices	3	-	2	**5**	3	25	75	100	**4**
	I	24UPAC720	**DSC20:** Theatre in Education	3	-	2	**5**	3	25	75	100	**4**
	I	24UPAC721	**DSC21(Practical):** Shakespearean Theatre	-	-	6	**6**	3	25	75	100	**3**
	I	24UPAC722	**DSC22(Practical):** Choreography & dance Composition	-	-	6	**6**	3	25	75	100	**3**
	II	24UPAE707	**DSE7:** Kinesiology for Dancers/Music and Society /Self-care & Fitness	4	-	-	**4**	3	25	75	100	**4**
	II	24UPAE708	**DSE8:** Cultural Sensitivity Professional Etiquette Script Analysis	4	-	-	**4**	3	25	75	100	**4**
							30				**600**	**22**
IV Year												
Semester VIII												
VIII	I	24UPAC823	**DSC23**: Ethics in Performing Arts	4	-	2	**6**	3	25	75	100	**4**
	I	24UPAC824	**DSC24:** Advanced Set & Costume Designing	-	-	-	**8**	3	25	75	100	**4**
	I	24UPAC825	**DSC25:** Contemporary Issues in Performing Arts	-	-	4	**4**	3	20	30	50	**2**
	VIII	24UPNR801	Research Project / Dissertation	-	-	12	**12**	3	100	200	300	**12**
							30				**550**	**22**
			Additional Credit Optional (I – II))									

Distribution of Credits and Marks

Semester	Credits	No. of Courses	Marks
I	22	8	650
II	22	6+1	675
III	22	7	600
IV	22	6+1	675
V	22	6	550
VI	22	6	550
VII	22	6	550
VIII	22	3+1	600
Total	**176**	**48 +3**	**4850**

Category 1: Discipline Specific Courses –DSC (Major Courses – 25 Courses with 88 Credits)

The DSC courses are to be studied compulsorily by the students as mandatory Courses. The students are required to take DSCs across eight semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline.

Category 2: Discipline Specific Elective Courses – DSE (Minor Stream Courses- 8 Courses – 32 Credits)

The DSE courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any **EIGHT** courses from the following list.

Category 3: Generic Elective Courses – GEC (Multidisciplinary Courses – 4 Courses - 12 Credits)

The GEC are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope and need of the department. The students has to subscribe any 4 courses in the following list:

Category 4: Ability Enhancement Courses – AEC

The AEC Courses enable the students to develop a deeper sense of commitment to oneself and to the society and nation largely. These courses will supplement in better understanding of how to integrate knowledge to application into a society. These are the generic skill courses which are basic and needed to

all to pursue any career. These courses ensure progression across all careers. In addition to English, a candidate shall opt for any of the languages studied at the Pre University or equivalent level.

Category 5: Skill Enhancement Courses – SEC (Practical, Soft Skill, Hands on Session based on Student Need – 6 Courses – 12 Credits)

The SEC courses are to promote skills pertaining to a particular field of study. The purpose of these courses is to provide students life-skills in the hands-on mode so as to increase their employability/ Self-employment. The objective is to integrate discipline related skills in a holistic manner with general education. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

Category 6: Value Added Courses – VAC (Common for all UG – 4 Courses – 8 Credits)

The VAC courses are part of the curriculum designed to provide the necessary skills to increase the employability quotient and equipping the students with essential skills to succeed in life.

Category 7: Summer Internship

The Students are to do the Summer Internship during second and fourth semester for a period of 4 weeks, in such case the fast track classes during summer vacation for Regular courses to provide flexibility in learning additional courses based on the availability of the teachers and students. The Continuous Internal Assessment mark distribution for Summer Internship is as follows:

Category 8: Research Project / Dissertation

Each Student should undertake a project work during the Eighth semester and submit the report. A guide will be allotted to each student by the respective Department. A student can select any research topic in discussion with the guide. It is mandatory to have three Reviews and recorded as per the Project Plan communicated to the students. The Continuous Internal Assessment mark distribution for Project is as follows:

AREAS OF DISTINCTION (ALL PROGS.)

S. No.	Semester	Distinct Areas of Study	Credits (40)
1	Sem 1	EVS Project (with Forest College & Agri University)	2
2	Sem 2	IKS Project (External)	4
3	Sem 3	SDG Survey & Project/ Industrial Visit	2 +2
4	Sem 4	L&T, Infosys, Oracle & IBM - (Industry run Add on) & Online Credit (SWAYAM/ Coursera) AI Skills	4 +2
5	Sem 5	NASCOM/ MSME/ Internship/ Skill Development	4
6	Sem 6	Professional Development (Placement) - Extra/ Core Credit	4

7	**Sem 7**	**Subject Specialization Project**	**4**
8	**Sem 8**	**Research Project**	**8**

P. K. DAS INSTITUTE OF SOCIAL SCIENCES AND TECHNOLOGY

(Deemed to be University under Distinct Category)

Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

Scheme of Examination

BACHELOR OF INDOLOGY

Programme Code: UIN

(Applicable to the students admitted during the year 2025-2026)

SEMESTER	Part	Course Code	Name of the Course	Instruction Hours / Week				Examination Marks				Credits
				L	T	P	Total	Duration	CIA	ESE	Total	
I Year												
Semester I												
I	I	25UINC101	**DSC1:** Introduction to Indology	3	1	-	**4**	3	25	75	100	**4**
	I	25UINC102	**DSC2:** History of Ancient India – I	4	-	-	**4**	3	25	75	100	**4**
	I	25UINC103	**DSC3:** Indian Philosophy – Practical (Vedic & Upanishadic)	-	-	6	**6**	3	25	75	100	**3**
	III	25UINA101/ 25UINA102	Art and Architecture of Ancient India – I Sanskrit Language – 1	3	1	-	**4**	3	25	75	100	**3**
	IV	25UING101	**AEC1(E):** English	2	1	-	**3**	3	20	30	50	**2**
	IV	25UINA103 25UINA104 25UINA105 25UINA106 25UINA107	**AEC3(L):** Tamil I Malayalam I Hindi I French I Sanskrit I	2	1	-	**3**	3	20	30	50	**2**
	V	25UINS101	**SEC1(Practical):** Basic of Photography	-	-	4	**4**	3	25	75	100	**2**
	VI	25UINV101	VAC1: Environmental Studies	2	-	-	**2**	-	50	-	50	**2**
	-		Extension Activities -Outreach Programmes (Panchayat, Municipality)	-	-	-	-	**Grade**				
	DTC - I - Additional Credit Courses (SWAYAM- NPTEL or Any other courses certified by Statutory Bodies)											
	Outreach Programmes - Community Engagement and Services											

							30				**650**	**22**
I Year												
Semester II												
		Course Code	Name of the Course	Instruction Hours / Week				Examination Marks				
				L	T	P	**Total**	**Duration**	**CIA**	**ESE**	**Total**	
II	I	25UINC204	Indian Epigraphy and Paleography	3	-	2	5	3	25	75	100	4
	I	25UINC205	History of Ancient India – II (Maurya to Gupta)	3	-	2	5	3	25	75	100	4
	I	25UINC206	Practical in Epigraphy and Paleography	-	-	6	6	3	25	75	100	3
	I	25UINC207	Manuscriptology	-	-	4	4	3	25	50	75	2
	III	25UING202	English 2	3	1	-	4	3	25	75	100	3
	IV	25UINA208/ 25UINA209	AEC2(E): Sanskrit Language – II Art and Architecture of Ancient India – II	2	1	-	3	3	20	30	50	2
	IV	25UINA210 25UINA211 25UINA212 25UINA213 25UINA214	AEC4(L): Tamil II Malayalam II Hindi II French II Sanskrit II	2	1	-	3	3	20	30	50	2
	VII	25UINI201	**SEC2(Practical):** Advance Photography	-	-	-	-	3	25	75	100	2
	-	25UIND201	Addon Course – Industry Institute Linkage - Python	-	-	-	-	**Grade**				
	-		IKS Project (External)	-	-	-	-	**Grade**				
	DTC - II - Additional Credit Courses ((SWAYAM- NPTEL or Any other courses certified by Statutory Bodies)											
	Outreach Programmes - Community Engagement and Services											
							30				**675**	**22**

II Year												
Semester III												
III	I	25UINC308	Extension of Indian Culture in the Neighbouring Countries	3	-	2	**5**	3	25	75	100	**4**
	I	25UINC309	Welfare of Weaker Section	3	-	2	**5**	3	25	75	100	**4**
	I	25UINC310	Field Work	-	-	6	**6**	3	25	75	100	**3**
	II	25UINE301	Digital Literacy	4	-	-	**4**	3	25	75	100	**4**
	III	25UING303	Entrepreneurship and Innovations	3	1	-	**4**	3	25	75	100	**3**
	V	25UINS302	Tribal Project	-	-	4	**4**	3	20	30	50	**2**
	VI	25UINV302	Yoga for Human Excellence	2	-	-	**2**	-	50	-	50	**2**
							30				**600**	**22**
II Year												
Semester IV												
IV	I	25UINC411	Indian Philosophy-I	2	-	4	**6**	3	25	75	100	**4**
	I	25UINC412	Social Inclusion and Exclusion	1	-	2	**5**	3	25	75	100	**3**
	I	25UINC413	Field Work	-	-	4	**4**	3	25	50	75	**2**
	II	25UINE402	Correctional Social Work	3	-	2	**5**	3	25	75	100	**4**
	III	25UING404	Legal Aspects of Business	3	1	-	**4**	3	25	75	100	**3**
	V	25UINS403	Cultural Exchange Project	-	-	4	**4**	3	20	30	50	**2**
	VI	25UINV403/ 25UINV404/ 25UINV405	Human Rights & Constitution of India Women's Rights Indian Culture & Heritage	2	-	-	**2**	-	50	-	50	**2**
	VII	25UINI402	SDG Survey & Project/ Industrial Visit	-	-	-	**-**		25	75	100	**2**
							30				**675**	**22**

III Year												
Semester V												
V	I	25UINC514	Cultural Study Of India – I	2	-	4	**6**	3	25	75	100	**4**
	I	25UINC515	Welfare of Women &Children	2	-	4	**6**	3	25	75	100	**4**
	I	25UINC516	Field Work	-	-	8	**8** 6+2	3	25	75	100	**4**
	II	25UINE503	NGO Management	4	-	-	**4**	3	25	75	100	**4**
	II	25UINE504	Youth Development	4	-	-	**4**	3	25	75	100	**4**
	V	25UINS504	Documentary Project	-	-	4	**4**	3	20	30	50	2
	-	25UIND202	Addon Course – Industry Institute Linkage – AI & ML	-	-	-	**-**	**Grade**				
							30				**550**	**22**
III Year												
Semester VI												
VI	I	25UINC617	Ancient Indian	2	-	4	**6**	3	25	75	100	**4**
	I	25UINC618	Rural Community Development	2	-	4	**6**	3	25	75	100	**4**
	II	25UINE605	Urban Community Development	4	-	-	**4**	3	25	75	100	**4**
	II	25UINE606	Geriatric Welfare	4	-	-	**4**	3	25	75	100	**4**
	V	25UINS605	Field Work	-	-	4	**4**	3	20	30	50	**2**
	V	25UINS606	Project Work	-	-	4	**4**	3	20	30	50	**2**
	VI	25UINV606/ 25UINV607/ 25UINV608	Gandhian Thoughts Waste Management Consumer Affairs	2	-	-	**2**	-	50	-	50	**2**
							30				**550**	**22**
IV Year												
Semester VII												
VII	I	25UINC719	Ancient Indian Epigraphy	3	-	2	**5**	3	25	75	100	**4**
	I	25UINC720	Social Development	3	-	2	**5**	3	25	75	100	**4**
	I	25UINC721	Field Work	-	-	6	**6**	3	25	75	100	**3**
	I	25UINC722	Block Placement	-	-	6	**6**	3	25	75	100	**3**
	II	25UINE707	Project Development And Project Management	4	-	-	**4**	3	25	75	100	**4**

	II	25UINE708	Disaster Management	4	-	-	**4**	3	25	75	100	**4**
							30				**600**	**22**

IV Year												
Semester VIII												
VIII	I	25UINC823	Literature and Archaeology	4	-	2	**6**	3	25	75	100	**4**
	I	25UINC825	History of performing arts in India	-	-	-	**8**	3	25	75	100	**4**
	I	25UINC825	Human Resource Management	-	-	4	**4**	3	20	30	50	**2**
	VIII	25UINR801	Research Project / Dissertation	-	-	12	**12**	3	100	200	300	**12**
							30				**550**	**22**
			Additional Credit Optional (I – II))									

Distribution of Credits and Marks

Semester	Credits	No. of Courses	Marks
I	22	8	650
II	22	6+1	675
III	22	7	600
IV	22	6+1	675
V	22	6	550
VI	22	6	550
VII	22	6	550

VIII	22	3+1	600
Total	**176**	**48 +3**	**4850**

Category 1: Discipline Specific Courses –DSC (Major Courses – 25 Courses with 88 Credits)

The DSC courses are to be studied compulsorily by the students as mandatory Courses. The students are required to take DSCs across eight semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline.

Category 2: Discipline Specific Elective Courses – DSE (Minor Stream Courses- 8 Courses – 32 Credits)

The DSE courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any **EIGHT** courses from the following list.

Category 3: Generic Elective Courses – GEC (Multidisciplinary Courses – 4 Courses - 12 Credits)

The GEC are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope and need of the department. The student has to subscribe any 4 courses in the following list:

Category 4: Ability Enhancement Courses – AEC

The AEC Courses enable the students to develop a deeper sense of commitment to oneself and to the society and nation largely. These courses will supplement in better understanding of how to integrate knowledge to application into a society. These are the generic skill courses which are basic and needed to all to pursue any career. These courses ensure progression across all careers. In addition to English, a candidate shall opt for any of the languages studied at the Pre University or equivalent level.

Category 5: Skill Enhancement Courses – SEC (Practical, Soft Skill, Hands on Session based on Student Need – 6 Courses – 12 Credits)

The SEC courses are to promote skills pertaining to a particular field of study. The purpose of these courses is to provide students life-skills in hands-on mode so as to increase their employability/ Self-employment. The objective is to integrate discipline related skills in a holistic manner with general edUINtion. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

Category 6: Value Added Courses – VAC (Common for all UG – 4 Courses – 8 Credits)

The VAC courses are part of the curriculum designed to provide necessary skills to increase the employability quotient and equipping the students with essential skills to succeed in life.

Category 7: Summer Internship

The Students are to do the Summer Internship during second and fourth semester for a period of 4 weeks, in such case the fast track classes during summer vacation for Regular courses to provide flexibility in learning additional courses based on the availability of the teachers and students. The Continuous Internal Assessment mark distribution for Summer Internship is as follows:

Note: Reviews can be done in Online / Offline mode.

The Viva-voce Marks for the Summer Internship will be given based on the report and viva-voce examination, conducted by the Department with External Expert.

Category 8: Research Project / Dissertation

Each Student should undertake a project work during the Eighth semester and submit the report. A guide will be allotted to each student by the respective Department. A student can select any research topic in discussion with the guide. It is mandatory to have three Reviews and recorded as per the Project Plan communicated to the students. The Continuous Internal Assessment mark distribution for Project is as follows:

Note: Reviews can be done in Online / Offline mode.

The project report will be evaluated through Viva-voce examination jointly by the Internal and External Examiners.

B.Sc., RADIOLOGY & IMAGING TECHNOLOGY

Curriculum

	Semester I						
	S.No	Category	Course Code	Name of the Course	Instruction Hours / W		
					L	T	P
FIRST YEAR	1.	HSC	24URIT101	Anatomy I	3	0	1
	2.	HSC	24URIT102	Physiology I	3	0	1
	3.	HSC	24URIT103	Pathology I	3	0	1
	4.	HSC	24URIT104	Pharmacology	3	0	1
	5.	DSC	24URIT105	Medical Physics	3	0	1
	7.	AEC	24UAEC101	Communicative English	2	0	1
	8.	VEC	24UVECXX-1	Value Enhancement Course 1*-	2	0	1
	10.	SEC	24USECXX-1	Skill Enhancement Course 1*	0	0	4
				Total	**19**	**0**	**11**

	Semester II						
	S.No	Category	Course Code	Name of the Course	Instruction Hours / W		
					L	T	P
FIRST YEAR	1.	HSC	24URIT201	Anatomy II	3	0	2
	2.	HSC	24URIT202	Physiology II	3	0	2
	3.	HSC	24URIT203	Pathology II	3	0	1
	4.	DSC	24URIT204	Radiological Physics & Dark	3	0	1
	5.	DSC	24URIT205	Radiology Equipments	3	0	1
	7.	AEC	24UAEC206	Computer Application	2	0	1
	8.	VEC	24UVECXX-3	Medical Ethics and Bio-Safety	2	0	0
	9.	SEC	24USECXX-2	Skill Enhancement Course 2	0	0	4
				Total	**19**	**0**	**12**

Semester III							
					Instruction Hours / W		
	S.No	Category	Course Code	Name of the Course	L	T	P
SECOND YEAR	1.	DSC	24URIT310	Clinical Radiography I	3	0	2
	2.	DSC	24URIT311	Contrast Radiological Procedures I	3	0	2
	3.	DSC	24URIT312	Equipments of Advanced Modalities I	3	0	2
	4.	DSE	24UDSE301	Basic and Advanced Life Support	2	0	1
	6.	AEC	24UAEC311	Employability Skills	0	2	0
	7.	VEC	24UVECXX-5	Value Enhancement Course 4	0	0	2
	8	SEC	24USECXX-3	Skill Enhancement Course 3*	0	0	8
				Total	**11**	**2**	**17**

Semester IV							
					Instruction Hours / W		
	S.No	Category	Course Code	Name of the Course	L	T	P
SECOND YEAR	1.	DSC	24URIT413	Clinical Radiography II	3	0	2
	2.	DSC	24URIT414	Contrast Radiological Procedures II	3	0	2
	3.	DSC	24URIT415	Equipments of Advanced Modalities II	3	0	2
	4.	DSE	24UABE402	Clinical Nutrition	2	0	0
	5.	AEC	24UAEC412	Medical Transcription	2	0	0
	5.	AEC	24UAEC413	Professional Etiquette	0	0	2
	6.	VEC	24UVECXX-6	Value Enhancement Course 7 AI &ML	0	0	2
	7.	SEC	24USECXX-4	Skill Enhancement Course 4	0	0	8
				Total	**9**	**0**	**18**

Semester V

	S.No	Category	Course Code	Name of the Course	Instruction Hours / W		
					L	T	P
THIRD YEAR	1.	DSC	24URIT515	Quality control and Radiation	3	0	2
	2.	DSC	24URIT516	Radiation Physics and Safety	3	0	2
	3.	DSC	24URIT517	Modern Techniques in Imaging I	3	0	2
	4.	AEC	24UAEC514	Medical Coding	2	0	0
	5.	VEC	24UVECXX-10	Value Enhancement Course 10	0	0	2
	6.	SEC	24UABES511	Clinical Training	0	0	10
				Total	**11**	**0**	**18**

Semester VI

	S.No	Category	Course Code	Name of the Course	Instruction Hours / W		
					L	T	P
THIRD YEAR	1.	DSC	24UCCT618	Quality control and Radiation	3	0	2
	2.	DSC	24UACT619	Modern Techniques in Imaging II	3	0	2
	3.	DSE	24UABE620	Seminar / Quiz / Group Discussion	3	0	0
	4.	OE	24UABOXX-6	Open Elective 1	3	0	0
	5.	AEC	24UAEC615	Biomedical Waste Management	0	0	2
	6.	VEC	24UVECXX-11	Value Enhancement Course 11	0	0	2
	7.	SEC	24USECXX-5	Clinical Training	0	0	10
				Total	**12**	**0**	**18**

Semester VII & VIII

	S.No	Category	Course Code	Name of the Course	L	T	P
FOURTH YEAR	1.	DSC	24UABE721	Internship	0	0	2
	2.	DSC	24UABE722	Thesis	0	0	0
				Total	**0**	**0**	**2**

S.No	Catergory	S1	S2	S3
1	Health Science Core(SC)	12	9	
3	Department Specific Core(DSC	3	6	12
4	Department Specific Elective(DSE)			2
5	Open Elective(OE)			
6	Ability Enhancement Courses (	2	2	2
7	Value Enhancement Courses (V	2	2	1
8	Skill Enhancement Courses (SE	3	3	5
	Total	**22**	**22**	**22**

Internship Time Period 3

SL.No	Posting Area	Duration	Credits
1	X-ray	2 Months	6
2	m/ Fluoroscop	2 Months	6
			6
3	C-arm	2 Months	6
4	DSA	2 Months	6
5	CT	2 Months	8
6	MRI	2 Months	8

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
4	3	40	60	100	**3**
4	3	40	60	100	**3**
4	3	40	60	100	**3**
4	3	40	60	100	**3**
4	3	40	60	100	**3**
3	3				**2**
3	3				**2**
4	3				**3**
30				**500**	**22**

Health Science Core(HSC)
Department Specific Core(DSC)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (VEC)

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
5	3	40	60	100	**3**
5	3	40	60	100	**3**
4	3	40	60	100	**3**
4	3	40	60	100	**3**
4	3	40	60	100	**3**
3	3				**2**
2	3				**2**
4	3				**3**
31				**500**	**22**

Health Science Core(HSC)
Department Specific Core(DSC)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (VEC)

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
5	3	40	60	100	**4**
5	3	40	60	100	**4**
5	3	40	60	100	**4**
3	3				**2**
2	3				**2**
2	3				**1**
8	3				**5**
30				**300**	**22**

Department Specific Core(DSC)
Department Specific Elective(DSE)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (SEC)

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
5	3	40	60	100	**4**
5	3	40	60	100	**4**
5	3	40	60	100	**4**
2	3				**2**
2	3				**2**
2	3				**1**
2	3				**1**
8	3				**4**
31				**300**	**22**

Department Specific Core(DSC)
Department Specific Elective(DSE)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (SEC)

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
5	3	40	60	100	**4**
5	3	40	60	100	**4**
5	3	40	60	100	**4**
2	3				**2**
2	3				**2**
10	3				**6**
29				**300**	**22**

Department Specific Core(DSC)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (SEC)

Veek	Examination Marks				Credits
Total	Duration Hours	CIA	ESE	Total	
5	3	40	60	100	**4**
5	3	40	60	100	**4**
3	3				**1**
3	3				**3**
2	3				**2**
2	3				**2**
10	3				**6**
30				**200**	**22**

Department Specific Core(DSC)
Department Specific Elective(DSE)
Open Elective(OE)
Ability Enhancement Courses (AEC)
Value Enhancement Courses (VEC)
Skill Enhancement Courses (SEC)

					Credits
					15
					5
					20

Department Specific Core(DSC)

S4	S5	S6	S7	S8	Total
					21
12	12	8	20	20	**93**
2		1			**5**
		3			**3**
2	2	2			**12**
2	2	1			**10**
4	6	6			**27**
22	**22**	**21**	**20**	**20**	**171**

S1
12
3
2
2
3

22

S2
9
6
2
2
3

22

S3
12
2
2
1
5
22

S4
12
2
2
2
4
22

S5
12
2
2
6
22

S6
8
1
3
2
2
6
22

S7& S8
40

40