



ANNASAHEB DANGE
College of Engineering and Technology
Ashta
(An Autonomous Institution)

Curriculum Structure

F.Y. B. Tech.

**ARTIFICIAL INTELLIGENCE
AND DATA SCIENCE**

R1

Semester I & Semester II

(Academic Year 2023 - 2024)

(Updated 2023 – 2024)

Anna's College of Engineering and Technology
Artificial Intelligence and Data Science Department
 Teaching and Evaluation Scheme

F. Y. B. Tech. Semester I

Course Code	Course Name	Teaching Scheme						THEORY						PRACTICAL						GRAND TOTAL				
		L		T		P		ISE		MSE + ESE		Total		Min		ISE		ESE			Total		Min	
1ADBS101	Applied Mathematics - I	3	1	-	4	40	16	30	30	24	100	40	-	-	-	-	-	-	-	-	-	-	100	
1ADES102	Basic Electrical Engineering	3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	-	-	-	-	-	100	
1ADES103	Engineering Graphics	2	-	-	2	40	16	30	30	24	100	40	-	-	-	-	-	-	-	-	-	-	100	
1ADES104	Analog Electronics	2	-	-	2	40	16	30	30	24	100	40	-	-	-	-	-	-	-	-	-	-	100	
1ADPC105	Problem Solving Using C	3	-	4	3	-	-	-	-	-	-	-	50	20	50*	20	100	40	20	50	20	40	100	
1ADES106	Engineering Graphics Laboratory	-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	-	-	50	20	50	
1ADES107	Design Thinking Laboratory	1	-	2	2	-	-	-	-	-	-	-	50	20	-	-	50	20	-	-	50	20	50	
1ADHS108	Professional Communication	-	-	4	2	-	-	-	-	-	-	-	50	20	-	-	50	20	-	-	50	20	50	
1ADHS109	Value Added Course - I	-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	-	-	50	20	50	
	Total Contact Hours	14	1	14	20																		700	

* Internal Institute Faculty as an Examiner


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Artificial Intelligence and Data Science Department
Teaching and Evaluation Scheme

Course Code		Course Name		F. Y. B. Tech. Semester II										GRAND TOTAL					
				Teaching Scheme				THEORY								PRACTICAL			
				L	T	P	Credits	ISE		MSE + ESE		Total				ISE		ESE	
Max	Min	MSE	ESE	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min			
1ADBS110		3	1	-	4	40	16	30	30	24	100	40	-	-	-	-	-	100	
1ADBS111		4	-	-	4	40	16	30	30	24	100	40	-	-	-	-	-	100	
1ADES112		3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	100	
1ADPC113		3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	100	
1ADPC114		2	-	2	2	-	-	-	-	-	-	-	50	20	50*	20	100	40	
1ADBS115		-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	
1ADES116		-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	
1ADPC117		-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	
1ADHS118		-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	
		15	1	10	20													700	
		Total Contact Hours		26															

* Internal Institute Faculty as an Examiner



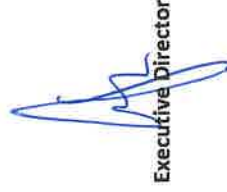
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Course Details:

Class	F.Y. B. Tech. Sem. - I
Course Code and Course Title	1ADBS101 / Applied Mathematics I
Prerequisite/s	Higher Secondary maths
Teaching Scheme: Lecture / Tutorial / Practical	03 / 01 / 00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes :Upon successful completion of this course, the students will be able to:	
1ADBS101_1	Solve the system of linear equations by using matrix method and numerical techniques. (K³)
1ADBS101_2	Use Cayley-Hamilton theorem to find higher powers of matrix, also determine Eigen values and Eigen vectors of matrix.(K³)
1ADBS101_3	Apply least square method to fit the polynomials for bi-variate data.(K³)
1ADBS101_4	Express any function in terms of power series.(K²)
1ADBS101_5	Calculate the roots of complex number by using De-Moivre's Theorem.(K³)

Course Contents:		Hrs.
Unit 1	Matrices and Solution of Linear System Equations: Rank of a matrix, Normal form of a matrix, echelon form, Consistency of linear system of equations (system of homogeneous and non-homogeneous linear equation).	06
Unit 2	Numerical Solution of System of Simultaneous Linear Equations: Gauss Elimination Method, Gauss-Jordan Method, Iterative Method –Gauss Jacobi method and Gauss Seidel method, LU-Decomposition Method.	07
Unit 3	Eigen Values and Eigen Vectors: Vectors, Linear dependence and linear independence of vectors, Eigenvalues, Properties of Eigen values, Eigen vectors, Properties of Eigenvectors, Cayley-Hamilton Theorem (Inverse and Higher powers of matrix).	08
Unit 4	Curve fitting and Statistics: Method of Least Squares, Fitting of Straight Line, Fitting of Parabola, Fitting of exponential curves, Lines of Regression.	08
Unit 5	Expansion of Functions and Indeterminate Forms: Taylor's series, Maclaurin's series, Standard expansions, Expansion of function using Standard series, Indeterminate forms.	06
Unit 6	Complex Numbers: De Moivre's theorem, Roots of a complex number, Expansion of and in powers of and/or, Circular functions of a complex variable, Hyperbolic functions, relation between circular and hyperbolic functions, Inverse Hyperbolic functions.	07

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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Numerical Methods in Engineering & Science	Dr. B. S. Grewal	Khanna Publishers	9 th	2010
2	Advanced Engineering Mathematics	H. K. Das	S. Chand	22 nd	2018
3	A textbook of Applied Mathematics	P.N. Wartikar and J. N. Wartikar	Pune Vidyarthi Griha Prakashan	1 st	2008
4	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw Hill Publ.	6 th	2010

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers	44 th	2018
2	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science press	7 th	2010
3	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley Publishers	10 th	2017
4	Numerical Methods	Dr. P. Kandasamy, Dr. K. Thilagavathy, Dr. K. Gunavathi	S. Chand	1 st	2010

List of Tutorials

Sr. No	Title of Tutorials
1	Matrices and Solution of Linear System of Equations
2	Numerical Solution of System of Simultaneous Linear Equations
3	Eigen Values and Eigen Vectors
4	Cayley-Hamilton Theorem
5	Curve fitting
6	Statistics
7	Expansion of Functions and Indeterminate Forms
8	Complex number


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Artificial Intelligence and Data Science Department

Course Details:

Class	F.Y. B. Tech. Sem. - I
Course Code and Course Title	1ADES102 / Basic Electrical Engineering
Prerequisite/s	Simultaneous Linear Equations Semiconductor Physics
Teaching Scheme: Lecture/Tutorial/Practical	03 / 00 / 00
Credits	03
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes :Upon successful completion of this course, the students will be able to:	
1ADES102_1	Explain basic terminologies related to DC, AC and magnetic circuits. (K ²)
1ADES102_2	Apply the magnetic circuit concepts to understand the working of electrical devices. (K ³)
1ADES102_3	Explain principle of operation, construction & applications of AC and DC Machines. (K ²)
1ADES102_4	Describe wiring circuits, earthing system and three phase connections. (K ²)
1ADES102_5	Apply conceptual understanding to solve numerical related to DC circuits and Single phase AC circuits. (K ³)

Course Contents:		Hrs.
Unit 1	DC Circuits : Definitions: EMF, Current, Electrical Work, Power, Energy, Dependent and independent sources, Ohm's Law, Kirchhoff's Laws, Factors affecting resistance, Series and Parallel resistive circuits, Analysis of DC Circuits using KCL & KVL [Numerical treatment].	06
Unit 2	Magnetic Circuits Magnetic circuits & definitions, Comparison between Electric and Magnetic circuit, Series and Parallel magnetic circuits, Magnetic Leakage and Fringing, Magnetization (B-H) curve, Faraday's Law of Electromagnetic Induction [Numerical treatment].	05
Unit 3	Fundamentals of AC Circuits Single Phase A.C Circuit: Generation of alternating voltage and current, RMS value, Average value, Form Factor, Peak factor, phasor representation, Analysis of pure R, L, C and series R-L-C circuits [Numerical Treatment]. Three Phase A.C Circuit: Advantages of three phase system over single phase system, Generation of three phase voltages, Phase Sequence, Star and Delta connection, Balanced and Unbalanced three phase system [Theoretical treatment only].	10
Unit 4	Earthing and Wiring circuits Concept of earthing, necessity of earthing, plate and pipe earthing, Types of switches, HRC fuse, Simple wiring, Staircase wiring, Godown wiring. [Theoretical treatment only].	05
Unit 5	Single Phase Transformer Working principle of a Transformer, Construction, Core type and Shell type transformer, EMF equation, Transformation ratio & applications.	06
Unit 6	DC Motor & Single phase AC motor D.C. Motor: Working principle of a DC motor, Construction, Torque equation, types and their applications. Single phase AC motor: Working principle, Types - Split phase IM, Capacitor start- induction run motors, Capacitor Start and run motors, Shaded pole IM and applications. Universal Motor: Construction, working principle, applications. [Theoretical treatment only].	10

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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Basic Electrical Engineering	V. K. Mehta Rohit Mehta	S. Chand Publications, New Delhi	1 st (Revised)	2016
02	Fundamentals of Electrical Engineering & Electronics	B L Theraja	S. Chand Publications, New Delhi	1 st (Revised)	2009
03	Fundamentals of Electrical Engineering	Ashfaq Husain	DhanpatRai&co.	3rd	2005
04	Basic Electrical & Electronics Engineering	S. K. Bhattacharya	Pearson Publication	4 th	2010

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Electrical Engineering Concepts and Applications	PV Prasad & S. Shivanaraju	CENGAGE Learning	4 th	2007
02	Fundamentals of Electrical Engineering	BharatiDwivedi, AnuragTripathi	Wiley	1 st	2000
03	Electrical Engineering Fundamental	Vincent Del Toro	Pearson Publication	2 nd	2015
04	Basic Electrical Engineering	I.J. Nagrath D. P. Kothari	Tata McGraw Hill	4th	2008



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Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADES103 / Engineering Graphics
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	02 / 00 / 00
Credits	02
Evaluation Scheme: ISE /MSE/ ESE	40 / 30 / 30

Course Outcomes : Upon successful completion of this course, the students will be able to:	
1ADES103_1	Explain basic concepts in drawing and its application. K ²
1ADES103_2	Construct simple engineering curves. K ³
1ADES103_3	Sketch projection of simple geometries. K ³
1ADES103_4	Sketch the Orthographic projections. K ³
1ADES103_5	Prepare the Isometric view of simple objects. K ³

Course Contents:		Hrs.
Unit 1	Fundamentals of Engineering Graphics Fundamentals of Engineering Graphics: Introduction to Drawing instruments and their uses. Different types of lines used in drawing practice, Dimensioning system as per BSI (Theoretical treatment only)	02
Unit 2	Engineering curves Construction of regular Polygons (up to hexagon). Ellipse, Parabola, Hyperbola, Involute, Archimedean spiral, Cycloid.	06
Unit 3	Projections of Lines Introduction to First angle and third angle methods of projection. Projections of points on regular and auxiliary reference planes. Projections of lines (horizontal, frontal, oblique and Profile lines) on regular and auxiliary reference planes. True length of a line, Point View of a line, angles made by the line with reference planes. Projections of intersecting lines, Parallel lines, perpendicular lines, and skew lines. Grade and Bearing of a line.	06
Unit 4	Projections of Planes Projections on regular and on auxiliary reference planes. Types of planes (horizontal, frontal, oblique and Profile planes), Edge view and True shape of a Plane. Angles made by the plane with Principle reference planes. Projections of plane figures inclined to both the planes (Circle & regular polygon).	05
Unit 5	Orthographic Projections Lines used, selection of views, dimensioning and sections. Drawing required views from given pictorial views (conversion of pictorial views in to orthographic views), including sectional orthographic views.	05
Unit 6	Isometric Projections Introduction to isometric. Isometric scale, Isometric projections and Isometric views /drawings. Circles in isometric view. Isometric views of simple solids and objects.	04


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Text Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing,	N. D. Bhatt	Charotar Publication House, Bombay	53rd	2014
02	Engineering Drawing	Dhananjay A. Jhole	Tata Mc Graw Hill International	5th	2011
03	Engineering Graphics	Agrawal B.	TMH Publication	3rd	2012

Reference Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing and Graphics	K. Venugopal	New Age Publication	5th	2004
02	Machine Drawing	K. L. Narayana	New Age Publication	3rd	2006
03	Engineering Drawing	N. B. Shaha and B. C. Rana	Pearson Education	2nd	2012
04	Fundamentals of Engineering Drawing	W. J. Luzadder	Prentice Hall of India.	1st	1964

Other Books/E-material			
Sr. No.	Title	Author	Publisher
01	NPTEL video lectures	NPTEL Author	www.nptel.ac.in



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Course Details:

Class	F.Y. B. Tech. Sem. - I
Course Code and Course Title	1ADES104 / Analog Electronics
Prerequisite/s	Simultaneous Linear Equations Semiconductor physics
Teaching Scheme: Lecture / Tutorial / Practical	02 / 00 / 00
Credits	02
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADES104_1	Explain the construction, working principle and characteristics of passive electronic Components. (K ²)
1ADES104_2	Illustrate the working principle and characteristics of active electronic components. (K ²)
1ADES104_3	Build the different wave shaping circuits with the help of passive electronic components. (K ³)
1ADES104_4	Compute different parameters of different circuits like rectifiers and filters. (K ³)
1ADES104_5	Explain the construction and working of transducers and sensors. (K ²)
1ADES104_6	Comprehend applications of analog electronics. (K ²)

Course Contents:

		Hrs.
Unit 1	Introduction to Electronics Components (Passive): Introduction to Resistors, Capacitors, Inductors, Series and Parallel Combinations (construction, working principle, characteristics)	04
Unit 2	Introduction to Electronics Components (Active): P-N junction diode, Special Purpose diodes- LED, Photodiode, Zener diode, BJT, JFET (construction, working principle, characteristics), Common Emitter Configuration	05
Unit 3	Wave Shaping Circuits: Low pass & high pass RC circuits, Differentiator, Integrator, Clipping, Clamping circuits & Voltage Multipliers(working principle, characteristics)	05
Unit 4	Rectifiers and Filters: Rectifier: Half wave rectifier, Full wave rectifier with center tapped transformer, Bridge rectifier, Filters: Definition, Working Principle; Types: Capacitor, Inductor Choke input (I), Capacitor input (π).	04
Unit 5	Transducers and Sensors: Introduction and application of transducers, Different types of sensors: Flow, Temperature, Pressure, Proximity sensor, Optical Sensors, Micro sensors, Smart Sensors	06
Unit 6	Applications of Analog Electronics: Regulated Power Supply, SMPS (Switched Mode Power Supply), IC 555 Timer, Case study based on application of analog electronics.	04



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Artificial Intelligence and Data Science Department

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Principle of Electronics	V.K. Mehta	S. Chand	5 th	2012
2	Electronic Instrumentation	H .S. Kalasi	Tata McGraw Hill	3 rd	2010
3	A Textbook of Applied Electronics	R. S. Sedha	S. Chand	2 nd	2013
4	Electronic Devices & Circuits	Allen Mottershed	Prentice-Hall India	1 st	2004

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Electronic Devices & Circuits	J. Millman & C. Hallkis	TMGH	3 rd	2010
2	Fundamentals of Electronics Engineering	R. Prasad	CENGAGE Learning	3 rd	2012
3	Electronic Devices and Circuits	R. Boylestad & L. Nashelsky	PHI	5 th	2008
4	Electronic Devices & Circuits	David Bell	Oxford University	5 th	2008



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Artificial Intelligence and Data Science Department

Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADPC105 / Problem Solving Using C
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	03 / 00 / 04
Credits	03
Evaluation Scheme: ISE / ESE	50 / 50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADPC105_1	Think logically to come up with algorithmic approach for problem solving (K2)
1ADPC105_2	Use various constructs for structuring and implementing the C program. (K3)
1ADPC105_3	Explain and Demonstrate various constructs for efficient memory management (K3)
1ADPC105_4	Solve simple real world problems using modular approach and data management using file handling.(K3)
1ADPC105_5	Prepare and present a power point presentation on assigned topic.(S3)
1ADPC105_6	Demonstrate structured approach to solve a problem. (A2)

Course Contents:		Hrs.
Unit 1	Basics of Programming The meaning of algorithms, Flowcharts, Pseudo codes, Writing algorithms and drawing flowcharts for simple exercises, Memory concepts, C Program development environment.	04
Unit 2	C Fundamentals Importance of 'C' Language, History, Structure of 'C' Program, Sample 'C' Program, Constants, variables and data types, Enumeration. Operators and expressions, Managing input / output operations, Control statements-Decision making, Case control & Looping Constructs	10
Unit 3	Array The meaning of an array, one dimensional and two dimensional arrays, declaration and initialization of arrays, reading, writing and manipulation of above types of arrays, multidimensional arrays. Strings -Declaring and initialing character array, reading and writing string to/from terminal, arithmetic operations on characters, putting strings together, string handling functions.	07
Unit 4	Functions Need of user defined functions, elements of User defined functions, defining functions, return values and their types, function calls, function declaration, methods of parameter passing, Scope rule of functions, user defined and library functions.	06
Unit 5	Structure & Pointers Need of Structure, defining a structure, declaring and accessing structure variables, structure initialization, copying and comparing structure variables, array of structures, structures and functions, Unions. Understanding pointers, accessing the address space of a variable, declaring and initialization pointer variables, accessing a variable through its pointer, pointer expressions, pointers and arrays, pointer and character strings, pointer and structure, Void pointer and generic pointer, null pointer, dangling pointer, pointer to a function, Calling A function through function pointer. Dynamic memory allocation malloc() ,calloc() ,realloc(),free(),Core dump ,Memory leak.	10
Unit 6	File Handling	05


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Defining and opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access files, command line arguments, C preprocessor	
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Experiment List:	
1	Write an algorithm for given problem statement.
2	Draw a flowchart for given problem.
3	program using different data types and operators in C.
4	Program using different operators and demonstration of operator precedence.
5	Program using if and if else construct.
6	Program using if else ladder and nested if else.
7	Program using switch case.
8	program to demonstrate looping constructs(while and for loops)
9	program to demonstrate looping constructs(do while and nested loops)
10	program to demonstrate one dimensionalarray
11	program to demonstrate two dimensionalarray
12	Implement a program to demonstrate String handling functions.
13	Implement a program to demonstrate user defined functions.
14	program to demonstrate concept of recursion (factorial, Fibonacci)
15	program to demonstrate concept of structures in c.
16	program to demonstrate concept of array of structures in c.
17	program to demonstrate pointers in c.
18	program to demonstrate pointers arithmetic in c.
19	Program to demonstrate function pointer.
20	Implement a program to demonstrate file handling.
21	Program to demonstrate command line arguments.

Note: The students shall undergo a micro project based on some real-world problem as one component of in-semester-evaluation.

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Let Us C	Yashwant Kanetkar	BPB	3 rd	2011
02	Programming in ANSI C	E. Balguruswamy	Tata Mc-Graw Hill	4 th	2008

Reference Books:					
Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Test your C Skills	Yashwant Kanetkar	BPB Publications	5 th	2013
02	C And Data Structures	Venkateswarlu N.B, Prasad E.V.	Chand Publication	---	2010


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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADES106 / Engineering Graphics Laboratory
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes :Upon successful completion of this course, the students will be able to:	
1ADES106_1	Draw the projections the different lines, Planes in different positions. K³
1ADES106_2	Draw orthographic, sectional and isometric views. K³
1ADES106_3	Use/Handle different engineering drawing instruments accurately & carefully. S²
1ADES106_4	Produce drawings with accuracy and proficiency. S³
1ADES106_5	Display a high degree of certainty in drawings and projections of complex components. A³

Expt. No.	Title of Experiment
	Introduction
1.	Engineering Curves
2.	Projections of Straight lines
3.	Projections of planes
4.	Orthographic projections (Sheet 1)
5.	Orthographic projections (Sheet 2)
6.	Isometric projections (Sheet 1)
7.	Isometric projections (Sheet 2)
	Submission

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Drawing,	N. D. Bhatt	Charotor Publication House, Bombay	53 rd	2014
2	Engineering Drawing	Dhananjay A. Jhole	Tata Mc Graw Hill International	5 th	2011
3	Engineering Graphics	Agrawal B.	TMH Publication	3 rd	2012



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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Drawing and Graphics	K. Venugopal	New Age Publication	5 th	2004
2	Machine Drawing	K. L. Narayana	New Age Publication	3 rd	2006
3	Engineering Drawing	N. B. Shaha and B. C. Rana	Pearson Education	2 nd	2012
4	Fundamentals of Engineering Drawing	W. J. Luzadder	Prentice Hall of India.	1 st	1964

Other Books / E-material

Sr. No	Title	Author	Publisher
01	NPTEL video lectures	NPTEL Author	www.nptel.ac.in



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADES107 / Design Thinking Laboratory
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	01 / 00 / 02
Credits	02
Evaluation Scheme: ISE	50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADES107_1	Explore the techniques of User Research(K2)
1ADES107_2	Practice brainstorming techniques for ideation(K3)
1ADES107_3	Select Design Thinking techniques for business problems(K5)
1ADES107_4	Create prototype, test and present the solution(K6)

Course Contents:		Hrs.
1	Overview of Design Thinking – What, Why and How? Using a case study	1
2	Empathy and Ethics	1
3	Discovery - Understanding the problem from users' perspective (User Research) - Who are the users? - Goals, motivations, behaviors, pain areas, opportunities Activities – planning, questionnaire, context of use, interviews	7
4	Envisioning (Defining and Conceptualizing) Story boarding Ideation Brainstorming	4
5	Process of Design Thinking Multiple frameworks – TCS 4D, Stanford DT, Cooper Method	1
6	Prototype Iteration – 1	2
	Prototype Iteration – 2	2
7	Testing with end users Refinement	2

Students will work in teams and pairs
 Each session will have activities and presentation of deliverables
 Prototypes can be – paper prototype, wireframes, click through prototype based on the skills and tools available
 All activities and phases will be carried out for a single problem/ opportunity brief.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Understanding Design Thinking, Lean, and Agile	Jonny Schneider	O'Reilly	---	2017
2	Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days	Jack Knapp and others	Simon & Schuster	---	2009


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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Design for How People Think	John Whalen	O'Reilly	---	2019
2	Change by Design	Tim Brown	HarperCollins	---	2009
3	Creative Confidence: Unleashing the Creative Potential Within Us All	Kelley, D. & Kelley, T	New York: William Collins	---	2014



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS108 / Professional Communication
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 04
Credits	02
Evaluation Scheme: ISE	50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADHS108_1	Develop his communicative performance that enable him considerable success in English Language competency tests. (K ³)
1ADHS108_2	Solve the exercise related to Reading comprehension and Listening comprehension. (K ³)
1ADHS108_3	Prepare his portfolio considering own strength, weakness and career opportunities. (K ³)
1ADHS108_4	Construct grammatically sound and meaningful sentences necessary for effective communication. (K ³)
1ADHS108_5	Write relevant professional letters and able to maintain official correspondence. (K ³)

Course Contents:

1. Checking my English Communication
2. Presenting my career Choices
3. Achieving my Goals
4. Beginning to write and speak like professional
5. Preparing my portfolio
6. Listening for Answers
7. Understanding sentence pattern
8. Avoiding Common errors
9. Presenting my portfolio
10. Getting even smarter with technical texts
11. Professional Presentation
12. Getting smart with technical descriptions of charts/ images/ processes
13. Writing technical review
14. Introduction to Correspondence: formal Letter
15. Application and resume writing
16. Email Writing
17. Reading for answers
18. LSRW Test

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Cambridge Guide to IELTS	Pauline Cullen, Amanda French	Cambridge University Press	Reprint	2017
2	Ultimate Guide to IELTS Writing	Parthesh Thakkar	M K Books	Reprint	2013


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
3	Target Band 7	Braverman Simone	Paperback	3 rd	2018
4	The Professional: Defining the New Standard of Excellence at Work	Subroto Bagchi	Penguin Books India Pvt. Ltd.	Revised Edition	2011

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	High-school English Grammar and Composition	Wren and Martin	S. Chand and Co., New Delhi	1 st	2015
2	Grammar for IELTS	Diana Hopkins, Pauline Cullen	Cambridge University Press	1 st	2018
3	Vocabulary for IELTS	Pauline Cullen	Cambridge University Press	1 st	2013



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Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_A / Badminton
Prerequisite/s	-----
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS109_A_1	Improve physical fitness.
1ADHS109_A_2	Understand the basic rules and how they can play the game of badminton.
1ADHS109_A_3	Provide opportunities for playing modified games to promote student learning
1ADHS109_A_4	Develop students' critical thinking skills, problem solving skills, self-management skills, collaboration skills, risk assessment etc.
1ADHS109_A_5	Learn various technical motor skills in badminton and how you can move better in the court.
1ADHS109_A_6	Acquiring a satisfactory level of knowledge and experience of the sport, to enable students to play by themselves for recreation.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction to badminton – Aim – Objectives – Short reference in Badminton history Understand the basic rules and how they should play normal game.	04
Unit 2	Skills - Service, Net shot, Clear, Drop, Smash. Skills - Service Forehand & Backhand, Net shot, Drive (Presentation and practice to the court)	06
Unit 3	Skills – Clear, Drop, Smash Implementation of singles rules	05
Unit 4	Footwork 1 Footwork 2	05
Unit 5	Implementation of doubles rules. Forehand strokes. Motor skills practice 1	06
Unit 6	Motor skills practice 2 Motor skills practice 3 Motor skills practice 4	04


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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_B / Volley Ball
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS109_B_1	To send the ball over the net, according to the regulations, to the ground on the opponents ground
1ADHS109_B_2	The ball is put into play through the service right back player within the service zone
1ADHS109_B_3	The Ball must hit with one hand or one arm and directly send over the net opponent's court.
1ADHS109_B_4	To volley the ball over the net before it touches on the ground
1ADHS109_B_5	The players use their hands to volley the ball.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction & Understand basic volleyball rules, terminology, and scoring procedures.	04
Unit 2	Demonstrate basic skills associated with volleyball, including passing, setting, serving, attacking (spiking), and blocking.	06
Unit 3	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 4	Demonstrate an understanding of the typical game sequencing: serve, pass, attack, defense, transition, and defense.	05
Unit 5	Understand and apply the knowledge of basic rules of volleyball. Skill Practice	06
Unit 6	Demonstrate proper etiquette and good sportsmanship. And Skill related Practice. Skill Practice	04



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_C / Kabaddi
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1ADHS109_C_1	Acquire, analyze and interpret basic skills
1ADHS109_C_2	Appraise the rules and regulation.
1ADHS109_C_3	Demonstrate and assess various basic skills/techniques and game strategies.
1ADHS109_C_4	Develops confidence, concentration and tolerance in players.
1ADHS109_C_5	This game also Provides an opportunity for healthy competitions among equal players and help them make friends.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to Kabaddi – Aim – Objectives – Short reference in Kabaddi history Understand the basic rules and how they should play normal game.	04
Unit 2	Demonstrate basic skills associated with Kabaddi, including pushing, Bonus, Tackling, attacking, and blocking	06
Unit 3	Demonstrate an understanding of the typical game sequencing: service, Bonus, attack, defense, Raiding and defense.	05
Unit 4	Demonstrate the ability to perform individual offensive and defensive skills and strategies. Stepping Practice.	05
Unit 5	Skill Demo – Stepping, Bonus, Foot touch, Toe touch, Thrust, Squat leg, Kicks & Practice.	06
Unit 6	Skill Practice And Shadow Practice	04



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_D / Foot Ball
Prerequisite/s	-----
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1ADHS109_D_1	By applying these principles through active participation, students develop the necessary Skills and knowledge to play football.
1ADHS109_D_2	Provides students with opportunities to improve physical fitness acquire knowledge of fitness concepts and practice positive personal and social skills.
1ADHS109_D_3	Students will gain an understanding of how a wellness lifestyle affects one's health, fitness and physical performance

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Introduction to Football – Aim – Objectives – Short reference in Football history Understand the basic rules and how they should play normal game.	04
Unit 2	Introduce students to the basic skills and knowledge associated with football. Understand basic football rules, terminology, and safety concerns.	06
Unit 3	Demonstrate the basic football skills of passing, three point stance, catching, blocking, hand-offs, punting, the carry and kicking & Practice.	05
Unit 4	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 5	Improve personal fitness through participation in yoga, muscular strength, muscular endurance, and flexibility activities & Practice.	06
Unit 6	Successfully participates in skill improvement and offensive game strategies & Practice	04



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_E, Bharatnatyam Classical Dance
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS109_E_1	Interpolation of Indian classical dance forms & basic types of Bharatnatyam.
1ADHS109_E_2	Subdivide bharatnatyam in terms of Nrutt, Nrutya & Nattya.
1ADHS109_E_3	Show the perform base on signal & combine hand posture in terms of Ganesh Vandana & Mahalaxmi Ashtak

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	History of Bharatnatyam Dance style & information about all Indian classical dance forms.	01
Unit 2	Basic types of Bharatanatyam: - Tatty Advu, Natty advu, Vishru advu, Kuddit Mett advu, Mett advu, tatti kuddit mett advu & Tirmanam (small). Study of Navras Abhinay. Singal Hand posture , Footwork , Shirobhed(head movement),	10
Unit 3	Combine Hand posture. Meaning of Guruvandna, Ganesh, mahalaxmi shlok. Definition of Nrutt, Nrutya & Nattya.	06
Unit 4	Practical session of Ganesh vandna Shlok in classical music.	06
Unit 5	Practice Sessions. & Presentation Of Ganesh vandna	07
Unit 6	History of Bharatnatyam Dance style & information about all Indian classical dance forms.	01



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_F / Harmonium Classical Music
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
IADHS109_F_1	Outline in History Harmonium & different Raags.
IADHS109_F_2	Perform on different songs
IADHS109_F_3	Role play the different music by means of harmonium.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	History & Introduction of Harmonium.	02
Unit 2	Harmonium presentation of Raag :- Bhoop raag / Bhimpalash raag.	12
Unit 3	Practice sessions.	03
Unit 4	Practice song notations & Harmonium Dhoon (percussion)	08
Unit 5	Practice sessions & students presentations	05
Unit 6	History & Introduction of Harmonium.	02



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Course Details:

Class	F.Y. B. Tech, Sem.-I
Course Code and Course Title	1ADHS109_G / Indian Folk Dance
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS109_G_1	Discuss different types in Indian Folk dance.
1ADHS109_G_2	Demonstrate Navras Abhinay, Tribal dance, Dhangari & Lavni dance.
1ADHS109_G_3	Compose dance on different folk dance style.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction to Indian Folk dance & its forms.	02
Unit 2	Basic steps of folk dance styles.	03
Unit 3	Importance of expressions (Acting) in dance, Navras Abhinay & its types. (9 type of navras)	03
Unit 4	Tribal dance, & its different styles.	06
Unit 5	Practice sessions.	04
Unit 6	History of Dhangari & Lavni dance. Types of dhangari & lavni dance.	01
Unit 7	Steps (dance composition) of Dhangari & Lavni dance.	07
Unit 8	Practice sessions & Students performance	04



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Course Details:

Class	F.Y. B. Tech, Sem.- I
Course Code and Course Title	1ADHS109_H / Karaoke Singing.
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

1ADHS109_H_1	Understand notation of the songs.
1ADHS109_H_2	Perform happy, sad, love devotional, patriotic songs.
1ADHS109_H_3	Compose songs in many variations.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	Song Notation	04
Unit 2	Happy song / Sad song (classical & semi classical)	08
Unit 3	Love song / Devotional song / Patriotic songs	08
Unit 4	Song composition	05
Unit 5	Practice session & students presentation	05



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Course Details:

Class	F.Y. B. Tech. Sem. - II
Course Code and Course Title	1ADBS110 / Applied Mathematics - II
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	03 / 01 / 00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADBS110_1	Develop basic knowledge of vector space. (K ³)
1ADBS110_2	Use the numerical methods to find the roots of algebraic and transcendental equations. (K ³)
1ADBS110_3	Apply numerical techniques for finding differentiation and integration. (K ³)
1ADBS110_4	Solve the problems on partial differentiation and its applications. (K ³)
1ADBS110_5	Solve problems on ordinary differential equations by using analytical and numerical methods. (K ³)
1ADBS110_6	Develop basic knowledge of vector space. (K ³)

Course Contents:		Hrs.
Unit 1	Vector Space: Vector spaces, subspaces, linear dependence and independence of vectors, basis, dimension, four fundamental subspaces (Rank and Nullity), linear transformation	08
Unit 2	Numerical Solution of Algebraic and Transcendental Equations: Introduction, Bisection method, False position method, Secant method, Newton Raphson's method	06
Unit 3	Numerical Differentiation and Integration: Numerical Differentiation – Newton's Forward Difference, Newton's Backward Difference, Central Difference (Stirling's Formula), Numerical Integration - Trapezoidal Rule, Simpson's 1/3 rd and 3/8 th Rule.	07
Unit 4	Partial Differentiation and Its Applications: Function of two or more variables, Partial derivatives, Change of variables, Euler's theorem, Jacobian, Maxima and minima of functions of two variables.	08
Unit 5	Ordinary Differential Equation (First order and First degree): Linear differential equation, Equation reducible to linear differential equation, Exact differential equation, Equation reducible to exact equation.	07
Unit 6	Numerical Solution of Ordinary Differential Equation (First order and First degree): Picard's method, Taylor's series method, Euler's method, Modified Euler's method, Runge-kutta method	06

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Numerical Methods in Engineering & Science	Dr. B. S Grewal	Khanna Publishers	9 th	2010
2	Advanced Engineering Mathematics	H. K. Das	S. Chand	22 nd	2018
3	A textbook of Applied Mathematics	P. N. Wartikar and J. N. Wartikar	Pune Vidyarthi GrihaPrakashan	1 st	2008
4	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw Hill Publ.	6 th	2010


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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers	44 th	2018
2	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science Press	7 th	2010
3	Linear Algebra	Seymour Lipschutz, Marc Lars Lipson	McGraw-Hill	4	2009
4	Numerical Methods	Dr. P. Kandasamy, Dr. K. Thilagavathy, Dr. K. Gunavathi	S. Chand	1 st	2010

List of Tutorials

Sr. No	Title of Tutorials
1	Vector Space: definition, subspace and basis
2	Vector Space: Linear transformation, fundamental subspaces.
3	Numerical Solution of Algebraic Transcendental Equations
4	Numerical Differentiation and integration
5	Partial Differentiation
6	Application of Partial Differentiation
7	Ordinary Differential Equation.
8	Numerical solution of Ordinary Differential Equation.



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Course Details:

Class	F.Y. B. Tech. Sem. - II
Course Code and Course Title	1ADBS111 / Engineering Physics and Chemistry
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	04 / 00 / 00
Credits	04
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADBS111_1	Apply fundamental concepts in optics and LASER to determine wavelength of light. (K ³)
1ADBS111_2	Describe various properties of engineering materials in view of crystallography study. (K ²)
1ADBS111_3	Explain the concept of nanotechnology and its Engineering applications. (K ²)
1ADBS111_4	Calculate total hardness of water and calorific values of the fuels. (K ³)
1ADBS111_5	Choose proper energy material from its properties and applications in given environment. (K ³)
1ADBS111_6	Discuss chemical synthesis, properties and uses of some advanced materials. (K ²)

Course Contents:

		Hrs.
Unit 1	<p>Wave Optics and LASER Introduction, diffraction, construction and theory of plane diffraction grating, Determination of wavelength of light for different color using plane diffraction grating, Resolving power of grating, Positive and Negative crystals, optical activity, Laurent's half shade Polari meter, numerical.</p> <p>Laser: Introduction, Basic concepts of Laser: - Absorption, spontaneous emission, stimulated emission, pumping, population inversion. Characteristics of laser, Solid State laser, Applications of laser</p>	10
Unit 2	<p>Solid State Physics: Crystallography: Introduction, Unit cell, Bravais lattices, Properties of unit cell (number of atoms per unit cell, coordination number, atomic radius, packing fraction), Calculation of lattice constant, Symmetry elements in cube, Miller indices:- Procedure, Features and Sketches for different planes, X-ray diffraction (Laue method), Bragg's law, X-ray diffractometer, Numerical</p>	09
Unit 3	<p>Nano Physics: Introduction, Concept of nanotechnology, Production techniques: - Top-down (eg. Ball milling) and Bottom-up (eg. Sol-gel process), Tools – Scanning Electron Microscope (SEM) and Atomic Force Microscope (AFM), Applications of nano- materials, Carbon Nano Tube (CNT):- Structure, two types, properties and applications</p>	09
Unit 4	<p>Water Chemistry Introduction, impurities in natural water, Water Testing: acidity, alkalinity and chlorides, hardness of water (definition, causes and significance), Calculations of total hardness, disadvantages of hard water in domestic and industrial applications. Scale and sludge: formation in boilers and removal, Treatment of hard water by ion exchange process, Zeolite process, Desalination of brackish water by Reverse Osmosis</p>	09
Unit 5	<p>Energy Science: Introduction, classification, characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numerical on Bomb and Boy's calorimeter.</p>	09



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	<p>Batteries: Introduction, Rechargeable Li- ion batteries (Diagram, charging-discharging reactions, advantages and applications).</p> <p>Fuel Cells: Introduction, H₂-O₂ Fuel cell (Construction, working and applications), Applications of fuel cells.</p>	
Unit 6	<p>Advanced Materials: Metallic materials: Introduction, alloy definition and classification, purposes of making alloys. Ferrous alloys: Plain carbon steels (mild, medium and high), Nonferrous alloys: Nickel alloy (Nichrome), Aluminum alloy (Duralumin and Alnico), Tin alloy (Solder metal). Polymers: Introduction, plastics, thermo softening and thermosetting plastics, industrially important plastics like phenol formaldehyde, urea formaldehyde. Conducting polymers, biopolymers (preparation, properties and applications). Composites: Introduction, composition, properties and uses of fiber reinforced plastics (FRP) and glass reinforced plastic (GRP).</p>	10

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2 nd	2009
2	Engineering Physics	G Vijayakumari	Vikas Pub. House (P) Ltd	3 rd	2009
3	Introduction to Nano science and Nanotechnology:	K.K. Chattopadhyay and A.N. Banerjee,	PHI Learning	3 rd	2009
4	A Text Book of Engineering Chemistry	S. S. Dara	S. Chand & Co. Ltd., New Delhi.	11 th	2008
5	A Text Book of Engineering Chemistry	Shashi Chawala	Dhanpat Rai Publishing Co. New Delhi.	3 rd	2007
6	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2 nd	2009

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Physics	Resnick Halliday, Krane,	John Wiley & Sons Pub.	8 th	2008
2	Introduction to Solid State Physics	Charles Kittle,	Wiley India Pvt. Ltd	7 th	2008
3	Solid State Physics:	S. O. Pillai	New Age International Ltd.	6 th	2007
4	Engineering Chemistry	Wiley India	Wiley India	5 th	2012
5	Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing Co., New Delhi.	15 th	2010
6	Engineering Physics	Resnick Halliday, Krane,	John Wiley & Sons Pub.	8 th	2008



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Course Details:

Class	F.Y. B. Tech. Sem. - II
Course Code and Course Title	1ADES112 / Digital Electronics
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	03 / 00 / 00
Credits	03
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes :Upon successful completion of this course, the students will be able to:

1ADES112_1	Solve various numerical on number system and its conversion.(K ³)
1ADES112_2	Apply Karnaugh Map to reduce Boolean expressions and logic circuits to their simplest forms (K ³)
1ADES112_3	Illustrate Logic Families (K ²)
1ADES112_4	Design of combinational circuits like comparators multiplexers, de-multiplexers, encoder, decoder and different code converters(K ³)
1ADES112_5	Interpret working of flip-flops, its characteristics and conversion.(K ²)
1ADES112_6	Design of sequential circuit like counters and shift registers(K ³)

Course Contents:

		Hrs.
Unit 1	Number Systems: Decimal, Binary, Octal & Hex number system, conversion of number system, Representation of signed and unsigned numbers and binary arithmetic in computer, representation of signed numbers using first and second complement's, two's complement arithmetic, ASCII code, SCSI code.	10
Unit 2	Logic Gates and optimization of Boolean functions: Basic gates, derived gates, universal gates, Axioms and laws of Boolean algebra, Boolean Laws and Theorems, simplification of logic expressions, K-map reduction with examples.	06
Unit 3	Logic Families: Digital IC Specification Terminology, Logic Families: TTL, CMOS, ECL Families, Interfacing of TTL to CMOS & CMOS to TTL.	05
Unit 4	Combinational Logic circuits: Adders and Subtractor, comparator, Decoders, Encoders, Multiplexers, De-multiplexers, parity generator and checker	09
Unit 5	Sequential Logic: Introduction to sequential circuit, Flip-flop & Timing Circuits: SR latch, Gated latch, Tri state logic, Edge triggered flip-flop: - D, JK, T Flip-flop, flip-flop asynchronous inputs, characteristic table of Flip-flop, excitation table of Flip-flop, master slave JK flip flop, inter conversion of Flip-flop. Study of timing parameters of flip-flop.	07
Unit 6	Shift registers and Counters: Shift registers: buffer register, controlled buffer register. Data transmission in shift resistor SISO, SIPO, PISO, PIPO, Counters - synchronous and ripple counters	05



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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Fundamentals of Digital Circuits	A. Anand Kumar	PHI	3 rd	2008
2	Modern Digital Electronics	R.P. Jain	Tata McGraw Hill	3 rd	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Design	M. Morris Mano	PHI	3 rd	2008
2	Digital Design	John Wakerly	Prentice Hall India Publication	4 th	2005



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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADPC113 / Computer Networks
Prerequisite/s	Basic Electrical Enff. / Analog Elec.
Teaching Scheme: Lecture/Tutorial/Practical	03 / 00 / 00
Credits	03
Evaluation Scheme: ISE / MSE / ESE	40 / 30 / 30

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADPC113 _1	Explain the fundamental concepts of data communication and networking. (K ²)
1ADPC113 _2	Describe the different coding schemes of digital transmission and transmission media.(K ²)
1ADPC113 _3	Apply various error detection and correction mechanism. (K ³)
1ADPC113 _4	Solve examples of logical addressing using various techniques. (K ³)
1ADPC113 _5	Make use of different protocols of network, transport and application layer. (K ³)

Course Contents:

		Hrs.
Unit 1	Communication Basics: Introduction: Data communications, Networks, Protocols & standards. Data & Signals: - Analog & Digital, Periodic analog signals, digital signals, Transmission Impairments (Attenuation, Distortion, Noise), Data rate limits & Performance (Throughput, Propagation Speed, Propagation time) Network Security: Message Confidentiality, Message Integrity, Message Authentication, Message Nonrepudiation and Introduction to Cryptography	07
Unit 2	Basics of Computer Network Introduction to Computer Networks, Uses of Computer Networks, Network Models Network topologies, Categories of Networks, Layered Tasks, The OSI model, Layers in the OSI model, TCP / IP protocol suit	07
Unit 3	Physical Layer Digital Transmission: - Line coding, Line coding Schemes (Unipolar, polar & Bipolar), Transmission modes (Asynchronous and synchronous transmission) Transmission media: - Guided, Unguided media Guided Media: Twisted pair cable, Coaxial cable, Optical Fiber cable. Unguided Media: Radio Waves, Microwaves, Infrared.	07
Unit 4	Data Link Layer Error detection & correction: - Introduction, Block coding, Cyclic codes, Checksum Data Link Control: - Framing, Flow & error control, Noisy and Noiseless channels Protocols, HDLC protocol.	07
Unit 5	Network Layer Logical Addressing: IPV4 Addresses: IPV4-Address Space, Notation, Classful, Classless Addressing, NAT, IPV6 Addresses –Structures, Address Space Internet Protocol: Internetworking, IPV4, IPV6 , Transition from IPv4 to IPv6	07


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Unit 6	Transport layer: TCP & UDP TCP: Services, Features, Segment, Connection UDP: Introduction, User Datagram, UDP Services, Applications Application Layer: DNS, FTP DNS: Name space, Domain Name Space, Distribution of Name Space, DNS in the Internet, Resolution, DNS message, FTP: Control connection and Data connection, Electronic Mail	07
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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Data Communications and Networking	Behrouz A Forouzan	Tata Mc Graw-Hill	4 th	2012
2	Computer Networks	Andrew S. Tanenbaum	Prentice Hall	5 th	2011

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Data & computer communications	William Stallings	Pearson Education	8 th	2011
2	Data communication and computer Networks	Ajit Pal	PHI Learning	1 st	2014
3	Computer Networking: Principles, technologies and protocols of network design	Natalia Olifer and victor Olifer	Wiley India Edition	1 st	2009
4	Computer Networking: A Top-Down Approach Featuring the Internet	Kurose, J.F. and Ross, K.W.	Addison Wesley	3 rd	2004


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADPC114 / Object Oriented Programming.
Prerequisite/s	Problem Solving using C
Teaching Scheme: Lecture/Tutorial/Practical	02 / 00 / 02
Credits	02
Evaluation Scheme: ISE / ESE	50 / 50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADPC114_1	Explain the fundamentals of object oriented programming. (K ²)
1ADPC114_2	Apply the concept of class, object, array and pointers inheritance and polymorphism in C++(K ³)
1ADPC114_3	Apply the concept of inheritance and polymorphism in C++. (K ³)
1ADPC114_4	Apply various library utilities and advanced features- template, STL (K ³)
1ADPC114_5	Communicate effectively, both orally and in preparing documentation of code(S ³)
1ADPC114_6	Follow given instructions during practical performance. (A ²)

Course Contents:

		Hrs.
Unit 1	Fundamentals of Object Oriented Programming The Origins of C++, C++ key words, Abstraction, Encapsulation, Polymorphism, Inheritance, Constructors & Destructors, Classes & Objects - Relation of Classes, Structures & Union, Friend Functions, Friend Classes, Inline Functions, Parameterized constructors, Scope resolution operators	05
Unit 2	Arrays & Pointers Arrays, Pointers, Arrays of objects, Pointers to objects, This Pointer, Dynamic Memory Allocation Operators —Introduction to new & delete operators. Function Overloading, Copy Constructors & Default Arguments, Operator Overloading, Operator overloading using friend function,	05
Unit 3	Inheritance: Single Inheritance, multilevel Inheritance, multiple Inheritance, hybrid Inheritance, hierarchical Inheritance,	04
Unit 4	Polymorphism- Virtual base classes. Virtual functions, Pure virtual function, Abstract classes, Early vs Late binding	04
Unit 5	File and Streams: Overview of C++ Stream classes, Read File using stream classes, Write in to file using stream classes. Exception Handling: Fundamentals of Exception Handling, Exception Handling Options: Try, Catch, Throw.	05
Unit 6	Templates: Generic classes, Generic functions, Applying generic functions, Power of templates. Introduction to JAVA Programming Language: Difference between C++ and JAVA, Applications of JAVA	05



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List of Experiments

Sr. No	Title of Experiment
1	Implement student grading system using class and object concept in C++.
2	Implement concept of function overloading.
3	Implement concept constructor overloading.
4	Implement program for Operator Overloading
5	Implement Multilevel & Multiple Inheritance concept.
6	Implement concept of Hierarchical Inheritance & Hybrid Inheritance.
7	Implement program for Friend Function
8	Implement program for Friend Class
9	Implement Virtual Function and Virtual Class concept in C++
10	Implement program for File Handling. (Read Write Operations)
11	Implement concept of Exception Handling.
12	Implement program for swapping of two numbers using Template concept in C++
Note: The students shall undergo a micro project based on some real-world problem as one component of in-semester-evaluation.	

Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	The Complete Reference: C++	Herbert Schildt,	Tata McGraw-Hill,	4 th	2010
2	Programming with C++	E Balagurusammy	Tata McGraw-Hill,	4 th	2010
3	JAVA - The Completer Reference	Herbert Schildt,	Tata McGraw-Hill,	7 th	2007

Reference Books:					
Sr. No	Title	Author	Publisher	Editton	Year of Edition
1	Object Oriented Programming in Turbo C++	Robert Lafore	Galgotia	4 th	2010
2	C++ Programming	John Thomas Berry	PHI	2 nd	1992
3	Programming with C++	D. Ravichandran,	TMGH	3 rd	2011
4	Test your C++ Skills	Yashwant Kanetkar	BPB	1 st	2010
5	Object Oriented Paradigm with C++	Dr. B. B. Meshram	Shroff Publishers	1 st	2016


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Other Books/E-material			
Sr. No	Title	Author	Publisher
1	NPTEL video lectures	NPTEL Author	www.nptel.ac.in



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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADBS115 / Engineering Physics & Chemistry Laboratory
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADBS115_1	Calculate wavelength of light and specific rotation of sugar solution. (K ³)
1ADBS115_2	Apply various optical formulae to determine wavelength and divergence of LASER and demonstrate Bravais lattices. (K ³)
1ADBS115_3	Identify hardness, alkalinity, and chloride content of water. (K ²)
1ADBS115_4	Analyze given materials using various instruments. (K ⁴)
1ADBS115_5	Communicate effectively and work in a team for laboratory activities. (S ²)
1ADBS115_6	Follow professional and ethical principles during laboratory. (A ²)

Experiment List:

1	Plane diffraction grating.
2	Wavelength of LASER
3	Divergence of The LASER Beam
4	Seven Crystal System.
5	Laurent's Half Shade Polarimeter.
6	Inverse square law.
7	Determination of alkalinity of water (Acid- Base Titration).
8	Determination of chloride content of water by Mohr's method. (Precipitation Titration).
9	Determination of total hardness of water by EDTA method (Complexometric Titration).
10	Preparation of urea formaldehyde.
11	Determination of rate of corrosion of Aluminium in acidic and basic medium.
12	Determination of pH of sample solution.

Note : Any Ten Experiments should be performed from above listed table

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2 nd	2009
2	Engineering Physics	G Vijayakumari	Vikas Pub. House (P) Ltd	3 rd	2009
3	A Text Book of Engineering Chemistry	S. S. Dara	S. Chand & Co. Ltd., New Delhi.	11 th	2008
4	A Text Book of Engineering Chemistry	Shashi Chawala	Dhanpat Rai Publishing Co. New Delhi.	3 rd	2007



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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Solid State Physics:	S. O. Pillai	New Age International Ltd.	6 th	2007
2	Materials Science and Engineering –	V. Raghvan	PHI Learning.	5 th	2006
3	Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing Co., New Delhi.	15 th	2010
4	Industrial Chemistry	B. K. Sharma	Goel publication (P) Ltd.	10 th	1999
5	Computers and their Applications to Chemistry	Ramesh Kumari	Narosa Publishing House Pvt. Ltd.	2 nd	2005



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Course Details:

Class	F.Y. B. Tech. Sem. - II
Course Code and Course Title	1ADES116 / Digital Electronics Laboratory
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes :Upon successful completion of this course, the students will be able to:	
1ADES116_1	Build Digital Circuits using Logic Gates(K ³)
1ADES116_2	Examine Digital Circuits as Boolean expressions, Combinational and Sequential Circuits(K ⁴)
1ADES116_3	Accept professional and ethical responsibility of engineering technology profession(A ³)
1ADES116_4	Acquire individual and team work skills for working effectively in groups(S ³)
1ADES116_5	Communicate effectively in technical and non-technical environments (S ³)

Experiment List:	
1	Introduction to digital electronics components and equipment's to be used – Resistors, LEDs, integrated circuits, DC Power supply, function generator.
2	Implementation of logic gates.
3	Implementation of logic circuits using universal gates.
4	Reduction and Implementation of Boolean function using logic gates.
5	Implementation of Adders & Subtractors.
6	Implementation of 4-bit adder using IC-7483.
7	Implementation of Comparator using IC 7485.
8	Implementation of Multiplexer and Demultiplexer using IC 74151 & 74138.
9	Implementation of flip-flops.
10	Implementation of decade counter with FND(Flat Numeric Display)



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Text Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Fundamentals of Digital Circuits	A. Anand Kumar	PHI	3 rd	2008
2	Modern Digital Electronics	R.P. Jain	Tata McGraw Hill	3 rd	2011

Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Design	M. Morris Mano	PHI	3 rd	2008
2	Digital Design	John Wakerly	Prentice Hall India Publication	4 th	2005



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Course Details:

Class	F.Y. B. Tech. Sem. - II
Course Code and Course Title	1ADPC117 / Computer Networks Laboratory
Prerequisite/s	---
Teaching Scheme: Lecture / Tutorial / Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE	50

Course Outcomes : Upon successful completion of this course, the students will be able to:

1ADPC117_1	Simulate , configure and analyze the network using network analyzer tools.(K ³)
1ADPC117_2	Demonstrate the installation and various features of computer network packet tracer tool.(K ³)
1ADPC117_3	Demonstrate the communication between computer nodes using TCP/UDP socket. (K ³)
1ADPC117_4	Propose LAN Design and make use of various network troubleshooting commands. (K ³)
1ADPC117_5	Follow given instructions during practical performance. (A ²)
1ADPC117_6	Proficiently use various networking protocols.(S ³)

Experiment List:

1	Design types of Network cables and Practically implement the cross-wired cable and straight through cable using clamping tool.
2	Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration)
3	Make use of basic network command and Network configuration commands.
4	Installation of Cisco Packet tracer tool.
5	Configuring and Working of networking control devices using cisco packet tracer tool
6	Design a topology of Computer Networks using cisco packet tracer tool.
7	Designa LAN by using cisco packet tracer tool.
8	Implementation of CRC and Hamming Code.
9	Implementation of TCP Socket program.
10	Implementation of UDP Socket program.
11	DNS, SMTP, FTP, and WEB Server configuration in packet tracer
12	Installation of network analyser tool (Wireshark). Wireshark Lab: HTTP, DNS
13	Case study: To study network of any organization and submit report

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Computer Networks	Andrew S. Tanenbaum	Prentice Hall	5 th	2011
2	Cisco Packet Tracer for Beginners	Kalyan Chinta	CCNA	--	--


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Reference Books:					
Sr. No	Title	Author	Publisher	Edition	Year of Editton
1	Networking	Jeffery S.Beasley	NewRidersPress.	2 nd	2011
2	ComputerNetworks	Larry L.Peterson, Bruce S.Davie	Morgan Kaufmann	5 th	2011
3	TCP/IPVolumel,2,3	W.RichardStevens	WileyIndiaEdition	5 th	2015
4	TCP/IP and Network Security	Dr. B. B. Meshram	Shroff Publishers	1 st	2016



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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	IADHS118_A / Table –Tennis
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
IADHS118_A_1	The students define table tennis game.
IADHS118_A_1	Willingly participates in Table Tennis as a component of an active lifestyle.
IADHS118_A_1	The students explain foot- work in forehand and backhand spin.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction & Understand basic Table Tennis rules, terminology, safety concerns, and scoring procedures.	04
Unit 2	Demonstrate proper court etiquette and good sportsmanship.	06
Unit 3	Demonstrate basic skills associated with table tennis including forehand, backhand, spins, grips & serves.	05
Unit 4	Demonstrate Exposition and Applying forehand and backhand straight strike.	05
Unit 5	Assess current personal fitness levels & Practice.	06
Unit 6	Use a variety of stroke placements to keep opponent moving during a table tennis match. Practice.	04


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADHS118_B / Kho-Kho
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS118_B_1	Helps In Motor Development.
1ADHS118_B_2	It helps in social and mental development of the student
1ADHS118_B_3	Kho-Kho helps the student to off depression, anxiety, stress and, increase self-esteem.
1ADHS118_B_4	It develops team spirit and leadership skill.
1ADHS118_B_5	It improves physical fitness.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction to Kho-Kho – Aim – Objectives – Short reference in Kho-Kho history Understand the basic rules and how they should play normal game.	04
Unit 2	Demonstrate basic skills associated with Kho-Kho, including Fundamental Skills. Chasing Skills- a) Giving Kho b) Taking Direction c) Sudden Change d) Tapping	06
Unit 3	Demonstrate basic skills associated with Kho-Kho, including Fundamental Skills. Chasing Skills-e) Turning Round the Post f) Trapping g) Diving h) Fake Kho i) Late kho & Practice.	05
Unit 4	Demonstrate basic skills associated with Kho-Kho, including Running Skills a) Position on the court b) Avoiding Trapping c) Positioning near post d) Dodging	05
Unit 5	Demonstrate basic skills associated with Kho-Kho, including Running Skills e) Front Dodge f) Back Dodge c) Round the post dodge & Practice	06
Unit 6	Kho-Kho Skills Practice & Matches.	04


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	IADHS118_C / Basket Ball
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
IADHS118_C_1	Introduce students to the basic skills and knowledge associated with basketball.
IADHS118_C_2	By applying these principles through active participation, students develop the necessary skills and knowledge to play basketball
IADHS118_C_3	Provides students with opportunities to improve physical fitness, acquire knowledge of fitness concepts and practice positive personal and social skills
IADHS118_C_4	Students will gain an understanding of how a wellness lifestyle affects one's health, fitness and physical performance.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction & Understand basic basketball rules, terminology, and safety concerns.	04
Unit 2	Demonstrate the six basic basketball skills of a) Running b) Jumping c) Passing d) catching e) Dribbling and f) Shooting.	06
Unit 3	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 4	Understand and apply the knowledge of basic rules of basketball. Skills Practice.	05
Unit 5	Demonstrate proper etiquette and good sportsmanship. Successfully participates in skill improvement and offensive game strategies.	06
Unit 6	Identify and apply injury prevention principles related to aerobic activities. Practice & Matches.	04


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADHS118_D, Hand Ball
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
IADHS118_D_1	The student has a basic knowledge of the team values of sports games
IADHS118_D_2	Acquainting with the characteristics and trends in the development of the discipline.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction & Understand basic Handball rules, terminology, and safety concerns.	04
Unit 2	Health and safety rules. Rules for obtaining credit for the course, Reminder of the history, methodology and basic rules of the game, Exercises to improve passing, grips and throws. The game. Reminder of the refereeing rules.	06
Unit 3	Improving the technique of passing and grips in a team setting. Individual ways of freeing oneself from the opponent and the organization of positional attacks with their use	05
Unit 4	Exercises improving feints and individual defense technique. Everyone's defense system. Principles of individual defense & Practice.	05
Unit 5	Improving the technique of passing and grips in a team setting. Individual ways of freeing oneself from the opponent and the organization of positional attacks with their use. The game & Practice.	06
Unit 6	Identify and apply injury prevention principles related to aerobic activities. Practice & Matches	04


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADHS118_E, Katthak Classical Dance
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
1ADHS118_E_1	Explain Importance of katthak with respect to Indian culture.
1ADHS118_E_2	Demonstrate Gurusvandana, Tatkar.
1ADHS118_E_3	Compose Katthak dance with consideration of classical & semi classical music.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	Introduction to Classical dance katthak & its importance.	01
Unit 2	Gurusvandana & Tatkar. (teen taal)	03
Unit 3	Chakri & Hast-sanchalan	03
Unit 4	Tode. (Tigida-tigdig-thai)	03
Unit 5	Practice sessions.	02
Unit 6	Paran & Tihaei	05
Unit 7	Classical dance on Song	05
Unit 8	Practice sessions.	08


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADHS118_F / Tabla Classical instruments
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE / ESE	50 / 00

Course Outcomes (COs):	
Upon successful completion of this course, the student will be able to:	
IADHS118_F_1	Discover History of table wadan.
IADHS118_F_2	Demonstration of different Taal in table wadan.
IADHS118_F_3	Develop notation on new music with help of table wadan.

Course Contents:		
Unit No.	Title	Hrs.
Unit 1	History & Introduction to Tabla Wadan.	01
Unit 2	Tabla presentation of Taal. Tritaal/ Dadra/ Zaptaal/ Kerwa/ Bhajni	05
Unit 3	Practice sessions.	06
Unit 4	Practice with notation ,& Set one song with tabla	08
Unit 5	Practice sessions & students' presentations.	10


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Course Details:

Class	F.Y. B. Tech, Sem.-II
Course Code and Course Title	1ADHS118_G, Western Dance
Prerequisite/s	-----
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes (COs):

Upon successful completion of this course, the student will be able to:

IADHS118_G_1	Describe History of Western dance & basic of western dance.
IADHS118_G_2	Organize western dance individually as well as group with help of western music.
IADHS118_G_3	Compose western dance on songs.

Course Contents:

Unit No.	Title	Hrs.
Unit 1	History of Western dance style & information about western dance.	02
Unit 2	Basic types of western dance: - worm-up, Hand- legs movements.	04
Unit 3	Teaching Basic style (focus on dance / music / movements, how to control body, emotion/feeling of music/ dance.)	06
Unit 4	Training western dance with music (original dance form of western, free style dance)	08
Unit 5	Dance composition.	05
Unit 6	Practice session , & Students Presentation	05



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