

**AIR FORCE SCHOOL , BAGDOGRA**  
**SPLIT UP SYLLABUS 2020-2021**  
**CLASS XI SUB: PHYSICS(042)**

MONTH	NO. OF PERIODS	CHAPTERS / TOPICS TO BE COVERED
AUG	12	<p><b>Chapter-1: Physical World</b> Physics-scope and excitement; nature of physical laws; Physics, technology and society.</p> <p><b>Chapter-2: Units and Measurements</b> Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.</p>
AUG	11	<p><b>Chapter-3: Motion in a Straight Line</b> Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion, uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).</p> <p><b>Chapter-4: Motion in a Plane</b> Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion, uniform circular motion.</p>
SEPT & OCT	25+16 =41	<p><b>Chapter-5: Laws of Motion</b> Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).</p> <p><b>Chapter-6: Work, Energy and Power</b> Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.</p> <p><b>Chapter-7: System of Particles and Rotational Motion</b> Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.</p> <p><b>Chapter-8: Gravitation</b> Kepler's laws of planetary motion, universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.</p>
NOV	13	<p><b>Chapter-9: Mechanical Properties of Solids</b> Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy.</p> <p><b>Chapter-10: Mechanical Properties of Fluids</b> Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.</p>
NOV	10	<p><b>Chapter-11: Thermal Properties of Matter</b> Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Green house effect.</p> <p><b>Chapter-12: Thermodynamics</b> Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and</p>

		adiabatic processes. Second law of thermodynamics: reversible and irreversible processes, Heat engine and refrigerator.
DEC	15	<b>Chapter–13: Kinetic Theory</b> Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.
DEC & JAN	2+17=19	<b>Chapter–14: Oscillations</b> Periodic motion - time period, frequency, displacement as a function of time, periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a loaded spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.  <b>Chapter–15: Waves</b> Wave motion: Transverse and longitudinal waves, speed of wave motion, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.
Feb' 21		<b>Revision</b>

**AIRFORCE SCHOOL BAGDOGRA**  
**SPLIT UP SYLLABUS**  
**SUBJECT: COMPUTER SCIENCE (083)**

CLASS XI

SUBJECT TEACHER: SUSRETI SUR

**Distribution of Marks**

Unit No.	Unit Name	Theory
		Marks
I	Computer Systems and Organisation	10
II	Computational Thinking and Programming - 1	45
III	Society, Law and Ethics	15
	<b>Total</b>	<b>70</b>

**DISTRIBUTION OF PRACTICAL MARKS**

S.No.	Area	Marks
		(Total=30)
1.	Lab Test (12 marks)	
	Python program (60% logic + 20% documentation + 20% code quality)	12
2.	Report File + Viva (10 marks)	
	Report file: Minimum 20 Python programs	7
	Viva voce	3
3.	Project	8
<b>TOTAL</b>		<b>30</b>

MONTH	UNIT	SPLIT UP SYLLABUS	LEARNING OUTCOMES
AUGUST	1	<p><b>Computer Systems and Organisation</b></p> <ul style="list-style-type: none"> <li>● <b>Basic computer organisation: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery.</b></li> <li>● <b>Types of software: Application software, System software and Utility software.</b></li> <li>● <b>Memory Units: bit, byte, MB, GB, TB, and PB.</b></li> <li>● <b>Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits</b></li> <li>● <b>Number System: numbers in base 2, 8, 16 and binary addition.</b></li> <li>● <b>Encoding Schemes: ASCII, UTF8, UTF32, ISCII and Unicode.</b></li> <li>● <b>Concept of Compiler and Interpreter</b></li> <li>● <b>Operating System (OS) - need for an operating system, brief introduction to functions of OS, user interface</b></li> <li>● <b>Concept of cloud computing and cloud services (SaaS,IaaS,PaaS), cloud (public/private), Blockchain technology</b></li> </ul>	<p><b>Students will learn about the basic functionalities and the general system of computer.</b></p> <p><b>Students will learn about the various logic gates and the Boolean algebra.</b></p> <p><b>Students will gain knowledge about the various language processors.</b></p> <p><b>Students will gain knowledge about some basics of cloud computing.</b></p>



<p>NOVEMBER</p>		<p>statement, expressions, operators and their precedence.</p> <ul style="list-style-type: none"> <li>● Operators &amp; types: Binary operators-Arithmetic, Relational Operators, Logical Operators, Augmented Assignment Operators.</li> <li>● Execution of a program, errors- syntax error, run-time error and logical error.</li> <li>● Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.</li> <li>● Notion of iterative computation and control flow: for(range(),len()), while, using flowcharts, suggested programs: calculation of simple and compound interests, finding the factorial of a positive number etc.</li> <li>● Strings: Traversal, operations – concatenation, repetition, membership; functions/methods–len(), capitalize(), title(), upper(), lower(), count(), find(), index(), isalnum(), islower(), isupper(), isspace(), isalpha(), isdigit(), split(), partition(), strip(), lstrip(),rstrip(), replace(); String slicing.</li> <li>● Lists: Definition, Creation of a list, Traversal of a list. Operations on a list -</li> </ul>	<p>Students will learn the implementation of operators, variables, keywords, datatypes and will know the details of them.They will learn about how to represent logic in pictorial form with help of flowchart.</p> <p>Students will learn about the functionalities of various inbuilt functions and will practice their implementation.</p>
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		<p>concatenation, repetition, membership; functions/methods–len(), list(),</p>	
<p>DECEMBER</p>	<p>2</p>	<p>append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), min(), max(), sum(); Lists Slicing; Nested lists; finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.</p> <ul style="list-style-type: none"> <li>• <b>Tuples:</b> Definition, Creation of a Tuple, Traversal of a tuple. Operations on a tuple - concatenation, repetition, membership; functions/methods – len(), tuple(), count(), index(), sorted(), min(), max(), sum(); Nested tuple; Tuple slicing; finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple.</li> <li>• <b>Dictionary:</b> Definition, Creation, Accessing elements of a dictionary, add an item, modify an item in a dictionary; Traversal, functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted() copy(); Suggested programs : count the number of times a character</li> </ul>	<p>Students will learn about the functionalities of various inbuilt functions and will practice their implementation.</p>
<p>JANUARY</p>		<p>Students will learn about the functionalities of various inbuilt functions and will practice their implementation</p>	

		<p>appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them.</p> <ul style="list-style-type: none"> <li>● <b>Sorting algorithm:</b> bubble and insertion sort; count the number of operations while sorting.</li> <li>● <b>Introduction to Python modules:</b> Importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random module (random, randint, randrange), statistics module (mean, median, mode).</li> </ul>	
<b>JANUARY</b>	<b>3</b>	<p><b>Society, Law and Ethics</b></p> <ul style="list-style-type: none"> <li>● <b>Cyber safety:</b> safely browsing the web, identity protection, confidentiality, social networks, cyber trolls and bullying.</li> <li>● <b>Appropriate usage of social networks:</b> spread of rumours, and common social networking sites (Twitter, LinkedIn, and Facebook) and specific usage rules.</li> <li>● <b>Safely accessing web sites:</b> adware, malware, viruses, trojans</li> <li>● <b>Safely communicating data:</b> secure connections, eavesdropping, phishing and identity verification.</li> <li>● <b>Intellectual property rights, plagiarism, digital rights management, and licensing</b></li> </ul>	<p>Students will acquire knowledge about various threats on internet technologies and be aware of cyber security laws.</p>

		<p>(Creative Commons, GPL and Apache), open source, open data, privacy.</p> <ul style="list-style-type: none"> <li>● Privacy laws, fraud; cyber-crime- phishing, illegal downloads, child pornography, scams; cyber forensics, IT Act, 2000.</li> <li>● Technology and society:</li> <li>● understanding of societal issues and cultural changes induced by technology.</li> <li>● E-waste management: proper disposal of used electronic gadgets.</li> <li>● Identity theft, unique ids and biometrics.</li> <li>● Gender and disability issues while teaching and using computers</li> </ul>	
<b>FEBRUARY</b>		<b>REVISION</b>	<b>PRACTICE OF QUESTIONS AND DOUBT CLEARING</b>

**AIRFORCE SCHOOL BAGDOGRA**

**SPLIT UP SYLLABUS**

**SUBJECT: INFORMATIC PRACTICES (065)**

**CLASS XI**

**SUBJECT TEACHER: SUSREETI SUR**

**THEORY MARKS DISTRIBUTION**

Unit No	Unit Name	Marks
1	Introduction to Computer System	5
2	Introduction to Python	25
3	Data Handling using NumPy	15
4	Database concepts and the Structured Query Language	20
5	Introduction to Emerging Trends	5
	Practical	30

**Practical Marks Distribution**

S.No.	Unit Name	Marks
1	Problem solving using Python programming language	8
2	Problem solving using NumPy	5
3	Creating database using MySQL and performing Queries	5
4	Practical file (minimum of 20 python programs , 5 Numpy programs and 20 SQL queries)	7
5	Viva-Voce	5
	Total	30

MONTH	UNIT	SPLIT UP SYLLABUS	LEARNING OUTCOMES
AUGUST	1	<p><b>: Introduction to Computer System</b></p> <p>Introduction to computer and computing: evolution of computing devices, components of a Computer System and their interconnections, Input/Output devices.</p> <p>Computer Memory: Units of memory, types of memory – primary and secondary, data deletion, its recovery and related security concerns.</p> <p>Software: purpose and types – system and application software, generic and specific purpose software.</p>	<p>Students will learn about the basic functionalities and the general system of computer.</p>
SEPTEMBER	2	<p><b>: Introduction to Python</b></p> <p>Basics of Python programming, Python interpreter - interactive and script mode, the structure of a program,</p> <p>indentation, identifiers, keywords, constants, variables, types of operators, precedence of operators, data</p> <p>types, mutable and immutable data types, statements, expressions, evaluation and comments, input and</p> <p>output statements, data type conversion, debugging.</p> <p>Control Statements: if-else, for</p>	<p>Students will learn about how to build the basic structures of the initial stages of programming.</p> <p>Students will learn the basic part of coding in PYTHON.</p> <p>Students will learn the</p>

		<p>loop</p> <p>Lists: list operations - creating, initializing, traversing and manipulating lists, list methods and built-in functions.</p> <p>Dictionary: concept of key-value pair, creating, initializing, traversing, updating and deleting elements, dictionary methods and built-in functions</p>	<p>implementation of operators, variables, keywords, datatypes and will know the details of them. They will learn about how to represent logic in pictorial form with help of flowchart and various datastructures.</p>
OCTOBER TO NOVEMBER	3	<p>Data Handling using NumPy</p> <p>Data and its purpose, importance of data, structured and unstructured data, data processing cycle, basic statistical methods for understanding data - mean, median, mode, standard deviation and variance. Introduction to NumPy library, NumPy arrays and their advantage, creation of NumPy arrays; indexing, slicing, and iteration; concatenating and splitting array;</p> <p>Arithmetic operations on one Dimensional and two Dimensional arrays.</p> <p>Calculating max, min, count, sum, mean, median, mode, standard deviation, variance on NumPy arrays.</p>	<p>Students will learn about the NUMPY array structures and implementations.</p>
DECEMBER	4	<p>Database concepts and the Structured Query Language</p> <p>Database Concepts: Introduction to database concepts and its need, Database Management System. Relational data model: Concept of domain, tuple,</p>	<p>Students will learn about the basics of database Management system.</p>

<p><b>TO</b></p> <p><b>JANUARY</b></p>		<p>relation, candidate key, primary key, alternate key, foreign key.</p> <p>Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, Creating a database using MySQL, Data Types Data Definition: CREATE TABLE, DROP TABLE, ALTER TABLE.</p> <p>Data Query: SELECT, FROM, WHERE.</p> <p>Data Manipulation: INSERT, UPDATE, DELETE.</p>	<p>Students will learn about various inbuilt functions of SQL</p>
<p><b>JANUARY</b></p>	<p>5</p>	<p>Introduction to the Emerging Trends</p> <p>Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience (AR, VR), Robotics, Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities, Cloud Computing and Cloud Services (SaaS, IaaS, PaaS); Grid Computing, Block chain technology.</p>	<p>Students will learn about the basic implementation of AI, machine learning, robotics.</p>
<p><b>FEBRUARY</b></p>		<p><b>REVISION</b></p>	<p><b>PRACTICE OF QUESTIONS &amp; DOUBT CLEARING.</b></p>

**AIR FORCE SCHOOL, BAGDOGRA**  
**SPLIT UP SYLLABUS**  
**SESSION – 2020-21**  
**CLASS – XI (PHYSICAL EDUCATION)**

<b>S. NO</b>	<b>CHAPTER</b>	<b>MONTHS</b>
<b>1</b>	<b>Changing Trends &amp; Career in Physical Education</b>	<b>AUGUST</b>
<b>2</b>	<b>Olympic Value Movement</b>	<b>AUGUST</b>
<b>3</b>	<b>Physical Fitness, Wellness &amp; Lifestyle &amp; Practical</b>	<b>SEPTEMBER</b>
<b>4</b>	<b>Physical Education &amp; Sports for CWSN</b>	<b>SEPTEMBER</b>
<b>5</b>	<b>Yoga &amp; Practical</b>	<b>OCTOBER</b>
<b>6</b>	<b>Physical Activity &amp; Leadership Training</b>	<b>NOVEMBER</b>
<b>7</b>	<b>Test, Measurement &amp; Evaluation &amp; Practical</b>	<b>NOVEMBER</b>
<b>8</b>	<b>Fundamentals of Anatomy, Physiology and Kinesiology in Sports</b>	<b>DECEMBER</b>
<b>9</b>	<b>Psychology &amp; Sports</b>	<b>JANUARY</b>
<b>10</b>	<b>Training and Doping in Sports</b>	<b>JANUARY</b>
<b>11</b>	<b>Revision (Theory and Practical)</b>	<b>FEBRUARY</b>