SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Semester – I/II

2315111: Problem Solving and Programming using Python

Teaching Scheme:	**Credits**	**Examination Scheme**	
Theory: 01 hrs/week	**TH:01**	**Theory**	**CIA : - -**
Practical: 02 hrs/week	**Practical:01**		**End-Sem: 25**
		Pract:	**25**
		Oral:	**--**
		Termwork	**25**

Course Objectives: To understand

1. To understand problem solving, problem solving aspects, programming and to know about Various program design tools.
2. To learn problem solving with computers
3. To learn basics, features and future of Python programming.
4. To acquaint with data types, input output statements, decision making, looping and functions in Python
5. To learn features of Object Oriented Programming using Python
6. To acquaint with the use and benefits of files handling in Python

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Inculcate and apply various skills in problem solving.

CO2: Choose most appropriate programming constructs and features to solve the problems in diversified domains.

CO3: Exhibit the programming skills for the problems those require the writing of well-Documented programs including use of the logical constructs of language, Python.

CO4: Demonstrate significant experience with the Python program development environment.

Unit I: Programming Methodology **(04 Hrs)**	**CO**
Problem definition, Types of Problem, Step involving in Problem Solving, Algorithms, Flowcharts and Pseudo-codes, implementation of Algorithms, Basics of Python Programming: Features of Python, History and Future of Python, Literal constants, variables and identifiers, Data Types, Input operation, Comments, Reserved words, Indentation, Operators and expressions, Expressions in Python.	CO1
Unit II: Decision Control Statements **(04 Hrs)**	CO2
Decision control statements, Selection/conditional branching Statements: if, if-else, nested if, if-elif-else statements, Basic loop Structures/Iterative statements: while loop, for loop, selecting appropriate loop, Nested loops, break, continue, pass, else statement used with loops, Other data types: Tuples, Lists and Dictionary.	
Unit III: Functions and Modules **(06 Hrs)**	CO3
Need for functions, Function: definition, call, variable scope and lifetime, the return statement, Defining functions, Lambda or anonymous function, documentation string, good programming practices, Introduction to modules, Introduction to packages in Python, Introduction to standard library modules.	

LIST OF PRACTICALS

Sr. No.	Title	CO
1	Write a python program to simulate simple calculator that performs basic tasks such as addition, subtraction, multiplication and division.	**CO2**
2	Write a python program to swap value of two variables.	**CO2**
3	To accept an object mass in kilograms and velocity in meters per second and display its momentum. Momentum is calculated as e=mCO2 where m is the mass of the object and c is its velocity.	**CO2**
4	To accept N numbers from user. Compute and display maximum in list, minimum in list, sum and average of numbers.	**CO2**
5	To accept N numbers from user. Compute and display maximum in list, minimum in list, sum and average of numbers.	**CO2**
6	To accept from user the number of Fibonacci numbers to be generated and print the Fibonacci series.	**CO3**
7	To accept two numbers from user and compute smallest divisor and Greatest Common Divisor of these two numbers.	**CO3**
8	Write a python program to create student name database using list and perform operations like add, delete, search student name in the list.	**CO3**

Textbooks

1. R. G. Dromey, "How to Solve it by Computer", 1st Edition, Prentice-Hall International,1982.
2. Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford University Press, ISBN 13: 978-0-19-948017-6.
3. R. Nageswara Rao, "Core Python Programming", Dreamtech Press; Second edition ISBN-10: 938605230X, ISBN-13: 978-9386052308 ASIN: B07BFSR3LL

Reference books

1. Maureen Spankle, "Problem Solving andbProgramming Concepts", Pearson; 9th edition, ISBN-10: 9780132492645, ISBN-13: 978- 0132492645
2. Jeeva Jose, P. Sojan Lal, "Introduction to Computing & Problem Solving with Python", Khanna Computer Book Store; First edition, ISBN-10: 9789382609810, ISBN-13: 978-9382609810.
3. R. G. Dromey, "How to Solve it by Computer", Pearson Education India; 1st edition, ISBN-10: 8131705625, ISBN-13: 978-8131705629
4. Paul Barry, "Head First Python- A Brain Friendly Guide", SPD O'Reilly, 2nd Edition, ISBN:978-93-5213-482-3.
5. Martin C. Brown, "Python: The Complete Reference", McGraw Hill Education, ISBN-10: 9789387572942, ISBN-13: 978-9387572942, ASIN: 9387572943.
6. Romano Fabrizio, "Learning Python", Packt Publishing Limited, ISBN: 9781783551712, 1783551712.

SANDIP FOUNDATION

SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) ***(2023 Pattern)***

Sem-I/II

2312112: Engineering Draftsmanship

Teaching Scheme:	**Credits**	**Examination Scheme:**
TH : 1 Hr./Week	**TH:01**	**CIA:--**
PR : 2 Hrs./Week	**Practical: 01**	**End-Sem:50**
		TW : 25

Course Objectives:-

1. To acquire basic knowledge about engineering drawing language, line types, dimension methods, and simple geometrical construction. To acquire basic knowledge about the various CAD drafting software's and its basic commands required to construct the simple engineering objects.
2. To acquire basic knowledge about physical realization of engineering objects and shall be able to draw its different views
3. To visualize three dimensional engineering objects and shall be able to draw their isometric views.

Course Outcomes:-

On completion of the course, learner will be able to

CO1: Draw the fundamental engineering objects using basic rules and able to construct the simple geometries. Draw fully-dimensioned 2D, 3D drawings using computer aided drafting tools.

CO2: Apply the concept of orthographic projection of an object to draw several 2D views and its sectional views for visualizing the physical state of the object.

CO3: Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment.

Units		
Unit 1	**Fundamentals of Engineering Drawing (02 Hrs.)**	**CO**
Content- Fundamentals of Engineering Drawing, Need of Engg. Drawing and Design, Different layouts of Sheets, Types of Lines and Dimensioning, Geometrical Constructions- Simple only. **Introduction to CAD** Content –What is CAD, Introduction to AutoCAD, Different Commands and Their Function, Use of AutoCAD to Draw simple drawings and dimensioning.		**CO1**
Unit 2	**Orthographic Projections (6 Hrs.)**	**CO2**
Content – Principle of Projections, Introduction to First and Third Angle Method of Projections, Orthographic Projections of Machine Element/Parts, Sectional Orthographic Projection.		
Unit 3	**Isometric Projections (6 Hrs.)**	**CO3**
Content – Introduction to Isometric Projections and Isometric View, Isometric Projections from Given Orthographic View.		

Books & Other Resources

Text Books:-

1. Bhatt, N. D. and Panchal, V. M., (2016), “Engineering Drawing”, Charotar Publication, Anand, India
2. K. Venugopal, K, (2015), “Engineering and Graphics”, New Age International, New Delhi
3. Jolhe, D. A., (2015), “Engineering Drawing with introduction to AutoCAD”, Tata McGraw Hill, New Delhi
4. Rathnam, K., (2018), “A First Course in Engineering Drawing”, Springer Nature Singapore Pte. Ltd., Singapore

Reference Books:-

1. Madsen, D. P. and Madsen, D. A., (2016), “Engineering Drawing and design”, Delmar Publishers Inc., USA
2. Bhatt, N. D., (2018), “Machine Drawing”, Charotor Publishing House, Anand, India
3. Dhawan, R. K., (2000), “A Textbook of Engineering Drawing”, S. Chand, New Delhi
4. Luzadder, W. J. and Duff, J. M., (1992), “The Fundamentals of Engineering Drawing: With an Introduction to Interactive Computer Graphics for Design and Production”, Peachpit Press, USA
5. Giesecke, F. E., Mitchell, A., Spencer, H. C., Hill, I. L., Loving, R. O., Dygon, J. T., (1990), “Principles of engineering graphics”, McMillan Publishing, USA
6. Jensen, C., Helsel, J. D., Short, D. R., (2008), “Engineering Drawing and Design”, McGraw-Hill International, Singapore

Term Work:- Sheet No. 1 to 3 on A2 (594X420mm) Half Imperial Size Drawing Sheet		**CO**
Sheet No. 1	Types of Lines, Letter and Dimensioning	**CO1**
Sheet No. 2	To draw One Principal and One Sectional view of any Machine Element.	**CO2**
Sheet No. 3	To draw Isometric view of Machine Element (Two Problems)	**CO3**

SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Sem-I/II

2313113: Introduction to Drone Technology

Teaching Scheme:	**Credits**	**Examination Scheme**	
Theory: 1 hrs/week	**Th:01**	**Theory**	**CIA: --**
Practical: --	**Practical: --**		**End-Sem:25**
		Pract:	**--**
		Oral:	**--**
		Termwork	**--**

Course Objectives: The student should be able to

1. Identify and describe common components of drone
2. Understand and design the application specific drone.
3. Understand and explain basics of aerodynamics

Course Outcomes:
On completion of the course, learner will be able to

CO1: Recognize and describe the role of drone in present, past and future society

CO2: Comprehend basic components of drone.

CO3: Explain the impact of various payloads of drone.

CO4: Interpret the aspects of legal issues

CO5: Implement and design application oriented drone.

Unit 1: Introduction to Drone and its legal aspects **7Hrs**	**CO**
Types of Drones and Their Technical Characteristics, Main Existing Drone Types, Level of Autonomy, Size and Weight, Differences in Energy Source, Widely Used Drone models, Legal issues on the use of frequency spectrum and electronic equipment, surveillance and compliance. Flight zones	CO1 to CO4
Unit 2: PayLoad Calculation and drone assembling **7Hrs**	CO1 to CO5
Types of Payloads and their application sensors, other payloads and frequency spectrum issues. Parts of a Drone, Motor, Propellers, Flight Controllers, Electronic Speed Controllers, Safe Assembly of Drone and Drone air Flight for aerial Photos. Battery management systems	

Text Books:

1. The future of Drone Use Opportunities and Threats from Ethical & Legal Perspectives
2. DIY Drones for the Evil Genius: Design, Build, and Customize Your Own Drones
3. Build a Drone: A Step-by-Step Guide to Designing, Constructing, and Flying Your Very Own Drone Barry Davies
4. Drones: An Illustrated Guide to the Unmanned Aircraft that are Filling our Skies

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SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Semester – I/II

2312114: Workshop practice

Teaching Scheme:	**Credits**	**Examination Scheme**	
Theory: 00 hrs/week	**TH:00**	**Theory**	**CIA: - -**
Practical: 02 hrs/week	**Practical: 01**		**End - Sem: - -**
		Practical :	**--**
		Oral:	**--**
		Term work	**25**

Course Objectives: To understand

1. To understand industrial safety norms and working of machine tools and functions of its parts.

2. To develop the skill through hands-on practices using hand tools, power tools, machine tools in manufacturing and assembly shop leading to understanding of a production processes.

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Familiar with safety norms to prevent any mishap in workshop.

CO2: handle appropriate hand tool, cutting tool and machine tools to manufacture a job.

CO3: understand the construction, working and functions of machine tools and their parts.

CO4: know simple operations (Turning and Facing) on a center lathe.

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SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Semester – I/II

2312114: Workshop practice

LIST OF PRACTICALS

Guidelines for Laboratory Conduction

A. Any 6 from 1st to 7th Experiments

B. Any 2 from 8th to 11th Experiments

Sr. no	Title of Experiment	CO
1	Study of Safety on the Manufacturing shop and Industrial safety norms.	CO1
2	Lathe Machine- Demonstration and Working Principle: Introduction, Working Principle, Main Parts of lathe machine and machine accessories, Operations of Lathe Machine, Specification Functions of lathe Machine (At least one turning job is to be demonstrated).	CO2, CO3,CO4
3	Drilling Machine- Demonstration and Working Principle: Definition, Types, Parts, Working Principle, Operations on Vertical drilling machine/Radial drilling machine, Drilling tool, Tool holding devices, Concept of speed, feed and depth of cut.	CO2, CO3
4	Milling machine- Demonstration and Working Principle: What is milling machine, Milling machine Parts, Operation, Working Principle, Construction, Table movements, Indexing and Multipoint cutter and Gear Cutting Operation.	CO2, CO3
5	Grinding/ Shaper machine- Demonstration (Any one) : Grinder: Surface grinding machines, Tool and cutter grinding machines. Shaper: Shaping Machine Working Principle, Mechanism used in Shaper machine.	CO2, CO3
6	Injection Moulding Machine- Demonstration and Working Principle: Basics of Injection Moulding Process, machine parts and its function	CO2, CO3
7	CNC Turning Machine- Demonstration: Basics of CNC manufacturing and CNC programming.	CO2, CO3
8	One job using different welding operations : Study and demonstration of metal joining processes using Arc Welding, Gas Welding and Spot Welding machines.(Any one)	CO2
9	One job using different sheet Metal operations: Sheet metal working and Brazing Use of sheet metal, working hand tools, cutting, punching, blanking, bending, spot welding	CO2
10	Fitting Shop- One job involving following operations: marking, filing to size, centre punching, drilling, tapping, one simple male- female joint.	CO2
11	Carpentry Shop- One carpentry job involving wood turning .Use and setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood turning and modern wood turning methods.	CO2

SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Semester – I/II

2300115: Physical Education and Yoga

Teaching Scheme:	**Credits**	**Examination Scheme**	
Theory: --	**Th:00**	**Theory**	**CIA: --**
Practical: 4 hrs/week	**Practical: 02**		**End-Sem:--**
		Pract:	**--**
		Oral:	**--**
		Termwork	**50**

Course Aim and Objectives: **56 hrs**

Introduction to Physical Education and Yoga

· · **Introduction to Yoga -** History of Yoga**,** Introduction to Ashtanga Yoga.

· **Mobility exercises – Neck up & down, Side to side, shoulder rotation, Twisting, Squats.**

· **Practice of Prone and Supine Asanas**

A student will have to perform standing and seating asanas, Pavanmuktasana, Shavasana, Setubandhasana, · Ardha Halasana, Salabhasana, Bhujangasana, Halasana, Makarasana, Dhanurasana

The following points to be covered:

- Benefits &Contraindication of each asana

Practice of Sitting and Standing Asanas:-

A student will have to perform sitting and standing asana

Vajrasana, Dandasan, Vakrasana, Ushtrasana, Uttanmandukasana, Bhadrasan, Vrikshasana, Shashankasan, Trikonasana, Padahastasana, Chakrasana - sideward, Tadasana

The following points to be covered:

- Benefits & Contraindication of each asana

Course Outcomes: The outcomes of the course are to create awareness among students about Yoga, and to facilitate knowledge about Asanas, This will help them to incorporate yogic practices in their lifestyle.

SANDIP INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE

F.Y. B. Tech(Common) *(2023 Pattern)*

Semester – I/II

2300116: Physical Education and Sports

Teaching Scheme:	**Credits**	**Examination Scheme**	
Theory: --	**Th:00**	**Theory**	**CIA: --**
Practical: 4 hrs/week	**Practical: 02**		**End-Sem:--**
		Pract:	**25**
		Oral:	**--**
		Termwork	**25**

Course Aim and Objectives:

1. The aim of the scheme is to make Physical Education as an integral part of Educational System. Students studying in the colleges should have the benefit of Physical Education to improve their health during the course of college education. It is designed to ensure that on completion of this training they would attain the minimum prescribed standard.
2. The object of the scheme is to enhance physical efficiency and maintain fitness of mind, body and character, which would help the student to be mentally alert and physically efficient to withstand the strain and fatigue of daily life. It would prepare them for the strenuous training which will help them to be fit to face the different barriers in life. The students will undergo this scheme for the first year of his/her under graduate Course education.

Course Outcomes:

To enhance physical efficiency and maintain fitness of mind, body and character, which would help the student to be mentally alert and physically Efficient to withstand the strain and fatigue of daily life.

Participation in the scheme: 56 hrs

Compulsory Activities: Under this category, a student shall have to choose total three activities, at least one from each part of group B (Running, Jumping, Endurance and Strength) during the sem, and have to participate in them throughout the sem. Whatever may be choices according to the availability, students shall have to show sufficient skill and have to achieve minimum prescribed target at the end of the SEM.

The Scheme: Choices for Compulsory Activities and tests for its evaluation: (Opt any three activities, out of which one from each selected parts i.e. Part A/B/C/D/)

List of Activities and tests:-

PART	EVENT	STUDENT	TESTS FOR EVALUATION
Part A	100 m. Run	(Male and Female)	50 yard dash (150 feet)
	400 m. Run	(Male and Female)	
Part B	High Jump or Pole Vault	(Male and Female)	Standing Vertical Jump
	Long Jump	(Male and Female)	
	Triple Jump	(Male and Female)	
Part C	12.5 Km. Cross Country	(Male)	Cooper's Test (12 minutes run and walk test)
	5 Km. Cross Country	(Female)	
	1500 m. Run	(Male)	
Part D	Rope Climbing	(Male)	Medicine Ball put for male and Sit Ups test for female
	Chin Ups/Flex Arm hang	(Male and Female)	
	Sit Ups	(Male and Female)	
	Push Ups and Modified push ups	(Male and Female)	

1. Optional Activities:

The Scheme: Optional Activities (Opt any Two, out of which one from individual event and one from team event)

A student shall have to participate in two types of physical activities viz.

Group (A) - Optional Activities (Opt any Two, out of which one from individual event and one from team event)

Name of Individual Event	**Individual Events Test for Evaluation**
Gymnastics	Flex arm Hang Test for Girls Vertical Reach Test for Boys
Judo	Pushups and 12 Minutes run and walk test
Malkhamb/Rope Malkhamb	Flex arm Hang Test for Girls Vertical Reach Test for Boys
Table Tennis	Eye-hand Coordination Test
Tennis	Dyer's Tennis Test
Weight Lifting and Power Lifting	Sit ups, Pushups, Standing Vertical Jump
Wrestling	Pushups and 12 Minutes run and walk test
	Sit and Reach Test
Name of Team Event	**Team Events Test for Evaluation**
Basketball	Johnson's Basketball Test
Football	Mc Donald's Soccer Skill Test
Hockey	SAI Hockey Skill test
Kabaddi	6X10 M. Shuttle Run Test
Kho –Kho	6X10 M. Shuttle Run Test
Volleyball	SAI Volleyball Skill test