

Syllabus Semester –I

Course Code: APS21BSL101 Course Name: Single and Multivariable Calculus Course Category: BSC Credits: 4 Teaching scheme: L-4 Evaluation scheme: CA–60, ESE–40 Pre-requisites: Pre-University Mathematics.
Course Objectives: 1. To provide the basic tools of calculus for the purpose of modeling the engineering problems mathematically and obtaining solutions. 2. To convey a sense of the utility of calculus and develop technical competence of the student.
Course Outcomes: On completion of the course, the student should be able to: CO1. Compute derivatives in engineering problems. CO2. Compute definite integrals arise in the problems such as arc length, surface of revolution, Work and Fluid Forces. CO3. Find the partial derivatives and apply the knowledge of partial differentiation to find maxima and minima of functions, Jacobians, estimating error and approximation. CO4. Calculate Area, Volume, Center of mass and Gravity using Double and Triple integral. CO5. Solve the problems on fundamental theorems of vector calculus such as Green’s, Stokes and Divergence theorems

Contents:

Unit	Content	Teaching Hours
1	Differentiation and its Applications: Limit ,Continuity and Differentiation, Rate of Change in sciences and Engineering, Chain Rule and implicit differentiation, Related rates, Extreme value theorem, Rolle’s Theorem, Lagrange’s Mean value theorems, Nth derivatives, Taylor and Maclaurin series Expansions, Linear approximations and Differentials.	10
2	Integration and its Applications: Integration, Reduction formulae, Beta and gamma function, Properties, Evaluation of integrals using Beta and gamma functions, Application of Definite integrals to volume, arc length, surface of revolution, Work and Fluid Forces.	10
3	Partial Differentiation and its Applications: Limit and Continuity, Partial derivatives of first and higher orders, Total differentials, Errors and Approximations, Total derivative, Extreme values and saddle points, Method of Lagrange multipliers, Jacobians, Vector differentiation, Gradient, Curl and Divergence, directional derivatives.	10
4	Multiple Integrals and its Applications: Double integrals, Evaluation of Double integrals, Change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: Area and Volume, Root mean square value, Center of mass and Gravity (constant and variable densities); Triple integrals (Cartesian),Volume by triple integration.	10
5	Vector Integration and its Applications: Line integrals, Surface integrals, Green’s Theorem, Stokes Theorems, Divergence theorems.	10

Text Books:
1. James Stewart, Calculus Early Transcendental, 7 th edition, Cengage.
2. George B. Thomas, Ross L. Finney, Calculus and Analytical Geometry, 9 th edition, Pearson.
3. Howard Anton, Irl Bivens, Stephens Davis, Calculus, 10 th Edition, Wiley.
Reference Books:
1. Shanti Narayan, Differential Calculus, S. Chand & Co.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, New York.
3. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi.
4. P. N. Wartikar, J. N. Wartikar, Applied Mathematics (Vol I & II) , Pune Vidyarthi Griha Prakashan, Pune.
5. H. K. Das and Rajnish Verma, Higher Engineering Mathematics , S. Chand & CO. Pvt. Ltd., New Delhi.
6. K. D Joshi, Calculus for Scientists and Engineers, CRC Press.
7. Prasad and Reena Garg, Advanced Engineering Mathematics, Khanna Publishing Company Private Limited, New Delhi.
Reference Books:
1. Shanti Narayan, Differential Calculus, S. Chand & Co.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, New York.

Course Code: APS21BSL102	Course Name: Engineering Physics	Course Category: BSC
Credits: 3	Teaching scheme: L-3	Evaluation scheme: CA–60, ESE–40
Pre-requisites: Student Should Know Basic Physics And Basic Mathematics		
Course Objectives:		
1. To impart knowledge in basic concepts of physics relevant to engineering applications		
2. To introduce advances in technology for engineering applications.		
Course Outcomes:		
On completion of the course, the student should be able to:		
CO.1 Summarize fundamentals of electron optics, modern physics and ultrasonic waves related to the engineering fields.		
CO.2 Identify the importance of the optical phenomenon i.e. interference, diffraction and polarization in relevance with its engineering applications.		
CO.3 Classify the material on the basis of electric conductivity as semiconductor and superconductors and dielectric materials this leads to their fascinating applications.		
CO.4 Recognize the use of laser and optical fibers in various fields.		
CO.5 Outline basics of crystallography and X- rays and demonstrate the applications of nano-materials relevant to engineering program.		

Contents:

Unit	Content	Teaching Hours
1	Modern Physics: Electron Optics: e/m by Thomson's method, Positive ray, Bainbridge mass spectrograph. Quantum Mechanics: Role and concepts, De- Broglie's hypothesis, Uncertainty Principle, Fundamentals of quantum computing, Quantum features Ultrasonic Waves: Production of ultrasonic waves (Magnetostriction & Piezoelectric method), Applications. Numericals.	8
2	Wave Optics: Interference- Interference in thin films (reflected light), Newton's Rings, Engineering applications of Interference. Diffraction- Fresnel's and Fraunhofer Diffraction, Theory of plane transmission Grating. Polarization-Polarization by reflection and double refraction, Optical activity, Specific rotation, Construction and working of Laurent's half shade polarimeter, Engineering applications of Polarization.	8

	Numericals.	
3	<p>Materials of Technological Importance: Dielectric Materials: Introduction, Types of polarizations: Electronic and Ionic, Orientation Polarizations - Applications of Dielectrics Semiconducting Materials: Introduction, Fermi energy in Intrinsic semiconductors and extrinsic semiconductors, Hall effect, Applications of Semiconductors. Numericals. Superconducting Materials: Introduction, Type – I and Type – II superconductors, Meissner effect, BCS Theory, Application</p>	8
4	<p>Optoelectronic Materials and Devices: LASER : Absorption, spontaneous and stimulated emission, population inversion n, pumping mechanism, Construction and working of Ruby laser, Construction and working of He-Ne laser. Lasers in various technological applications. Introduction to Optical Fibers-Introduction Acceptance Angle-Numerical Aperture, Applications of optical fibers. Numericals.</p>	8
5	<p>Physics of Materials: Crystal structure: Unit cell, Coordination number, atomic radius, packing density of cubic system. X-rays: Bragg's law, X-Ray Diffraction (XRD), Industrial Applications of X-Rays. Numericals. Particle detector: G.M. Counter Nano-Materials: Basic principles of Nano science and technology, properties, applications of nanotechnology.</p>	8

Text Books:
<ul style="list-style-type: none"> ● Engineering Physics- H.K. Malik & A.K. Singh, McGraw Hill publication. ● Engineering Physics - R.K. Gaur and S. L. Gupta. Dhanpat Rai Publications Pvt. Ltd.-New Delhi ● M. N.Avadhanulu, P.G.Kshirsagar “A Text book of Engineering Physics”-S. Chand Publications. ● B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2012.
Reference Books:
1. Fundamental of Physics - Halliday and Resnik. Willey Eastern Limited.
2. Introduction to Electrodynamics –David R. Griffiths.
3. Concept of Modern Physics – Arthur Beizer. Tata McGraw-Hill Publishing Company Limited.
4. Optics – AjoyGhatak.MacGraw Hill Education (India) Pvt. Ltd.
5. Science of Engineering Materials- C.M. Srivastava and C. Srinivasan. New Age International Pvt.Ltd.
6. Solid State Physics – A.J. Dekker. McMillan India –Limited.
7. The Feynman Lectures on Physics Vol I, II,III.
8. Introduction to solid state physics – Charles Kittel. John Willey and Sons
9. T Pradeep “A Text book of Nano Science and Nano Technology”-Tata Mc GrawHill 2019.

E-Resources:
1. https://nptel.ac.in/courses/122107035/ Engineering Physics
2. https://youtu.be/98xoZknQjI8 Polarization
3. https://youtu.be/yINtzw63Knc Maxwell's Equations and EM theory
4. https://youtu.be/bwreHReBH2A Maxwell's Equations and EM theory
5. https://www.youtube.com/playlist?list=PLuv3GM6-gsE3-hVNaw-YEb7EeY5XVPZdz Maxwell's Equations and EM theory(nptel)
1. https://nptel.ac.in/courses/115105120/ Experimental Physics
2. https://youtu.be/2CsMpEBI5QY Crystal Structure and X- rays
3. https://youtu.be/z_8aJPLr21E Crystal Structure and X- rays
4. https://youtu.be/_Ckh-60B6LY Condensed matter Physics
5. https://youtu.be/QQZ6EGf0Ju8 Magnetic Properties
6. https://youtu.be/DDLljK1ODeg Magnetic Materials
7. https://youtu.be/etjZmdmrjSU Dielectrics
8. https://youtu.be/k6Zxp9Yr02E Semiconductor
9. https://youtu.be/D-9M3GwoBrw Superconductivity
10. https://youtu.be/GglT1RoBPzg Superconductivity
11. https://youtu.be/VHp2Ff5N_bs Superconductivity
12. https://youtu.be/FNp81kkxj5c LASER
13. https://youtu.be/YvrwVK9ZqQY LASER
14. https://nptel.ac.in/courses/115107095/ Optic Fiber
15. https://youtu.be/cjBPnIXK60U Quantum Mechanics (Prof.H.C. Verma)
16. https://youtu.be/BDuqChhUhm0 Divergence and Curl(Prof.H.C. Verma)
17. https://youtu.be/sCviGSMaYfi Divergence and Curl (Prof.H.C. Verma)
18. https://youtu.be/SZCsFS9izfQ Divergence and Curl And other related videos from following resources
19. www.nptel.ac.in ; www.swayam.gov.in ; https://inlibnet.ac.in/
20. www.sciencedirect.com
21. http://vlabs.iitb.ac.in/vlab/
22. www.youtube.com
23. https://nptel.ac.in/courses/122107035/ Engineering Physics

Course Code:APS21ESL101 **Course Name:** Python Programming **Course Category:** ESC
Credits: 2 **Teaching scheme:** L-2 **Evaluation scheme:** CA–60, ESE–40
Pre-requisites: Basic Computer Knowledge& Knowledge Of Any Programming Language
(Optional)

Course Objectives:

1. To understand fundamental concepts in Python Programming
2. To learn the different Conditional Loops and Iteration
3. To understand various data structures and packages

Course Outcomes:

- CO1:** Describe programming fundamentals of python.
CO2: Interpret the python syntax and semantics of control flow statements.
CO3: Identify the methods to create and manipulate programs with python data structures.
CO4: Use modular approach for problem solving.
CO5: Apply advanced features and packages of python programming required for data science.

Contents:

Unit	Content	Teaching Hours
1	Python for everybody: Why Program, Hardware Overview, Python as a Language, Why Python, Installation Python Jupiter notebook, <u>Using the Python Playground</u> ,how to write program and compile in Jupiter notebook. Writing input and output statements in Python, output formatting, Writing comments, keywords in Python .variables and variable assignments, Operators ,writing expressions	6
2	Conditional Loops and Iteration: <u>Conditional Statements</u> , in Python, <u>Loops and Iteration</u> , Definite Loops, Finding the Largest Value, Loop Idioms	6
3	Data Structures in Python: Strings, Manipulating Strings, <u>Files</u> , Processing Files, <u>Dictionaries</u> , <u>sets</u> , <u>Tuple</u> , <u>Lists</u> , Manipulating Lists, Lists and Strings, Strings, Manipulating Strings	6
4	Functions, Modules and Packages: Functions, Lambda functions, Recursive function, Types of functions, modules and packages.	6
5	Packages in Python for Data Science: NumPy introduction, Numerical operations on NumPy, Introduction of Matplotlib, getting started with Pandas, Data frames basics in Pandas, key operations on data frames. Introduction to Data Science, Binary search, finding elements in common in lists using Hash, Finding largest elements, Introduction of SQL	6

Text Books:
1. Kent D. Lee, “Python Programming Fundamentals”, Second Edition, Springer Publication.
2. Wes McKinney, “Python for Data Analysis” O’Reilly Publication.
Reference Books:
1. The Python Language Reference: http://docs.python.org/2/reference/index.html
2. The Python Standard Library: http://docs.python.org/2/library/
3. https://docs.scipy.org/doc/scipy/reference/tutorial/stats.html
4. http://matplotlib.org/api/mlab_api.html#module-matplotlib.mlab
5. http://conference.scipy.org/proceedings/scipy2010/pdfs/seabold.pdf
6. http://seaborn.pydata.org
7. https://www.datacamp.com/community/data-science-cheatsheets
8. PEP 20 -- The Zen of Python: https://www.python.org/dev/peps/pep-0020/
9. https://docs.scipy.org/doc/numpy-dev/user/numpy-for-matlab-users.html
General Instructions:
The theory classes are to be conducted batch wise in Lab. Each class should be divided into four batches.

Course Code: APS21SL102	Course Name: Engineering Graphics	Course Category: ESC
Credits: 2	Teaching scheme: L-2	Evaluation scheme: CA–60, ESE–40
Pre-requisites: Nil		
Course Objectives:		
<ol style="list-style-type: none"> 1. Understand the basic principles of engineering graphics and improve the visualization skills 2. To gain knowledge on projection of points, straight lines, planes, solids. 3. To understand the real life objects through Drawings. 4. To know the principles of orthographic and isometric projections. 		
Course Outcomes:		
CO 1. Identify basic concepts in drawing and its application.		
CO 2. Plan and prepare neat orthographic drawings of points, straight lines, planes and solids.		
CO 3. To visualize and draw orthographic and isometric projection of solids.		
CO 4. Acquire skill to draw real life engineering objects by using the engineering drawing		

Contents:

Unit	Content	Teaching Hours
1	<p>Projections of Straight Lines:</p> <p>Introduction to Engineering Graphics, Need of Engineering Drawing, Drawing Instruments, BIS code of practice for general engineering drawing, Projections of Points in Four Quadrants, Projections of Points in Reference Plane, Line Parallel to both the Plane, Line Parallel to One Plane and Perpendicular to the other, Line Inclined to One Plane and Parallel to The Other, Line Inclined to Both the Reference Planes, Traces of Line (Only first quadrant to be considered)</p>	5
2	<p>Engineering Curves:</p> <p>Curves used in Engineering Practice, Conic sections, Construction of conics by different methods, Rectangular-hyperbola, Cycloidal curves, Epi and hypo-cycloids, Involute and Archimedean spiral.</p>	5
3	<p>Projections of Planes:</p> <p>Plane with Surface Parallel to One Plane and Perpendicular to other, Plane Inclined to One Plane and Perpendicular to other, Projections of Planes Inclined to both the Planes</p>	5
4	<p>Projections of Solids:</p> <p>Introduction to Solids: Prisms, Pyramid, Cylinder, Cone, Cube, Tetrahedron, Sphere, Projections of above Solids with Axis inclined to one plane, Projections of above solids with Axis inclined to both the Planes, Projection of composite solids (different arrangement of Spheres with above</p>	5

	Solids).	
5	Orthographic Projections: Orthographic projections of different Machine Parts (First Angle Projection method only)	5
6	Isometric Projections ,Introduction to CAD: Introduction to Pictorial views, Converting Orthographic Projections into Isometric Projections and Isometric views. Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects	5

Text Books:

1. N. D. Bhatt and Panchal V. M., "Engineering Drawing", Charotar Publishing House, Anand
2. P. J. Shah , " A Text Book of Engineering Drawing", S.Chand, New Delhi
3. Shah M.B. & Rana B.C, "Engineering Drawing & Computer Graphics", Pearson Publications,
4. Agrawal B.& Agrawal C.M, "Engineering Graphics", TMH Publications
5. Narayana K.L. & P. Kannaiah, "Engineering Drawing", Scitech Publications
6. P.I Vargese, "Engineering Graphics", Mcgraw Hill Publications
7. D.A.Hindoliya," Engineering Graphics", B. S. Publications

Reference Books:

1. Dabhade M. L., "Engineering Graphics", Vol.-I and Vol.-II, Vision Publications, Pune
2. K.Venugopal, "Engineering Drawing and Graphics" ,New Age International Publishers

Course Code: MGM54AEL101 Course Name: Communicative English Course Category: AEC Credits: 1 Teaching scheme: L-1 Evaluation scheme: CA–30, ESE–20 Pre-requisites: Basic knowledge of English
Course Objectives: The course aims at grooming the professional ethics of the students through various personality traits and behavioral patterns focusing on communication skills.
Course Outcomes: CO.1 communicate formally with enhanced communication Competency CO.2 to adapt professional nonverbal communication CO.3 construct English formal syntax and apply corporate vocabulary in written and verbal communication CO.4 acquire listening and drafting skills with professional competency

Contents:

Unit	Content	Teaching Hours
1	Communication and Communication Process: Introduction to Communication, Forms and functions of Communication, Barriers to Communication and overcoming them, Ways of Effective Communication.	5
2	Non-verbal Communication And its types: Kinesics, Occulesics, Appearance, Proxemics, Chronemics, Paralanguage, Qualities of effective speech	3
3	English Grammar: Overview of basic Mid-level grammar, Tenses & concept of time Sentence construction, Corporate vocabulary, Difference between formal and informal sentences, phrases and words	3
4	Listening Skills and Writing Skills: Listening : Active and Passive Listening writing styles layouts Business Letters- job application, resignation, resume	4

Text Books/ Reference Books:

1. Ashraf Rizvi, Communication Skills for Engineers, Tata McGraw Hill
2. Sanjay Kumar, Pushp Lata, Communication Skills, Oxford University Press, 2016.
3. Meenakshi Raman, Sangeeta Sharma, Communication Skills, Oxford University Press, 2017.
4. Teri Kwal Gamble, Michael Gamble, Communication Works, Tata McGraw Hill Education, 2010.
5. Anderson, Kenneth. Joan Maclean and Tossny Lynch. Study Speaking: A Course in Spoken English for Academic Purposes. Cambridge: CUP, 2004.
6. Bellare, Nirmala. Reading Strategies. Vols.1 and 2. New Delhi. Oxford University Press, 1998
7. Bhasker, W.W. S & Prabhu, N.S.: English through Reading, Vols.1 and 2. Macmillan, 1975
8. Bovee Courtland, Land Thrill, John V. Business Communication, Today McGraw Hill, New York,
9. Taxman Publication (1989).
10. Murphy, Raymond. Essential English Grammar, Cambridge: University Press (2000)
11. Hewings Martin Advanced English Grammar Cambridge : University press (2003)
12. Bansal Harrison. Spoken English

Course Code:APS21VSP101 **Course Name:** Engineering Exploration **Course Category:** VSEC

Credits: 2

Teaching scheme: P-4

Evaluation scheme: CA–60, ESE–40

Pre-requisites: Nil

Course Objectives:

1. Understand the principles of Engineering Design and apply them to identify product requirements, objectives, and constraints through interactions with clients, users, and relevant stakeholders.
2. Develop critical thinking and problem-solving skills to analyze existing technologies, conduct surveys, study literature, and generate creative design concepts using various means and combinations.
3. Acquire proficiency in using appropriate tools and techniques to generate electronic and mechanical simulations, schematic diagrams, and product concept sketches or CAD models for effective communication of design ideas.
4. Demonstrate competency in categorizing inputs and outputs of systems in terms of materials, information, and energy, enabling a holistic understanding of engineering projects.
5. Cultivate effective teamwork and communication skills to collaborate with peers, mentors, and team members during the development and presentation of engineering prototypes.
6. Develop the ability to evaluate, defend, and communicate design decisions, progress, and project outcomes, showcasing awareness of course concepts and their application in real-world scenarios.

Course Outcomes:

On completion of the course, the student should be able to:

- LO 1. Effectively interact with clients, users, and stakeholders to gather relevant information and derive product requirements, thereby demonstrating proficiency in Requirement Analysis and Client Interaction.
- LO 2. Analyze and compare existing technologies, conduct surveys, and study literature to identify potential solutions, and develop objective trees and function trees, reflecting their competency in Conceptual Design and Analysis.
- LO 3. Create product concept diagrams, combining different means, and prepare sketches or CAD models to present their design ideas aesthetically and coherently, indicating proficiency in Product Concept Development.
- LO 4. Categorize system inputs and outputs in terms of materials, information, and energy, illustrating their understanding of System Categorization and Analysis.
- LO 5. Exhibit hands-on skills in physical assembly, connection, and demonstration of engineering prototypes, showcasing Proficiency in Prototyping and Implementation.
- LO 6. Explain and defend their design choices, project progress, and outcomes during presentations, demonstrating Communication Skills, Project Evaluation, and Awareness of Engineering Concepts.

Contents:

Sr. No.	List of Practical	Lab Hours
1	The course is conducted in the following modules: <ol style="list-style-type: none">1. Introduction to Engineering Exploration2. Engineering Design3. Platform Based Development4. Mechanisms5. Data acquisition and analysis6. Engineering Ethics7. Project Management	10
2	The following practical contents are delivered in an integrated mode along with theory: <ol style="list-style-type: none">1. Conceptualizing a product2. Designing a product with constraints3. Simulation of electronic circuits (at least 10 sets)4. Implementation of electronic circuits (at least 5 sets)5. Implementation of four bar chain mechanism6. Conversion of problem statement to need statement7. Identification of objectives, constraints and functions8. Generation of black box, glass box and expanded class box9. Generation of morphological chart10. Generation of concepts11. Comparison of concepts12. Selection of concept13. Implementation and testing of prototype	20

Reference Books:

- George E. Dieter and Linda C. Schmidt (2009), Engineering Design, 4ed, Mc Graw Hill Higher Education
- Clive L. Dym, Patrick Little, and Elizabeth J. Orwin (2014), Engineering Design: A project-based introduction, 4ed, John Wiley and Sons
- G. Pahl, W. Beitz, J. Feldhusen and K.-H. Grote (2007), Engineering Design: A systematic approach, 3ed, Springer, New York

Course Code: APS21BSP101 Course Name: Engineering Physics Lab Course Category: BSC Credits: 1 Teaching scheme: P-2 Evaluation scheme: CA-30, ESE-20 Pre-requisites: Student should know the basic aspects of measurements like least count and range of instrument, scale identification, accuracy, error etc.
Course Objectives: The Objective of this course is 1. To make the students gain practical knowledge to co-relate with the theoretical studies. 2. To achieve perfectness in experimental skills. 3. The study of practical applications will bring more confidence.
Course Outcomes: At the end of the laboratory course, the students will be able to, LO1: Plot the I-V characteristics of pn junction diode and determine the value of band gap energy which can be used for core engineering Courses. LO2: Perform optical experiments; using light properties like interference, polarization, diffraction and their applications. LO3: Interpret the results and analyze the data and use the experimental data to plot the graph for a best fit. LO4: Discuss the characteristics of plateau region and determine operating voltage of G.M. counter LO5: Determine the numerical aperture and bending loss of optical fibre cable

Contents:

Sr. No.	List of Practical	Lab Hours
1	Thomson's Bar Magnetic method -Determination of e/m of electron	02
2	Newton's rings -Determination of radius of curvature of Plano convex lens.	02
3	Polarization - Half shade Polarimeter -Determination of specific rotation of optically active material.	02
4	Diffraction - Determination of wavelength of light by plane transmission grating.	02
5	Wedge Shaped film -Determination of thickness of thin wire	02
6	Semiconductors – To study of forward and reverse bias characteristic of Semiconductors diode	02
7	Fibre Optics – Determination of Bending losses in optical fibre	02
8	Fibre Optics – Determination of Numerical Aperture of given optical fibre	02
9	Determination of operating voltage of G.M. tube and characteristics of plateau region	02
10	Determination of wavelength of laser source	02

Course Code:APS21ESP101 **Course Name:** Python Programming Lab **Course Category:**AEC
Credits: 1 **Teaching scheme:** P-2 **Evaluation scheme:** CA–30, ESE–20
Pre-requisites: Nil

Course Objectives: The Objective of this course is

Course Outcomes:

LO1: Demonstrate python program using development environment.

LO2: Develop logical thinking to solve the problems using programming fundamental concepts.

LO3: Construct python program using various data structures.

LO4: Apply modularization approach for solving complex problem.

LO5: Make use of various packages in Python for data science.

LO6: Implement different SQL commands in python.

Contents:

Sr. No.	List of Practical	Lab Hours
1	Program to perform input/output operations Write a program to take input (integer, float, string) and print it.	02
2	Program based on operators 1. Write a program to simulate a simple calculator (+ - / * %) that takes two 2. Write a program to find area and perimeter of geometric objects. 3. The distance between two cities (in km.) is input through the keyboard centimeters. 4. Write a Program to interchange two numbers. 5. Write a program to compute Fahrenheit from centigrade	02
3	Programs based on Decision making. 1. Write a program to read marks from keyboard and your program should display equivalent grade according to following table(else-if) (ladder) Marks Grade 100 – 80 Distinction 79 - 60 First Class 59 - 40 Second Class < 40 Fail 2. Write a program to input basic salary of an employee and calculate gross salary according to given conditions. Basic Salary <= 10000 : HRA = 20%, DA = 80% Basic Salary is between 10001 to 20000 : HRA = 25%, DA = 90% Basic Salary >= 20001 : HRA = 30%, DA = 95% 3. If the ages of three brothers are input through the keyboard, write a C Program to determine the youngest and oldest of the three. 4. Write a program to calculate overtime pay of employee. Overtime is paid at the rate of Rs. 12.00 per hour for every hour worked above 40 hours. Assume that employee do not work for fractional part of an hour. 5. Write a program for checking the speed of drivers.	02

	<p>6. If speed is less than 70, it should print “Ok”. Otherwise, for every 5km above the speed limit (70), it should give the driver one demerit point and print the total number of demerit points. For example, if the speed is 80, it should print: “Points: 2”. If the driver gets more than 12 points, the function should print: “License suspended”</p>	
4	<p>Programs using while and for loops</p> <ol style="list-style-type: none"> 1. WAP to find factorial of given number 2. WAP to check whether given number is Palindrome or not 3. WAP to check whether given number is Armstrong or not 4. WAP to print Fibonacci series 5. Write a Python program which iterates the integers from 1 to 50. For multiples of three print "Fizz" instead of the number and for the multiples of five print "Buzz". For numbers which are multiples of both three and five print "Fizz Buzz". 6. WAP to check whether given number is Perfect number or not 7. WAP to check whether given number is Prime number or not 8. Write C program to print given star and number patterns and reverse it. <ul style="list-style-type: none"> • * 1 • ** 12 • *** 123 • **** 1234 	02
5	<p>Programs on string</p> <ol style="list-style-type: none"> 1. Write Python Program to find length of string without using len() function. 2. Count all letters, digits, and special symbols from a given string. 3. Python Program to Count the Number of Vowels in a String. 4. Python Program to Calculate the Number of Upper Case Letters and Lower Case Letters in a String. 5. Python Program to Check whether given string is palindrome or not 	02
6	<p>Programs on List and Tuple</p> <ol style="list-style-type: none"> 1. Write a Python program to sum all the items in a list. 2. Write a Python program to multiply all the items in a list 3. Write a Python program to get the largest number from a list. 4. Write a Python program to get the smallest number from a list 5. Write a Python program to count all elements in list and count Occurrences Of A List Item In Python 6. Write a Python program to create a tuple with different data types 7. Write a Python program to check whether an element exists within a tuple 8. Write a Python program to reverse a tuple 9. Write a Python program calculate the product of all the numbers given in tuple. Original Tuple: (2, 4, 8, 8, 3, 2, 9) Product - multiplying all the numbers of the said tuple: 27648 	02
7	<p>Programs on set and dictionary</p> <ol style="list-style-type: none"> 1. Write a Python program to concatenate following dictionaries to create a new one. Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60} Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60} 2. Write a Python program to check whether a given key already exists in a 	02

	<p>dictionary</p> <ol style="list-style-type: none"> Write a Python script to generate and print a dictionary that contains a number (between 1 and n) in the form (x, x*x) Sample Dictionary (n = 5) : Expected Output : { 1: 1, 2: 4, 3: 9, 4: 16, 5: 25 } Write a Python program to merge two Python dictionaries Write a Python program to get the maximum and minimum value in a dictionary Write a Python program to create set difference, Union and intersection Write a Python program to check if two given sets have no elements in common 	
8	<p>Programs using function</p> <ol style="list-style-type: none"> Write Functions to calculate your trip's costs: Define a function called hotel cost with one argument nights as input Define a function called plane_ride_cost that takes a string, city, as input. Define a function called rental_car_cost with an argument called days. Define a function called trip_cost that takes two arguments, city and days. Like the example above, have your function return the sum of calling the rental_car_cost (days), hotel_cost(days), and plane_ride_cost(city) functions. Write a program in to check a given number is even or odd using the function. Write a function Exchange to interchange the values of two variables, say x and y. illustrate the use of this function in a calling function. Write a program to find Sum of natural number using recursion. Write a program to print Fibonacci series number using recursion 	02
9	<p>Program using NumPy, Matplotlib and Pandas library</p> <ol style="list-style-type: none"> Write a program to perform matrix addition, subtraction, multiplication. Plot all types of graph using Matplotlib. Write a program which performs basic operation of Pandas. 	02
10	<p>Program on SQL Commands</p> <ol style="list-style-type: none"> Write a program of binary search Write a program which perform basic SQL commands Programs based on real life problems/GUI based programs 	02

Course Code:APS21ESP102 **Course Name:** Engineering Graphics Studio **Course Category:**AEC
Credits: 2 **Teaching scheme:** P-4 **Evaluation scheme:** CA–30, ESE–20

Pre-requisites: Nil

Course Objectives:

The Objective of this course is

Course Outcomes:

Students will be able to,

1. Develop competence in correct expression of the visualized objects
2. Dimension and annotate two-dimensional engineering drawings
3. Plan and prepare neat orthographic drawings of points, straight lines, planes and solids
4. Develop the ability to visualize and draw orthographic and isometric projection of solids

Contents:

Sr. No.	List of Practical	Lab Hours
1	Drawing three problems based on projections of lines on half imperial size drawing sheet	02
2	Drawing three problems based on engineering curves on half imperial size drawing sheet	02
3	Drawing three problems based on projections of planes on half imperial size drawing sheet	02
4	Drawing three problems based on projections of solids on half imperial size drawing sheet	02
5	Drawing three problems based on orthographic projections on half imperial size drawing sheet	02
6	Drawing three problems based on isometric projections on half imperial size drawing sheet	02
7	Demonstration of CAD software in CAD lab, drawing simple objects using various commands	02

Course Code:APS21ESP103 **Course Name:** Recent Trends in Integrated Technologies Lab **Course Category:** ESC
Credits: 1 **Teaching scheme:** P-2 **Evaluation scheme:** CA–30, ESE–20
Pre-requisites: Nil

Course Objectives:

1. To introduce students the basics of additive manufacturing/rapid prototyping and its applications in various fields, reverse engineering techniques.
2. To recognize industrial control problems suitable for Industrial Robotics.
3. To acquire basic skills in exploring the potential of the drone technology in professional activities
4. Ability to recognize industrial automation problems suitable for PLC control.

Course Outcomes:

- LO1 Prepare 3D Model (slice & print) in either Strategy’s or Zortrax & generate scan data through Hexagon portable scanning arm.
- LO2 Describe basic industrial robotics & it’s applications
- LO3 Operate a small drone in a controlled environment
- LO4 Explain principles of sensor, PLC & applications.

Contents:

Sr. No.	List of Practical	Lab Hours
1	Scan to CAD, CAD to STL conversion& patching, machine setup & processes for printing	02
2	Programming the TATA Robot(pendant) for pick & place, programming the Yaskawa Robot(pendant) for motion planning, Demonstrate welding exercise by the instructor	02
3	Introduction to components of drone, Demonstration of assembly of drone, Demonstration of mission planning & flying the drone	02
4	Controller & sensor & their interfacing, basic ladder logic instructions, pneumatic& hydraulic actuator	02

Reference Books:

1. A Step-by-Step Guide For Beginners: Aircraft Design & Construction Design Guide by :Merlin Debrie
2. Industrial Automation & Robotics By A.K. Gupta & S.K.Arora
3. Additive Manufacturing Principles, Technologies & Applications By C.P.Paul (TMH)
4. Basics of unmanned aerial vehicle By Garvit Pandya (Motion press)

Course Code:MGM54AEP101 **Course Name:** Communicative English Lab **Course Category:**AEC
Credits: 1 **Teaching scheme:** P-2 **Evaluation scheme:** CA–30, ESE–20
Pre-requisites: Basic knowledge of English

Course Objectives:

The course aims at grooming the professional ethics of the students through various personality traits and behavioral patterns focusing on communication skills.

Course Outcomes:

The Students will be able to

- LO1 Introduce themselves formally and informally through practice.
- LO2 Pronounce English vowel and Consonant sounds effectively
- LO3 Participate effectively in G.Ds, Presentations, &Interviews
- LO4 Face Interviews competently
- LO5 Draft resume, business letters, reports formally
- LO6 Comprehend them Learning of English text by comprehension techniques.

Contents:

Sr. No.	List of Practical	Lab Hours
1	Self Introduction	02
2	Pronunciation of Vowel sounds in English	02
3	Pronunciation of consonant sounds in English	02
4	Group discussion	04
5	Presentation techniques	04
6	Interview techniques	04
7	Letter writing	04
8	Email writing, Agenda of the meeting and notices	02
9	Resume Writing	02
10	Report writing	02
11	Skimming & Scanning	02

Course Code: MGM82CCP101 Course Name: National Cadet Corps Course Category: CCA Credits: 2 Teaching scheme: P-4 Evaluation scheme: CA–50, ESE–00 Pre-requisites: Nil
Course Objectives: Nil
Course Outcomes: Nil

Contents:

Unit No.	Content	Hours
1	NCC General, National Integration and Awareness, Social Service and Community Development, Drill: Aims, Objectives and Organization of NCC, Duties of NCC Cadet, National Integration Importance and Necessity, Factors Affecting National Integration, Foot Drill, Drill With Arms, Ceremonial Drill with Arms, Social Service and Community Development Activities- Pollution, Mission Indradhanush, Beti Bachao Beti Padhao, Tree Plantation, Digital Awareness.	12
2	Personality Development, Disaster Management, Weapon Training, Map Reading : Critical and Creative Thinking, Decision Making, Self Awareness, Public Speaking, Interview Skills, Types, Org, Capability and Role of NCC cadets, Initiative Trg, Organizing Skills, Do's & Don't, Introduction and Characteristics of .22 rifle, Handling of .22 rifle, Introduction to Map Reading, Conduct of MR- Google and Tourist Maps and Apps.	10
3	Health and Hygiene, Environmental Awareness and Conservation, Adventure, Obstacle Training: Hygiene & Sanitation (Personal & Camp Hygiene) Soch Vichar, First Aid in Common Medical Emergencies, Treatment & Care of Wounds, Introduction Yoga & Exercises, Water Conservation, Energy Conservation, Introduction Adventure Activities. Obstacle Course.	10
4	Leadership, Introduction to Infantry Weapons and Equipments: Traits, Indicators, Motivation, Ethics, Case Studies- Chhatrapati Shivaji Maharaj, Maharana Pratap, Jhasi ki Rani, Ratan Tata, Narayan Murty, Rabindra Nath Tagor, Organization of Infantry Battalion and its weapons.	08
5	Armed Forces, Field Craft and Battle Craft, : Armed Forces, Army, CAPF, Police, Modes of Entry to Army, CAPF, Police, Introduction to Field Craft, Indication of Landmark, Observation, Camouflage and Concealment, Fire and Move Capsule.	08

References:

- Cadet's Handbook- Common Subject, all wings by DG NCC, New Delhi.
- Cadet's Handbook- Common Subject by NCC Directorate- Bhubaneshwar.
- Cadet's Handbook- Specialized Subjects, Army, Navy, Air-Force by DG NCC, New Delhi.
- NCC OTA Precise by DG NCC, New Delhi.
- Chanakya's 7 Secrets of Leadership by Radhakrishanan Pillai and D. Shivnandhan.
- National Cadets Corps (India) by Lambert M. Suvarkar.

E-Resources:

1. National Cadet Corps, Youth in Action (Google eBook).

<https://indiancc.nic.in/dg-ncc-lt-gen-gurbirpal-singh/>

Course Code: MGM82CCP103	Course Name: Sports	Course Category: CCA
Credits: 2	Teaching scheme: P-4	Evaluation scheme: CA-50, ESE-00
Pre-requisites: Nil		
Course Objectives:		
<ol style="list-style-type: none"> 1. To understand the importance of sports in physical and mental development. 2. To learn about the different types of sports. 3. To learn about the different types of indoor games. 4. To participate in indoor games. 5. To learn about the different types of outdoor games. 6. To participate in outdoor games. 		
Course Outcomes:		
<ul style="list-style-type: none"> • Upon completion of this course, students will be able to • Demonstrate knowledge of the history, benefits, types, equipment, and safety of sports • Demonstrate proficiency in the basic skills of indoor and outdoor games • Understand the rules and regulations of selected sports • Participate in sports competitions 		

Contents:

Sr. No.	Content	Hours
1	<p>Football: History of Football: The earliest forms of football can be traced back to ancient China, Greece, and Rome. In England, the game of football developed in the 19th century, with different rules being used by different schools and organizations. In 1863, the Football Association (FA) was founded, and it standardized the rules of the game. The first international match was played between England and Scotland in 1872. Football became an Olympic sport in 1900, and the first World Cup was held in 1930. Today, football is the most popular sport in the world, with billions of fans around the globe.</p> <p>Fundamental Skills of Football Dribbling: Dribbling is the ability to move the ball with your feet while keeping control of it. It is an essential skill for all footballers, as it allows you to move past defenders and create scoring opportunities. Passing: Passing is the ability to accurately and effectively throw the ball to your teammates. It is another essential skill, as it allows you to move the ball up the field and create scoring opportunities. Shooting: Shooting is the ability to kick the ball with power and accuracy. It is the most important skill for scoring goals, and it is essential for all footballers to develop a good shot. Heading: Heading is the ability to use your head to control and direct the ball. It is a valuable skill for both attacking and defending, and it is important for all footballers to learn how to head the ball effectively.</p>	12

	<p>Tackling: Tackling is the ability to take the ball away from an opponent. It is an important skill for defenders, but it is also valuable for midfielders and attackers.</p>	
2	<p>Basket Ball</p> <p>History of Basketball</p> <p>Basketball was invented by James Naismith in 1891 at the International YMCA Training School in Springfield, Massachusetts.</p> <p>Naismith was a physical education instructor who was looking for a game that would be less injury-prone than football.</p> <p>He nailed two peach baskets to the lower rail of a balcony and used a soccer ball to play the game.</p> <p>The first game of basketball was played on December 21, 1891, with nine players on each team.</p> <p>The rules of basketball have evolved over time, but the basic premise of the game has remained the same.</p> <p>Today, basketball is one of the most popular sports in the world, with millions of players and fans around the globe.</p> <p>Fundamental Skills of Basketball</p> <p>Dribble: Dribbling is the ability to move the ball with your hands while keeping control of it. It is an essential skill for all basketball players, as it allows you to move past defenders and create scoring opportunities.</p> <p>Passing: Passing is the ability to accurately and effectively throw the ball to your teammates. It is another essential skill, as it allows you to move the ball up the court and create scoring opportunities.</p> <p>Shooting: Shooting is the ability to throw the ball through the hoop with power and accuracy. It is the most important skill for scoring points, and it is essential for all basketball players to develop a good shot.</p> <p>Rebounding: Rebounding is the ability to catch the ball after it has been missed by a shooter. It is an important skill for both offense and defense, as it allows teams to get second chances at scoring.</p> <p>Defense: Defense is the ability to prevent the other team from scoring points. It is an essential skill for all basketball players, as it is impossible to win a game without playing good defense.</p>	10
3	<p>Volley Ball</p> <p>History of Volleyball</p> <p>Volleyball was invented in 1895 by William G. Morgan, a physical education instructor at the Young Men's Christian Association (YMCA) in Holyoke, Massachusetts.</p> <p>Morgan was looking for a game that would be less vigorous than basketball, and he created volleyball as a way to keep his students active during the winter months.</p> <p>The original name of the game was "mintonette," but it was renamed "volleyball" in 1896.</p> <p>Volleyball quickly spread throughout the United States and around the world, and it became an official Olympic sport in 1964.</p> <p>Fundamental Skills of Volleyball</p> <p>Passing: Passing is the ability to receive the ball from the opponent and direct it to a teammate. It is an essential skill for all volleyball players, as it allows the team to keep possession of the ball and start an attack.</p> <p>Setting: Setting is the ability to control the height and direction of the ball so that a teammate can spike it. It is a critical skill for setters, as they are</p>	10

	<p>responsible for setting up the team's offense.</p> <p>Spiking: Spiking is the ability to hit the ball over the net with power and accuracy. It is the most important skill for scoring points in volleyball, and it is essential for all attackers to develop a good spike.</p> <p>Blocking: Blocking is the ability to prevent the opponent from spiking the ball over the net. It is an important skill for blockers, as they can prevent the other team from scoring points.</p> <p>Digging: Digging is the ability to prevent the opponent from scoring a point by returning the ball over the net. It is an important skill for all defenders, as they are responsible for preventing the other team from scoring points</p>	
4	<p>Kabaddi</p> <p>History of Kabaddi</p> <p>Kabaddi is a contact team sport that originated in India. It is believed to have originated in the Indian subcontinent over 4,000 years ago. The game is mentioned in the Sangam literature of Tamil Nadu, which dates back to the 3rd century BC. Kabaddi was first played as a competitive sport in the Indian Olympic Games in 1938. It was included as a demonstration sport at the 1982 Asian Games in Delhi, and it became a full medal sport in the 1990 Asian Games in Beijing. Kabaddi is now played in over 100 countries around the world.</p> <p>Fundamental Skills of Kabaddi</p> <p>Dabki: Dabki is the act of entering the opponent's half of the court while chanting "kabaddi, kabaddi." It is a fundamental skill for all raiders, as it allows them to enter the opponent's half of the court without being tackled.</p> <p>Touch: Touching an opponent is the most important skill in kabaddi. It is how raiders score points for their team. There are many different ways to touch an opponent, such as touching their arm, leg, or torso.</p> <p>Tackling: Tackling is the act of preventing a raider from touching an opponent. It is a fundamental skill for all defenders, as it allows them to prevent the other team from scoring points. There are many different ways to tackle a raider, such as grabbing them, pushing them, or tripping them.</p> <p>Stamina: Stamina is essential for all kabaddi players, as the game is very physically demanding. Players need to be able to run, jump, and tackle for long periods of time.</p> <p>Agility: Agility is also important for kabaddi players, as they need to be able to change direction quickly and avoid being tackled.</p>	08
5	<p>Badminton</p> <p>History of Badminton</p> <p>The game of badminton originated in ancient Greece, China, and India. It was brought to England in the 1870s by British army officers stationed in India. The first badminton club was founded in 1873 at Badminton House, the country estate of the Duke of Beaufort. The first official all-England badminton championships for men were held in 1899, and the first badminton tournament for women was arranged the next year. Badminton became an Olympic sport in 1992. Today, badminton is a popular sport played by millions of people around the world.</p> <p>Fundamental Skills of Badminton</p> <p>Grip: The grip is the most important fundamental skill in badminton. It allows</p>	08

	<p>you to control the racket and hit the shuttlecock with power and accuracy. There are many different grips, but the most common are the forehand grip and the backhand grip.</p> <p>Footwork: Footwork is essential for moving around the court and positioning yourself to hit the shuttlecock. There are many different footwork drills that you can practice to improve your footwork.</p> <p>Racket control: Racket control is the ability to hit the shuttlecock with power and accuracy. It is important to practice hitting the shuttlecock in different directions and with different levels of power.</p> <p>Timing: Timing is the ability to hit the shuttlecock at the right time. It is important to practice hitting the shuttlecock at the peak of its flight.</p> <p>Stamina: Stamina is essential for badminton, as it is a physically demanding sport. You need to be able to run, jump, and hit the shuttlecock for long periods of time.</p>	
6	<p>Soft Tennis</p> <p>History of Soft Tennis</p> <p>Soft tennis is a racquet sport that originated in Japan in the early 20th century. It was created as a less dangerous alternative to lawn tennis, as the ball used in soft tennis is made of foam rubber and does not travel as fast as a regular tennis ball.</p> <p>The first soft tennis tournament was held in Japan in 1921, and the sport quickly spread to other countries in Asia.</p> <p>Soft tennis was first introduced to the United States in the 1950s, and it has since become a popular recreational sport in the country.</p> <p>Fundamental Skills of Soft Tennis</p> <p>Grip: The grip is the most important fundamental skill in soft tennis. It allows you to control the racquet and hit the ball with power and accuracy. There are many different grips, but the most common are the forehand grip and the backhand grip.</p> <p>Footwork: Footwork is essential for moving around the court and positioning yourself to hit the ball. There are many different footwork drills that you can practice to improve your footwork.</p> <p>Racket control: Racket control is the ability to hit the ball with power and accuracy. It is important to practice hitting the ball in different directions and with different levels of power.</p> <p>Timing: Timing is the ability to hit the ball at the right time. It is important to practice hitting the ball at the peak of its flight.</p> <p>Stamina: Stamina is essential for soft tennis, as it is a physically demanding sport. You need to be able to run, jump, and hit the ball for long periods of time.</p> <p>Here are some additional fundamental skills of soft tennis:</p> <p>Ball control: The ability to control the direction and speed of the ball.</p> <p>Serve: The ability to serve the ball accurately and with power.</p> <p>Volley: The ability to hit the ball before it bounces.</p> <p>Overhead smash: The ability to hit the ball forcefully and accurately overhand.</p> <p>Drop shot: The ability to hit the ball softly and precisely so that it bounces low and close to the net.</p>	
7	<p>Tennis</p> <p>History of Tennis</p> <p>The origins of tennis can be traced back to a 12th–13th-century French handball game called jeu de paume (“game of the palm”), from which was derived a complex indoor racket-and-ball game: real tennis.</p> <p>The modern game of lawn tennis was invented in England in the 1870s by</p>	

	<p>Major Walter Wingfield. Wing field created a set of rules and equipment for the game, and he called it "Sphairistike". The game quickly became popular, and it was renamed "lawn tennis" in 1874. The first lawn tennis tournament was held in 1877 at the All England Club in Wimbledon, England. Tennis became an Olympic sport in 1896. Today, tennis is a popular sport played by millions of people around the world.</p> <p>Fundamental Skills of Tennis</p> <p>Grip: The grip is the most important fundamental skill in tennis. It allows you to control the racket and hit the ball with power and accuracy. There are many different grips, but the most common are the forehand grip and the backhand grip.</p> <p>Footwork: Footwork is essential for moving around the court and positioning yourself to hit the ball. There are many different footwork drills that you can practice to improve your footwork.</p> <p>Racket control: Racket control is the ability to hit the ball with power and accuracy. It is important to practice hitting the ball in different directions and with different levels of power.</p> <p>Timing: Timing is the ability to hit the ball at the right time. It is important to practice hitting the ball at the peak of its flight.</p> <p>Stamina: Stamina is essential for tennis, as it is a physically demanding sport. You need to be able to run, jump, and hit the ball for long periods of time.</p>	
8	<p>Fencing</p> <p>History of Fencing</p> <p>The earliest evidence of fencing dates back to ancient Egypt, Greece, and Rome. Fencing was used as a form of training for warfare and as a way to settle disputes. The modern sport of fencing developed in Italy in the 15th century. The first fencing competition was held in 1550 in Paris. Fencing became an Olympic sport in 1896, and it has been a part of every Game since then. Fencing is now a popular sport all over the world, and there are three main disciplines: foil, épée, and sabre.</p> <p>Fundamental Skills of Fencing</p> <p>Footwork: Footwork is essential in fencing, as it allows you to move quickly and efficiently around the piste. There are many different footwork drills that you can practice to improve your footwork.</p> <p>Blade work: Blade work is the ability to use the sword effectively. There are many different blade work techniques, and you need to practice them in order to become proficient.</p> <p>Parrying: Parrying is the ability to deflect an opponent's attack. There are many different parrying techniques, and you need to practice them in order to become proficient.</p> <p>Riposte: The riposte is the counterattack that follows a parry. It is an important skill in fencing, as it allows you to score points.</p> <p>Mental Focus: Mental focus is also an important skill in fencing, as it allows you to stay focused on the opponent and to avoid making mistakes.</p>	
9	<p>Athletics</p> <p>History of Athletics</p> <p>The history of athletics can be traced back to the ancient Olympic Games,</p>	

	<p>which were held in Greece from 776 BC to 393 AD. The original events included running, jumping, throwing, and wrestling. The modern Olympic Games were revived in 1896, and athletics has been a part of every Games since then. Athletics is now a global sport, with competitions held at all levels, from local to international.</p> <p>Fundamental Skills of Athletics</p> <p>Running: Running is the most basic skill in athletics. It is the ability to move forward quickly and efficiently. There are many different types of running, including sprinting, distance running, and middle-distance running.</p> <p>Jumping: Jumping is the ability to move upwards from the ground. There are many different types of jumping, including high jump, long jump, and triple jump.</p> <p>Throwing: Throwing is the ability to propel an object through the air. There are many different types of throwing, including shot put, discus throw, javelin throw, and hammer throw.</p> <p>Sprinting: Sprinting is a type of running that involves short bursts of speed. Sprinters need to be able to accelerate quickly and maintain their speed for a short period of time.</p> <p>Distance Running: Distance running is a type of running that involves running for long distances. Distance runners need to be able to pace themselves and maintain their energy levels for long periods of time.</p> <p>Middle-Distance Running: Middle-distance running is a type of running that involves running for distances between 800 meters and 1500 meters. Middle-distance runners need to be able to combine speed and endurance.</p> <p>High Jump: High jumping is a type of jumping that involves clearing a bar that is raised progressively higher. High jumpers need to be able to generate a lot of power in their legs and have good timing.</p> <p>Long Jump: Long jumping is a type of jumping that involves jumping as far as possible. Long jumpers need to have good speed and coordination.</p> <p>Triple Jump: Triple jumping is a type of jumping that involves jumping three times in a row. Triple jumpers need to have good speed, coordination, and power.</p> <p>Shot Put: Shot put is a type of throwing that involves throwing a heavy ball as far as possible. Shot putters need to have good upper body strength and technique.</p> <p>Discus Throw: Discus throw is a type of throwing that involves throwing a disc as far as possible. Discus throwers need to have good upper body strength and technique.</p> <p>Javelin Throw: Javelin throw is a type of throwing that involves throwing a spear as far as possible. Javelin throwers need to have good upper body strength and technique.</p> <p>Hammer Throw: Hammer throw is a type of throwing that involves throwing a heavy ball on a chain as far as possible. Hammer throwers need to have good upper body strength and technique.</p>	
10	<p>Kho-Kho History of Kho-Kho Kho-Kho is a tag game that originated in India. It is believed to have originated in the Indian subcontinent over 4,000 years ago. The game is mentioned in the Sangam literature of Tamil Nadu, which dates back to the 3rd century BC. Kho-Kho was first played as a competitive sport in the Indian Olympic Games</p>	

	<p>in 1938.</p> <p>It was included as a demonstration sport at the 1982 Asian Games in Delhi, and it became a full medal sport in the 1990 Asian Games in Beijing.</p> <p>Kho-Kho is now played in over 100 countries around the world.</p> <p>Fundamental Skills of Kho-Kho</p> <p>Touch: Touching an opponent is the most important skill in Kho-Kho. It is how raiders score points for their team. There are many different ways to touch an opponent, such as touching their arm, leg, or torso.</p> <p>Dive: Diving is a fundamental skill for all Kho-Kho players. It allows players to avoid being touched by the opponents. There are many different types of dives, such as front dive, side dive, and back dive.</p> <p>Stamina: Stamina is essential for all Kho-Kho players, as the game is very physically demanding. Players need to be able to run, jump, and dive for long periods of time.</p> <p>Agility: Agility is also important for Kho-Kho players, as they need to be able to change direction quickly and avoid being touched by the opponents.</p> <p>Teamwork: Teamwork is essential for Kho-Kho, as it is a team sport. Players need to be able to work together to score points and defend their territory.</p>	
11	<p>Cricket</p> <p>History of Cricket</p> <p>The history of cricket can be traced back to the 16th century in England. The game is believed to have originated from a game called "stoolball", which was played by children in the 15th century.</p> <p>The first recorded cricket match was played in 1611 between two teams of Kentish cricketers.</p> <p>Cricket became a popular sport in England during the 18th century, and it was first played in Australia in 1826.</p> <p>Cricket became an international sport in the 19th century, and the first Test match was played between England and Australia in 1877.</p> <p>Cricket is now played in over 100 countries around the world.</p> <p>Fundamental Skills of Cricket</p> <p>Batting: Batting is the act of hitting the ball with a bat. It is the most important skill in cricket, as it is how runs are scored. There are many different batting techniques, such as the defensive technique and the attacking technique.</p> <p>Bowling: Bowling is the act of delivering the ball to the batsman. There are many different bowling techniques, such as the fast bowling technique and the spin bowling technique.</p> <p>Fielding: Fielding is the act of catching the ball and preventing the batsman from scoring runs. It is an important skill for all cricketers, as it helps to prevent the other team from scoring runs.</p> <p>Running: Running is essential for scoring runs in cricket. Players need to be able to run quickly between the wickets to score runs.</p> <p>Stamina: Stamina is essential for all cricketers, as the game is very physically demanding. Players need to be able to run, jump, and field for long periods of time.</p> <p>Agility: Agility is also important for cricketers, as they need to be able to change direction quickly and avoid being run out.</p> <p>Teamwork: Teamwork is essential for cricket, as it is a team sport. Players need to be able to work together to score runs and prevent the other team from scoring runs.</p>	
12	<p>Rifle Shooting</p> <p>History of Rifle Shooting</p>	

	<p>The history of rifle shooting can be traced back to the 16th century in Europe. The first recorded rifle shooting competition was held in 1533 in Zurich, Switzerland.</p> <p>Rifle shooting became a popular sport in Europe during the 18th century, and it was first introduced to the United States in the 1770s.</p> <p>Rifle shooting became an Olympic sport in 1896, and it has been a part of every Games since then.</p> <p>Rifle shooting is now a popular sport all over the world.</p> <p>Fundamental Skills of Rifle Shooting</p> <p>Accuracy: Accuracy is the most important skill in rifle shooting. It is the ability to hit the target with the bullet. There are many different factors that affect accuracy, such as the stance, the grip, the breathing, and the trigger control.</p> <p>Consistency: Consistency is also important in rifle shooting. It is the ability to hit the target with the same accuracy shot after shot. There are many different factors that affect consistency, such as the mental focus and the physical preparation.</p> <p>Stance: The stance is the position of the body when shooting. It is important to have a stable stance in order to be accurate. There are many different stances that can be used, such as the standing stance, the kneeling stance, and the prone stance.</p> <p>Grip: The grip is the way that the rifle is held. It is important to have a firm grip in order to be accurate. There are many different grips that can be used, such as the weaver grip and the isosceles grip.</p> <p>Breathing: Breathing is important in rifle shooting because it can affect the accuracy of the shot. It is important to breathe slowly and evenly before and after the shot.</p> <p>Trigger Control: Trigger control is the ability to pull the trigger smoothly and evenly. It is important to avoid jerking the trigger, as this can cause the shot to go off target.</p>	
13	<p>Yoga</p> <p>History of Yoga</p> <p>Yoga is a mind and body practice with a 5,000-year history in ancient Indian philosophy.</p> <p>The word "yoga" comes from the Sanskrit word "yuj," which means "to yoke" or "to unite."</p> <p>Yoga is a system of physical postures, breathing exercises, and meditation designed to help practitioners achieve physical, mental, and spiritual well-being. The earliest written records of yoga date back to the 2nd century BCE, and the practice has been evolving ever since.</p> <p>Yoga has spread to all corners of the world, and there are now many different styles of yoga practiced today.</p> <p>Fundamental Skills of Yoga</p> <p>Postures: The postures, or asanas, are the physical component of yoga. There are many different postures, and they can be practiced in a variety of ways.</p> <p>Breathing: Breathing, or pranayama, is an important part of yoga. There are many different breathing techniques, and they can be used to help relax the body and mind.</p> <p>Meditation: Meditation is the mental component of yoga. There are many different meditation techniques, and they can be used to help focus the mind and achieve a state of peace.</p>	

14	<p>Swimming</p> <p>History of Swimming</p> <p>Swimming is one of the oldest sports in the world, with evidence of swimming dating back to 2500 BC.</p> <p>The earliest recorded swimming competitions were held in ancient Greece and Rome.</p> <p>Swimming became an Olympic sport in 1896, and it has been a part of every Game since then.</p> <p>Swimming is now a popular sport all over the world, and there are many different types of swimming, including freestyle, backstroke, breaststroke, butterfly, and individual medley.</p> <p>Fundamental Skills of Swimming</p> <p>Breathing: Breathing is one of the most important skills in swimming. It is important to be able to breathe efficiently while swimming in order to avoid getting tired.</p> <p>Body Position: Body position is another important skill in swimming. It is important to maintain a good body position in order to be hydrodynamic and to swim efficiently.</p> <p>Stroke Technique: Stroke technique is the way that the arms and legs are used to propel the body through the water. There are many different stroke techniques, and it is important to develop a good stroke technique in order to swim efficiently.</p> <p>Drills: Drills are exercises that can be used to improve swimming skills. There are many different drills, and they can be used to improve different aspects of swimming, such as breathing, body position, and stroke technique.</p> <p>Mental Toughness: Mental toughness is also an important skill in swimming. It is important to be able to stay focused and motivated during long swims, especially in competitions.</p>	
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