

**NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR**

**(AN AUTONOMOUS INSTITUTE)**



**Affiliated to**

**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW**



**Evaluation Scheme & Syllabus**

For

**Bachelor of Technology**

**Master of Integrated Technology**

**Computer Science and Engineering**

**First Year**

**(Effective from the Session: 2024-25)**

**NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR**  
(AN AUTONOMOUS INSTITUTE)

**Bachelor of Technology**  
**Master of Integrated Technology**  
**Computer Science and Engineering**

**Evaluation Scheme**  
**SEMESTER-I**

| Sl. No.                                     | Subject code        | Subject  | Types of Subject | Periods |   |   | Evaluation Schemes |    |       |    | End Semester |     | Total      | Credit    |
|---|---------------------|--|------------------|---------|---|---|--------------------|----|-------|----|--------------|-----|------------|-----------|
|   |                     |  |                  | L       | T | P | CT                 | TA | TOTAL | PS | TE           | PE  |            |           |
| <b>3 WEEKS COMPULSORY INDUCTION PROGRAM</b> |                     |  |                  |         |   |   |                    |    |       |    |              |     |            |           |
| 1   | BMIAS0103           | Engineering Mathematics-I  | Mandatory        | 3       | 1 | 0 | 30                 | 20 | 50    |    | 100          |     | 150        | 4         |
| 2   | BMIAS0101AZ         | Engineering Physics  | Mandatory        | 3       | 0 | 0 | 30                 | 20 | 50    |    | 100          |     | 150        | 3         |
| 3   | BMICSE0103          | Design Thinking-I  | Mandatory        | 2       | 1 | 0 | 30                 | 20 | 50    |    | 50           |     | 100        | 3         |
| 4   | BMICSE0151          | Problem Solving using Python   | Mandatory        | 0       | 0 | 6 |                    |    |       | 50 |              | 100 | 150        | 3         |
| 5   | BMICSE0152          | C Programming  | Mandatory        | 0       | 0 | 6 |                    |    |       | 50 |              | 100 | 150        | 3         |
| 6   | BMIAS0151A          | Engineering Physics Lab  | Mandatory        | 0       | 0 | 2 |                    |    |       | 25 |              | 25  | 50         | 1         |
| 7   | BMIASL0151Z         | Acquiring Business Communication (ABC) Lab   | Mandatory        | 0       | 0 | 6 |                    |    |       | 50 |              | 100 | 150        | 3         |
| 8   | BNC0102/<br>BNC0103 | Constitution of India, Law and Engineering/Essence of Indian Traditional Knowledge | Compulsory Audit | 2       | 0 | 0 | 30                 | 20 | 50    |    | 50           |     | 100        | NA        |
|   |                     | *Massive Open Online Courses (For B.Tech. Hons. Degree)                            | *MOOCs           |         |   |   |                    |    |       |    |              |     |            |           |
|   |                     | <b>TOTAL</b>   |                  |         |   |   |                    |    |       |    |              |     | <b>900</b> | <b>20</b> |

**PLEASE NOTE: -**

- **Compulsory Audit (CA) Courses (Non-Credit - BNC0103/BNC0102)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The total and obtained marks are not added in the grand total.

**\* List of MOOCs Based Recommended Courses for first year (Semester-I) B. Tech Students**

| <b>S. No.</b> | <b>Subject Code</b> | <b>Course Name</b>  | <b>University/ Industry Partner Name</b> | <b>N. of Hours</b> | <b>Credits</b> |
|---------------|---------------------|---|--|--------------------|----------------|
| 1.            | BMC0002             | Next Gen Technologies   | Infosys Wingspan (Infosys Springboard)   | 10h 14m            | 0.5            |
| 2.            | BMC0042             | Programming Fundamentals using Python -<br>Science Graduates - Foundation Program | Infosys Wingspan (Infosys Springboard)   | 66h 10m            | 4              |

**Abbreviation Used:**

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam.,  
CE: Core Elective, OE: Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, CA: Compulsory Audit,  
MOOCs: Massive Open Online Courses.

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**Bachelor of Technology**  
**Master of Integrated Technology**  
**Computer Science and Engineering**

**Evaluation Scheme**

**SEMESTER-II**

| Sl. No. | Subject code        | Subject   | Types of Subject | Periods |   |   | Evaluation Schemes |    |       |    | End Semester |     | Total       | Credit    |
|---------|---------------------|---|------------------|---------|---|---|--------------------|----|-------|----|--------------|-----|-------------|-----------|
|         |                     |   |                  | L       | T | P | CT                 | TA | TOTAL | PS | TE           | PE  |             |           |
| 1       | BMIAS0203           | Engineering Mathematics-II  | Mandatory        | 3       | 1 | 0 | 30                 | 20 | 50    |    | 100          |     | 150         | 4         |
| 2       | BMIEC0201Z          | Basic Electrical and Electronics Engineering  | Mandatory        | 3       | 0 | 0 | 30                 | 20 | 50    |    | 100          |     | 150         | 3         |
| 3       | BMICSE0204          | Discrete Structures   | Mandatory        | 3       | 0 | 0 | 30                 | 20 | 50    |    | 100          |     | 150         | 3         |
| 4       |                     | Foreign Language  | Core Elective    | 2       | 0 | 0 | 30                 | 20 | 50    |    | 50           |     | 100         | 2         |
| 5       | BMICSE0252          | Advanced Python   | Mandatory        | 0       | 0 | 6 |                    |    |       | 50 |              | 100 | 150         | 3         |
| 6       | BMIASL0251          | Communication for Career Enhancement  | Mandatory        | 0       | 0 | 4 |                    |    |       | 50 |              | 50  | 100         | 2         |
| 7       | BMIEC0251N          | Basic Electrical and Electronics Engineering Lab                                    | Mandatory        | 0       | 0 | 2 |                    |    |       | 25 |              | 25  | 50          | 1         |
| 8       | BMIME0251N          | CAD and Digital Manufacturing   | Mandatory        | 0       | 0 | 6 |                    |    |       | 50 |              | 100 | 150         | 3         |
| 9       | BNC0203/<br>BNC0202 | Essence of Indian Traditional Knowledge /Constitution of India, Law and Engineering | Compulsory Audit | 2       | 0 | 0 | 30                 | 20 | 50    |    | 50           |     | 100         | NA        |
|         |                     | *Massive Open Online Courses (For B.Tech. Hons. Degree)                             | *MOOCs           |         |   |   |                    |    |       |    |              |     |             |           |
|         |                     | <b>TOTAL</b>  |                  |         |   |   |                    |    |       |    |              |     | <b>1000</b> | <b>21</b> |

**PLEASE NOTE: -**

- **A 3-4 weeks Internship shall be conducted during summer break after semester-II and will be assessed during semester-III**
- **Compulsory Audit (CA) Courses (Non-Credit - BNC0202/BNC0203)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The total and obtained marks are not added in the grand total.

**Foreign Language:**

| S. No. | Subject Code | Course Name | Types of Subject |
|--------|--------------|-------------|------------------|
| 1.     | BMIASL0202   | French      | Core Elective    |
| 2.     | BMIASL0203   | German      | Core Elective    |
| 3.     | BMIASL0204   | Japanese    | Core Elective    |

**\* List of MOOCs Based Recommended Courses for first year (Semester-II) B. Tech Students**

| S. No. | Subject Code | Course Name           | University/ Industry Partner Name      | N. of Hours | Credits |
|--------|--------------|-----------------------|--|-------------|---------|
| 1.     | BMC0004      | Programming In C      | Infosys Wingspan (Infosys Springboard) | 17h 7m      | 1       |
| 2.     | BMC0041      | Microsoft Office 2016 | Infosys Wingspan (Infosys Springboard) | 31h 54m     | 2.5     |

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CE: Core Elective, OE: Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, CA: Compulsory Audit,  
MOOCs: Massive Open Online Courses.

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**AICTE Guidelines in Model Curriculum:**

A student will be eligible to get Under Graduate degree with Honours only, if he/she completes the additional MOOCs courses such as Coursera certifications, or any other online courses recommended by the Institute (Equivalent to 20 credits). During Complete B.Tech. Program Guidelines for credit calculations are as follows.

1. For 6 to 12 Hours =0.5 Credit
2. For 13 to 18 =1 Credit
3. For 19 to 24 =1.5 Credit
4. For 25 to 30 =2 Credit
5. For 31 to 35 =2.5 Credit
6. For 36 to 41 =3 Credit
7. For 42 to 47 =3.5 Credit
8. For 48 and above =4 Credit

For registration to MOOCs Courses, the students shall follow Coursera registration details as per the assigned login and password by the Institute these courses may be cleared during the B. Tech degree program (as per the list provided). After successful completion of these MOOCs courses, the students shall provide their successful completion status/certificates to the Controller of Examination (COE) of the Institute through their coordinators/Mentors only.

The students shall be awarded Honours Degree as per following criterion.

- i. If he / she secures 7.50 as above CGPA.
- ii. Passed each subject of that degree program in the single attempt without any grace.
- iii. Successful completion of MOOCs based 20 credits



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Mathematics**

**Subject Name: Engineering Mathematics - I** **L-T-P [3-1-0]**

**Subject Code: BMIAS0103** **Applicable in Department: B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Knowledge of Mathematics up to 12<sup>th</sup> standard

**Course Objective:**

The objective of this course is to familiarize the graduate engineers with techniques in linear algebra, differential calculus-I, differential calculus-II and multivariable calculus. It aims to equip the students with standard concepts and tools from intermediate to advanced level that will enable them to tackle more advanced level of mathematics and applications that they would find useful in their disciplines.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to: |   | <b>Bloom's Knowledge Level(KL)</b> |
|--|---|------------------------------------|
| CO 1   | Apply the concept of matrices to solve linear simultaneous equations  | K3                                 |
| CO2  | Apply the concept of successive differentiation and partial differentiation to solve problems of Leibnitz theorems and total derivatives. | K3                                 |
| CO3  | Apply partial differentiation for evaluating maxima, minima, Taylor's series and Jacobians.   | K3                                 |
| CO4  | Apply the concept of multiple integral to find area, volume, centre of mass and centre of gravity.  | K3                                 |
| CO5  | Solve the problems of Profit, Loss, Number & Series, Coding & decoding, Algebra.  | K3                                 |

**Syllabus**

| <b>Unit No</b> | <b>Module Name</b>               | <b>Topic covered</b>  | <b>Pedagogy</b>                        | <b>Lecture Required (L+P)</b> | <b>Practical/ Assignment/ Lab Nos</b> | <b>CO Mapping</b> |
|----------------|----------------------------------|---|--|-------------------------------|---------------------------------------|-------------------|
| Unit 1         | <b>Matrices</b>                  | Types of Matrices: Symmetric, Skew-symmetric and Orthogonal Matrices; Complex Matrices, Inverse and Rank of matrix using elementary transformations, System of linear equations, Characteristic equation, Cayley-Hamilton Theorem and its application, Eigen values and eigenvectors; Diagonalisation of a Matrix. Applications in Engineering. | Classroom,PPT,<br>M.Tutor, Smart Board | 8                             | 1.1, 1.2, 1.3, 1.4                    | <b>CO1</b>        |
| Unit 2         | <b>Differential Calculus -I</b>  | Successive Differentiation (nth order derivatives), Leibnitz theorem and its application, Asymptotes, Curve tracing: Cartesian and Polar co-ordinates. Partial derivatives, Total derivative, Euler's Theorem for homogeneous functions. Applications in Engineering.   | Classroom,PPT,<br>M.Tutor, Smart Board | 8                             | 2.1, 2.2, 2.3                         | <b>CO2</b>        |
| Unit 3         | <b>Differential Calculus -II</b> | Taylor and Maclaurin's theorems for a function of one and two variables, Jacobians, Approximation of errors. Maxima and Minima of functions of several variables, Lagrange Method of Multipliers. Applications in Engineering.  | Classroom,PPT,<br>M.Tutor, Smart Board | 8                             | 3.1, 3.2, 3.3                         | <b>CO3</b>        |
| Unit 4         | <b>Multivariable Calculus</b>    | Multiple integration: Double integral, Triple integral, Change of order of integration,<br><br>Change of variables, Application: Areas and volumes, Beta & Gama function and their properties, Dirichlet's integral and its applications. Applications in Engineering.  | Classroom,PPT,<br>M.Tutor, Smart Board | 10                            | 4.1, 4.2, 4.3                         | <b>CO4</b>        |
| Unit 5         | <b>Aptitude-I</b>                | Simplification, Percentage, Profit, loss & discount, Average, Number & Series, Coding & decoding, Algebra.  | Classroom,PPT,<br>M.Tutor, Smart Board | 8                             | 5.1, 5.2, 5.3, 5.4                    | <b>CO5</b>        |



|                        |   |           |  |  |
|------------------------|---|-----------|--|--|
| <b>Total</b>           |   | <b>42</b> |  |  |
| <b>Textbooks</b>       |   |           |  |  |
| <b>Sr No</b>           | <b>Book Details</b>   |           |  |  |
| 1.                     | B. V. Ramana, Higher Engineering Mathematics, Tata Mc Grew-Hill Publishing Company Ltd.                                       |           |  |  |
| 2.                     | B. S. Grewal, Higher Engineering Mathematics, Khanna Publisher.   |           |  |  |
| 3.                     | R K. Jain & S R K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House.   |           |  |  |
| <b>Reference Books</b> |   |           |  |  |
| <b>Sr No</b>           | <b>Book Details</b>   |           |  |  |
| 1.                     | E. Kreyszig, Advance Engineering Mathematics, John Wiley & Sons.  |           |  |  |
| 2.                     | Peter V. O'Neil, Advance Engineering Mathematics, Thomson (Cengage) Learning.   |           |  |  |
| 3.                     | D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole.  |           |  |  |
| 4.                     | Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi.   |           |  |  |
| 5.                     | Ray Wylie C and Louis C Barret, Advanced Engineering Mathematics, Tata Mc-Grew-Hill; Sixth Edition.                           |           |  |  |
| 6.                     | P. Siva Ramakrishna Das and C. Vijayakumari, Engineering Mathematics, 1st Edition, Pearson India Education Services Pvt. Ltd. |           |  |  |
| 7.                     | Advanced Engineering Mathematics. Chandrika Prasad, Reena Garg.   |           |  |  |
| 8.                     | Engineering Mathematics – I. Reena Garg.  |           |  |  |
| 9.                     | Quantitative Aptitude by R.S. Agrawal.  |           |  |  |

10. Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas, Calculus, Eleventh Edition, Pearson.

**Links (Only Verified links should be pasted here)**

**Youtube Link:**

**Unit 1:**

<https://www.youtube.com/watch?v=kcL5WWJjmIU>

<https://www.youtube.com/watch?v=VTHz4gjzsKI>

[https://youtu.be/56dEt9EOZ\\_M](https://youtu.be/56dEt9EOZ_M)

<https://www.youtube.com/watch?v=njDiwB43w80>

<https://www.youtube.com/watch?v=N33SOw1A5fo>

<https://www.youtube.com/watch?v=yLi8RxqfowA>

[www.math.ku.edu/~lerner/LAnotes/Chapter5.pdf](http://www.math.ku.edu/~lerner/LAnotes/Chapter5.pdf)

<http://www.math.hawaii.edu/~lee/linear/sys-eq.pdf>

<https://youtu.be/41Y38WjHbtE>

[https://www.youtube.com/watch?v=4jcvZmMK\\_28](https://www.youtube.com/watch?v=4jcvZmMK_28)

<https://www.youtube.com/watch?v=G4N8vJpf7hM>

<https://www.youtube.com/watch?v=r5dIXpssvrA>

<https://youtu.be/ZX5YnDMzwbs> <http://web.mit.edu/2.151/www/Handouts/CayleyHamilton.pdf>

**Unit 2:** [https://www.youtube.com/watch?v=tQxk5IX9S\\_8&list=PLbu\\_fGT0MPstS3DTIyqkUecSW\\_7axdxKe](https://www.youtube.com/watch?v=tQxk5IX9S_8&list=PLbu_fGT0MPstS3DTIyqkUecSW_7axdxKe)

<https://www.youtube.com/watch?v=U5sGFf0DjLs&t=34s>

<https://www.youtube.com/watch?v=TCPPvRfHtXw>

[https://www.youtube.com/watch?v=PkuPGKSacu0&list=PL2FUpm\\_Ld1Q3H00wVFuwjWOo1gtMXk1eb](https://www.youtube.com/watch?v=PkuPGKSacu0&list=PL2FUpm_Ld1Q3H00wVFuwjWOo1gtMXk1eb)

<https://www.youtube.com/watch?v=QeWrQ9Fz3Wo&t=22s>

<https://www.youtube.com/watch?v=5dFrWCE6bHg>

<https://www.youtube.com/watch?v=WX6O9TiFYsA&t=110s>

<https://www.youtube.com/watch?v=GII1ssdR2cg&list=PLhSp9OSVmeyK2vt8hdoo3Qze3O0Y67qaY>

### **Unit 3:**

<https://www.youtube.com/watch?v=6tQTRlkbkc8>

<https://www.youtube.com/watch?v=McT-UsFx1Es>

[https://www.youtube.com/watch?v=\\_1TNtFqiFQo](https://www.youtube.com/watch?v=_1TNtFqiFQo)

<https://www.youtube.com/watch?v=X6kp2o3mGtA>

<https://www.youtube.com/watch?v=btLWNJdHzSQ>

<https://www.youtube.com/watch?v=jiEaKYI0ATY>

<https://www.youtube.com/watch?v=r6lDwJZmfGA>

<https://www.youtube.com/watch?v=Jk9xMY4mPH8>

[https://www.youtube.com/watch?v=fqq\\_UR4zhfI](https://www.youtube.com/watch?v=fqq_UR4zhfI)

[https://www.youtube.com/watch?v=G0V\\_yy0jz5c](https://www.youtube.com/watch?v=G0V_yy0jz5c)

<https://www.youtube.com/watch?v=9-tir2V3vYY>

<https://www.youtube.com/watch?v=jGwA4hknYp4>

### **Unit 4:**

<https://www.youtube.com/watch?v=3BbrC9JcjOU> <https://www.youtube.com/watch?v=-DduB46CoZY>

<https://www.youtube.com/watch?v=VvKAuFBjLs0>

<https://www.youtube.com/watch?v=4rc3w1sGoNU>

<https://www.youtube.com/watch?v=X6kp2o3mGtA&t=1003s>

<https://www.youtube.com/watch?v=wtY5fx6VMGQ&t=1151s>

<https://www.youtube.com/watch?v=-I3HUeHi1Ys&t=1933s>

<https://www.youtube.com/watch?v=kfv9h3c46CI>

[https://www.youtube.com/watch?v=9\\_m36W3cK74](https://www.youtube.com/watch?v=9_m36W3cK74)

<https://www.youtube.com/watch?v=HQM7XMd5QQo>

<https://www.GovernmentAdda.com>

**Unit 5:**

<https://www.GovernmentAdda.com>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Physics**

**Subject Name: Engineering Physics** **L-T-P [3-0-0]**

**Subject Code: BMIAS0101AZ** **Applicable in Department: B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:**

1. Newton's law of motion.
2. Scalar and vector (grad, div. and curl)
3. Basic laws of optics.
4. Basic laws of electricity and magnetism.
5. Atomic structure and atomic spectra.
6. Properties of matter.

**Course Objective:**

1. To provide the knowledge of Relativistic Mechanics and their uses to engineering applications.
2. To provide the knowledge of Quantum Mechanics and to explore possible engineering utilization.
3. To provide the knowledge of interference and diffraction.
4. To provide the knowledge of the phenomenon of semiconductors and its uses to engineering applications.
5. To provide the basic knowledge of Optical Fiber and Laser which is necessary to understand the working of modern engineering tools and techniques.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

|      |  | <b>Bloom's Knowledge Level(KL)</b> |
|------|--|------------------------------------|
| CO 1 | Solve the relativistic mechanics problems.                           | K1                                 |
| CO2  | Apply the concept of quantum mechanics.                              | K3                                 |
| CO3  | Apply the laws of optics and their application in various processes. | K3                                 |

| CO4      | Define the laws of semiconductors.   |  |                 |                        |   | K2         |
|----------|--|--|-----------------|------------------------|---|------------|
| CO5      | Explain the working of modern engineering tools and techniques of optical fiber and laser. |  |                 |                        |   | K3         |
| Syllabus |  |  |                 |                        |   |            |
| Unit No  | Module Name  | Topic covered  | Pedagogy        | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos                  | CO Mapping |
| Unit 1   | <b>Relativistic Mechanics</b>  | Frame of reference, Inertial & non-inertial frames, Galilean transformations, Michelson Morley experiment, Postulates of special theory of relativity, Lorentz transformations, Length contraction, Time dilation, Velocity addition theorem, Variation of mass with velocity, Einstein's mass energy relation, Relativistic relation between energy and momentum, Massless particle.<br><br>Some engineering applications(qualitative): Global positioning system (GPS), Application to Satellites. | Smartboard, PPT | 8                      | Assignment 1.1,1.2,1.3                          | <b>CO1</b> |
| Unit 2   | <b>Quantum Mechanics</b>   | Introduction to wave-particle duality, de Broglie matter waves, Phase and group velocities, Heisenberg's uncertainty principle and its applications, Wave function characteristics and significance, Time-dependent and time- independent Schrödinger's wave equations, Particle in one-dimensional rigid box. Theory of Quantum excitation of the Higgs field ( Higgs Boson or GOD particle)(qualitative).  | Smartboard, PPT | 8                      | Assignment 2.1, 2.2,2.3/ Exp. 7,5, 19           | <b>CO2</b> |
| Unit 3   | <b>Wave Optics</b>   | Coherent sources, Interference in uniform and wedge shaped thin films, Necessity of extended sources, Newton's Rings and its applications, Fraunhofer diffraction at single slit and at double slit, absent spectra, Diffraction grating, grating spectra, Rayleigh's criterion of resolution, Resolving power of grating, Some engineering applications(qualitative): Optical filters.  | Smartboard, PPT | 10                     | Assignment 3.1, 3.2/ Exp.1,2,4                  | <b>CO3</b> |
| Unit 4   | <b>Semiconductor Physics and Information Storage</b>                                       | (a) Introduction to the concept of electrical conductivity, conductivity of conductors and semiconductors, Fermi-Dirac probability distribution function, Position of Fermi level in intrinsic semiconductors and extrinsic semiconductors, variation of Fermi level with temperature  | Smartboard, PPT | 6                      | Assignment 4.1, 4.2/Exp.5, 8, 9, 11, 12, 20, 22 | <b>CO4</b> |

|              |                                 |  |                 |           |                                     |            |
|--------------|---------------------------------|--|-----------------|-----------|-------------------------------------|------------|
|              |                                 | (qualitative), Photovoltaic effect, working of a solar cell on the basis of band diagrams and Applications.<br><br>(b) Basics of magnetic, and semiconductor memories  |                 |           |                                     |            |
| Unit 5       | <b>Fiber Optics &amp; Laser</b> | Fiber Optics: Introduction to fiber optics, Acceptance angle, Numerical aperture, Normalized frequency, Classification of fiber, Attenuation and Dispersion in optical fibers.<br><br>Laser: Absorption of radiation, Spontaneous and stimulated emission of radiation, Einstein's coefficients, Population inversion, Ruby Laser, He-Ne Laser.<br><br>Recent engineering applications of optical fibers and Laser(Qualitative): Laser-guided UAV (Drone). | Smartboard, PPT | 8         | Assignment 5.1, 5.2/ Exp.16, 17, 18 | <b>CO5</b> |
| <b>Total</b> |                                 |  |                 | <b>40</b> |                                     |            |

| <b>Textbooks</b>       |  |
|------------------------|--|
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | A. Beiser, Concepts of Modern Physics (McGraw Hill)                  |
| 2.                     | Brijlal & Subramanian, Optics (S. Chand )                            |
| 3.                     | Neeraj Mehta, Applied Physics for Engineers (PHI Learning, New)      |
| <b>Reference Books</b> |  |
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | Robert Resnick, Introduction to Special Theory of Relativity (Wiley) |

|     |   |
|-----|---|
| 2.  | Katiyar and Pandey, Engineering Physics: Theory and Practical (Wiley India)   |
| 3.  | H. K. Malik and A. K. Singh, Engineering Physics- (McGrawHill)  |
| 4.  | J.W. Jewett , Jr. and R. A. Serway , Physics for Scientists and Engineers with Modern Physics,7th Edn. (CENGAGE Learning) |
| 5.  | C. Kittel , Solid State Physics,7th Edn. (Wiley Eastern)  |
| 6.  | V. Raghavan, Materials Science and Engineering ( Prentice Hall, India)  |
| 7.  | S.O. Pillai , Solid State Physics,5th Edn (New Age International )  |
| 8.  | R. Booker and E. Boysen , Nanotechnology (Wiley Publ.)  |
| 9.  | K.Rajagopal, Engineering Physics, 2nd Edn. (PHI Learning)   |
| 10. | G. Aruldas , Engineering Physics (PHI Learning)   |
| 11. | S.D. Jain and G.S. Sahasrabudhe , Engineering Physics (Universities Press)  |
| 12. | L. F. Bates, Modern Magnetism, (Cambridge Univ. Press)  |
| 13. | F.T.S.Yu , X.-Y. Yang, Introduction to Optical Engineering (Cambridge Univ.Press)   |
| 14. | G.Keiser, Optical Communications Essentials (Tata McGrawHill)   |

**Links (Only Verified links should be pasted here)**

**UNIT1:** [https://www.youtube.com/watch?v=lzBKlY4f1XA&list=PL10WTjZXSIIHKMnU4UCxpPsH-yAf\\_n1O6&index=11](https://www.youtube.com/watch?v=lzBKlY4f1XA&list=PL10WTjZXSIIHKMnU4UCxpPsH-yAf_n1O6&index=11)

**UNIT2:** <http://nptel.ac.in/> , <http://www.mit.edu/>

**UNIT3:** <https://www.youtube.com/watch?v=bWTxf5dSUBE> , <http://ocw.mit.edu/>, <http://nptel.ac.in/>

**UNIT4:** <https://www.youtube.com/watch?v=6vyYRnLvnqI>

**UNIT5:** <https://www.youtube.com/watch?v=0GD-18Jqnro>, <https://www.youtube.com/watch?v=dQhhcgn8YZo>





**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Computer Science in Emerging Technologies**

**Subject Name: Design Thinking- I**

**L-T-P [2-1-0]**

**Subject Code: BMICSE0103**

**Applicable in Department: B. Tech.-First Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:**

**Course Objective:**

The objective of this course is to familiarize students with design thinking process as a tool for breakthrough innovation. It aims to equip students with design thinking skills and ignite the minds to create innovative ideas, develop solutions for real-time problems.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

|      |   |    |
|------|---|----|
| CO 1 | Develop a strong understanding of the design process and apply it in a variety of business settings         | K1 |
| CO2  | Analyze self, culture, teamwork to work in a multidisciplinary environment and exhibit empathetic behaviour | K3 |
| CO3  | Formulate specific problem statements of real time issues and generate innovative ideas using design tools  | K4 |
| CO4  | Apply critical thinking skills in order to arrive at the root cause from a set of likely causes             | K4 |
| CO5  | Demonstrate an enhanced ability to apply design thinking skills for evaluation of claims and arguments      | K4 |

**Syllabus**

| Unit No | Module Name                       | Topic covered  | Pedagogy                                | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos   | CO Mapping  |
|---------|-----------------------------------|--|---|------------------------|--|-------------|
| Unit 1  | <b>Introduction</b>               | An overview of future skills, introduction to design thinking, traditional problem solving versus design thinking, history of design thinking, wicked problems. Innovation and creativity, the role of innovation and creativity in organizations, creativity in teams and their environments, design mindset. Introduction to elements and principles of design, 13 Musical Notes for Design Mindset, Examples of Great Design, Design Approaches across the world.   | Smartboard/PPT/Text book/Reference book | <b>10</b>              | Practical Approach (Discussion and Activities),<br>Workshop at School of Future Skills<br><br>Activity related to observation & team building exercise | <b>CO 1</b> |
| Unit 2  | <b>Ethical Values and Empathy</b> | Understanding humans as a combination of I (self) and body, basic physical needs up to actualization, prosperity, the gap between desires and actualization. Understanding culture in family, society, institution, startup, socialization process. Ethical behaviour: effects on self, society, understanding core values and feelings, negative sentiments and how to overcome them, definite human conduct: universal human goal, developing human consciousness in values, policy, and character. Understand stakeholders, techniques to empathize, identify key user problems.<br><br>Empathy tools-<br><br>Interviews, empathy maps, emotional mapping, immersion and observations, Emotional Intelligence, customer journey maps, classifying insights after Observations, Classifying Stakeholders, Individual activity- ‘Moccasin walk’ | Smartboard/PPT/Text book/Reference book | <b>8</b>               | Practical Approach (Discussion and Activities)/ Assignment<br><br>Activity related to Empathy Map and Journey Mapping                                  | <b>CO 2</b> |

|        |                                       |  |   |   |  |      |
|--------|---------------------------------------|--|---|---|--|------|
| Unit 3 | <b>Problem Statement and Ideation</b> | <p>Defining the problem statement, creating personas, Point of View (POV) statements. Research identifying drivers, information gathering, target groups, samples, and feedbacks. Idea Generation basic design directions, Themes of Thinking, inspirations and references, brainstorming, inclusion, sketching and presenting ideas, idea evaluation, double diamond approach, analyze – four W’s, 5 why’s, “How Might We”, Defining the problem using Ice-Cream Sticks, Metaphor &amp; Random Association Technique, Mind-Map, ideation activity games - six thinking hats, million-dollar idea, introduction to visual collaboration and brainstorming tools - Mural, JamBoard.</p> | Smartboard/PPT/Text book/Reference book | 8 | <p>Practical Approach (Discussion and Activities)/ Assignment</p> <p>Activity related to Brainstorming and Six Thinking Hats</p> | CO 3 |
| Unit 4 | <b>Critical Thinking</b>              | <p>Fundamental concepts of critical thinking, the difference between critical and ordinary thinking, characteristics of critical thinkers, critical thinking skills- linking ideas, structuring arguments, recognizing incongruences, five pillars of critical thinking, argumentation versus rhetoric, cognitive bias, tribalism, and politics. Case study on applying critical thinking on different scenarios.</p>  | Smartboard/PPT/Text book/Reference book | 6 | <p>Practical Approach (Discussion and Activities)/Assignment</p> <p>Activity related to identifying Biases</p>                   | CO 4 |
| Unit 5 | <b>Logic and Argumentation</b>        | <p>The argument, claim, and statement, identifying premises and conclusion, truth and logic conditions, valid/invalid arguments, strong/weak arguments, deductive argument, argument diagrams, logical reasoning, scientific reasoning, logical fallacies, propositional logic, probability, and judgment, obstacles to critical thinking. Group activity/role plays on evaluating arguments.</p>  | Smartboard/PPT/Text book/Reference book | 8 | <p>Practical Approach (Discussion and Activities)/Assignment</p>   | CO 5 |

|              |           |  |  |
|--------------|-----------|--|--|
| <b>Total</b> | <b>40</b> |  |  |
|--------------|-----------|--|--|

|                  |
|------------------|
| <b>Textbooks</b> |
|------------------|

| Sr No | Book Details  |
|-------|---|
| 1.    | Arun Jain, UnMukt : Science & Art of Design Thinking, 2020, Polaris   |
| 2.    | Jeanne Liedta, Andrew King and Kevin Benett, Solving Problems with Design Thinking – Ten Stories of What Works, 2013, Columbia Business School Publishing |
| 3.    | RR Gaur, R Sangal, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, First Edition, 2009, Excel Books: New Delhi                  |

|                        |
|------------------------|
| <b>Reference Books</b> |
|------------------------|

| Sr No | Book Details  |
|-------|---|
| 1.    | Vijay Kumar, 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization, 2013, John Wiley and Sons Inc, New Jersey |
| 2.    | Mootee, I. (2013). Design thinking for strategic innovation: What they can't teach you at business or design school. John Wiley & Sons.       |
| 3.    | Gavin Ambrose and Paul Harris, Basics Design 08: Design Thinking, 2010, AVA Publishing SA   |
| 4.    | Roger L. Martin, Design of Business: Why Design Thinking is the Next Competitive Advantage, 2009, Harvard Business Press, Boston MA           |

|  |
|--|
| <b>Links (Only Verified links should be pasted here)</b> |
|--|

**Video Link:**

**Unit1:**

<https://nptel.ac.in/courses/110/106/110106124/>

<https://nptel.ac.in/courses/109/104/109104109/>

<https://designthinking.ideo.com/>

<https://blog.hypeinnovation.com/an-introduction-to-design-thinking-for-innovation-managers>

<https://www.creativityatwork.com/design-thinking-strategy-for-innovation/>

<https://www.youtube.com/watch?v=GFffb2H-gK0>

## **Unit 2**

<https://aktu.ac.in/hvpe/>

<http://aktu.uhv.org.in/>

<https://nptel.ac.in/courses/110/106/110106124/>

[https://swayam.gov.in/nd1\\_noc19\\_mg60/preview](https://swayam.gov.in/nd1_noc19_mg60/preview)

## **Unit 3**

<https://nptel.ac.in/courses/110/106/110106124/>

[https://swayam.gov.in/nd1\\_noc19\\_mg60/preview](https://swayam.gov.in/nd1_noc19_mg60/preview)

<https://www.udemy.com/course/design-thinking-for-beginners/>

<https://www.designthinking-methods.com/en/>

<https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them>

## **Unit 4**

<https://www.forbes.com/sites/sap/2016/08/25/innovation-with-design-thinking-demands-critical-thinking/#340511486908>

<https://www.criticalthinking.org/pages/defining-critical-thinking/766>

## **Unit 5**

<https://www.udemy.com/course/critical-thinker-academy/>

[https://swayam.gov.in/nd2\\_aic19\\_ma06/preview](https://swayam.gov.in/nd2_aic19_ma06/preview)



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Computer Science in Emerging Technologies**

**Subject Name: Problem Solving using Python**

**L-T-P [0-0-6]**

**Subject Code: BMICSE0151**

**Applicable in Department: B.Tech.- First Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Basic Computer Knowledge, Logical Thinking & Basic Mathematics

**Course Objective:** To provide Basic knowledge of Python programming and to implement programming skill for solving real world problems

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

|      |  |    |
|------|--|----|
| CO 1 | Understanding basic programming logic.                             | K1 |
| CO2  | Implement python programs using decision control statements.       | K3 |
| CO3  | Implement user defined functions and modules in python             | K3 |
| CO4  | Implement python data structures –lists, tuples, set, dictionaries | K3 |
| CO5  | Apply programming concepts to solve real world problem.            | K3 |

## Syllabus

| Unit No | Module Name                  | Topic covered   | Pedagogy   | Lecture Required (L+P) | Practical/Assignment/ Lab Nos | CO Mapping |
|---------|------------------------------|---|--|------------------------|-------------------------------|------------|
| Unit-I  | Basics of python programming | Problem Solving Techniques, Algorithm, Building blocks of algorithms (statements, state, control flow, functions), Notation, Flow chart, Pseudo code, programming language, Categories of programming languages. A Brief History of Python, Applications areas of python, The Programming Cycle for Python, Python IDE, Interacting with Python Programs. | White board,<br>Smart board<br>Lecture, Hands-on exercise,<br><br>Demonstration<br><br>practical lab | 7+8                    | Practical (1.1-1.45)          | CO1        |
| Unit-II | Decision Control Statements  | Conditionals: Conditional statement in Python (if-else statement, its working and execution)<br>Nested-if statement and elif statement in Python,<br>Expression Evaluation & Float Representation. Loops: Purpose and working of loops, while loop, For Loop, Nested Loops, Break and Continue, pass statement.   | White board,<br><br>Smart board<br>Lecture,<br><br>Hands-on exercise,<br>Demonstration               | 4+10                   | Practical (2.1-2.66)          | CO2        |

|                 |  |  |  |     |                      |            |
|-----------------|--|--|--|-----|----------------------|------------|
|                 |  |  | practical lab  |     |                      |            |
| <b>Unit III</b> | <b>Function and Modules</b>            | Introduction of Function, calling a function, Function arguments, built in function, scope rules Passing function to a function, recursion, Lambda functions Modules and Packages: Importing Modules, writing own modules, Standard library modules, dir( ) Function, Packages in Python | White board,<br>Smart board<br>Lecture, Hands-on<br><br>exercise,<br>Demonstration,<br><br>practical lab | 6+9 | Practical (3.1-3.29) | <b>CO3</b> |
| <b>Unit IV</b>  | <b>Basic Data structures in Python</b> | Strings: Basic operations, Indexing and Slicing of Strings, Comparing strings<br>Regular expressions. Python Basic Data Structure: Sequence, Unpacking Sequences, Mutable Sequences, Lists, Looping in lists, Tuples, Sets, Dictionaries. Map, filter, Reduce, Comprehension             | White board,<br>Smart board<br>Lecture, Hands-on<br><br>exercise,<br>Demonstration<br><br>practical lab  | 5+9 | Practical (4.1-4.75) | <b>CO4</b> |



|               |                                    |   |  |           |                      |            |
|---------------|------------------------------------|---|--|-----------|----------------------|------------|
| <b>Unit V</b> | <b>File and Exception handling</b> | Exception Handling, Errors, Run Time Errors, Handling IO Exception, Try-except statement, Raise | White board, Smart board Lecture, Hands-on exercise, Demonstration Practical lab | 3+7       | Practical (5.1-5.21) | <b>CO5</b> |
| <b>Total</b>  |                                    |   |  | <b>68</b> |                      |            |

### Lab Experiments

**Course Objective:** To understand Python syntax and its data types and develop problem solving and debugging skills to solve real world problems.

### Course Outcomes (CO)

**Course outcome:** After completion of this course students will be able to:

|      |  | <b>Bloom's Knowledge Level(KL)</b> |
|------|--|------------------------------------|
| CO 1 | Understanding basic programming logic.                       | K1                                 |
| CO2  | Implement python programs using decision control statements. | K3                                 |
| CO3  | Implement user defined functions and modules in python       | K4                                 |

### List of Practical

| Sr No | Program Title | CO Mapping |
|-------|---------------|------------|
|-------|---------------|------------|

|      |   |     |
|------|---|-----|
| 1.1  | Python Program to Print Statement                         | CO1 |
| 1.2  | Swap two variables without using a temporary variable     | CO1 |
| 1.3  | Check if a given number is even or odd.                   | CO1 |
| 1.4  | Find the largest of three numbers.                        | CO1 |
| 1.5  | Convert a string to an integer.                           | CO1 |
| 1.6  | Convert an integer to a string.                           | CO1 |
| 1.7  | Convert a string to a floating-point number.              | CO1 |
| 1.8  | Convert a floating-point number to an integer.            | CO1 |
| 1.9  | WAP to demonstrate implicit and explicit type conversion. | CO1 |
| 1.10 | Convert Employee Count to Binary                          | CO1 |

|      |   |     |
|------|---|-----|
| 1.11 | Convert Revenue to Currency Format  | CO1 |
| 1.12 | Write a program to Calculate Sum of 5 Subjects and Find Percentage (Max Mark in each subject is 100). | CO1 |
| 1.13 | Write a program to find gross salary.   | CO1 |
| 1.14 | Write a program to Calculate Area of Rectangle, Square.   | CO1 |
| 1.15 | Write a program to Calculate Area of Scalene Triangle and Right-angle Triangle.                       | CO1 |
| 1.16 | Write a program to find the perimeter of a circle, rectangle and triangle.                            | CO1 |
| 1.17 | Write a program to Compute Simple Interest.   | CO1 |
| 1.18 | Write a program to Convert Fahrenheit temperature in to Celsius.                                      | CO1 |
| 1.19 | Write a program to Find the Gravitational Force Acting Between Two Objects.                           | CO1 |
| 1.20 | Write a program to swap the values of two variables with and without using third variable.            | CO1 |

|      |   |     |
|------|---|-----|
| 1.21 | Write a program to perform arithmetic operations on $a = 8$ , $b = 3$ .         | CO1 |
| 1.22 | Write a program to apply relational operations on $a=8$ , $b=3$ .               | CO1 |
| 1.23 | Write a program to apply assignment operations on $a=8$ , $b=3$ .               | CO1 |
| 1.24 | Write a program to apply logical operations on $a=8$ , $b=3$ .                  | CO1 |
| 1.25 | Write a program to apply bitwise operations on $a=8$ , $b=3$ .                  | CO1 |
| 1.26 | Write a program to apply identity operators.                                    | CO1 |
| 1.27 | Write a program to Swap the Contents of two Numbers using Bitwise XOR Operation | CO1 |
| 1.28 | WAP to find the absolute value of the given number.                             | CO1 |
| 1.29 | Write a program to Add two Complex Numbers.                                     | CO1 |

|      |  |     |
|------|--|-----|
| 1.30 | Write a Program to find roots of a quadratic expression.   | CO1 |
| 1.31 | Program to perform basic arithmetic operations (addition, subtraction, multiplication, division) on two numbers. | CO1 |
| 1.32 | Program to calculate the area of a rectangle using the multiplication operator.                                  | CO1 |
| 1.33 | Program to calculate the average of a list of numbers using the division operator.                               | CO1 |
| 1.34 | Program to compare two numbers and determine if they are equal.  | CO1 |
| 1.35 | Program to compare two numbers and determine whether they are greater than or less than .                        | CO1 |
| 1.36 | Program to check if a given string is equal to a specific value.   | CO1 |
| 1.37 | Write a program to apply Logical AND operator on two operands.   | CO1 |
| 1.38 | Write a program to apply Logical OR operator on two operands.  | CO1 |
| 1.39 | Write a program to apply Logical NOT operator on an operand.   | CO1 |

|      |   |      |
|------|---|------|
| 1.40 | Program to increment or decrement a variable using assignment operators.  | CO1  |
| 1.41 | Program to calculate compound interest using compound assignment operators.   | CO1  |
| 1.42 | Program to perform bitwise AND, OR, XOR, left shift, and right shift operations.  | CO1  |
| 1.43 | Program to check if a given number is odd or even using bitwise operators.  | CO1  |
| 1.44 | Write a Python script that calculates the average score from a list of exam scores using basic arithmetic operations and control flow statements. | CO1  |
| 1.45 | Create a basic calculator GUI application using Python's Tkinter library.   | CO1  |
| 2.1  | Write a program to Accept two Integers and Check if they are Equal.   | CO 2 |
| 2.2  | Write a program to Check if a given Integer is Positive or Negative and Odd or Even.  | CO 2 |
| 2.3  | Write a program to Check if a given Integer is Divisible by 7 or not.   | CO 2 |
| 2.4  | Write a program to find the greatest of three numbers using else if ladder.   | CO 2 |
| 2.5  | Write a program to find the greatest of three numbers using Nested if.  | CO 2 |
| 2.6  | Write a program to convert an Upper-case character into lower case and vice-versa.  | CO 2 |
| 2.7  | Write a program to check weather an entered year is leap year or not.   | CO 2 |

|      |   |      |
|------|---|------|
| 2.8  | Write a Program to check whether an alphabet entered by the user is a vowel or a constant.  | CO 2 |
| 2.9  | Write a program to print day according to the day number entered by the user.   | CO 2 |
| 2.10 | Write a program to print color name, if user enters the first letter of the color name.   | CO 2 |
| 2.11 | Write a program to Simulate Arithmetic Calculator.  | CO 2 |
| 2.12 | Write a menu driven program for calculating area of different geometrical figures such as circle, square, rectangle, and triangle.  | CO 2 |
| 2.13 | WAP that accepts the marks of 5 subjects and finds the percentage marks obtained by the student. It also prints grades according to the following criteria: Between 90-100% Print 'A', 80-90% Print 'B', 60-80% Print 'C', 50-60% Print 'D', 40-50% Print 'E', Below 40% Print 'F'. | CO 2 |
| 2.14 | WAP to enter a character and then determine whether it is a vowel, consonants, or a digit.  | CO 2 |
| 2.15 | Write a program to display all even numbers from 1 to 20  | CO 2 |
| 2.16 | Write a program to print all the Numbers Divisible by 7 from 1 to 100.  | CO 2 |
| 2.17 | Write a program to print table of any number.   | CO 2 |
| 2.18 | Write a program to Find the Sum of first 50 Natural Numbers using for Loop.   | CO 2 |
| 2.19 | Write a program to calculate factorial of a given number using for loop and also using while loop.  | CO 2 |
| 2.20 | Write a program to count the sum of digits in the entered number.   | CO 2 |
| 2.21 | Write a program to find the reverse of a given number.  | CO 2 |
| 2.22 | Write a program to Check whether a given Number is Perfect Number.  | CO 2 |

|      |   |      |
|------|---|------|
| 2.23 | Write a program to Print Armstrong Number from 1 to 1000.   | CO 2 |
| 2.24 | Write a program to Compute the Value of $X_n$ .   | CO 2 |
| 2.25 | Write a program to Calculate the value of $nCr$ .   | CO 2 |
| 2.26 | Write a program to generate the Fibonacci Series.   | CO 2 |
| 2.27 | Write a program to check whether a given Number is Palindrome or Not.   | CO 2 |
| 2.28 | Write a program to Check whether a given Number is an Armstrong Number.   | CO 2 |
| 2.29 | Write a program to print all prime numbers from 1-500.  | CO 2 |
| 2.30 | Write a program to find the Sum of all prime numbers from 1-1000.   | CO 2 |
| 2.31 | Write a program to display the following pattern:<br><br><pre>* *</pre> | CO 2 |
| 2.32 | Write a program to display the following pattern:<br><br><pre>*</pre>   | CO 2 |



|      |   |      |
|------|---|------|
|      | <pre> * *  * * *  * * * *  * * * * *</pre>  |      |
| 2.33 | <p>Write a program to display the following pattern: 1</p> <pre> 1 2  1 2 3  1 2 3 4  1 2 3 4 5</pre> | CO 2 |
| 2.34 | <p>Write a program to display the following pattern: A</p> <pre> B B  C C C  D D D D  E E E E E</pre> | CO 2 |

|      |  |      |
|------|--|------|
| 2.35 | Write a program to display the following pattern:<br><br>* * * * *<br><br>* * * *<br><br>* * *<br><br>* *<br><br>* | CO 2 |
| 2.36 | Write a program to display the following pattern: 1 2 3 4 5<br><br>1 2 3 4<br><br>1 2 3<br><br>1 2<br><br>1        | CO 2 |
| 2.37 | Write a program to display the following pattern:<br><br>*   | CO 2 |

|      |   |      |
|------|---|------|
|      | <pre>*** **** *****</pre>   |      |
| 2.38 | <p>Write a program to display the following pattern:</p> <pre>***** **** *** ** *</pre>                   | CO 2 |
| 2.39 | <p>Write a program to display the following pattern (Pascal Triangle): 1</p> <pre>1 1 1 2 1 1 3 3 1</pre> | CO 2 |

|      |   |      |
|------|---|------|
|      | <pre> 1 4 6 4 1 1 5 10 10 5 1 </pre>  |      |
| 2.40 | <p>Write a program to display the following pattern: 1</p> <pre> 2 3 4 5 6 7 8 9 10 </pre>  | CO 2 |
| 2.41 | <p>Write a program to display the following pattern: A B C D E F G</p> <pre> F E D C B A A B C D E F   F E D C B A A B C D E           E D C B A A B C D         D C B A A B C               C B A A B             B A </pre> | CO 2 |

|      |  |      |
|------|--|------|
|      | A<br>A   |      |
| 2.42 | Write a program to display the following pattern:<br><br>*<br><br>* *<br><br>* * *<br><br>* * * *<br><br>* * * * *<br><br>* * * * *<br><br>* * * * *<br><br>* * * *<br><br>* * *<br><br>* *<br><br>*<br><br> | CO 2 |
| 2.43 | Write a program to display the following pattern:  | CO 2 |

|      |   |      |
|------|---|------|
|      | <pre> 0      0 01     10 010    010 0101   1010 0101001010 </pre>                                   |      |
| 2.44 | <p>Write a program to display the following pattern: A</p> <pre> B C D E F G H I J K L M N O </pre> | CO 2 |
| 2.45 | <p>Write a program to display the following pattern: A</p> <pre> BAB CBABC </pre>                   | CO 2 |

|      |   |      |
|------|---|------|
|      | DCBABCD<br>EDCBABCDE  |      |
| 2.46 | Write a program to Find the Sum of A.P Series.  | CO 2 |
| 2.47 | Write a program to Find the Sum of G.P Series.  | CO 2 |
| 2.48 | Write a program to Find the Sum of H.P Series.  | CO 2 |
| 2.49 | Write a program to print the following sequence of integers. 1, 2, 4, 8, 16, 32                                       | CO 2 |
| 2.50 | Write a program to find the Sum of following Series:<br>$(1*1) + (2*2) + (3*3) + (4*4) + (5*5) + \dots + (n*n)$       | CO 2 |
| 2.51 | Write a program to find the Sum of following Series:<br>$(1^1) + (2^2) + (3^3) + (4^4) + (5^5) + \dots + (n^n)$       | CO 2 |
| 2.52 | Write a program to find the Sum of following Series:<br>$(1!/1) + (2!/2) + (3!/3) + (4!/4) + (5!/5) + \dots + (n!/n)$ | CO 2 |
| 2.53 | Write a program to print the following Series:<br>1, 2, 3, 6, 9, 18, 27, 54, ... upto n terms                         | CO 2 |
| 2.54 | Write a program to print the following Series:<br>2, 15, 41, 80, 132, 197, 275, 366, 470, 587                         | CO 2 |
| 2.55 | Write a program to print the following Series:1, 3, 4, 8, 15, 27, 50, 92, 169, 311                                    | CO 2 |

|      |  |      |
|------|--|------|
| 2.56 | Write a program to Convert the given Binary Number into Decimal.   | CO 2 |
| 2.57 | Write a program to Convert Binary to Hexadecimal.  | CO 2 |
| 2.58 | Write a program to find out L.C.M. of two numbers.   | CO 2 |
| 2.59 | Write a program to find out H.C.F. of two numbers.   | CO 2 |
| 2.60 | Python Program to Accept Three Digits and Print all Possible Combinations from the Digits.   | CO 2 |
| 2.61 | Python Program to Print Odd Numbers within a Given Range.  | CO 2 |
| 2.62 | Python Program to Find the Smallest Divisor of an Integer.   | CO 2 |
| 2.63 | Python Program to Count the Number of Digits in a Number   | CO 2 |
| 2.64 | Python program to find GCD between two given integer numbers.  | CO 2 |
| 2.65 | Create a program that calculates the grade based on the score entered by the user.<br><br>Hint: Use if-elif-else statements to check the score range and assign the corresponding grade (e.g., A, B, C, D, F). | CO2  |
| 2.66 | Extend the temperature converter case study to handle invalid inputs.<br><br>Hint: Use try-except blocks to catch errors when the user enters non-numeric values or invalid temperature ranges.                | CO2  |
| 3.1  | Write a Python function to find the Max of three numbers.  | CO3  |
| 3.2  | Write a Python function to sum all the numbers in a list.<br><br>Sample List: (8, 2, 3, 0, 7)  | CO3  |



|     |   |     |
|-----|---|-----|
|     | Expected Output: 20   |     |
| 3.3 | Write a Python program to reverse a string. Sample String:<br>"1234abcd"<br>Expected Output: "dcba4321"   | CO3 |
| 3.4 | Write a Python function to check whether a number of falls in a given range.  | CO3 |
| 3.5 | Write a Python function that accepts a string and calculate the number of upper-case letters and lower-case letters.<br>Sample String: 'The quick Brow Fox' Expected Output:<br>No. of Upper case characters : 3<br>No. of Lower case Characters : 1                                | CO3 |
| 3.6 | Write a Python function that takes a number as a parameter and check the number is prime or not.  | CO3 |
| 3.7 | Write a Python function that checks whether a passed string is palindrome or not.   | CO3 |
| 3.8 | Write a Python function that prints out the first n rows of Pascal's triangle.  | CO3 |
| 3.9 | Write a Python function that accepts a hyphen-separated sequence of words as input and prints the words in a hyphen-separated sequence after sorting them alphabetically.<br><br><i>Sample Items:</i> green-red-yellow-black-white Expected Result:<br>black-green-red-white-yellow | CO3 |

|      |   |     |
|------|---|-----|
| 3.10 | Python function to convert height (in feet and inches) to centimetres   | CO3 |
| 3.11 | Python function to Convert Celsius to Fahrenheit.   | CO3 |
| 3.12 | Implement a function to check if two strings are anagrams of each other.  | CO3 |
| 3.13 | Python function to display all the Armstrong number from 1 to n.  | CO3 |
| 3.14 | Write a program using recursion to compute factorial of a given number.   | CO3 |
| 3.15 | Write a program to print Fibonacci Series using recursion.  | CO3 |
| 3.16 | Write a program to calculate sum of numbers 1 to N using recursion.   | CO3 |
| 3.17 | Write a program to Find Sum of Digits of the Number using Recursive Function.   | CO3 |
| 3.18 | Write a program to print Tower of Hanoi using recursion.  | CO3 |
| 3.19 | Python Program to Determine How Many Times a Given Letter Occurs in a String Recursively  | CO3 |
| 3.20 | Python Program to Find the Binary Equivalent of a Number Recursively  | CO3 |
| 3.21 | Python Program to Find the GCD of Two Numbers Using Recursion   | CO3 |
| 3.22 | Python Program to Find the Power of a Number Using Recursion  | CO3 |
| 3.23 | WAP to compute the sum of all the elements of the list using reduce() function.   | CO3 |
| 3.24 | A) Write a program to create a module and import the module in another python program.  | CO3 |
| 3.25 | Write a program to import all objects from a modules, specific objects from module and provide custom import name to the imported object from the module. | CO3 |
| 3.26 | Create a python package having at least two modules in it.  | CO3 |

|      |   |      |
|------|---|------|
| 3.27 | Create a python package having at least one subpackage in it.   | CO3  |
| 3.28 | <p>Explore and use standard library modules available in Python.</p> <p>Hint: Import standard library modules such as math, random, and os. Demonstrate the usage of functions and constants provided by these modules, such as calculating square roots, generating random numbers, and navigating the file system. Additionally, use the dir() function to inspect the attributes of these modules.</p> | CO3  |
| 3.29 | <p>Create a Python module for basic arithmetic operations such as addition, subtraction, multiplication, and division.</p> <p>Hint: Develop a module named simple_calculator.py with functions for each arithmetic operation. Import this module into another Python script and use its functions to perform calculations.</p>  | CO3  |
| 4.1  | Python program to check whether the string is Symmetrical or Palindrome   | CO 4 |
| 4.2  | Ways to remove i'th character from string in Python   | CO 4 |
| 4.3  | Python program to Check if a Substring is Present in a Given String   | CO 4 |
| 4.4  | Find length of a string in python (4 ways)  | CO 4 |
| 4.5  | Python program to print even length words in a string   | CO 4 |
| 4.6  | Python program to accept the strings which contains all vowels  | CO 4 |
| 4.7  | Remove all duplicates from a given string in Python   | CO 4 |
| 4.8  | Python program to Maximum frequency character in String   | CO 4 |

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|------|---|------|
| 4.9  | Python Program to Replace all Occurrences of 'a' with \$ in a String  | CO 4 |
| 4.10 | Python Program to Form a New String where the First Character and the Last Character have been Exchanged  | CO 4 |
| 4.11 | Python Program to Count the Number of Vowels in a String  | CO 4 |
| 4.12 | Python Program to Take in a String and Replace Every Blank Space with Hyphen  | CO 4 |
| 4.13 | Python Program to Calculate the Length of a String Without Using a Library Function   | CO 4 |
| 4.14 | Python Program to Remove the Characters of Odd Index Values in a String   | CO 4 |
| 4.15 | Python Program to Calculate the Number of Words and the Number of Characters Present in a String  | CO 4 |
| 4.16 | Python Program to Take in Two Strings and Display the Larger String without Using Built-in Functions  | CO 4 |
| 4.17 | Python Program to Check if a String is a Pangram or Not<br><br>(A pangram is a sentence that uses all 26 letters of the English alphabet at least once. like” The quick brown fox jumps over the lazy dog”) | CO 4 |
| 4.18 | Python Program to Accept a Hyphen Separated Sequence of Words as Input and Print the Words in a Hyphen-Separated Sequence after Sorting them Alphabetically   | CO 4 |
| 4.19 | Python Program to Form a New String Made of the First 2 and Last 2 characters From a Given String   | CO 4 |
| 4.20 | Python Program to Count the Occurrences of Each character in a Given String Sentence  | CO 4 |
| 4.21 | Python Program to Check if a Substring is Present in a Given String   | CO 4 |

|      |  |      |
|------|--|------|
| 4.22 | Python Program to Find the Most Repeated Word in a String.   | CO 4 |
| 4.23 | <p>Write a python program to check the validity of a password given by the user. The password should satisfy the following criteria:</p> <ul style="list-style-type: none"> <li>i) Contain at least 1 letter between a and z.</li> <li>ii) Contain at least 1 number between 0 and 9.</li> <li>iii) Contain at least 1 letter between A and Z.</li> <li>iv) Contain at least 1 character from \$,#,@.</li> <li>v) Maximum length of password 6.</li> </ul> <p>Maximum length of password:12.</p> | CO 4 |
| 4.24 | Write a python program to validate mobile number.  | CO 4 |
| 4.25 | <p>Given an input file which contains a list of names and phone numbers separated by spaces in the following:</p> <ul style="list-style-type: none"> <li>i) Phone number contains a 3- or 2-digit area code and a hyphen followed by an 8-digit number.</li> </ul> <p>Find all names having phone number with a 3digit area code using regular expression.</p>   | CO 4 |
| 4.26 | Program to interchange first and last elements in a list   | CO 4 |
| 4.27 | WAP to find min, max and average of elements of a list having numeric data   | CO 4 |
| 4.28 | Program to check if element exists in list   | CO 4 |
| 4.29 | Program for Reversing a List   | CO 4 |

|      |  |      |
|------|--|------|
| 4.30 | Program to Multiply all numbers in the list  | CO 4 |
| 4.31 | Program to find smallest and largest number in a list  | CO 4 |
| 4.32 | Program to find second largest number in a list  | CO 4 |
| 4.33 | Program to print all even numbers in a range   | CO 4 |
| 4.34 | Program to print all negative numbers in a range   | CO 4 |
| 4.35 | Program to Remove multiple elements from a list in Python  | CO 4 |
| 4.36 | Program to Cloning or Copying a list   | CO 4 |
| 4.37 | Program to Count occurrences of an element in a list   | CO 4 |
| 4.38 | Program to find Cumulative sum of a list   | CO 4 |
| 4.39 | Program to Break a list into chunks of size N in Python  | CO 4 |
| 4.40 | Python Program to transpose of Matrix.   | CO 4 |
| 4.41 | Python Program to Add Two Matrices.  | CO 4 |
| 4.42 | Python Program to Multiply Two Matrices.   | CO 4 |
| 4.43 | Program to get K <sup>th</sup> Column of Matrix  | CO 4 |
| 4.44 | WAP to print all even numbers of a list using list comprehension.  | CO 4 |
| 4.45 | WAP that prompts user to enter an alphabet and then print all the words that starts with that alphabet from the list of words. | CO 4 |
| 4.46 | WAP to transpose a given matrix using list comprehension.  | CO 4 |

|      |   |      |
|------|---|------|
| 4.47 | Print All the characters of a string using list Comprehension   | CO 4 |
| 4.48 | Write a program to calculate square of numbers upto n using list comprehension.                       | CO 4 |
| 4.49 | Python program to Find the size of a Tuple  | CO 4 |
| 4.50 | Python – Maximum and Minimum K <sup>th</sup> elements in Tuple  | CO 4 |
| 4.51 | Create a list of tuples from given list having number and its cube in each tuple                      | CO 4 |
| 4.52 | Python – Flatten tuple of List to tuple   | CO 4 |
| 4.53 | Python Program to Count the Number of Vowels Present in a String using Sets                           | CO 4 |
| 4.54 | Python Program to Check Common Letters in Two Input Strings   | CO 4 |
| 4.55 | Python Program that Displays which Letters are in the First String but not in the Second              | CO 4 |
| 4.56 | Python Program that Displays which Letters are Present in Both the Strings                            | CO 4 |
| 4.57 | Python Program that Displays which Letters are in the Two Strings but not in Both                     | CO 4 |
| 4.58 | Python Program to Add a Key-Value Pair to the Dictionary  | CO 4 |
| 4.59 | Python Program to Concatenate Two Dictionaries into One.  | CO 4 |
| 4.60 | Python Program to Check if a Given Key Exists in a Dictionary or Not                                  | CO 4 |
| 4.61 | Python Program to Generate a Dictionary that Contains Numbers (between 1 and n) in the Form (x,x*x).  | CO 4 |
| 4.62 | Python program to create an instance of an Ordered dict using a given dictionary. Sort the dictionary | CO 4 |

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|      | during the creation and print the members of the dictionary in reverse order.   |      |
| 4.63 | Python Program to Sum All the Items in a Dictionary   | CO 4 |
| 4.64 | WAP to create dictionary which has characters of given string as keys and frequency of characters as values.  | CO 4 |
| 4.65 | Python Program to Multiply All the Items in a Dictionary  | CO 4 |
| 4.66 | Python Program to Remove the Given Key from a Dictionary  | CO 4 |
| 4.67 | Python Program to Form a Dictionary from an Object of a Class   | CO 4 |
| 4.68 | Python Program to Map Two Lists into a Dictionary   | CO 4 |
| 4.69 | Write a program Filtering even numbers from a list using tuple comprehension  | CO 4 |
| 4.70 | Creating a list of tuples from two lists using comprehension function   | CO 4 |
| 4.71 | Extracting the first character from each word in a list of strings  | CO 4 |
| 4.72 | Swapping keys and values in a dictionary  | CO 4 |
| 4.73 | Filtering even numbers from a dictionary:   | CO 4 |
| 4.74 | Write a Program to calculate square of number using dictionary comprehension  | CO 4 |
| 4.75 | Develop a Python program to analyze and manipulate text data using string operations and regular expressions.<br><br>Hint: Implement functions to perform basic operations like concatenation, string slicing, and string | CO4  |



|      |   |      |
|------|---|------|
|      | comparison. Utilize regular expressions to extract specific patterns or information from the text data. |      |
| 5.1  | Python program to read file word by word  | CO 5 |
| 5.2  | Python program to read character by character from a file   | CO 5 |
| 5.3  | Python – Get number of characters, words, spaces and lines in a file                                    | CO 5 |
| 5.4  | Program to Find ‘n’ Character Words in a Text File  | CO 5 |
| 5.5  | Python Program to obtain the line number in which given word is present                                 | CO 5 |
| 5.6  | Count number of lines in a text file in Python  | CO 5 |
| 5.7  | Python Program to remove lines starting with any prefix   | CO 5 |
| 5.8  | Python Program to Eliminate repeated lines from a file  | CO 5 |
| 5.9  | Python Program to read List of Dictionaries from File   | CO 5 |
| 5.10 | Python – Append content of one text file to another   | CO 5 |
| 5.11 | Python program to copy odd lines of one file to other   | CO 5 |
| 5.12 | Python Program to merge two files into a third file   | CO 5 |
| 5.13 | Python program to Reverse a single line of a text file  | CO 5 |
| 5.14 | Python program to reverse the content of a file and store it in another file                            | CO 5 |
| 5.15 | Python Program to handle divide by zero exception.  | CO 5 |
| 5.16 | WAP to handle multiple exception.   | CO 5 |

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| 5.17 | Python program to combine each line from first file with the corresponding line in second file.   | CO 5 |
| 5.18 | Write a program to copy the contents of one file to another.  | CO 5 |
| 5.19 | Write a program to print First 5 line in a file   | CO 5 |
| 5.20 | <p>a) Write a program to catch the following exception:</p> <ul style="list-style-type: none"> <li>i) Value error</li> <li>ii) Index error</li> <li>iii) Name error</li> <li>iv) Type error</li> <li>v) Divide zero error.</li> </ul> <p>b) Write a program to create user defined exceptions.</p> <p>c) Write a program to understand the use of else and finally block with try block.</p> <p>Write a python program that uses raise and exception class to throw an exception.</p> | CO 5 |
| 5.21 | <p>Develop a Python module containing custom functions for file handling operations such as reading CSV files, writing JSON files, and copying files.</p> <p>Hint: Write functions that encapsulate file handling operations for specific file formats or tasks. Utilize these functions in different Python scripts to perform file operations efficiently and consistently.</p>   | CO5  |

### Required Software and Tools

1. Anaconda (Jupyter Notebook)
2. Python Compiler (Open Source)
3. Google Co-Lab

### Textbooks

| Sr No | Book Details   |
|-------|--|
| 1.    | Magnus Lie Hetland, "Beginning Python-From Novice to Professional"—Third Edition, Apress   |
| 2.    | Python Programming using Problem solving approach by Reema Thareja OXFORD Higher education |
| 3.    | Kenneth A. Lambert, —Fundamentals of Python: First Programs, CENGAGE Learning.             |

### Reference Books

| Sr No | Book Details  |
|-------|---|
| 1.    | John V Guttag, —Introduction to Computation and Programming Using Python “, Revised and expanded Edition, MIT Press.          |
| 2.    | Charles Dierbach, —Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition. |

|    |   |
|----|---|
| 3. | Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers.                                 |
| 4. | Robert Sedgewick, Kevin Wayne, Robert Dondero: Introduction to Programming in Python: An Inter- disciplinary Approach, Pearson India Education Services Pvt. Ltd.,2016. |
| 5. | Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd.   |

**Links (Only Verified links should be pasted here)**

**Unit 1:** <https://nptel.ac.in/courses/106/106/106106182/>

**Unit 2:** <https://nptel.ac.in/courses/106/106/106106212/>  
<https://www.youtube.com/watch?v=PqFKRqpHrjw>

**Unit 3:** <https://nptel.ac.in/courses/106/106/106106145/>  
<https://www.youtube.com/watch?v=m9n2f9lhtrw>  
<https://www.youtube.com/watch?v=oSPMmeaiQ68>

**Unit 4:** <https://nptel.ac.in/courses/106/106/106106145/>  
<https://www.youtube.com/watch?v=ixEeeNjjOJ0&t=4s>

**Unit 5:** <https://nptel.ac.in/courses/106/106/106106145/>  
<https://www.youtube.com/watch?v=NMTEjQ8-AJM>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Computer Science & Information Technology**

**Subject Name: C Programming** **L-T-P [0-0-6]**

**Subject Code: BMICSE0152** **Applicable in Department: B.Tech.- First Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Basic knowledge of computers

**Course Objective:** The objective of a C programming course is to provide students with a solid foundation in the C programming language. The course aims to familiarize students with the syntax, concepts, and principles of C programming, as well as develop their ability to write efficient and effective C code.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to: |  | <b>Bloom's Knowledge Level(KL)</b> |
|--|--|------------------------------------|
| CO 1   | Implement and trace the execution of conditional and iteration programs.                           | K3                                 |
| CO2  | Implement Pointers, Functions, Recursion and Memory allocation concepts.                           | K3                                 |
| CO3  | Acquire the knowledge of memory allocation and binding, array, structure to solve complex problems | K3                                 |
| CO4  | Compare and contrast between Structure and union along with concepts of DMA                        | K4                                 |
| CO5  | Understand and apply the concepts of File Handling and Embedded Programming                        | K3                                 |

**Syllabus**

| <b>Unit No</b> | <b>Module Name</b> | <b>Topic covered</b> | <b>Pedagogy</b> | <b>Lecture Required (L+P)</b> | <b>Practical/ Assignment/ Lab Nos</b> | <b>CO Mapping</b> |
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|

|  |   |   |  |     |   |            |
|--|---|---|--|-----|---|------------|
| <b>Unit-1 :<br/>Basic Concepts of C Programming</b>            | Module 1.1: Introduction to Algorithm and C Program | Programming using C: Concepts of Algorithm and Flowchart, Translator and its types, Applications of C programming, Structure of C program, Overview of compilation and execution process in an IDE, transition from algorithm to program, Syntax, logical errors and Run time errors, object and executable code, | T3, R1, Chalk & Duster/PPT/Online Programs | 2+2 | Basic Program in C  | <b>CO1</b> |
|  | Module 1.2: Tokens & Operators                      | Keywords, identifiers, constant, data types. Operators and their types, Arithmetic expressions and precedence: Operators, operator precedence and associativity, type conversion, mixed operands  | T3, R1, Chalk & Duster/PPT/Online Programs | 3+3 | Basic Program in C  | <b>CO1</b> |
|  | Module 1.3: Conditional Branching                   | if, else-if, nested if - else, switch statements, use of break, and default with switch   | T3, R1, Chalk & Duster/PPT/Online Programs | 1+2 | Programs using Conditional Statement  | <b>CO1</b> |
|  | Module 1.4: Iteration and loops                     | Concept of loops, for, while and do- while, multiple loop variables, use of break and continue statements, nested loop.   | T3, R1, Chalk & Duster/PPT/Online Programs | 1+2 | Programs using Looping Statement  | <b>CO1</b> |
| <b>Unit-2 :<br/>Iteration, Recursion &amp; Memory Concepts</b> | Module 2.1: Functions                               | Concept of Sub-programming, function, types of functions, passing parameters to functions: call by value Definition   | T3, R1, Chalk & Duster/PPT/Online Programs | 3+3 | Function Programs   | <b>CO2</b> |
|  | Module 2.2: Recursion                               | Definition, Types of recursive functions, Tower of Hanoi problem,   | T3, R1, Chalk & Duster/PPT/Online Programs | 1+2 | Recursion Programs  | <b>CO2</b> |
|  | Module 2.3: Storage                                 | scope of variable, local and global variables, Nesting of Scope, Storage classes: Auto, Register, Static and Extern   | T3, R1, Chalk & Duster/PPT/Online Programs | 1+1 | Programs showing use of Storage   | <b>CO2</b> |
|  | Module 2.4: Pointers                                | defining and declaring pointer, pointer arithmetic and scaling, Pointer Aliasing. call by reference   | R1, R3, R4 Chalk & Duster/PPT/ Labs        | 2+2 | Programs illustrating use of Pointers Arithmetic/Addressing/Call by Reference | <b>CO2</b> |
| <b>Unit-3 :<br/>Arrays &amp; Strings</b>                       | Module 3.1: Arrays                                  | Array notation and representation (one and two dimensional), array using pointers, manipulating array elements, 2-D arrays used in matrix computation.  | R1, R3, R4 Chalk & Duster/PPT/ Labs        | 2+2 | Programs illustrating use of Pointers Arithmetic/Addressing/Call by Reference | <b>CO3</b> |

|   |   |  |   |           |  |            |
|---|---|--|---|-----------|--|------------|
|   | Module 3.2:<br>Strings                              | Introduction, initializing strings, accessing string elements, Array of strings, Passing strings to functions, String functions like Strcat, strcmp, strcpy and any other functions  | R1, R3, R4 Chalk & Duster/PPT/ Labs     | 2+3       | Use of Arrays both Single and Multi-Dimensional.             | <b>CO3</b> |
| <b>Unit-4 :<br/>Structure &amp; Union</b>                             | Module 4.1:<br>Structure                            | Introduction, Initializing, defining and declaring structure, accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structure  | T1, T2, R1, R2 Chalk & Duster/PPT/ Labs | 2+2       | Program Based on structure implementation                    | <b>CO4</b> |
|   | Module 4.2:<br>Union                                | Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on Union, Difference between Structure and Union   | T1, T2, R1, R2 Chalk & Duster/PPT/ Labs | 1+1       |  | <b>CO4</b> |
|   | Module 4.3<br>Dynamic Memory Allocation             | Introduction, Library functions– malloc, calloc, realloc and free.   | T1, T2, R1, R2 Chalk & Duster/PPT/ Labs | 1+1       | Programs allocating memory during run time and manipulations | <b>CO4</b> |
| <b>Unit-5 :<br/>File Handling &amp; Embedded Programming Concepts</b> | Module 5.1:<br>File Handling                        | Basics, File Types, File operations, File pointer, File opening modes, File handling functions, Command Line Arguments, File handling through command line argument, Record I/O in files   | T1, T2, R1, R2 Chalk & Duster/PPT/ Labs | 2+4       | Implementation of Data Files and Command Line Arguments      | <b>CO5</b> |
|   | Module 5.2:<br>Introduction to Embedded Programming | Introduction to Embedded System, Factors for Selecting the Embedded Programming Language, Difference Between C and Embedded C, Keyword, Datatypes, Components of Embedded Program, Program Structure, Basic concepts of Embedded Programming, Defining Macros, Types & File Inclusion, Pre-processor directives implementation | T1, T2, R1, R2 Chalk & Duster/PPT/ Labs | 2+4       | Example on Embedded Programs                                 | <b>CO5</b> |
| <b>Total</b>  |   |  |   | <b>60</b> |  |            |

## Lab Experiments

**Course Objective:** The objective of a C programming course is to provide students with a solid foundation in the C programming language. The course aims to familiarize students with the syntax, concepts, and principles of C programming, as well as develop their ability to write efficient and effective C code.

## Course Outcomes (CO)

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge Level  
(KL)**

|      |  |    |
|------|--|----|
| CO 1 | Implement and trace the execution of conditional and iteration programs.                           | K3 |
| CO2  | Implement Pointers, Functions, Recursion and Memory allocation concepts.                           | K3 |
| CO3  | Acquire the knowledge of memory allocation and binding, array, structure to solve complex problems | K3 |
| CO4  | Compare and contrast between Structure and union along with concepts of DMA                        | K4 |
| CO5  | Understand and apply the concepts of File Handling and Embedded Programming                        | K3 |

## List of Practical

| Sr. No. | Program Title                    | CO Mapping |
|---------|----------------------------------|------------|
| 1       | Half pyramid of *                | CO1        |
| 2       | Half pyramid of numbers          | CO1        |
| 3       | Half pyramid of alphabets        | CO1        |
| 4       | Inverted half pyramid of *       | CO1        |
| 5       | Inverted half pyramid of numbers | CO1        |
| 6       | Full pyramid of *                | CO1        |
| 7       | Full pyramid of numbers          | CO1        |
| 8       | Inverted full pyramid of *       | CO1        |
| 9       | Pascal's triangle                | CO1        |



|    |  |     |
|----|--|-----|
| 10 | Floyd's triangle   | CO1 |
| 11 | Half pyramid of *  | CO1 |
| 12 | C Program to Print Diamond Pattern   | CO1 |
| 13 | C Program to Print Floyd's Triangle  | CO1 |
| 14 | C Program to Print Pascal Triangle   | CO1 |
| 15 | Star Pattern Programs in C   | CO1 |
| 16 | Pyramid Patterns in C  | CO1 |
| 17 | <p>Write a C program for a matchstick game being played between the computer and a user. Your program should ensure that the computer always wins.</p> <p>Rules for the game are as follows:</p> <ul style="list-style-type: none"> <li>_ There are 21 matchsticks.</li> <li>_ The computer asks the player to pick 1, 2, 3 or 4 matchsticks.</li> <li>_ After the person picks, the computer does its picking.</li> </ul> <p>Whoever is forced to pick up the last matchstick loses the game.</p> | CO1 |
| 18 | <p>Write a program that plays tic-tac-toe. The tic-tac-toe game is played on a 3x3 grid the game is played by two players, who take turns. The first player marks move with a circle, the second with a cross. The player who has formed a horizontal, vertical, or diagonal sequence of three marks wins. Your program should draw the game_board, ask the user for the coordinates of the next mark, change the players after every successful move, and pronounce the winner.</p>               | CO1 |
| 19 | Design a Calculator which performs Number system conversion  | CO1 |
| 20 | C Program to Simulate a Simple arithmetic Calculator   | CO1 |
| 21 | C Program to Evaluate the Given Polynomial Equation  | CO1 |
| 22 | C Program to Find Mean, Variance and Standard Deviation  | CO1 |
| 23 | C Program to Add Two Complex Numbers   | CO1 |
| 24 | C Program to Find Power of a Number  | CO1 |

|    |  |     |
|----|--|-----|
| 25 | C Program to Calculate Pow (x,n)   | CO1 |
| 26 | C program to Find the Sum of Arithmetic Progression Series   | CO1 |
| 27 | C program to Find the Sum of Geometric Progression Series  | CO1 |
| 28 | C program to Find the Sum of Harmonic Progression Series   | CO1 |
| 29 | C Program to Find Sum of Series $1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$  | CO1 |
| 30 | C Program to Find Sum of Series $1^2 + 2^2 + \dots + n^2$  | CO1 |
| 31 | C Program to Find Sum of Series $1^3 + 2^3 + 3^3 + \dots + n^3$  | CO1 |
| 32 | C Program to Find Sum of the Series $1/1! + 2/2! + 3/3! + \dots + 1/N!$  | CO1 |
| 33 | Accept five subject marks of the student. Calculate his percentage. If his percentage is below 35 mark him “fail”. If between 35to 45 “Third Div”, 45-60 Second and above 60 then first.Do this process till the user wishes. No field should be left blank.   | CO1 |
| 34 | <p>Design a program which displays following options on screen</p> <ol style="list-style-type: none"> <li>1. Figure</li> <li>2. Exit</li> <li>3. Enter Choice</li> </ol> <p>Once valid choice is entered it executes further. If choice one is entered, then it should display</p> <ol style="list-style-type: none"> <li>1. TRAIANGLE</li> <li>2. SQUARE</li> <li>3. RHOMBUS</li> <li>4. TRAPEZIUM</li> <li>5. RETURN TO PREVIOUS MENU ENTER CHOICE</li> </ol> <p>Once valid choice is entered it executes further. After that it ask for specific data and prints the area and volume and perimeter/circumference of the respective figure. After that a choice is to be asked for Do you wish to continue (Y/N)? And should work accordingly. Before Every Menu the screen should be cleared,</p> | CO1 |
| 35 | C Program to Find the Largest Number Among Three Numbers.  | CO1 |
| 36 | C Program to Find the Roots of a Quadratic Equation.   | CO1 |
| 37 | C Program to Check Leap Year. Evaluate all the cases.  | CO1 |

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| 38 | C Program to Check Whether a Number is Positive or Negative    | CO1 |
| 39 | C Program to Check Whether a Character is an Alphabet or not   | CO1 |
| 40 | C Program to Calculate the Sum of Natural Numbers              | CO1 |
| 41 | C Program to Find Factorial of a Number                        | CO1 |
| 42 | C Program to Generate Multiplication Table                     | CO1 |
| 43 | C Program to Display Fibonacci Sequence                        | CO1 |
| 44 | C Program to Find GCD of two Numbers                           | CO1 |
| 45 | C Program to Find LCM of two Numbers                           | CO1 |
| 46 | C Program to Display Characters from A to Z Using Loop         | CO1 |
| 47 | C Program to Reverse a Number using looping concepts           | CO1 |
| 48 | C Program to Check Whether a Number is Palindrome or Not       | CO1 |
| 49 | C Program to Check Whether a Number is Prime or Not            | CO1 |
| 50 | C Program to Check Armstrong Number                            | CO1 |
| 51 | C Program to Display Armstrong Number Between Two Intervals    | CO1 |
| 52 | C Program to Display Factors of a Number                       | CO1 |
| 53 | C Program to Make a Simple Calculator Using switch...case      | CO1 |
| 54 | C Program to Check Whether a Number is Even or Odd             | CO1 |
| 55 | C Program to Check Whether a Character is a Vowel or Consonant | CO1 |
| 56 | C Program to Find the Largest Number Among Three Numbers       | CO1 |
| 57 | C Program to Check Whether a Number is Positive or Negative    | CO1 |
| 58 | C Program to Calculate the Sum of Natural Numbers              | CO1 |
| 59 | C Program to Find Factorial of a Number                        | CO1 |
| 60 | C Program to Generate Multiplication Table                     | CO1 |

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| 61 | C Program to Display Fibonacci Sequence  | CO1 |
| 62 | C Program to Display Prime Numbers Between Intervals Using Function  | CO1 |
| 63 | C Program to Check Prime or Armstrong Number Using User- defined Function  | CO1 |
| 64 | C Program to Check Whether a Number can be Expressed as Sum of Two Prime Numbers   | CO1 |
| 65 | C Program to Find the Sum of Natural Numbers using Recursion   | CO1 |
| 66 | C Program to Find Factorial of a Number Using Recursion  | CO2 |
| 67 | C Program to Find G.C.D Using Recursion  | CO2 |
| 68 | C Program to Convert Binary Number to Decimal and vice-versa   | CO2 |
| 69 | C program to calculate the power using recursion   | CO2 |
| 70 | C Program to Check Prime or Armstrong Number Using User-defined Function   | CO2 |
| 71 | C Program to Find the Sum of Natural Numbers using Recursion   | CO2 |
| 72 | Design a calculator  | CO2 |
| 73 | <p>Design a Menu Driven program which performs the functions as per the menu</p> <ol style="list-style-type: none"> <li>1. Add Details of students</li> <li>2. Search the student data</li> <li>3. Display the records</li> <li>4. Exit</li> </ol> <p>Enter the Choice:</p> <p>Note: Choice must be between 1-4 Only. Other than that, an error message must be displayed and entry should be done again. Name must not be blank, and first letter should be alphabet Student details should contain Name, Age, Class, Roll-No</p> |     |
| 74 | C Program to add two number using recursion.   | CO2 |
| 75 | C Program to find sum of digit of number using recursion.  | CO2 |

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| 76 | Write a method in C which will remove any given character from a String.   | CO2 |
| 77 | C Program to Calculate Average Using Arrays                                | CO3 |
| 78 | C Program to Find Largest Element in an Array                              | CO3 |
| 79 | C Program to search an element   | CO3 |
| 80 | C Program to Add Two Matrices Using Multi-dimensional Arrays               | CO3 |
| 81 | C Program to Multiply Two Matrices Using Multi-dimensional Arrays          | CO3 |
| 82 | C Program to Find Transpose of a Matrix                                    | CO3 |
| 83 | C program to illustrate Point Arithmetic                                   | CO3 |
| 84 | C Program to Access Array Elements Using Pointer                           | CO3 |
| 85 | C Program to Find Largest Number Using Dynamic Memory Allocation           | CO3 |
| 86 | C Program to Calculate Average Using Arrays                                | CO3 |
| 87 | C Program to Find Largest Element in an Array                              | CO3 |
| 88 | C Program to Calculate Standard Deviation                                  | CO3 |
| 89 | C Program to Find the Frequency of Characters in a String                  | CO3 |
| 90 | C Program to Count the Number of Vowels, Consonants and so on              | CO3 |
| 91 | C Program to Remove all Characters in a String Except Alphabets            | CO3 |
| 92 | C Program to Find the Length of a String                                   | CO3 |
| 93 | C Program to Concatenate Two Strings                                       | CO3 |
| 94 | C Program to Copy String Without Using strcpy()                            | CO3 |
| 95 | C Program to Sort Elements in Lexicographical Order (Dictionary Order)     | CO3 |
| 96 | C Program to Find the Frequency of Characters in a String                  | CO3 |
| 97 | Write a method in C which will remove any given character from a String.   | CO3 |
| 98 | Write a program in C to count occurrence of a given character in a String. | CO3 |

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| 99  | Write a program in C to check if two Strings are Anagram.          | CO3 |
| 100 | Write a program in C to check a String is palindrome or not.       | CO3 |
| 101 | C program to check given character is vowel or consonant.          | CO3 |
| 102 | C program to check given character is digit or not.                | CO3 |
| 103 | C program to replace the string space with a given character.      | CO3 |
| 104 | C program to convert lowercase char to uppercase of string.        | CO3 |
| 105 | C program to convert lowercase vowel to uppercase in string.       | CO3 |
| 106 | C program to delete vowels in a given string.                      | CO3 |
| 107 | C program to count Occurrence of Vowels & Consonants in a String.  | CO3 |
| 108 | C program to print the highest frequency character in a String.    | CO3 |
| 109 | C program to Replace First Occurrence Of Vowel With '-' in String. | CO3 |
| 110 | C program to count alphabets, digits and special characters.       | CO3 |
| 111 | C program to separate characters in a given string.                | CO3 |
| 112 | C program to remove blank space from string.                       | CO3 |
| 113 | C program to count blank space from string.                        | CO3 |
| 114 | C program to concatenate two strings.                              | CO3 |
| 115 | C program to remove repeated character from string.                | CO3 |
| 116 | C program to calculate sum of integers in string.                  | CO3 |
| 117 | C program to print all non-repeating character in string.          | CO3 |
| 118 | C program to copy one string to another string.                    | CO3 |
| 119 | C Program to sort characters of string.                            | CO3 |
| 120 | C Program to sort character of string in descending order.         | CO3 |

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| 121 | Write a program in C for, In array 1-100 numbers are stored, one number is missing how do you find it.                   | CO3 |
| 122 | Write a program in C for, In a array 1-100 multiple numbers are duplicates, how do you find it.                          | CO3 |
| 123 | Write a program in C to find first duplicate number in a given array.  | CO3 |
| 124 | Write a program in C to remove duplicate elements form array in C.   | CO3 |
| 125 | Write a program in C for, Given two arrays 1,2,3,4,5 and 2,3,1,0,5 find which number is not present in the second array. | CO3 |
| 126 | Write a program in C for, How to compare two array is equal in size or not.  | CO3 |
| 127 | Write a program in C to find largest and smallest number in array.   | CO3 |
| 128 | Write a program in C to find second highest number in an integer array.  | CO3 |
| 129 | Write a program in C to find top two maximum number in array?  | CO3 |
| 130 | C program to print array in reverse Order.   | CO3 |
| 131 | C program to reverse an Array in two ways.   | CO3 |
| 132 | C Program to calculate length of an array.   | CO3 |
| 133 | C program to insert an element at end of an Array.   | CO3 |
| 134 | C program to insert element at a given location in Array.  | CO3 |
| 135 | C Program to delete element at end of Array.   | CO3 |
| 136 | C Program to delete given element from Array.  | CO3 |
| 137 | C Program to delete element from array at given index.   | CO3 |
| 138 | C Program to find sum of array elements.   | CO3 |
| 139 | C Program to print all even numbers in array.  | CO3 |
| 140 | C Program to print all odd numbers in array.   | CO3 |
| 141 | C program to perform left rotation of array elements by two positions.   | CO3 |
| 142 | C program to perform right rotation in array by 2 positions.   | CO3 |
| 143 | C Program to merge two arrays.   | CO3 |

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| 144 | C Program to find highest frequency element in array.   | CO3 |
| 145 | C Program to Store Information of a Student Using Structure   | CO4 |
| 146 | C Program to Store Information of Students Using Structure  | CO4 |
| 147 | C Program to Store Data in Structures Dynamically   | CO4 |
| 148 | C Program to Store Information of a Student Using Structure   | CO4 |
| 149 | C Program to Add Two Distances (in inch-feet system) using Structures   | CO4 |
| 150 | Snake Game Mini Project in C is a basic console program with no graphics. You may play the famous "Snake Game" in this project exactly as you would anywhere else. To move the snake, use the up, down, right, and left arrows. Food is placed at various co-ordinates on the screen for the snake to consume. The snake's length and score will both rise by one element each time it consumes the food. | CO4 |
| 151 | C Program to Write a Sentence to a File   | CO5 |
| 152 | C Program to Read the First Line From a File  | CO5 |
| 153 | C Program to showcase use of DMA  | CO5 |
| 154 | C Program to Write a record to a File   | CO5 |
| 155 | C Program to Read the last Line From a File   | CO5 |
| 156 | Program to create a file using command line argument  | CO5 |
| 157 | Program to copy one file into another   | CO5 |
| 158 | Implement macro handling  | CO5 |
| 159 | Program to write a structure into a file and display its content  | CO5 |
| 160 | Program to search a record in a file  | CO5 |
| 161 | Program to implement multi line macro and Conditional Macros  | CO5 |
| 162 | Program to draw Circle/Rectangle/Triangle/ A Hut/with colors in it  | CO5 |
| 163 | Program to shut down/ sleep a system if not component is being Touched  | CO5 |
| 164 | Write a program in C to create and store information in a text file.  | CO5 |



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| 165 | Write a program in C to read an existing file.:  | CO5 |
| 166 | Write a program in C to write multiple lines to a text file.:  | CO5 |
| 167 | Write a program in C to read the file and store the lines in an array.   | CO5 |
| 168 | Write a program in C to find the number of lines in a text file.   | CO5 |
| 169 | Write a program in C to find the content of a file and the number of lines in a text file.   | CO5 |
| 170 | Write a program in C to count the number of words and characters in a file.  | CO5 |
| 171 | C Program to list all files and sub-directories in a directory   | CO5 |
| 172 | C Program to count number of lines in a file   | CO5 |
| 173 | C Program to print contents of file  | CO5 |
| 174 | C Program to copy contents of one file to another file   | CO5 |
| 175 | C Program to merge contents of two files into a third file   | CO5 |
| 176 | C Program to read records from a data file   | CO5 |
| 177 | C Program to count number of lines, words, characters, blank space in a file   | CO5 |
| 178 | C Program to Illustrate how User Authentication is Done  | CO5 |
| 179 | C Program to Shutdown Computer in Linux  | CO5 |
| 180 | C Program to Compute First N Fibonacci Numbers using Command Line Arguments  | CO5 |
| 181 | C Program to Generate Fibonacci Series using Command Line Argument   | CO5 |
| 182 | Design an ATM Simulation using C   | CO5 |
| 183 | <p>Manage the information of workers working in a firm or organization using this Employee Management System. The file handling technique is used here to save the data in a particular file, and you get the notion of this project as soon as you hear the name. This project uses the Insert, Edit, and Delete file actions, but the sole constraint is that you can only display the data, not search for any data item in particular. If you have more experience with C, you may alter this program by using the searching strategies. The following modules are included in this project. Add Employee Details</p> <ul style="list-style-type: none"> <li>• Edit Employee details</li> <li>• Modify Employee</li> </ul> |     |

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|-----|---|-----|
|     | <ul style="list-style-type: none"> <li>Delete Employee</li> </ul> Create a Database using C file structure  |     |
| 184 | A Library in charge is facing problems in handling books and customers. Design a solution using C regarding his problem   | CO5 |
| 185 | Design a Simple Result System in the C programming language. You can keep track of the pupils' grades and update them at any time. Students might be given marks based on their performance in each subject. The project is straightforward and straightforward to use. The system is written entirely in the C programming language. You will be greeted with a "Welcome Screen" when you build and execute the project. Following that, many choices will appear on your computer screen. Select the required project modification function from the drop-down menu. The admin is in charge of the majority of the system. He has the ability to add and remove teachers. He can also add students. Following the addition of instructors, the administrator may finally assign grades to the pupils. All of the data has been preserved. | CO5 |

### Required Software and Tools

C Compiler

### Textbooks

| Sr. No. | Book Details   |
|---------|--|
| 1.      | "C: The Complete Reference", Herbert Scheldt, McGraw Hill Education, 4 <sup>th</sup> Edition 2022      |
| 2       | E Balagurusamy, "Computing Fundamentals and C Programming", McGraw-Hill, 2 <sup>nd</sup> Edition, 2018 |
| 3       | Yashwant P. Kanetkar, "Let Us C", BPB publication, 16 <sup>th</sup> Edition, 2018                      |

### Reference Books

| Sr. No. | Book Details   |
|---------|--|
| 1       | Modern C, Third Edition" by Jens Gustedt,: Manning Publications, 3 <sup>rd</sup> Edition, 2023.                  |
| 2       | <b>Head First C: A Brain-Friendly Guide"</b> by David Griffiths, Shroff/O'Reilly, 1 <sup>st</sup> Edition, 2022. |

|               |  |
|---------------|--|
| 3             | C Programming in Easy Steps" by Mike McGrath, In Easy Steps Limited, 5 <sup>th</sup> Edition ,2022.  |
| <b>Links</b>  |  |
| <b>Unit 1</b> | <a href="https://www.youtube.com/watch?v=KnbvUiSxvbM&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;ab_channel=Programiz">https://www.youtube.com/watch?v=KnbvUiSxvbM&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;ab_channel=Programiz</a>  |
| <b>Unit 2</b> | <a href="https://www.youtube.com/watch?v=JYHpD9huNR4&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;index=25&amp;ab_channel=Programiz">https://www.youtube.com/watch?v=JYHpD9huNR4&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;index=25&amp;ab_channel=Programiz</a>  |
| <b>Unit 3</b> | <a href="https://www.youtube.com/watch?v=MOeGnamlUP4&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;index=19&amp;ab_channel=Programiz">https://www.youtube.com/watch?v=MOeGnamlUP4&amp;list=PL98qAXLA6aftD9ZlnjpLhdQAOFI8xIB6e&amp;index=19&amp;ab_channel=Programiz</a>  |
| <b>Unit 4</b> | <a href="https://www.youtube.com/watch?v=zmRxC7gYw-g&amp;list=PLBlnK6fEyqRiteqwlMLXYtZ16xXDR7MO0&amp;ab_channel=NesoAcademy">https://www.youtube.com/watch?v=zmRxC7gYw-g&amp;list=PLBlnK6fEyqRiteqwlMLXYtZ16xXDR7MO0&amp;ab_channel=NesoAcademy</a>  |
| <b>Unit 5</b> | <a href="https://www.youtube.com/watch?v=UxifZwjd5xU&amp;ab_channel=GateSmashers">https://www.youtube.com/watch?v=UxifZwjd5xU&amp;ab_channel=GateSmashers</a><br><a href="https://www.youtube.com/watch?v=VM7s1k0s7kk&amp;list=PLzx1ARJOmyed-PYHMduhZDQ4eKXmWJj_T&amp;ab_channel=SmartLogicAcademy">https://www.youtube.com/watch?v=VM7s1k0s7kk&amp;list=PLzx1ARJOmyed-PYHMduhZDQ4eKXmWJj_T&amp;ab_channel=SmartLogicAcademy</a> |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Physics**

**Subject Name: Engineering Physics Lab**

**L-T-P [0-0-2]**

**Subject Code: BMIAS0151A**

**Applicable in Department: B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Lab Experiments**

**Course Objective:**

1. To provide the practical knowledge of the phenomenon of interference, diffraction and polarization.
2. To provide the practical knowledge of energy band gap and resistivity.
3. To provide the practical knowledge of the measurement techniques of magnetism.
4. To provide the practical knowledge of the flow of liquids and characteristics of photoelectric cell.
5. To provide the practical knowledge of Planck's constant and dielectric constant.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge Level  
(KL)**

CO 1 | Apply the practical knowledge of the phenomenon of interference, diffraction and polarization.

K3

CO2 | Understand energy band gap and resistivity.

K2

|     |  |    |
|-----|--|----|
| CO3 | Develop the measurement techniques of magnetism.                       | K6 |
| CO4 | Analyze the flow of liquids and characteristics of photoelectric cell. | K4 |
| CO5 | Understand Planck's constant and dielectric constant.                  | K2 |

### List of Practicals

| Sr No | Program Title  | CO Mapping |
|-------|--|------------|
| 1     | To determine the wavelength of monochromatic light by Newton's ring.   | CO1        |
| 2     | To determine the focal length of two lenses by nodal slide and to verify the formula for the focal length of combination of two lenses.              | CO1        |
| 3     | To determine the specific rotation of cane sugar solution using Polarimeter.   | CO1        |
| 4     | To determine the wavelength of spectral lines using plane transmission grating.  | CO1        |
| 5     | To determine the specific resistance of a given wire using Carey Foster's bridge.  | CO2        |
| 6     | To study the variation of magnetic field along the axis of current carrying - circular coil and then to estimate the radius of the coil.             | CO3        |
| 7     | To verify Stefan's Law by electrical method.   | CO2        |
| 8     | To study the Hall effect and determine the Hall Coefficient, carrier density and mobility of a given semiconductor material using Hall effect setup. | CO2        |
| 9     | To determine the energy band gap of a given semiconductor material.  | CO2        |
| 10    | To determine the coefficient of viscosity of a liquid.   | CO4        |
| 11    | To calibrate a voltmeter using potentiometer.  | CO2        |
| 12    | To calibrate a ammeter using potentiometer.  | CO2        |
| 13    | To determine E.C.E. of copper using Tangent or Helmholtz galvanometer.   | CO3        |
| 14    | To determine the magnetic susceptibility of a ferromagnetic salt ( $\text{FeCl}_3$ ) by using Quincke's tube method.                                 | CO3        |
| 15    | To study the hysteresis curve and then to estimate the retentivity and coercivity of a given ferromagnetic material.                                 | CO3        |

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|-----------|--|-----|
| <b>16</b> | To determine the angle of divergence of laser beam using He-Ne Laser.                          | CO1 |
| <b>17</b> | To determine the wavelength of laser using diffraction grating.                                | CO1 |
| <b>18</b> | To determine the numerical aperture of optical fiber.  | CO1 |
| <b>19</b> | To determine the Planck's constant using LEDs of known wavelength.                             | CO5 |
| <b>20</b> | To determine the resistivity of given material using four probe method.                        | CO2 |
| <b>21</b> | To determine the dielectric constant of the material by charging and discharging of capacitor. | CO5 |
| <b>22</b> | To determine the characteristics of photoelectric cell.  | CO4 |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
Department of Languages

**Subject Name: Acquiring Business Communication (ABC) Lab** **L-T-P [0-0-6]**

**Subject Code: BMIASL0151Z** **Applicable in Department(s): B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject: Comprehension of basic English language**

**Course Objective:**

- To improve proficiency in the English language to the Intermediate level of CEFR (Common European Framework of Languages).
- To motivate students to look within and create a better version of 'self.'
- To introduce the key concepts of ethics, etiquette, and life skills.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

|      |   | <b>Bloom's Knowledge Level(KL)</b> |
|------|---|------------------------------------|
| CO 1 | Identify key concepts of life-skills                        | K1, K2                             |
| CO2  | Apply effective listening skills                            | K3                                 |
| CO3  | Demonstrate fluency and spontaneity while speaking          | K3                                 |
| CO4  | Understand and analyze simple written texts                 | K2, K4                             |
| CO5  | Compose clear and concise texts on a wide range of subjects | K6                                 |

**List of Practical**

| Sr No | Program Title   | CO Mapping |
|-------|---|------------|
| 1     | <b>Introduction to the course and the evaluation scheme</b><br>Students will gain knowledge about Examination Pattern.  | CO1        |
| 2     | <b>Importance of Communication Skills and motivation to improve</b><br>Students will watch Video Clips of famous personalities who have learnt to communicate well e.g., Kapil Dev, Jahnvi Panwar, APJ Abdul Kalam, and others.                 | CO1        |
| 3     | <b>Anubhav Activity</b><br>Students will share their expectations from the course.  | CO1        |
| 4     | <b>Showcasing the talents</b><br>Participants will gain confidence in expressing themselves through song/dance, overcome inhibitions, and develop a sense of freedom and creativity.  | CO1        |
| 5     | <b>Developing active listening and accurate communication skills</b><br>Participants will enhance their listening skills, practice conveying information accurately, and understand the importance of clear communication and active listening. | CO1        |
| 6     | <b>Language Toolbox 1: Vocabulary enrichment</b><br>Participants will be exposed to General Service List (GSL) by West and Academic Word List (AWL); the students will be asked to keep a journal of new words learnt every day.                | CO1        |
| 7     | <b>Introducing others and oneself</b><br>Participants will improve their speaking skills and develop clarity in listening and retaining information.  | CO1        |
| 8     | <b>Think-Pair-Share for Reading Comprehension</b><br>Students will actively interact with the reading material by engaging in this activity, collaborating with their peers, and refining their comprehension skills.                           | CO2        |
| 9     | <b>Basics of Writing</b>  | CO2        |



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|    | The students will practice basic writing skills through sentence construction by understanding the requisites of a good sentence.   |     |
| 10 | <b>Listen and write</b><br>The students will practice writing exactly what they hear.   | CO2 |
| 11 | <b>Reading Aloud</b><br>The students will improve their reading ability and vocabulary. Students will read Economic Times, Readers Digest, Fiction, National Geographic, Technology magazines etc.                    | CO2 |
| 12 | <b>Art of Listening</b><br>Participants will listen to their peers reading aloud and write down the gist; and will repeat verbatim what is read.  | CO2 |
| 13 | <b>Language Toolbox 2: Word association &amp; word formation</b><br>The students will be able to improve their language proficiency.  | CO2 |
| 14 | <b>Small Talk through Role Plays</b><br>The students will learn to initiate and engage in simple conversations.   | CO3 |
| 15 | <b>Voice Dynamics: Clarity of Speech; Importance of Pronunciation</b><br>The students will know the importance of pronunciation in bringing in clarity in speech.   | CO3 |
| 16 | <b>Reading Techniques for Time Management</b><br>Students will be able to identify keywords, headings, and topic sentences. Further, they will be able to analyse and synthesize information from the selected texts. | CO3 |
| 17 | <b>Writing through prompts</b><br>The students will practice writing skills through visual or verbal prompts.   | CO3 |
| 18 | <b>Practice Prompt writing in Groups</b><br>The students will practice writing skills through visual or verbal prompts.   | CO3 |
| 19 | <b>Listening to directions and instructions</b><br>Participants will improve their listening comprehension and enhance their ability to follow instructions & directions.   | CO3 |
| 20 | <b>Analysing Caselets</b>   | CO3 |

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|    | The students will improve their analytical and speaking skills by analysing & providing solutions to the issues in the caselets.  |     |
| 21 | <b>Decoding infographics</b><br>Participants will improve their ability to interpret and analyse information presented in diagrams, graphs, and pie charts.   | CO4 |
| 22 | <b>Language Toolbox 3: Vocabulary Building – Homophones, homonyms, synonyms, antonyms, phrases &amp; idioms</b><br>The students will be able to bring in variety in the usage of words.   | CO4 |
| 23 | <b>Filling forms</b><br>Participants will improve their ability to understand and follow instructions and develop ability in filling out forms accurately.  | CO4 |
| 24 | <b>Writing Captions and Identifying Topic Sentences</b><br>The students will be provided with paragraphs on a variety of topics to develop their concise & precise writing skills.  | CO5 |
| 25 | <b>Analysing Speech/Ted Talks</b><br>The students will be able to improve their listening by analysing speeches by famous personalities/Ted Talks on the subjects related to technology/science.  | CO4 |
| 26 | <b>Sharing your views in a group discussion</b><br>Participants will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.   | CO4 |
| 27 | <b>Language Toolbox 4: Vocabulary Enrichment – Abbreviations and Acronyms</b><br>The exercises and activities will enhance language proficiency of the students by helping them bring in variety in their usage of words  | CO5 |
| 28 | <b>Basics of Email Writing</b><br>Students will be able to write letters/applications on familiar topics and will gain knowledge to apply in real life scenarios.   | CO5 |
| 29 | <b>Situation based Role Play writing</b><br>The students will write role plays to practice effective communication strategies, develop empathy and understanding, and improve their writing skills and ability to handle real-life situations through role-playing exercises. | CO5 |
| 30 | <b>Role Play Activity</b><br>The students will present their role-play which will further help them improve their speaking skills.  | CO5 |

|    |  |     |
|----|--|-----|
| 31 | <b>Language Toolbox 4: Developing concise and clear communication</b><br>The students will be able to remove verbosity from their language.  | CO5 |
| 32 | <b>Overcoming nervousness: Extempore and JAM sessions</b><br>Students will learn to speak with confidence in public, utilizing various verbal and non-verbal aspects of speech. Students will practice speaking in front of an audience. | CO5 |
| 33 | <b>Project Presentations</b><br>The students will be presenting their Projects   | CO5 |

#### Required Software and Tools

British Council English Score Mobile App

#### Textbooks

| Sr No | Book Details                                      |
|-------|---|
| 1.    | ABC Workbook, NIET Publishing House, Meerut, 2023 |

#### Reference Books

| Sr No | Book Details   |
|-------|--|
| 1     | Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2013, UK. |
| 2     | Listening in the Language Classroom by John Field, Cambridge University Press, 2021, UK.   |

|   |   |
|---|---|
| 3 | Speaking: Second Language Acquisition, from Theory to Practice by William Littlewood, <b>Cambridge University Press, 2022, UK.</b>  |
| 4 | Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by Vinita Vaish and Guangwei Hu, Routledge, 2019, UK.                |
| 5 | The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades by Judith C. Hochman and Natalie Wexler, Jossey-Bass, 2022, USA.               |
| 6 | The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching edited by Hossein Nassaji and Eva Kartchava, <b>Cambridge University Press, 2021, UK</b> |
| 7 | IELTS 11: General Training with answers. Cambridge English, 2018  |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
 Department of MBA

**Subject Name: Constitution of India, Law and Engineering** **L-T-P [2-0-0]**

**Subject Code: BNC0102** **Applicable in Department: B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Basic understanding of political science.

**Course Objective:** Acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

- |   |    |
|---|----|
| <b>CO1</b> - Identify and explore the basic features and modalities about Indian constitution.                      | K1 |
| <b>CO2</b> - Differentiate and relate the functioning of Indian parliamentary system at the center and state level. | K2 |
| <b>CO3</b> - Differentiate different aspects of Indian Legal System and its related bodies.                         | K4 |
| <b>CO4</b> - Discover and apply different laws and regulations related to engineering practices.                    | K4 |
| <b>CO5</b> - Correlate role of engineers with different organizations and governance models.                        | K4 |

**Syllabus**

| Unit No | Module Name | Topic covered | Pedagogy | Lecture<br>Required<br>(L+P) | Practical/<br>Assignment/<br>Lab Nos | CO Mapping |
|---------|-------------|---------------|----------|------------------------------|--------------------------------------|------------|
|---------|-------------|---------------|----------|------------------------------|--------------------------------------|------------|

|        |   |   |              |   |              |            |
|--------|---|---|--------------|---|--------------|------------|
| Unit 1 | <b>Introduction and Basic Information about Indian Constitution</b> | Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947, Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India. | PPT, Lecture | 8 | Assignment 1 | <b>CO1</b> |
| Unit 2 | <b>Union Executive and State Executive</b>                          | Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of Vice-President, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.                       | PPT, Lecture | 8 | Assignment 2 | <b>CO2</b> |

|        |   |  |              |   |              |            |
|--------|---|--|--------------|---|--------------|------------|
| Unit 3 | <b>Introduction and Basic Information about Legal System</b>    | The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace. | PPT, Lecture | 8 | Assignment 3 | <b>CO3</b> |
| Unit 4 | <b>Intellectual Property Laws and Regulation to Information</b> | Intellectual Property Laws: Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.       | PPT, Lecture | 8 | Assignment 4 | <b>CO4</b> |
| Unit 5 | <b>Business Organizations and E-Governance</b>                  | Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union   | PPT, Lecture | 8 | Assignment 5 | <b>CO5</b> |

|              |  |  |  |           |  |  |
|--------------|--|--|--|-----------|--|--|
|              |  | and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development. |  |           |  |  |
| <b>Total</b> |  |  |  | <b>40</b> |  |  |

| <b>Textbooks</b>   |  |
|--|--|
| <b>Sr No</b>   | <b>Book Details</b>  |
| 1.   | Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.              |
| 2.   | Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press. |
| <b>Reference Books</b>   |  |
| <b>Sr No</b>   | <b>Book Details</b>  |
| 1.   | Madhav Khosla: The Indian Constitution, Oxford University Press.   |
| <b>Links</b>   |  |
| <b>Video Link</b>  |  |
| <a href="https://www.youtube.com/watch?v=D3vQEoXkiAA">https://www.youtube.com/watch?v=D3vQEoXkiAA</a><br><a href="https://www.youtube.com/watch?v=N8nRnralqiI">https://www.youtube.com/watch?v=N8nRnralqiI</a><br><a href="https://www.youtube.com/watch?v=t96A1DrsZTw">https://www.youtube.com/watch?v=t96A1DrsZTw</a><br><a href="https://www.youtube.com/watch?v=6CS3WwY2_h8">https://www.youtube.com/watch?v=6CS3WwY2_h8</a><br><a href="https://www.youtube.com/watch?v=7hnKGOgjYNI">https://www.youtube.com/watch?v=7hnKGOgjYNI</a><br><a href="https://www.youtube.com/watch?v=SXeKCB8WPGg">https://www.youtube.com/watch?v=SXeKCB8WPGg</a> |  |





**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
**Department of MBA**

**Subject Name: Essence of Indian Traditional Knowledge** **L-T-P [2-0-0]**

**Subject Code: BNC0103** **Applicable in Department: B.Tech.- First Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Philosophical Systems, Spiritual Practices, Cultural Heritage, Ayurveda and Traditional Medicine, Architecture,

**Course Objective:** To enable the students to understand the importance of our surroundings and encourage them to contribute towards sustainable development.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to:   | <b>Bloom's Knowledge Level(KL)</b> |
|--|------------------------------------|
| <b>CO1</b> - Understand the basics of past Indian politics and state polity.   | K2                                 |
| <b>CO2</b> - Understand the Vedas, Upanishads, languages & literature of Indian society.   | K2                                 |
| <b>CO3</b> - Know the different religions and religious movements in India.  | K4                                 |
| <b>CO4</b> - Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda. | K4                                 |
| <b>CO5</b> - Identify Indian dances, fairs & festivals, and cinema.  | K1                                 |

**Syllabus**

| Unit No | Module Name | Topic covered | Pedagogy | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
|---------|-------------|---------------|----------|------------------------|--------------------------------|------------|
|         |             |               |          |                        |                                |            |

|        |   |  |              |   |              |            |
|--------|---|--|--------------|---|--------------|------------|
| Unit 1 | <b>Society State and Polity in India</b>                    | State in Ancient India: Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women. | PPT, Lecture | 8 | Assignment 1 | <b>CO1</b> |
| Unit 2 | <b>Indian Literature, Culture, Tradition, and Practices</b> | Evolution of script and languages in India: Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali,Prakrit And Sanskrit, <b>Sikh Literature</b> , Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature   | PPT, Lecture | 8 | Assignment 2 | <b>CO2</b> |
| Unit 3 | <b>Indian Religion, Philosophy, and Practices</b>           | Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines , Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.   | PPT, Lecture | 8 | Assignment 3 | <b>CO3</b> |

|              |  |  |              |           |              |            |
|--------------|--|--|--------------|-----------|--------------|------------|
| Unit 4       | <b>Science, Management and Indian Knowledge System</b> | Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India , Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technology in India Pyrotechnics in India Trade in Ancient India/,India's Dominance up to Pre-colonial Times.  | PPT, Lecture | 8         | Assignment 4 | <b>CO4</b> |
| Unit 5       | <b>Cultural Heritage and Performing Arts</b>           | Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, <b>Indian Handicraft, UNESCO'S List of World Heritage sites in India</b> , Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, <b>UNESCO'S List of Intangible Cultural Heritage, Calenders</b> , Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema | PPT, Lecture | 8         | Assignment 5 | <b>CO5</b> |
| <b>Total</b> |  |  |              | <b>40</b> |              |            |

| <b>Textbooks</b>       |  |
|------------------------|--|
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill  |
| 2.                     | Sharma, R.S., Aspects of Political Ideas and Institutions in Ancient India (fourth edition), Delhi, Motilal Banarsidass, |
| <b>Reference Books</b> |  |
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.   |

## Links

### Video Link:

<https://www.youtube.com/watch?v=wjepzXnEqYo>

<https://www.youtube.com/watch?v=AnGJ7zwyCAk>

[https://www.youtube.com/watch?v=5xpJeO\\_syN4&t=832s](https://www.youtube.com/watch?v=5xpJeO_syN4&t=832s)

<https://www.youtube.com/watch?v=IGOJMQC7Jy4>

<https://indianexpress.com/article/research/a-crackling-history-of-fireworks-in-india-4890178/>

<https://artsandculture.google.com/partner/national-council-of-science-museums>

<https://artsandculture.google.com/exhibit/QQLyzPzKbMIEKg>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Mathematics**

**Subject Name: Engineering Mathematics-II** **L-T-P [3-1-0]**

**Subject Code: BMIAS0203** **Applicable in Department: B.Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Knowledge of Mathematics up to 12<sup>th</sup> standard

**Course Objective:**

The objective of this course is to familiarize the engineering students with techniques of solving Ordinary Differential Equations, Fourier series expansion, Laplace Transform and vector calculus and its application in real world. It aims to equip the students with adequate knowledge of mathematics that will enable them in formulating problems and solving problems analytically.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge Level  
(KL)**

|     |  |    |
|-----|--|----|
| CO1 | Apply the concept of differentiation to solve differential equations.  | K3 |
| CO2 | Apply the concept of convergence of sequence and series to evaluate Fourier series.  | K3 |
| CO3 | Apply the Laplace transform to solve ordinary differential equations.  | K3 |
| CO4 | Apply the concept of vector calculus to evaluate line, surface and volume integrals.   | K3 |
| CO5 | Solve the problems of Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation , Simple & Compound interest, Geometry and Mensuration. | K3 |

**Syllabus**

| <b>Unit No</b> | <b>Module Name</b>                                    | <b>Topic covered</b>   | <b>Pedagogy</b>     | <b>Lecture Required (L+P)</b> | <b>Practical/ Assignment/ Lab Nos</b> | <b>CO Mapping</b> |
|----------------|---|--|---------------------|-------------------------------|---------------------------------------|-------------------|
| Unit 1         | <b>Ordinary Differential Equation of Higher Order</b> | Linear differential equation of nth order with constant coefficients, Cauchy-Euler equation, Simultaneous linear differential equations, Second order linear differential equations with variable coefficients, Solution by changing independent variable, Reduction of order, Normal form, Method of variation of parameters, Application of ordinary differential equation in Engineering. | Smart Board And PPT | 10                            | 1.1,1.2,1.3 & 1.4                     | <b>CO1</b>        |
| Unit 2         | <b>Sequences and series</b>                           | Definition of Sequence and series with examples, Convergence of sequence and series, Tests for convergence of series, (p-test, D' Alembert's test or Ratio test, Raabe's test). Fourier series, Half range Fourier sine and cosine series. Applications in Engineering.  | Smart Board And PPT | 8                             | 2.1 & 2.2                             | <b>CO2</b>        |
| Unit 3         | <b>Laplace Transform</b>                              | Laplace transform, Existence theorem, Laplace transforms of derivatives and integrals, Initial and final value theorems, Unit step function, Dirac- delta function, Laplace transform of periodic function, Inverse Laplace transform, Convolution theorem, Application to solve simple linear and simultaneous differential equations. Applications in Engineering.                         | Smart Board And PPT | 8                             | 3.1,3.2 & 3.3                         | <b>CO3</b>        |
| Unit 4         | <b>Vector Calculus</b>                                | Vector differentiation: Gradient, Curl and Divergence and their Physical interpretation,<br>Directional derivatives, Tangent and Normal planes.<br>Vector Integration: Line integral, Surface integral, Volume integral, Gauss's Divergence  | Smart Board And PPT | 8                             | 4.1 & 4.2                             | <b>CO4</b>        |

|              |                    |   |                     |           |               |            |
|--------------|--------------------|---|---------------------|-----------|---------------|------------|
|              |                    | Theorem, Green's theorem, Stoke's theorem (without proof) and their applications. Applications in Engineering.  |                     |           |               |            |
| Unit 5       | <b>Aptitude-II</b> | Ratio, Proportion & Partnership, Problem of ages, Allegation & Mixture, Direction, Blood relation, Simple & Compound interest, Geometry and Mensuration, Puzzles. | Smart Board And PPT | 8         | 5.1,5.2 & 5.3 | <b>CO5</b> |
| <b>Total</b> |                    |   |                     | <b>42</b> |               |            |

| <b>Textbooks</b>       |  |
|------------------------|--|
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | B. V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Ltd..                          |
| 2.                     | B. S. Grewal, Higher Engineering Mathematics, Khanna Publisher.  |
| <b>Reference Books</b> |  |
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | E. Kreyszig, Advance Engineering Mathematics, John Wiley & Sons.   |
| 2.                     | Peter V. O'Neil, Advance Engineering Mathematics, Thomson (Cengage) Learning.                                    |
| 3.                     | Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas, Calculus, Eleventh Edition, Pearson.                      |
| 4.                     | G.B Thomas, R L Finney, Calculus and Analytical Geometry, Ninth Edition Pearson.                                 |
| 5.                     | James Ward Brown and Ruel V Churchill, Fourier Series and Boundary Value Problems, 8th Edition-Tata McGraw-Hill. |

|     |  |
|-----|--|
| 6.  | D. Poole, Linear Algebra : A Modern Introduction, 2nd Edition, Brooks/Cole.  |
| 7.  | Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi.  |
| 8.  | Charles E Roberts Jr, Ordinary Differential Equations, Application, Model and Computing, CRC Press T&F Group.                |
| 9.  | Ray Wylie C and Louis C Barret, Advanced Engineering Mathematics, 6th Edition, Tata McGraw-Hill.                             |
| 10. | James Ward Brown and Ruel V Churchill, Complex Variable and Applications, 8th Edition, Tata McGraw-Hill.                     |
| 11. | P. Sivaramakrishna Das and C. Vijayakumari, Engineering Mathematics, 1st Edition, Pearson India Education Services Pvt. Ltd. |
| 12. | Advanced Engineering Mathematics By Chandrika Prasad, Reena Garg Khanna Publishing House, Delhi.                             |
| 13. | Quantitative Aptitude by R.S. Aggrawal.  |

**Links (Only Verified links should be pasted here)**

**Youtube Link:**

**UNIT-1**

<https://www.youtube.com/watch?v=Ql42qcOLKfo&t=7s>

<https://www.youtube.com/watch?v=qIyx1kFTqT8>

[https://www.youtube.com/watch?v=n\\_3ZmnVnrc4](https://www.youtube.com/watch?v=n_3ZmnVnrc4)

<https://www.youtube.com/watch?v=19Vt7ds8Lvw>

**UNIT-2**

<https://www.youtube.com/watch?v=HUKR4LWrZ14&t=74s>

<https://www.youtube.com/watch?v=uei7JPnPpVg>

<https://www.youtube.com/watch?v=ummJvI0Ax2Q>

<https://www.youtube.com/watch?v=bWTmUWWZnhQ>

<https://www.youtube.com/watch?v=wpN1wn98XiA>



<https://www.youtube.com/watch?v=gK1Y11UxOhw>

<https://www.youtube.com/watch?v=C1wkvn77QrE&t=10s>

[https://www.youtube.com/watch?v=LGxE\\_yZYigI](https://www.youtube.com/watch?v=LGxE_yZYigI)

### **UNIT-3**

<https://youtu.be/nmp-5tSp-UY>

<https://youtu.be/6ANT4eD6fII>

<https://youtu.be/c9NibpoQjDk>

<https://www.youtube.com/playlist?list=PLNOG1XC4kCBT8G5pWCrH71hmwaAvwsBY3>

### **UNIT-4**

<https://youtu.be/IwggKjA6wko>

<https://youtu.be/d4OyeuRTZNA>

<https://youtu.be/j36lJKSJMqk>

<https://youtu.be/DhwMOrl6Q9g>

<https://youtu.be/DhwMOrl6Q9g>

[https://youtu.be/fsMouTxce\\_A](https://youtu.be/fsMouTxce_A)

<https://youtu.be/yq5olnzDCGc>

<https://youtu.be/2SB3IVCwW1w>

<https://www.khanacademy.org/math/multivariable-calculus/integrating-multivariable-functions/line-integrals-vectors/v/line-integra>

<https://www.khanacademy.org/math/multivariable-calculus/integrating-multivariable-functions/3d-flux/v/vector-representation-of-a-su>

[http://nucinkis-lab.cc.ic.ac.uk/HELM/workbooks/workbook\\_29/29\\_2\\_surfac](http://nucinkis-lab.cc.ic.ac.uk/HELM/workbooks/workbook_29/29_2_surfac)

<https://www.youtube.com/watch?v=Mb6Yb-SGqio>

<https://www.khanacademy.org/math/multivariable-calculus/greens-theorem-and-stokes-theorem/stokes-theorem/v/stokes-theorem-intuition>

<https://www.youtube.com/watch?v=eSqznPrtzS4>

**UNIT-5**

<https://www.GovernmentAdda.com>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Electronics and Communication Engineering**

**Subject Name: Basic Electrical and Electronics Engineering** **L-T-P [3-0-0]**

**Subject Code: BMIEC0201Z** **Applicable in Department: B.Tech.- Second Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Physics, Mathematics

**Course Objective:** The student will learn about DC circuit fundamentals, element of power system, semiconductors diodes applications, analysis of BJT, logic simplification, combinational and sequential circuits.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to: |   | <b>Bloom's Knowledge Level(KL)</b> |
|--|---|------------------------------------|
| CO1  | Apply circuit laws and theorems to solve the problems of electrical circuits and understand elements of power system. | K2, K3, K5                         |
| CO2  | Illustrate semiconductor diode and Bipolar junction transistor.   | K2                                 |
| CO3  | Demonstrate truth table of various types of logic gates and binary codes.   | K2                                 |
| CO4  | Demonstrate different type of combinational circuits.   | K2                                 |
| CO5  | Demonstrate different type of sequential circuits.  | K2                                 |

**Syllabus**

| <b>Unit No</b> | <b>Module Name</b> | <b>Topic covered</b> | <b>Pedagogy</b> | <b>Lecture Required (L+P)</b> | <b>Practical/ Assignment/ Lab Nos</b> | <b>CO Mapping</b> |
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|

|              |  |  |   |              |   |            |
|--------------|--|--|---|--------------|---|------------|
| Unit 1       | <b>D.C. circuits and elements of power system</b>          | <p>Concept of network, Active and passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, source transformation, Kirchhoff's Law: loop and nodal methods of analysis, network theorems: Superposition theorem, Thevenin's theorem, maximum power transfer theorem.</p> <p>Introduction to Elements of Power System: General layout of Power system. Elementary calculations for energy consumption.</p> | Smart Digital board/ PPT/ White board/ Videos/M-Tutor | 8+4          | Assignment/ Lab 1.1, 1.2, 1.3, 2.1      | <b>CO1</b> |
| Unit 2       | <b>Semiconductor diode and Bipolar junction transistor</b> | <p>Semiconductor diode: P-N Junction Diode: Depletion layer, V-I characteristics, Half and Full Wave rectification.</p> <p>Bipolar Junction Transistor: Operation, CB, CE, CC Configurations, Common Emitter input/output characteristics, Transistor Biasing and Stabilization: Need of biasing, Operating Point, The DC load line, Voltage Divider Biasing technique.</p>  | Smart Digital board/ PPT/ White board/ Videos/M-Tutor | 8+4          | Assignment/ Lab 2.2, 2.3, 3.1           | <b>CO2</b> |
| Unit 3       | <b>Logic simplification and binary codes</b>               | Number Systems, Complements of binary Number, Boolean Algebra, De Morgan's Theorem, Logic Gates, SOP & POS Forms, Canonical Forms, Karnaugh Maps, Multilevel NAND/NOR realizations, Binary Codes.  | Smart Digital board/ PPT/ White board/ Videos/M-Tutor | 8+4          | Assignment/ Lab 3.2, 3.3, 4.1           | <b>CO3</b> |
| Unit 4       | <b>Combinational Circuit</b>                               | Code Conversion, Comparators, Adders: Half Adder, Full Adder, Carry Look Ahead Adder, Subtractors: Half Subtractor, Full Subtractor, Serial And Parallel Adders, BCD Adder, Multiplexers, Demultiplexers, Encoders, and Decoders.  | Smart Digital board/ PPT/ White board/ Videos/M-Tutor | 8+4          | Assignment/ Lab 4.2, 4.3, 4.4, 5.1, 5.2 | <b>CO4</b> |
| Unit 5       | <b>Sequential Circuit</b>                                  | Basic Building Blocks of Sequential circuits like SR Latch, Flip Flops: SR, JK, JK Master Slave, D and T Type Flip Flops, Excitation and characteristics Table of all Flip Flops, Conversion from one type of Flip-Flop to another, Types of Shift Registers, Counters: Synchronous and Asynchronous, RAM and ROM.   | Smart Digital board/ PPT/ White board/ Videos/M-Tutor | 8+4          | Assignment/ Lab 5.3, 5.4, 5.5           | <b>CO5</b> |
| <b>Total</b> |  |  |   | <b>40+20</b> |   |            |

### Textbooks

| Sr No | Book Details   |
|-------|--|
| 1.    | J.B. Gupta, Basic Electrical Engineering, Kataria & Sons   |
| 2     | Robert L. Boylestad / Louis Nashelsky “Electronic Devices and Circuit Theory”, Latest Edition, Pearson Education |
| 3     | R.P. Jain, “Modern digital Electronics”, Tata McGraw Hill, 4th edition, 2009.                                    |
| 4     | Morris Mano,” Digital Design, 3/E” Prentice Hall India   |

### Reference Books

| Sr No | Book Details  |
|-------|---|
| 1     | Electrical Engineering Fundamentals, Vincent Del Toro, Pearson Publication, 2015.                                 |
| 2     | Microelectronics Circuits, Adel S. Sedra and Kenneth Carless Smith, Oxford University Press.                      |
| 3     | John F Wakerly, Digital Design: Principles and Practices, Pearson, (2000).  |
| 4     | W.H. Gothmann, “Digital Electronics- An introduction to theory and practice”, PHI, 2 <sup>nd</sup> edition, 2006. |
| 5     | Fundamentals of Logic Design”, Cengage Learning, 5th, Edition, 2004.  |

### Links

#### UNIT1:

<https://www.youtube.com/watch?v=nHssOEh5DkY&list=PLDN15nk5uLiAluhKNZwdblke36lBDz8iD>

<https://www.youtube.com/watch?v=zTDgziJC-q8>

<https://www.youtube.com/watch?v=8CA6ZNXgI-Y>

**UNIT2:**

<https://www.youtube.com/watch?v=EdUAecpYVWQ>

<https://www.youtube.com/watch?v=Xmu31a-59vw>

<https://www.youtube.com/watch?v=KynKHr2cXgk>

**UNIT3:**

<https://www.youtube.com/watch?v=sUutDs7FFeA>

<https://www.youtube.com/watch?v=XCiLHOZsQl8>[https://www.youtube.com/watch?v=juJR\\_JDJRa0](https://www.youtube.com/watch?v=juJR_JDJRa0)

[https://www.youtube.com/watch?v=2cpl\\_HjcI3A](https://www.youtube.com/watch?v=2cpl_HjcI3A)

<https://www.youtube.com/watch?v=KergVtV3SxU>

<https://www.youtube.com/watch?v=kgL5UaSVuro>

<https://www.youtube.com/watch?v=EznCqZ1eh5Q>

**UNIT4:**

<https://www.youtube.com/watch?v=ibQBb5yEDIQ>

<https://www.youtube.com/watch?v=LHAbLXfRYXk>

<https://www.youtube.com/watch?v=Gc3DL-tmr-g>

<https://www.youtube.com/watch?v=8S1kvCJRfvch>[https://www.youtube.com/watch?v=ntiv1g7G\\_C4](https://www.youtube.com/watch?v=ntiv1g7G_C4)

[https://www.youtube.com/watch?v=Qe\\_9CPac23c](https://www.youtube.com/watch?v=Qe_9CPac23c)

**UNIT5:**

[https://www.youtube.com/watch?v=4GpWA\\_hmRhw](https://www.youtube.com/watch?v=4GpWA_hmRhw)

<https://www.youtube.com/watch?v=p4R0Ej6FCn0&list=PLAuW6sm6dy0yRMLX47Kz4nfhB7tURK88p>

<https://www.youtube.com/watch?v=jrQ1YYgiOTo>



# NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science & Information Technology

**Subject Name: Discrete Structures**

**L-T-P [3-0-0]**

**Subject Code: BMICSE0204**

**Applicable in Department: B.Tech.- Second Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Some basic knowledge of algebra and logic is usually sufficient to begin studying discrete mathematics for computer science. Familiarity with sets, functions, and basic Boolean algebra is also helpful.

**Course Objective:** The objective of discrete structure is to enable students to formulate problems precisely, solve the problems, apply formal proofs techniques and hence enhance one's logical thinking and problem-solving skills.

### Course Outcomes (CO)

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

|      |  |    |
|------|--|----|
| CO 1 | Apply the basic principles of sets, relations & functions and mathematical induction in computer science & engineering related problems. | K3 |
| CO2  | Describe the algebraic structures and it's properties to solve complex problems.   | K2 |
| CO3  | Describe lattices and it's type to simplify digital circuits.  | K2 |
| CO4  | Infer the validity of statements and construct proofs using predicate logic formulas.  | K4 |
| CO5  | Implement and use non-linear data structure like graphs to solve real world problems.  | K3 |

## Syllabus

| Unit No  | Module Name  | Topic covered  | Pedagogy                               | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
|--|--|--|--|------------------------|--------------------------------|------------|
| <b>Unit-1:<br/>Set Theory &amp; Relations</b>          | Module 1.1:<br>Set Theory                          | Set Theory: Definition of sets, countable and uncountable sets, Set operations, Partition of set, Cardinality, Venn Diagrams, proofs of some general identities on sets.<br><b>Applications of set Theory</b>  | Lecture Notes, PPT, Online Videos & R2 | 8                      | NA                             | <b>CO1</b> |
|  | Module 1.2:<br>Relations                           | Relation: Definition, types of relation, composition of relations, Equivalence relation, Partial ordering relation.<br><b>Applications of Relations</b>  | Lecture Notes, PPT, Online Videos & R2 |                        |                                |            |
| <b>Unit-2:<br/>Algebraic Structures</b>                | Module 2.1:<br>Algebraic Structures                | Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, Properties of groups, Subgroup, cyclic group, Permutation group, Cosets, Normal subgroup, Homomorphism and isomorphism of Groups.<br><b>Applications of Algebraic Structure</b>                             | Lecture Notes, PPT, Online Videos & R2 | 8                      | NA                             | <b>CO2</b> |
| <b>Unit-3:<br/>Posets, Hasse Diagram and Lattices</b>  | Module 3.1:<br>Posets, Hasse Diagram and Lattices: | Introduction, ordered set, Hasse diagrams of partially ordered set, isomorphic ordered set, well ordered set, properties of lattices, types of lattices.<br><b>Applications of Lattice</b>   | Lecture Notes, PPT, Online Videos & R2 | 8                      | NA                             | <b>CO3</b> |
| <b>Unit-4:<br/>Propositional &amp; Predicate Logic</b> | Module 4.1:<br>Propositional Logic                 | Propositions and compound Propositions, Basic logical operations, truth tables, tautologies, Contradictions, CNF, DNF Algebra of Proposition, logical implications, logical equivalence, predicates and quantifiers, Rules of Inference<br><b>Application of Propositional Logics.</b> | Lecture Notes, PPT, Online Videos & R2 | 8                      | NA                             | <b>CO4</b> |
|  | Module 4.2:<br>Predicate Logic                     | First order predicate, Well-formed formula of Predicate, Quantifiers, Inference Theory of Predicate Logic<br><b>Application of Predicate Logics.</b>   | Lecture Notes, PPT, Online Videos & R2 |                        |                                |            |



|                           |                       |  |   |           |    |            |
|---------------------------|-----------------------|--|---|-----------|----|------------|
| <b>Unit-5:<br/>Graphs</b> | Module 5.1:<br>Graphs | Definition and terminology, Representation of Graphs, Paths connectivity, Walks, Paths, Cycles, Bipartite, Regular, Planar and connected graphs, Components, Euler graphs, Euler's theorem, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and homomorphism of graphs.<br><b>Application of Graphs</b> | Lecture Notes,<br>PPT,<br>Online Videos<br>& R2 | 8         | NA | <b>CO5</b> |
| <b>Total</b>              |                       |  |   | <b>40</b> |    |            |

| <b>Textbooks</b>       |   |
|------------------------|---|
| <b>Sr. No.</b>         | <b>Book Details</b>   |
| 1.                     | Swapan Kumar Sarkar, "A Textbook of Discrete Mathematics", S. Chand Publication, 9 <sup>th</sup> Edition, 2021  |
| 2.                     | T Veerarajan, "Discrete Mathematics, with Graph Theory and Combinatorics" TMH Publication, 4 <sup>th</sup> Edition, 2021  |
| <b>Reference Books</b> |   |
| <b>Sr. No.</b>         | <b>Book Details</b>   |
| 1.                     | B. Kolman, R.C. Busby, and S.C. Ross, Discrete Mathematical Structures, Prentice Hall, 6th Edition, 2020.   |
| 2.                     | Lipschutz, Seymour, "Discrete Mathematics", TMH, 4th Edition, 2021.   |
| 3.                     | Kenneth H. Rosen, Kamala Krithivasan, "Discrete Mathematics and its Applications", TMH, 8th Edition, 2021   |
| <b>Links</b>           |   |
| Unit 1                 | <a href="https://www.youtube.com/watch?v=hGtOLG3SsjI&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=9">https://www.youtube.com/watch?v=hGtOLG3SsjI&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=9</a> |

|        |  |
|--------|--|
|        | <a href="https://www.youtube.com/watch?v=rGcTcGFx9_s&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=10">https://www.youtube.com/watch?v=rGcTcGFx9_s&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=10</a><br><a href="https://www.youtube.com/watch?v=_BIKq9Xo_5A&amp;list=PL0862D1A947252D20&amp;index=13">https://www.youtube.com/watch?v=_BIKq9Xo_5A&amp;list=PL0862D1A947252D20&amp;index=13</a> |
| Unit 2 | <a href="https://www.youtube.com/watch?v=dQ4wU0k7JKI&amp;list=PL0862D1A947252D20&amp;index=35">https://www.youtube.com/watch?v=dQ4wU0k7JKI&amp;list=PL0862D1A947252D20&amp;index=35</a><br><a href="https://www.youtube.com/watch?v=CjmWE-f3vEc&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=41">https://www.youtube.com/watch?v=CjmWE-f3vEc&amp;list=PLwdnzlV3ogoVxVxCTII45pDVM1aoYoMHf&amp;index=41</a> |
| Unit 3 | <a href="https://www.youtube.com/watch?v=qPtGlrB_sXg&amp;list=PL0862D1A947252D20&amp;index=40">https://www.youtube.com/watch?v=qPtGlrB_sXg&amp;list=PL0862D1A947252D20&amp;index=40</a>  |
| Unit 4 | <a href="https://www.youtube.com/watch?v=xlUFkMKSb3Y&amp;list=PL0862D1A947252D20&amp;index=1">https://www.youtube.com/watch?v=xlUFkMKSb3Y&amp;list=PL0862D1A947252D20&amp;index=1</a><br><a href="https://www.youtube.com/watch?v=DmClf8ypks&amp;list=PL0862D1A947252D20&amp;index=3">https://www.youtube.com/watch?v=DmClf8ypks&amp;list=PL0862D1A947252D20&amp;index=3</a>                                       |
| Unit 5 | <a href="https://www.youtube.com/watch?v=E40r8DWgG40&amp;list=PLEAYkSg4uSQ2fXcfrTGZdPuTmv98bnFY5">https://www.youtube.com/watch?v=E40r8DWgG40&amp;list=PLEAYkSg4uSQ2fXcfrTGZdPuTmv98bnFY5</a>  |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
 Department of Languages

**Subject Name: French Language** **L-T-P [2-0-0]**

**Subject Code: BMIASL0202** **Applicable in Department: B. Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:**

**Course Objective:**

To help the students learn to articulate in French language in day-to-day real-life situations.

To enable the students acquire the four basic skills LSRW (Listening, Speaking, Reading, and Writing) of language learning.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

|      |   |    |
|------|---|----|
| CO 1 | Recognize the basic sounds, letters, numbers, words, and phrases of French. | K1 |
| CO2  | Develop basic French vocabulary.  | K2 |
| CO3  | Use simple vocabulary and sentences in day-to-day life.                     | K3 |
| CO4  | Introduce a third person  | K3 |
| CO5  | Develop basic skills in writing and speaking                                | K2 |

**Syllabus**

| Unit No | Module Name | Topic covered | Pedagogy | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
|---------|-------------|---------------|----------|------------------------|--------------------------------|------------|
|---------|-------------|---------------|----------|------------------------|--------------------------------|------------|

|        |   |  |  |   |   |            |
|--------|---|--|--|---|---|------------|
| Unit 1 | <b>Introduction to French</b>           | <ul style="list-style-type: none"> <li>• Basic greetings</li> <li>• French letters, sounds and accents</li> <li>• Numbers</li> <li>• The subject pronouns</li> <li>• Verbs- être, avoir</li> <li>• Basic adjectives (How to change into feminine form)</li> <li>• Introductory questions and Self introduction</li> </ul>                                      | Audio-lingual method & reference of the learning aids  | 5 | Assignment on-Greetings, numbers, verb conjugation, adjective and basic questions                               | <b>CO1</b> |
| Unit 2 | <b>Vocabulary Building</b>              | <ul style="list-style-type: none"> <li>• Days of the week, months of the year and date</li> <li>• Colors</li> <li>• Basic vocabulary</li> <li>• Articles (indefinite and definite)</li> <li>• How to make nouns plural</li> <li>• Use of C'est and Ce sont</li> <li>• Vocabulary of nationality and professions</li> <li>• Introduction of a friend</li> </ul> | Learning through attractive pictures, word-picture association & question-answer patterns.   | 6 | Assignment on-days, months, colors, articles, nationality, professions and making sentences plural              | <b>CO2</b> |
| Unit 3 | <b>Everyday Common Simple Sentences</b> | <ul style="list-style-type: none"> <li>• Contracted articles with à</li> <li>• Vocabulary of transports</li> <li>• Use of prepositions à and en</li> <li>• Time</li> <li>• Negation</li> </ul> <p>3 ways to frame question and how to reply accordingly</p>  | Communicative method and learning through videos, Total Physical Respond Methodology (TPR), activities might include: dialogue framing, question making. | 7 | Assignment on-contracted articles, transports, prepositions (à and en), time, negative sentences, and questions | <b>CO3</b> |
| Unit 4 | <b>Reading &amp; Writing</b>            | <ul style="list-style-type: none"> <li>• Vocabulary of family members</li> <li>• Introduction of a family member</li> <li>• “ER” verbs with exceptions</li> </ul>  | Tasked-Based Learning, Grammar-Translation Method,   | 3 | Assignment on-family members and verb conjugation   | <b>CO4</b> |

|              |                        |   |   |           |  |            |
|--------------|------------------------|---|---|-----------|--|------------|
|              |                        |   | Reading Aids,<br>Reference<br>Books   |           |  |            |
| Unit 5       | <b>Skilled writing</b> | <ul style="list-style-type: none"> <li>• How to fill a basic form</li> <li>• How to write a brief post card in French.</li> </ul> | Communicative and Tasked-Based Learning method, activities might include: developing writing skills through various forms of exercises. | 3         | Assignment on-writing post card in French and filling form | <b>CO5</b> |
| <b>Total</b> |                        |   |   | <b>24</b> |  |            |

| Reference Books  |  |
|--|--|
| Sr No  | Book Details                                       |
| 1.   | Edito 1 (Méthode de français/Cahiers d'exercices)  |
| 2.   | Echo A1 (Méthode de français/Cahier d'exercices)   |
| 3.   | Saison A1 (Méthode de français/Cahier d'exercices) |
| <b>Links (Only Verified links should be pasted here)</b>   |  |
| <b><u>Youtube Link:</u></b>  |  |
| <b><u><a href="#">1.Learn French   French for Beginners  French Alphabet   L' alphabet français   Pronunciation. (youtube.com)</a></u></b> |  |

2. [📖 French numbers 1-100 \(with free PDF\) | French grammar for beginners \(youtube.com\)](#)
3. [French verbs \(avoir; être; faire; aller\) en chanson \(youtube.com\)](#)
4. [Les articles définis le, la les, l' \(youtube.com\)](#)
5. [les articles indéfinis un, une, des \(youtube.com\)](#)
6. [Les Nationalités en français ! The Nationalities in French \(youtube.com\)](#)
7. [French Lesson 103 - Jobs Professions Occupations in French - Les métiers Oficios y profesiones \(youtube.com\)](#)
8. [When to use C'EST / CE SONT or IL EST // French Grammar Course // Lesson 8 FR \(youtube.com\)](#)
9. [French Verb 'Parler' Present Tense \(youtube.com\)](#)
10. [L'interrogation \( Intonation, Est-ce que, Inversion \) with sentences... \(youtube.com\)](#)
11. [La Négation \( ne...pas \) ! Negation in French... \(youtube.com\)](#)
12. [écrivez une carte postale décrivant votre nouvelle école ! Post Card describing your new school !!! \(youtube.com\)](#)



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Languages**

**Subject Name: German Language** **L-T-P [2-0-0]**

**Subject Code: BMIASL0203** **Applicable in Department: B. Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:**

**Course Objective:**

To help the students learn to articulate in German language in day-to-day real-life situations.

To enable the students acquire the four basic skills LSRW (Listening, Speaking, Reading, and Writing) of language learning.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

|      |  |    |
|------|--|----|
| CO 1 | Understand and be familiar with basic German Language concepts and the culture | K1 |
| CO2  | Recognise the fundamental vocabulary   | K1 |
| CO3  | Use simple vocabulary and sentences in everyday conversations                  | K3 |
| CO4  | Read and write simple sentences  | K2 |
| CO5  | Use complex sentences and develop basic writing skills                         | K3 |

## Syllabus

| Unit No | Module Name                             | Topic covered  | Pedagogy   | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos   | CO Mapping |
|---------|---|--|--|------------------------|--|------------|
| Unit 1  | <b>Introduction to German</b>           | <ul style="list-style-type: none"> <li>• Letters and Numbers</li> <li>• German Greetings and Self Introduction</li> <li>• Personal Pronouns and Verb Conjugations (Regular and Irregular Verbs)</li> <li>• W-Question</li> <li>• Simple Sentences</li> </ul> | Audio-lingual method & reference books   | 4                      | Assignment on – Verb Exercises, Question Making                          | <b>CO1</b> |
| Unit 2  | <b>Vocabulary building</b>              | <ul style="list-style-type: none"> <li>• The concept of German Articles (Definite and Indefinite)</li> <li>• Nouns and Articles</li> <li>• Days, Months, &amp; Seasons</li> <li>• Adjectives</li> <li>• Negation</li> </ul>                                  | Learning through attractive pictures, audio-lingual method<br><u>Activities</u> will include pantomiming, word-picture association & question-answer patterns. | 4                      | Assignment on – Articles, Vocabulary, Negative Sentences                 | <b>CO2</b> |
| Unit 3  | <b>Everyday common simple sentences</b> | <ul style="list-style-type: none"> <li>• Basic directions</li> <li>• Imperativ</li> <li>• Date and Time</li> <li>• Modal Verben</li> <li>➤ (Basic everyday life conversations and making appointments)</li> </ul>  | Communicative method and learning through videos, Total Physical Respond Methodology (TPR),  | 4                      | Assignment on – Sentence Making and Dialogue                             | <b>CO3</b> |
| Unit 4  | <b>Reading and Writing</b>              | <ul style="list-style-type: none"> <li>• Separable Verbs</li> <li>• Possessive Pronouns</li> <li>• Sentences - Nomminativ, Akkusativ, Dativ</li> <li>➤ Translations (English to German, German to English)</li> <li>Short Text and Form Filling</li> </ul>   | Tasked-Based Learning, Grammar-Translation Method, Reading Aids, Reference Books   | 6                      | Assignment on – Translations and Sentence Making, Form Filling exercises | <b>CO4</b> |
| Unit 5  | <b>Skilled Writing</b>                  | <ul style="list-style-type: none"> <li>• Changeable Prepositions</li> <li>• Present Perfect Tense</li> <li>• Past Tense of – To have and To Be</li> <li>• Health and Body, Vacations</li> </ul>  | Communicative and Tasked-Based Learning method, Grammar-Translation, activities  | 6                      | Assignment on - Vocabulary Exercises, Usage of Prepositions, Changing a  | <b>CO5</b> |



|              |  |  |  |           |  |  |
|--------------|--|--|--|-----------|--|--|
|              |  | <ul style="list-style-type: none"> <li>• Leisure Activities, Celebrations</li> <li>➤ E-mail Writing</li> </ul> | will include developing writing skills through various forms of exercises. |           | sentence/Text from Present tense to past tense, E-mail writing |  |
| <b>Total</b> |  |  |  | <b>24</b> |  |  |

| Reference Books   |                                       |
|---|---------------------------------------|
| Sr No   | Book Details                          |
| 1.  | Netzwerk A1 (Goyal Saab Publications) |
| 2.  | Studio D A1 (Goyal Saab Publications) |
| 3.  | Langescheidt Dictionary               |
| Links (Only Verified links should be pasted here)   |                                       |
| <p><b>Video Link</b></p> <p><b>Unit 1:</b></p> <p><a href="https://www.youtube.com/watch?v=nd0Y_iIaJns">https://www.youtube.com/watch?v=nd0Y_iIaJns</a></p> <p><a href="https://www.youtube.com/watch?v=LLTX3k1gJ0A">https://www.youtube.com/watch?v=LLTX3k1gJ0A</a></p> <p><a href="https://www.youtube.com/watch?v=1dBD8P9cCrA">https://www.youtube.com/watch?v=1dBD8P9cCrA</a></p> <p><a href="https://www.youtube.com/watch?v=CyME2ZobD60">https://www.youtube.com/watch?v=CyME2ZobD60</a></p> <p><b>Unit 2:</b></p> <p><a href="https://www.youtube.com/watch?v=8Smh9MRp2vc">https://www.youtube.com/watch?v=8Smh9MRp2vc</a></p> <p><a href="https://www.youtube.com/watch?v=t0uLiNMvY6o">https://www.youtube.com/watch?v=t0uLiNMvY6o</a></p> <p><b>Unit 3:</b></p> <p><a href="https://www.youtube.com/watch?v=bD4vSw6AWps">https://www.youtube.com/watch?v=bD4vSw6AWps</a></p> |                                       |

**Unit 4:**

[https://www.youtube.com/watch?v=Kj\\_L8uAffG8](https://www.youtube.com/watch?v=Kj_L8uAffG8)

<https://www.youtube.com/watch?v=nf1rzqG3nvA>

**Unit 5:**

[https://www.youtube.com/watch?v=Dmv2BzXv\\_7U](https://www.youtube.com/watch?v=Dmv2BzXv_7U)

<https://www.youtube.com/watch?v=IN-5Z4puA6U>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
(An Autonomous Institute)  
**Department of Languages**

**Subject Name: Japanese Language**

**L-T-P [2-0-0]**

**Subject Code: BMIASL0204**

**Applicable in Department: B. Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:**

**Course Objective:**

To help the students learn to articulate in Japanese language in day-to-day real-life situations.

To enable the students acquire the four basic skills LSRW (Listening, Speaking, Reading, and Writing) of language learning.

**Course Outcomes (CO)**

**Course outcome:** After completion of this course students will be able to:

**Bloom's  
Knowledge  
Level(KL)**

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| CO 1 | Understand and be familiar with basic Japanese Language concepts and the culture. | K1 |
| CO2  | Recognise the fundamental vocabulary.   | K1 |
| CO3  | Use simple vocabulary and sentences in everyday conversations.                    | K3 |
| CO4  | Read and write simple sentences.  | K2 |
| CO5  | Use complex sentences and develop basic writing skills.                           | K3 |

**Syllabus**

| Unit No | Module Name                             | Topic covered   | Pedagogy   | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos                               | CO Mapping |
|---------|---|---|--|------------------------|--|------------|
| Unit 1  | <b>Introduction to Japanese</b>         | <ul style="list-style-type: none"> <li>• General features of Japanese</li> <li>• Japanese scripts</li> <li>• Pronunciation of Japanese words</li> <li>• Classroom instructions</li> <li>• Daily greetings and expressions</li> <li>• Numerals, Months name Days of the week, Time &amp; Calendar</li> <li>• Family members</li> <li>• Vocabulary lessons 1&amp;2</li> <li>• Sentence pattern &amp; Example sentences</li> <li>• Self-introduction (jikoshokai)</li> </ul> | Audio-lingual method & reference books   | <b>5</b>               | Assignment on – Verb Exercises, Question Making              | <b>CO1</b> |
| Unit 2  | <b>Vocabulary building</b>              | <ul style="list-style-type: none"> <li>• Country, language, and people</li> <li>• Basic conversations</li> <li>• Vocabulary lessons 3&amp;4</li> <li>• Use of patterns (KO, SO, AA, and DO)</li> <li>• Conversations between guests and hosts</li> <li>• Conversations between customers and shopkeepers</li> </ul>   | <p>Learning through attractive pictures, audio-lingual method.</p> <p>Activities might include pantomiming, word-picture association &amp; question-answer patterns.</p> | <b>5</b>               | Assignment on – Articles, Vocabulary, and Negative Sentences | <b>CO2</b> |
| Unit 3  | <b>Everyday common simple sentences</b> | <ul style="list-style-type: none"> <li>• Vocabulary lessons 5&amp;6</li> <li>• Grammar explanation</li> <li>• Colour &amp; taste</li> <li>• Conversations in post office</li> <li>• Conversations with friends</li> <li>• Making a request</li> <li>• Making an enquiry – Railway Station</li> <li>• Buying Fruits &amp; Vegetables</li> <li>• Names of the Animals</li> <li>• Question formation</li> </ul>  | Communicative method and learning through videos, Total Physical Respond Methodology (TPR), activities might include dialogue framing, question making.                  | <b>5</b>               | Assignment on – Sentence Making and Dialogue                 | <b>CO3</b> |

|              |                            |  |  |           |   |     |
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| Unit 4       | <b>Reading and Writing</b> | <ul style="list-style-type: none"> <li>Scanning based Newspaper reading</li> <li>Transportation</li> <li>KANJI Form of Writing – 40 Characters</li> <li>Shopping Counters</li> <li>Basic Japanese grammar rules – particles: か (ka), は (wa), の (no), と (to), を (o), に (ni), も (mo), が (ga), や (ya).</li> <li>Kara, Soshite</li> <li>Grammar - Present, Past, Future</li> <li>Adjectives</li> <li>Vocabulary Lessons 7&amp;8</li> </ul> | Tasked-Based Learning, Grammar-Translation Method, Reading Aids, Reference Books   | 4         | Assignment on – Translations and Sentence Making  | CO4 |
| Unit 5       | <b>Skilled Writing</b>     | <ul style="list-style-type: none"> <li>Write short text on oneself.</li> <li>Grammar: Pronouns – subject, object, possessive, Modal verbs</li> </ul>   | Communicative and Tasked-Based Learning method, Grammar-Translation, activities might include -developing writing skills through various forms of exercises. | 5         | Assignment on - Vocabulary Exercises, Usage of Prepositions, Changing a sentence/Text from Present tense to past tense. | CO5 |
| <b>Total</b> |                            |  |  | <b>24</b> |   |     |

| <b>Reference Books</b> |   |
|------------------------|---|
| <b>Sr No</b>           | <b>Book Details</b>   |
| 1.                     | Minna no nihongo – N5   |
| 2.                     | <a href="https://mfadhillah.wordpress.com/wp-content/uploads/2012/12/minna-no-nihongo-i-c3bcbersetzungen-grammatikalische-erkl3a4rungen-englisch.pdf">https://mfadhillah.wordpress.com/wp-content/uploads/2012/12/minna-no-nihongo-i-c3bcbersetzungen-grammatikalische-erkl3a4rungen-englisch.pdf</a> |

**Links (Only Verified links should be pasted here)**

**Video Link**

<https://www.youtube.com/@NihonGoal/community>

[https://www.youtube.com/watch?v=wDpsF90DoeI&list=PLag\\_mhJfCJ-1-EZcPapMFPTIzVzwjz33M](https://www.youtube.com/watch?v=wDpsF90DoeI&list=PLag_mhJfCJ-1-EZcPapMFPTIzVzwjz33M)

[https://www.youtube.com/watch?v=W\\_qW904Gn3M&list=PL\\_Sdfd1Q7hZrDFwVYpsrxWqsridvP6kTK](https://www.youtube.com/watch?v=W_qW904Gn3M&list=PL_Sdfd1Q7hZrDFwVYpsrxWqsridvP6kTK)

<https://www.youtube.com/watch?v=z4qh8BVrb3w>

<https://www.jlpt.jp/e/samples/forlearners.html>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Computer Science in Emerging Technologies**

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|--|--|--|
| <b>Subject Name: Advanced Python</b>   |  | <b>L-T-P [0-0-6]</b>   |
| <b>Subject Code: BMICSE0252</b>  |  | <b>Applicable in Department: B. Tech.- Second Semester<br/>CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)</b> |
| <b>Pre-requisite of Subject:</b> Basic Python Programming & Python Concepts.   |  |  |
| <b>Course Objective:</b> To become familiar with Python's Object-Oriented Concepts, functional programming and create GUI application and to gain the knowledge of Python libraries. |  |  |
| <b>Course Outcomes (CO)</b>  |  |  |
| <b>Course outcome:</b> After completion of this course students will be able to:   |  | <b>Bloom's<br/>Knowledge<br/>Level(KL)</b>   |
| CO1  | Implement classes and create instances in python     | K3   |
| CO 2   | Implement GUI based Python application               | K3   |
| CO 3   | Use Python libraries for data handling.              | K3   |
| CO 4   | Analyse data using visualization libraries.          | K4   |
| CO 5   | Analyse web scraping application for real world data | K4   |

## Syllabus

| Unit No | Module Name                           | Topic covered  | Pedagogy                       | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
|---------|---------------------------------------|--|--------------------------------|------------------------|--------------------------------|------------|
| Unit 1  | <b>Classes and Objects</b>            | Introduction: Python Classes and objects, User- Defined Classes, Class Variables and Instance Variables, Instance methods, Class method, static methods, constructor in python, parametrized constructor, Magic Methods in python, Object as an argument, Instances as Return Values, namespaces, Introduction to inheritance and polymorphism, Abstract Class, Introduction to Abstraction and Encapsulation. | Smart board, Hands-on exercise | 10+10                  | Program1-32                    | CO1        |
| Unit 2  | <b>Functional and GUI Programming</b> | Functional Programming: Immutability, Closures and Decorators, generators, Co-routines, iterators, Declarative programming, GUI Programming: Intro to GUI Programming, Settling widgets in the window's interior, Numeric Widgets, Boolean Widgets, Selection Widgets, String Widgets, Date Picker, Color Picker, Container Widgets, Creating a GUI Application, Tkinter, button, canvas.                      | Smart board, Hands-on exercise | 4+10                   | Program33-78                   | CO2        |
| Unit 3  | <b>Libraries for Data Handling</b>    | NumPy: Basic Operation, Indexing, slicing and Iterating, Multidimensional arrays, NumPy Datatypes, Reading and writing data on Files   | Smart board, Hands-on exercise | 5+8                    | Program79-116                  | CO3        |



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|--------|--|--|-----------------------------------|-----|----------------|-----|
|        |  | <p>SciPy: Introduction to SciPy, Create function,modules of SciPy.</p> <p>Pandas: Series and Data Frames, Grouping, aggregation, Merge Data Frames, Generate summary tables, Group data into logical pieces, Manipulation of data</p>  |                                   |     |                |     |
| Unit 4 | <b>Libraries in Data Visualization</b> | <p>Matplotlib: Scatter plot, Bar charts, histogram, Stack charts, Legend title Style, Figures andsubplots, Plotting function in pandas, Labelling and arranging figures, Save plots.</p> <p>Seaborn: style function, color palettes, heatmaps,distribution plots, category plot, regressionplotPlotly: Line plots, Area plots, Scatterplots, Bubble plots, Stacked bar charts, Grouped bar charts, Pie charts, Tables, Dashboards.</p> | Smart board,<br>Hands-on exercise | 5+8 | Program117-174 | CO4 |
| Unit 5 | <b>Web Scraping with Python</b>        | <p>WebScraping: Introduction, Web Crawling v/s WebScraping, Uses of Web Scraping, Components of a Web Scraper, working of a Web Scraper, Crawl, Parse and Transform Store the Data. BeautifulSoup: Introduction to Beautiful Soup library, Accessing Tags, Navigable Strings, Navigating and searching with Beautiful Soup, Web Scraping.</p> <p>Example: Scraping Flipkart Website Introduction to</p>                                | Smart board,<br>Hands-on exercise | 4+8 | Program175-208 | CO5 |

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|--------------|--|---------|--|-----------|--|--|
|              |  | GitHub. |  |           |  |  |
| <b>Total</b> |  |         |  | <b>72</b> |  |  |

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| <b>Lab Practical</b> |
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**Course Objective:** To enhance students' proficiency in advanced Python features, including object-oriented programming, functional programming, python packages and libraries for data science, web development.

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| <b>Course Outcomes (CO)</b> |
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| <b>Course outcome:</b> After completion of this course students will be able to: |  | <b>Bloom's Knowledge Level(KL)</b> |
| CO1  | Apply classes and instances in real world problems.            | K3                                 |
| CO2  | Implement GUI based Python application                         | K3                                 |
| CO3  | Design python packages, libraries and web scraping application | K6                                 |

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| <b>List of Practical</b> |
|--------------------------|

| Sr No | Program Title  | CO Mapping |
|-------|--|------------|
| 1.    | Write a program illustrating class definition and accessing class members.                   | CO1        |
| 2.    | Write a program to implement default constructor, parameterized constructor, and destructor. | CO 1       |

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| 3. | Create a Python class named Rectangle constructed by a length and width. a. Create a method called area which will compute the area of a rectangle.  | CO 1 |
| 4. | Create a class called Numbers, which has a single class attribute called MULTIPLIER, and a constructor which takes the parameters x and y (these should all be numbers).<br>a. Write an instance method called add which returns the sum of the attributes x and y.<br>b. Write a class method called multiply, which takes a single number parameter a and returns the product of a and MULTIPLIER. | CO 1 |
| 5. | Create a class named as Student to store the name and marks in three subjects. Use List to store the marks.<br>a. Write an instance method called compute to compute total marks and average marks of a student.<br>b. Write a method called display to display student information.   | CO 1 |
| 6. | Create a Python class named Circle constructed by a radius. Use a class variable to define the value of constant PI.<br>a. Write two methods to be named as area and circum to compute the area and the perimeter of a circle respectively by using class variable PI.<br>b. Write a method called display to print area and perimeter.  | CO 1 |

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| 7.  | <p>Write a program that has a class called Fraction with attributes numerator and denominator.</p> <p>a. Write a method called getdata to enter the values of the attributes.</p> <p>b. Write a method show to print the fraction in simplified form.</p>          | CO 1 |
| 8.  | <p>Write a program that has a class Numbers with a list as an instance variable.</p> <p>a. Write a method called insert_element that takes values from user.</p> <p>b. Write a class method called find_max to find and print largest value in the list.</p>       | CO 1 |
| 9.  | <p>Create a class called Complex. Write a menu driven program to read, display, add and subtract two complex numbers by creating corresponding instance methods.</p>   | CO 1 |
| 10. | <p>Write a program that has a class Point with attributes x and y.</p> <p>a. Write a method called midpoint that returns a midpoint of a line joining two points.</p> <p>b. Write a method called length that returns the length of a line joining two points.</p> |      |
| 11. | <p>Write a Python program to create a class called "Rectangle" with attributes length and width. Include methods to calculate the perimeter and area of the rectangle.</p>   | CO 1 |
| 12. | <p>Implement a Python class called "BankAccount" with attributes account number, account holder</p>  | CO 1 |

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|            | name, and balance. Include methods to deposit and withdraw money from the account.  |      |
| <b>13.</b> | Write a Python program to create a class called "Student" with attributes roll number, name, and marks in three subjects. Include a method to calculate the average marks of the student.               | CO 1 |
| <b>14.</b> | Implement a Python class called "Car" with attributes make, model, and year. Include methods to start the car, stop the car, and display its details.   | CO 1 |
| <b>15.</b> | Write a Python program to create a class called "Book" with attributes title, author, and price. Include methods to calculate the discounted price of the book based on a discount percentage provided. | CO 1 |
| <b>16.</b> | Implement a Python class called "Bank" with attributes bank name and branch. Include methods to add a new account, display all accounts, and search for an account based on the account number.         | CO 1 |
| <b>17.</b> | Write a Python program to create a class called "Rectangle" with attributes length and width. Include a method to check if the rectangle is a square or not.  | CO 1 |
| <b>18.</b> | Implement a Python class called "Employee" with attributes name, designation, and experience. Include methods to promote an employee to a higher designation based on their experience.                 | CO 1 |
| <b>19.</b> | Write a Python program to create a class called "Employee" with attributes name, employee ID, and salary. Include a method to display the employee details.   | CO 1 |
| <b>20.</b> |   | CO 1 |

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|     | Write a program to illustrate the use of following built-in methods: a. hasattr(obj,attr) b. getattr(object, attribute_name [, default]) c. setattr(object, name, value) d. delattr(class_name, name)                |      |
| 21. | Write a Program to illustrate the use of _____str____(),_____repr____(),_____new____,_____doc____,_____dict____, _____name____and_____bases____methods.  | CO 1 |
| 22. | Write a program to create class Employee. Display the personal information and salary details of 5employees using single inheritance.  | CO 1 |
| 23. | WAP that extends the class Employee. Derive two classes Manager and Team Leader from Employee class. Display all the details of the employee working under a particular Manager and Team Leader.                     | CO 1 |
| 24. | Write a program that has a class Point. Define another class Location which has two objects (Location and destination) of class Point. Also, define a function in Location that prints the reflection on the y-axis. | CO 1 |
| 25. | Write a program that create a class Distance with members km and metres. Derive classes Schooland office which store the distance from your house to school and office along with other details.                     | CO 1 |

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| 26. | Write a program to create an abstract class Vehicle. Derive three classes Car, Motorcycle and Truck from it. Define appropriate methods and print the details of vehicle   | CO 1 |
| 27. | Write a program to demonstrate hybrid inheritance and show MRO for each class.   | CO 1 |
| 28. | Write a program to overload + operator to multiply to fraction object of fraction class which contain two instance variable numerator and denominator. Also, define the instance method simplify() to simplify the fraction objects. | CO 1 |
| 29. | 26. Write a program to compare two-person object based on their age by overloading > operator.   | CO 1 |
| 30. | Write a program to overload in operator.   | CO 1 |
| 31. | WAP to create a Complex class having real and imaginary as it attributes. Overload the +,-,/,* and += operators for objects of Complex class   | CO 1 |
| 32. | Design a fundamental banking system where users can create accounts, deposit money, withdraw money, and check their balance.   | CO1  |
| 33. | WAP to Show the concept of inner function.   | CO2  |
| 34. | WAP to create closure.   | CO2  |

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| 35. | WAP to create a decorator which will convert a string into upper case string.   | CO2 |
| 36. | WAP to show the concept of nested decorator.                                    | CO2 |
| 37. | WAP to decorate a function with arguments.                                      | CO2 |
| 38. | WAP to decorate instance method   | CO2 |
| 39. | WAP to calculate sum of 1,2,3,4,5 using reduce function.                        | CO2 |
| 40. | WAP to generate numbers from 1 to 10 using generator.                           | CO2 |
| 41. | WAP to decide number is even or odd using generator.                            | CO2 |
| 42. | WAP to generate square of 1,2,3,4,5,6,7,8,9,10 using generator.                 | CO2 |
| 43. | WAP to generate square of even number upto 10 using generator and save in list. | CO2 |



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| <b>44.</b> | WAP to make a co-routine which will print all name with prefix Dear.                                      | CO2  |
| <b>45.</b> | WAP to close a co-routine.  | CO2  |
| <b>46.</b> | WAP to iterate tuple using iter() and next() method.  | CO2  |
| <b>47.</b> | WAP to iterate a string using iter and next method.   | CO2  |
| <b>48.</b> | WAP to print numbers from 1 to 20 using iterator and generate StopIteration exception once wereach limit. | CO2  |
| <b>49.</b> | Hello World: Display a simple "Hello, World!" message box.  | CO 2 |
| <b>50.</b> | Button: Create a button that displays a message when clicked.   | CO 2 |
| <b>51.</b> | Entry: Create a text entry field and display the entered text.  | CO 2 |
| <b>52.</b> | Check button: Create a checkbox and display the selected options  | CO 2 |

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| <b>53.</b> | Radio button: Create radio buttons and display the selected option. | CO 2 |
| <b>54.</b> | List box: Create a list box and display the selected items.         | CO 2 |
| <b>55.</b> | Text: Create a text area and display the entered text.              | CO 2 |
| <b>56.</b> | Menu: Create a menu with different options.                         | CO 2 |
| <b>57.</b> | Message: Display a message in a dialog box.                         | CO 2 |
| <b>58.</b> | Progress bar: Create a progress bar that updates over time python   | CO 2 |
| <b>59.</b> | Scale: Create a scale widget and display the selected value.        | CO 2 |
| <b>60.</b> | Spin box: Create a spin box and display the selected value.         | CO 2 |
| <b>61.</b> | Canvas: Create a canvas and draw shapes on it.                      | CO 2 |
| <b>62.</b> | Label Frame: Create a labeled frame with widgets inside.            | CO 2 |
| <b>63.</b> | Scrollbar: Add a scrollbar to a widget like a text area or list box | CO 2 |

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| <b>64.</b> | Frame: Create a frame and place widgets inside it.  | CO 2 |
| <b>65.</b> | Tree view: Create a tree view widget to display hierarchical data   | CO 2 |
| <b>66.</b> | Notebook: Create a notebook widget with tabs.   | CO 2 |
| <b>67.</b> | File Dialog: Open a file dialog to select a file.   | CO 2 |
| <b>68.</b> | Color Dialog: Open a color dialog to select a color.  | CO 2 |
| <b>69.</b> | Button Counter: Create a button that increments a counter when clicked.                                       | CO 2 |
| <b>70.</b> | Checkbox List: Display a list of checkboxes and show selected options.  | CO 2 |
| <b>71.</b> | Dropdown Menu: Create a dropdown menu with multiple options.  | CO 2 |
| <b>72.</b> | Slider Value Display: Display the current value of a slider widget.   | CO 2 |
| <b>73.</b> | Text Input and Button: Take user input in a text box and display it when a button is clicked.                 | CO 2 |
| <b>74.</b> | Radio Buttons: Present a set of options as radio buttons and display the selected option.                     | CO 2 |
| <b>75.</b> | Progress Bar: Show the progress of a task using a progress bar widget.  | CO 2 |
| <b>76.</b> | Password Input: Create a password input field that hides the entered characters.                              | CO 2 |
| <b>77.</b> | File Uploader: Enable users to upload files and display the selected file name.                               | CO 2 |
| <b>78.</b> | Implement a Student class where students can enroll in courses and the class keeps track of total enrolments. | CO2  |
| <b>79.</b> | Creating Arrays: Create NumPy arrays using various methods like np.array(), np.zeros(), np.ones(),            | CO 3 |

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|            | np.arange(), etc.  |      |
| <b>80.</b> | Array Shape and Size: Get the shape and size of a NumPy array using the shape and size attributes.   | CO 3 |
| <b>81.</b> | Array Indexing: Access and modify individual elements of a NumPy array using indexing  | CO 3 |
| <b>82.</b> | Array Slicing: Extract a subset of elements from a NumPy array using slicing.  | CO 3 |
| <b>83.</b> | Array Reshaping: Change the shape of a NumPy array using the reshape() function.   | CO 3 |
| <b>84.</b> | Array Arithmetic: Perform basic arithmetic operations (addition, subtraction, multiplication, division) on NumPy arrays.   | CO 3 |
| <b>85.</b> | Array Broadcasting: Perform element-wise operations on arrays with different shapes using broadcasting rules.  | CO 3 |
| <b>86.</b> | Array Aggregation: Calculate aggregate values on arrays, such as sum(), min(), max(), mean(), etc. using NumPy   | CO 3 |
| <b>87.</b> | Array Transposition: Transpose a NumPy array using the transpose() function.   | CO 3 |
| <b>88.</b> | Write a program that demonstrates advanced array indexing techniques, such as indexing with boolean arrays or using fancy indexing to select specific elements or subsets of an array. | CO3  |
| <b>89.</b> | Write a program using NumPy to perform data manipulation tasks, such as sorting arrays, removing duplicates, or finding unique elements in an array.                                   | CO3  |
| <b>90.</b> | Array Sorting: Sort the elements of a NumPy array using the sort() function.   | CO 3 |
| <b>91.</b> | Array Filtering: Filter elements in a NumPy array based on a condition using boolean indexing.   | CO 3 |

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| <b>92.</b>  | Array Statistics: Calculate statistical measures like mean, median, standard deviation using functions like np.mean(), np.median(), np.std(). | CO 3 |
| <b>93.</b>  | Array Randomization: Generate random numbers or arrays using functions from the np.random module.   | CO 3 |
| <b>94.</b>  | Array Dot Product: Compute the dot product of two NumPy arrays using the dot() function.  | CO 3 |
| <b>95.</b>  | Array Matrix Operations: Perform matrix operations like matrix multiplication, matrix inverse using functions from the np.linalg module.      | CO 3 |
| <b>96.</b>  | Array File I/O: Save and load NumPy arrays from files using functions like np.save() and np.load().   | CO 3 |
| <b>97.</b>  | Array Masking: Create a mask array to select or manipulate specific elements of a NumPy array based on a condition.                           | CO 3 |
| <b>98.</b>  | Array Broadcasting: Understand and utilize broadcasting rules in NumPy for efficient computations.  | CO 3 |
| <b>99.</b>  | Write a program to finds the cube root of values using scipy library.   | CO 3 |
| <b>100.</b> | Write a program to computes the $10^{**x}$ element-wise using scipy library .   | CO 3 |
| <b>101.</b> | Write a SciPy program to calculate Permutations and Combinations.   | CO 3 |
| <b>102.</b> | Write a SciPy program to calculates the inverse of any square matrix.   | CO 3 |
| <b>103.</b> | Write a SciPy program to calculates the Eigenvalues and Eigenvector.  | CO 3 |
| <b>104.</b> | Read and Load a CSV File into a Pandas DataFrame using pandas.read_csv.   | CO 3 |
| <b>105.</b> | Access and Display the First N Rows of a DataFrame using DataFrame.head(N).   | CO 3 |

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| <b>106.</b> | Access and Display the Last N Rows of a DataFrame using <code>DataFrame.tail(N)</code> .  | CO 3 |
| <b>107.</b> | Retrieve Basic Information about a DataFrame using <code>DataFrame.info</code> .  | CO 3 |
| <b>108.</b> | Perform Descriptive Statistics on a DataFrame using <code>DataFrame.describe</code> .   | CO 3 |
| <b>109.</b> | Filter Rows of a DataFrame based on a Condition using Boolean Indexing.   | CO 3 |
| <b>110.</b> | Rename Columns in a DataFrame using <code>DataFrame.rename</code> .   | CO 3 |
| <b>111.</b> | Group Data in a DataFrame using <code>DataFrame.groupby</code> .  | CO 3 |
| <b>112.</b> | Perform Aggregation on Grouped Data using <code>GroupBy.agg</code> .  | CO 3 |
| <b>113.</b> | Sort a DataFrame by One or Multiple Columns using <code>DataFrame.sort_values</code> .  | CO 3 |
| <b>114.</b> | Perform Basic Arithmetic Operations on Columns of a DataFrame.  | CO 3 |
| <b>115.</b> | Apply a Function to Each Element or Column of a DataFrame using <code>DataFrame.apply</code> or <code>DataFrame.applymap</code> . | CO 3 |
| <b>116.</b> | Reshape Data using Pivot Tables using <code>DataFrame.pivot_table</code> .  | CO 3 |
| <b>117.</b> | Perform Data Visualization using <code>pandas.plotting</code> or <code>matplotlib.pyplot</code> .                                 | CO 3 |
| <b>118.</b> | Save a DataFrame to a CSV File using <code>DataFrame.to_csv</code> .  | CO 3 |
| <b>119.</b> | Perform Data Sampling or Random Selection using <code>DataFrame.sample</code> .   | CO 3 |
| <b>120.</b> | Find the roots of a mathematical equation using SciPy's root-finding functions, such as <code>scipy.optimize.root</code> .        | CO 3 |
| <b>121.</b> | Fit a polynomial function to a set of data points using SciPy's curve fitting functions, such as                                  | CO 3 |

|             |   |      |
|-------------|---|------|
|             | <code>scipy.optimize.curve_fit</code>   |      |
| <b>122.</b> | Perform linear regression on a dataset using SciPy's linear regression functions, such as <code>scipy.stats.linregress</code> .               | CO 3 |
| <b>123.</b> | Calculate the Fast Fourier Transform (FFT) of a signal using SciPy's FFT functions, such as <code>scipy.fft.fft</code> .                      | CO 3 |
| <b>124.</b> | Solve a system of linear equations using SciPy's linear algebra functions, such as <code>scipy.linalg.solve</code> .                          | CO 3 |
| <b>125.</b> | Perform numerical integration using SciPy's integration functions such as <code>scipy.integrate.quad</code> .                                 | CO 3 |
| <b>126.</b> | Calculate the eigenvalues and eigenvectors of a square matrix using SciPy's linear algebra functions, such as <code>scipy.linalg.eig</code> . | CO 3 |
| <b>127.</b> | Load a CSV file of the temperature readings and analyze the data using grouping, aggregation, and merging data frames.                        | CO3  |
| <b>128.</b> | Create a Simple Line Plot using <code>matplotlib.pyplot.plot</code> .   | CO 4 |
| <b>129.</b> | Create a Scatter Plot using <code>matplotlib.pyplot.scatter</code> .  | CO 4 |
| <b>130.</b> | Create a Bar Chart using <code>matplotlib.pyplot.bar</code> .   | CO 4 |
| <b>131.</b> | Create a Histogram using <code>matplotlib.pyplot.hist</code> .  | CO 4 |
| <b>132.</b> | Create a Pie Chart using <code>matplotlib.pyplot.pie</code> .   | CO 4 |
| <b>133.</b> | Create a Box Plot using <code>matplotlib.pyplot.boxplot</code> .  | CO 4 |
| <b>134.</b> | Create a Heatmap using <code>matplotlib.pyplot.imshow</code> .  | CO 4 |
| <b>135.</b> | Customize Plot Labels and Titles using <code>matplotlib.pyplot.xlabel</code> , <code>matplotlib.pyplot.ylabel</code> , and                    | CO 4 |

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|-------------|---|------|
|             | matplotlib.pyplot.title.  |      |
| <b>136.</b> | Customize Plot Colors, Line Styles, and Marker Styles using matplotlib.pyplot.plot parameters.    | CO 4 |
| <b>137.</b> | Add Gridlines to a Plot using matplotlib.pyplot.grid.   | CO 4 |
| <b>138.</b> | Add Legends to a Plot using matplotlib.pyplot.legend.   | CO 4 |
| <b>139.</b> | Create Subplots using matplotlib.pyplot.subplots.   | CO 4 |
| <b>140.</b> | Save a Plot as an Image File using matplotlib.pyplot.savefig.                                     | CO 4 |
| <b>141.</b> | Create 3D Plots using mpl_toolkits.mplot3d module.  | CO 4 |
| <b>142.</b> | Create Error Bars on a Plot using matplotlib.pyplot.errorbar.                                     | CO 4 |
| <b>143.</b> | Customize Axis Ticks and Tick Labels using matplotlib.pyplot.xticks and matplotlib.pyplot.yticks. | CO 4 |
| <b>144.</b> | Create a Bar Plot with Stacked Bars using matplotlib.pyplot.bar and the bottom parameter.         | CO 4 |
| <b>145.</b> | Create a Scatter Plot using seaborn.scatterplot.  | CO 4 |
| <b>146.</b> | Create a Line Plot using seaborn.lineplot.  | CO 4 |
| <b>147.</b> | Create a Bar Plot using seaborn.barplot.  | CO 4 |
| <b>148.</b> | Create a Histogram using seaborn.histplot.  | CO 4 |
| <b>149.</b> | Create a Box Plot using seaborn.boxplot.  | CO 4 |
| <b>150.</b> | Create a Violin Plot using seaborn.violinplot.  | CO 4 |
| <b>151.</b> | Create a Heatmap using seaborn.heatmap.   | CO 4 |



|             |  |      |
|-------------|--|------|
| <b>152.</b> | Create a Pair Plot using <code>seaborn.pairplot</code> .   | CO 4 |
| <b>153.</b> | Create a Joint Distribution Plot using <code>seaborn.jointplot</code> .  | CO 4 |
| <b>154.</b> | Create a KDE (Kernel Density Estimate) Plot using <code>seaborn.kdeplot</code> .   | CO 4 |
| <b>155.</b> | Create a Categorical Scatter Plot using <code>seaborn.stripplot</code> .   | CO 4 |
| <b>156.</b> | Create a Categorical Bar Plot using <code>seaborn.countplot</code> .   | CO 4 |
| <b>157.</b> | Create a Facet Grid using <code>seaborn.FacetGrid</code> .   | CO 4 |
| <b>158.</b> | Customize Plot Colors and Styles using <code>seaborn.set_palette</code> and <code>seaborn.set_style</code> .                         | CO 4 |
| <b>159.</b> | Add Error Bars to a Plot using <code>seaborn.barplot</code> or <code>seaborn.pointplot</code> with the <code>ci</code> parameter.    | CO 4 |
| <b>160.</b> | Create a Clustered Heatmap using <code>seaborn.clustermap</code> .   | CO 4 |
| <b>161.</b> | Create a Regression Plot using <code>seaborn.regplot</code> .  | CO 4 |
| <b>162.</b> | Create a Pairwise Relationship Plot using <code>seaborn.pairplot</code> or <code>seaborn.scatterplot</code> with multiple variables. | CO 4 |
| <b>163.</b> | Create a Boxen Plot using <code>seaborn.boxenplot</code> .   | CO 4 |
| <b>164.</b> | Create a Stacked Bar Plot using <code>seaborn.barplot</code> with the <code>hue</code> parameter.                                    | CO 4 |
| <b>165.</b> | Write a program to draw a line chart using Plotly  | CO 4 |
| <b>166.</b> | Write a program to draw a Bar chart using Plotly   | CO 4 |
| <b>167.</b> | Write a program to draw a Histogram chart using Plotly   | CO 4 |

|             |   |      |
|-------------|---|------|
| <b>168.</b> | Write a program to draw a scatter plot using Plotly   | CO 4 |
| <b>169.</b> | Write a program to draw a Bubble chart using Plotly   | CO 4 |
| <b>170.</b> | Write a program to draw a pie chart using Plotly  | CO 4 |
| <b>171.</b> | Write a program to draw a Boxplot using Plotly  | CO 4 |
| <b>172.</b> | Write a program to draw Violin Plots using Plotly   | CO 4 |
| <b>173.</b> | Write a program to draw a Gant chart using Plotly   | CO 4 |
| <b>174.</b> | As a data analyst working on a project to analyse sales data for a retail company. Your task is to visualize various aspects of the data using Matplotlib, Seaborn, and Plotly to gain insights and communicate findings effectively. | CO4  |
| <b>175.</b> | Write a Python program to find the title tags from a given html document.   | CO 5 |
| <b>176.</b> | Write a Python program to retrieve all the paragraph tags from a given html document.   | CO 5 |
| <b>177.</b> | Write a Python program to get the number of paragraph tags of a given html document.  | CO 5 |
| <b>178.</b> | Write a Python program to extract the text in the first paragraph tag of a given html document.   | CO 5 |
| <b>179.</b> | Write a Python program to find the length of the text of the first <h2> tag of a given html document.   | CO 5 |
| <b>180.</b> | Write a Python program to find the text of the first <a> tag of a given html text.  | CO 5 |
| <b>181.</b> | Write a Python program to find the href of the first <a> tag of a given html document.  | CO 5 |
| <b>182.</b> | Write a Python program to a list of all the h1, h2, h3 tags from the webpage python.org.  | CO 5 |

|             |  |      |
|-------------|--|------|
| <b>183.</b> | Write a Python program to extract all the text from a given web page.  | CO 5 |
| <b>184.</b> | Write a Python program to print the names of all HTML tags of a given web page going through the document tree.  | CO 5 |
| <b>185.</b> | Write a Python program to retrieve children of the html tag from a given web page.   | CO 5 |
| <b>186.</b> | Write a Python program to retrieve all descendants of the body tag from a given web page.  | CO 5 |
| <b>187.</b> | Write a Python program to print content of elements that contain a specified string of a given web page.   | CO 5 |
| <b>188.</b> | Write a Python program to print the element(s) that has a specified id of a given web page.  | CO 5 |
| <b>189.</b> | Write a Python program to create a BeautifulSoup parse tree into a nicely formatted Unicode string, with a separate line for each HTML/XML tag and string. | CO 5 |
| <b>190.</b> | Write a Python program to find the first tag with a given attribute value in an html document.   | CO 5 |
| <b>191.</b> | Write a Python program to find tag(s) beneath other tag(s) in a given html document.   | CO 5 |
| <b>192.</b> | Write a Python program to find tag(s) directly beneath other tag(s) in a given html document.  | CO 5 |
| <b>193.</b> | Write a Python program to find the siblings of tags in a given html document.  | CO 5 |
| <b>194.</b> | Write a Python program to find tags by CSS class in a given html document.   | CO 5 |
| <b>195.</b> | Write a Python program to change the tag's contents and replace with the given string.   | CO 5 |
| <b>196.</b> | Write a Python program to add to a tag's contents in a given html document.  | CO 5 |
| <b>197.</b> | Write a Python program to insert a new text within a url in a specified position.  | CO 5 |

|             |  |      |
|-------------|--|------|
| <b>198.</b> | Write a Python program to insert tags or strings immediately before specified tags or strings.   | CO 5 |
| <b>199.</b> | Write a Python program to insert tags or strings immediately after specified tags or strings.  | CO 5 |
| <b>200.</b> | Write a Python program to remove the contents of a tag in a given html document.   | CO 5 |
| <b>201.</b> | Write a Python program to extract a tag or string from a given tree of html document.  | CO 5 |
| <b>202.</b> | Write a Python program to remove a tag from a given tree of html document and destroy it and its contents.   | CO 5 |
| <b>203.</b> | Write a Python program to remove a tag or string from a given tree of html document and replace it with the given tag or string.   | CO 5 |
| <b>204.</b> | Write a Python program to wrap an element in the specified tag and create the new wrapper.   | CO 5 |
| <b>205.</b> | Write a Python program to replace a given tag with whatever's inside a given tag.  | CO 5 |
| <b>206.</b> | As a data analyst working for a retail company. Your task is to gather product information from various e-commerce websites to analyze market trends and competitor pricing. | CO5  |
| <b>207.</b> | Write a program illustrating class definition and accessing class members.   | CO 1 |
| <b>208.</b> | Write a program to implement default constructor, parameterized constructor, and destructor.   | CO 1 |

#### **Required Software and Tools**

1. Anaconda (Jupyter Notebook)
2. Python Compiler (Open Source)
3. Google Co-Lab

**Textbooks**

| <b>Sr No</b> | <b>Book Details</b>  |
|--------------|--|
| 1            | Magnus Lie Hetland, "Beginning Python-From Novice to Professional"—Third Edition, Apress   |
| 2            | Peter Morgan, Data Analysis from Scratch with Python, AI Sciences  |
| 3            | Allen B. Downey, "Think Python: How to Think Like a Computer Scientist," 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 |
| 4            | Miguel Grinberg, Developing Web applications with Python, OREILLY  |

**Reference Books**

| <b>Sr No</b> | <b>Book Details</b>   |
|--------------|---|
| 1            | Dusty Phillips, Python 3 Object-oriented Programming - Second Edition, O'Reilly   |
| 2            | Burkhard Meier, Python GUI Programming Cookbook - Third, Packt  |
| 3            | DOUG HELLMANN, THE PYTHON 3 STANDARD LIBRARY BY EXAMPLE, : Pyth 3 Stan Libr Exam _2 (Developer's Library), 1st Edition, Kindle Edition. |
| 4            | Kenneth A. Lambert, —Fundamentals of Python: First Programs, CENGAGE Learning, 2012.  |

**Links (Only Verified links should be pasted here)**

**UNIT 1:** <https://nptel.ac.in/courses/106/106/106106145/>

<https://www.youtube.com/watch?v=vr5faCXFo8>

**UNIT 2:** <https://realpython.com/python-gui-tkinter/>

<https://realpython.com/courses/functional-programming-python/>

**UNIT 3:** <https://www.youtube.com/watch?v=5rNu16O3YNE>

<https://www.youtube.com/watch?v=8Y0qQEH7dJg>

**UNIT 4:** <https://www.youtube.com/watch?v=OZOOLe2imFo>

<https://www.youtube.com/watch?v=6GUZXDef2U0>

**UNIT 5:** <https://www.youtube.com/watch?v=8dTpNajxaH0>

<https://www.youtube.com/watch?v=4tAp9Lu0eDI>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
**Department of Languages**

**Subject Name: Communication for Career Enhancement Lab** **L-T-P [0-0-4]**

**Subject Code: BMIASL0251** **Applicable in Department: B. Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Should have completed ABC course in semester I.

**Course Objective:**

- To improve proficiency in Business English to the upper-intermediate level of CEFR (Common European Framework of Reference)
- To improve communication skills

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to: |   | <b>Bloom's Knowledge Level(KL)</b> |
|--|---|------------------------------------|
| CO 1   | Apply key concepts of life skills in real life scenarios.         | K3                                 |
| CO2  | Understand conversations and discussions on a variety of topics.  | K2                                 |
| CO3  | Express ideas clearly and effectively through oral communication. | K2, K5                             |
| CO4  | Understand and analyze main ideas of complex texts.               | K2, K4                             |
| CO5  | Construct clear and detailed texts on a wide range of topics.     | K3, K5                             |

**List of Practical**

| Sr No | Program Title   | CO Mapping |
|-------|---|------------|
| 1     | <b>Introduction to the course and the evaluation scheme</b><br>Students will be familiarised with the course and the Examination Pattern.   | CO1        |
| 2     | <b>Anubhav Activity</b><br>Students will share their aspirations in life  | CO1        |
| 3     | <b>Listening to audio conversations of native speakers</b><br>The students will develop their ability to comprehend standard English conversations.   | CO2        |
| 4     | <b>Interactions Level 1- Meet &amp; greet</b><br>Students will practice how to meet, and greet in professional scenarios, and strike a conversation.  | CO3        |
| 5     | <b>Deciphering critical information from official documents</b><br>The students will be able to identify and analyse the critical information in various official documents such as reports, articles, research papers etc. | CO4        |
| 6     | <b>Art of condensation</b><br>The students will develop the ability to summarize official texts.  | CO4        |
| 7     | <b>Writing professional emails</b><br>Students will practice and develop ability to write clear and concise emails.   | CO5        |
| 8     | <b>Critiquing Films/Videos</b><br>Participants will improve their listening and critical thinking skills.   | CO2        |
| 9     | <b>Conversations in different situations (through caselets)</b><br>Participants will learn to converse in different professional situations.  | CO3        |
| 10    | <b>Case Study Analysis</b><br>The students will develop their critical thinking and analytical skills.  | CO4        |



|    |   |     |
|----|---|-----|
| 11 | <b>Presentations based on the Case</b><br>The students will be able to improve their presentation skills.   | CO3 |
| 12 | <b>Language Toolbox 1</b><br>Class discussions on good and bad writing, common errors, punctuation rules.   | CO5 |
| 13 | <b>Paragraph Writing</b><br>Students will be able to write coherent paragraphs on a variety of topics.  | CO5 |
| 14 | <b>Language Toolbox 2: Domain specific terms and expressions</b><br>The students will practice using domain specific terms in different professional scenarios.             | CO1 |
| 15 | <b>Peer Talk</b><br>The students will develop conversational skills by discussing topics in pairs and will record their response to general questions asked by their peers. | CO3 |
| 16 | <b>Responding to general questions</b><br>The students will develop the ability to respond spontaneously to general questions.  | CO2 |
| 17 | <b>Impromptu Speaking</b><br>The students will develop spontaneous thinking, and ability to express their ideas effectively.  | CO3 |
| 18 | <b>Reading for the Gist</b><br>The students will practice reading to get the central idea of a text.  | CO3 |
| 19 | <b>Writing short answers</b><br>The students will be able to write short notes on general as well as professional topics.   | CO4 |
| 20 | <b>Language Toolbox 3: Language concord</b><br>The students will be able to develop and improve their language proficiency.   | CO4 |
| 21 | <b>Individual Presentations</b><br>The students will hone their presentation skills.  | CO3 |
| 22 | <b>Group Talk</b>   | CO4 |

|    |   |     |
|----|---|-----|
|    | Participants will improve their ability to express their views clearly while discussing a topic in a group. |     |
| 23 | <b>Hansei Activity</b><br>The students will discuss their key learnings from the course.                    | CO4 |

### Required Software and Tools

- British Council EnglishScore Mobile App  
Free Apps to practice English:
  1. Memrise - <https://www.memrise.com>
  2. Open Language - <https://open-language.en.uptodown.com>
  3. Duolingo - <https://englishtest.duolingo.com/applicants>
  4. Rosetta Stone - <https://www.rosettastone.com/product/mobile-apps/>
  5. FluentU - <https://www.rosettastone.com/product/mobile-apps/>

### Textbooks

| Sr No | Book Details                                      |
|-------|---|
| 1.    | ABC Workbook, NIET Publishing House, Meerut, 2023 |

### Reference Books

| Sr No | Book Details   |
|-------|--|
| 1     | Cambridge English Business Benchmark (Pre-intermediate to Intermediate), 2nd edition, Norman Whitby, Cambridge University Press, 2013, UK. |
| 2     | Listening in the Language Classroom by John Field, Cambridge University Press, 2021, UK.   |
| 3     | Speaking: Second Language Acquisition, from Theory to Practice by William Littlewood, Cambridge University Press, 2022, UK.                |

|   |  |
|---|--|
| 4 | Second Language Writing in Transitional Spaces: Teaching and Learning Across Languages and Cultures edited by Viniti Vaish and Guangwei Hu, Routledge, 2019, UK.         |
| 5 | The Writing Revolution: A Guide to Advancing Thinking Through Writing in All Subjects and Grades by Judith C. Hochman and Natalie Wexler, Jossey-Bass, 2022, USA.        |
| 6 | The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching edited by Hossein Nassaji and Eva Kartchava, Cambridge University Press, 2021, UK |
| 7 | IELTS 11: General Training with answers. Cambridge English, 2018   |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY  
GREATER NOIDA-201306**

(An Autonomous Institute)

**School of Electronics and Communication Engineering**

**Subject Name: Basic Electrical and Electronics Engineering Lab** **L-T-P [0-0-2]**

**Subject Code: BMIEC0251N** **Applicable in Department: B.Tech.- Second Semester  
CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Physics, Mathematics

**Lab Experiments**

**Course Objective:** The student will learn about DC circuit fundamentals, element of power system, semiconductors diodes applications, analysis of BJT, logic simplification, combinational and sequential circuits.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to: |  | <b>Bloom's Knowledge Level (KL)</b> |
|--|--|-------------------------------------|
| CO 1   | Apply circuit laws and theorems to solve the problems of electrical circuits.    | K1, K2                              |
| CO2  | Illustrate diode characteristics, Rectifier circuits and characteristics of BJT. | K1, K2                              |
| CO3  | Verify truth table of various types of logic gates.                              | K2, K3                              |
| CO4  | Design and verify different type of combinational circuits.                      | K3, K4                              |
| CO5  | Implement and verify truth table of various types of flip-flops.                 | K3, K4                              |

**List of Practicals**

| <b>Sr No</b> | <b>Program Title</b> | <b>CO</b> |
|--------------|----------------------|-----------|
|--------------|----------------------|-----------|

|           |  | <b>Mapping</b> |
|-----------|--|----------------|
| <b>1</b>  | Study and verify the Kirchhoff's Current Law and Kirchhoff's Voltage Law for given circuit.  | <b>CO1</b>     |
| <b>2</b>  | Study and verify the Super position theorem for the given circuit.   | <b>CO1</b>     |
| <b>3</b>  | Study and verify the Thevenin's Theorem for the given circuit.   | <b>CO1</b>     |
| <b>4</b>  | Study and verify the Maximum Power transfer Theorem for the given circuit.   | <b>CO1</b>     |
| <b>5</b>  | To plot the V-I characteristics of PN junction diode   | <b>CO2</b>     |
| <b>6</b>  | Design and verify half wave and full wave rectifier for $V_{dc} = 10$ volt and $I_L = 100$ mA. Observe output waveform.  | <b>CO2</b>     |
| <b>7</b>  | To Plot the input and output characteristics of a Bipolar Junction Transistor (BJT) connected in Common Emitter (CE) configuration.  | <b>CO2</b>     |
| <b>8</b>  | Verification of the truth tables of Basic Logic Gates and Universal Logic Gates using TTL ICs.<br>a) AND (7408)<br>b) OR (7432)<br>c) NOT (7404)<br>d) NAND (7400)<br>NOR (7402)                       | <b>CO3</b>     |
| <b>9</b>  | Implementation of the given Boolean function using TTL Logic Gates (NOT, AND and OR Gates) in SOP for following Boolean expressions:<br>a) $Y1 = AB' + A'B$<br>$Y2 = ABC + A'B'C' + A'C$               | <b>CO3</b>     |
| <b>10</b> | Implementation of the given Boolean function using TTL Logic Gates (NOT, AND and OR Gates) in POS forms for following Boolean expressions:<br>a) $Y1 = (A'+B)(A+B')$<br>$Y2 = (A+B+C)(A'+B'+C')(A'+C)$ | <b>CO3</b>     |
|           | Implementation of Half-adder, Full-adder and Full-adder using two Half-adder with TTL Logic Gates (EXOR-7486, AND-7408, OR-7432) and verify its truth table.   | <b>CO4</b>     |

|                                    |  |            |
|------------------------------------|--|------------|
|                                    | Implementation of Half-subtractor, Full-subtractor and Full-subtractor using two Half-subtractor with TTL Logic Gates (EXOR-7486, AND-7408, OR-7432) and verify its truth table. | <b>CO4</b> |
|                                    | Implement 2 Bit magnitude comparator using logic gates and verify the truth table.   | <b>CO4</b> |
|                                    | Verification of truth table of flip-flop using NAND gate (7400) & NOR gates (7402).<br>a) RS Flip Flop<br>b) JK Flip Flop<br>c) D Flip Flop<br>T Flip Flop                       | <b>CO5</b> |
|                                    | Implement D flip flop using SR flip flop and verify the truth table.   | <b>CO5</b> |
| <b>Required Software and Tools</b> |  |            |
| None                               |  |            |



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
**School of Mechanical Engineering**

|   |  |   |
|---|--|---|
| <b>Subject Name: CAD and Digital Manufacturing</b>  |  | <b>L-T-P [0-0-6]</b>  |
| <b>Subject Code: BMIME0251N</b>   |  | <b>Applicable in Department: B.Tech.- Second Semester<br/>CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)</b> |
| <b>Pre-requisite of Subject:</b>  |  |   |
| <b>Course Objective:</b><br>The course aims are to provide students with comprehensive knowledge and practical skills in Computer-Aided Design (CAD) and its application in digital manufacturing. Students will gain understanding of CAD software fundamentals and its relevance in modern industrial processes. Through advanced techniques in modelling, simulation, and prototyping, they will learn to effectively design the products for digital fabrication methods like 3D printing and CNC machining. The course emphasizes hands-on learning with practical exercises and real-world case studies, enabling students to develop critical problem-solving abilities essential in the field of CAD and digital manufacturing. |  |   |
| <b>Course Outcomes (CO)</b>   |  |   |
| <b>Course outcome:</b> After completion of this course students will be able to:  |  | <b>Bloom's Knowledge Level</b>  |
| CO1   | Understand engineering drawings, projections, and CAD software for accurate technical design and visualization.                                    | K2  |
| CO2   | Gain proficiency in sketching, dimensioning, editing, and detailing drawings in CAD, including advanced layout and plotting techniques             | K3  |
| CO3   | Apply skills in 3D modeling, visualization, and assembly, mastering techniques for creating and editing complex digital prototypes and blueprints. | K3  |
| CO4   | Understand workshop practices, machining tools, and materials, with insights into digital manufacturing, automation, and Industry 5.0 innovations. | K2  |

| CO5      | Demonstrate and apply 3D printing, understand various production types, and explore smart factories and industry technologies for advanced manufacturing. |  |                     |                        |                                | K3         |
|----------|---|--|---------------------|------------------------|--------------------------------|------------|
| Syllabus |   |  |                     |                        |                                |            |
| Unit No  | Module Name   | Topic covered  | Pedagogy            | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
| 1.       | <b>Introduction to CAD</b>  | Introduction to Engineering Drawings, Scale, Basic Measurement System, Coordinate System, Types of View: Orthographic, Isometric & Perspective, Type of Projection, Sections of solids and Development of surfaces, Introduction to CAD Software, Exploring GUI, Workspaces, Coordinate systems, File Management, Display Control.   | Smart Board/<br>PPT | 8                      | -                              | CO1        |
| 2.       | <b>Working on CAD in 2D environment</b>   | Starting with Sketching, working with Drawing Aids, Editing Sketched Objects, Layers, Creating Text and Tables, Dimensioning and Detailing of Drawings, Editing Dimensions, Dimension Styles, Adding Constraints to Sketches, Hatching Drawings, Paper Layout, Plotting Drawings in AutoCAD, Template Drawings.  | Smart Board/<br>PPT | 8                      | -                              | CO2        |
| 3.       | <b>Working on CAD in 3D environment</b>   | Introduction to 3D Modeling, 3D Environment and Drawing, Modeling Workflow, Editing Models, Assembly, sectioning a Model and Creating Drawings, Visualization, Downstream, Rectangular 3D coordinates, 3D Construction techniques, constructing wireframe objects, constructing solid primitives, dynamically changing a 3D view, and shading a 3D model, Blueprint Drawing, Uses of Digital Prototype | Smart Board/<br>PPT | 8                      | -                              | CO3        |
| 4.       | <b>Introduction to</b>  | Introduction to workshop layout, engineering   | Smart Board/        | 8                      | -                              | CO4        |



|                                    |  |  |                     |           |          |          |
|------------------------------------|--|--|---------------------|-----------|----------|----------|
|                                    | <b>Digital Manufacturing</b>   | materials, Fitting, Carpentry, Forging, Casting, Welding, Forming, Basic Machining Tools: Lathe, Milling, Drilling, Shaper, Grinding, Introduction to Digital Manufacturing: additive manufacturing, basics of automation & robotics and Industry 5.0.                         | PPT                 |           |          |          |
| 5.                                 | <b>Applications of Digital Manufacturing</b>   | 3D Modelling and simulation of various Forming, machining in CAD, Overview of Computational Fluid Dynamics, Basic introduction to 3D Printing & Technologies (FDM, LDM, SLA) Slicing software. Types of Production, Various types of Industries, Introduction to Smart Factory | Smart Board/<br>PPT | 8         | -        | CO5      |
| <b>Total</b>                       |  |  |                     | <b>40</b> | <b>-</b> | <b>-</b> |
| <b>Required Software and Tools</b> |  |  |                     |           |          |          |
| 1. AutoCAD<br>2. CNC Simulator     |  |  |                     |           |          |          |
| <b>Textbooks</b>                   |  |  |                     |           |          |          |
| <b>S. No.</b>                      | <b>Book Details</b>  |  |                     |           |          |          |
| 1.                                 | A Handbook on AUTOCAD tool practice by SSR Krishna   |  |                     |           |          |          |
| 2.                                 | Engineering. Graphics, by Agrawal B. & Agrawal CM., TMH Publication                            |  |                     |           |          |          |
| 3.                                 | Engineering. Drawing by Bhatt ND, Charotar Publiction  |  |                     |           |          |          |
| 4.                                 | CAD by CAM by M.P. Grover.   |  |                     |           |          |          |
| 5.                                 | A course in Workshop technology by B.S. Raghuwanshi, Vol I & II, Dhanpat Rai & sons, New Delhi |  |                     |           |          |          |
| 6.                                 | Industrial automation and Robotics by A.K. Gupta., S K Arora, Laxmi publication                |  |                     |           |          |          |
| 7.                                 | CNC Fundamentals and Programming by P.M Agarwal, V.J Patel, Charotar Publication               |  |                     |           |          |          |

## Reference Books

| S. No. | Book Details  |
|--------|---|
| 1.     | Engineering Drawing +AUTOCAD 6th Edition by K Venugopal & V Prabhu Raja, New Age International Publishers                   |
| 2.     | Computer Aided Engineering Drawing - S. Triyambaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi.      |
| 3.     | Advance CAD Modelling by Nicola & Duhovnik  |
| 4.     | Manufacturing Engineering and Technology, Kalpakjian S. And Steven S. Schmid, 4th edition, Pearson Education India Edition. |
| 5.     | Rapid Product Development, Kimura Fumihiko  |
| 6.     | CNC Machines by M. Adhitan, B.S Pabla; New age international.   |
| 7.     | CAD/CAM, by Groover and Zimmers, Prentice Hall India Ltd  |

## Links

1. [AutoCAD Basics](#)
2. [AutoCAD 3D Screwdriver](#)
3. [AutoCAD 3D Funnel Model](#)
4. [AutoCAD 3D Wooden Table](#)
5. [AutoCAD 3D Door Model](#)
6. [AutoCAD 3D Window Model](#)
7. [AutoCAD 3D Spark Plug Model](#)
8. [AutoCAD 3D Jet Engine Propeller](#)
9. [AutoCAD 3D Wind Turbine Model](#)
10. [AutoCAD 3D Solar Panel Layout](#)
11. [AutoCAD 3D Belt Pulley Model](#)
12. [Fitting, fitting operations](#)
13. [Carpentry joints and operations](#)
14. [Forging operations](#)
15. [Casting Process](#)

16. Forging operations such as drawing out, upsetting, bending, upsetting
17. To demonstrate casting experiments using materials like aluminum or bronze.
18. To study different welded joints using different welding techniques.
19. To study basic metal forming techniques (rolling, extrusion, wire drawing)
20. Study of Machining Tools- Lathe, Milling
21. Study of Machining Tools- Drilling, Shaper, Grinding.
22. Study and demonstration of automation & robotics.
23. To study the concepts of Industry 4.0 & Industry 5.0
24. Setting up of work piece zero position and tool adjustment in CNC Turning machine
25. To write and simulate CNC Part program
26. CNC Part program for facing operation
27. CNC Part program for milling operations.
28. FDM 3D Printing Technology.
29. SLA 3D Printing Technology.
30. conversion of CAD model on a slicing software.
31. AutoCAD Projects
32. AutoCAD 2D Drawings
33. AutoCAD 3D Drawings
34. CAD Projects

| Lab No. | UNIT | Topic   | Simulator/ Software | CO Mapping |
|---------|------|---|---------------------|------------|
| 1       | 1    | To create design of a robotic Arm model on CAD  | AutoCAD             | CO1        |
| 2       |      | To draw & design a Cell phone adapter in CAD Software.  | AutoCAD             | CO1        |
| 3       |      | To create layout of job shop, batch shop and continuous manufacturing on CAD                          | AutoCAD             | CO1        |
| 4       |      | To draw the orthographic projection view of Hub, Arms, and Face of a Pulley                           | AutoCAD             | CO1        |
| 5       |      | To draw the isometric projection view of Pipe, 90-degree elbow and 180-degree bend of a piping system | AutoCAD             | CO1        |

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| 6  |   | To draw the isometric projection view of motor coupling in CAD Software | AutoCAD | CO1 |
| 7  |   | To draw the orthographic projection view of a Study Chair.              | AutoCAD | CO1 |
| 8  |   | To draw the isometric projection view of one-way mobile connector       | AutoCAD | CO1 |
| 9  |   | Two dimensional drawings of Cam and Rocker Arm on AutoCAD.              | AutoCAD | CO1 |
| 10 |   | To create a design of a Soap Case on CAD software.                      | AutoCAD | CO1 |
| 11 |   | To draw a two-way cable connector on CAD software.                      | AutoCAD | CO1 |
| 12 |   | To draw orthographic projections of hexagonal bolt in CAD Software.     | AutoCAD | CO1 |
| 13 |   | Two dimensional drawings of washer on AutoCAD.                          | AutoCAD | CO1 |
| 14 |   | Two dimensional drawings of Gaskets of a vacuum pump on AutoCAD.        | AutoCAD | CO1 |
| 15 |   | To create 2D Drawings of Ring and Pinion Gear in CAD Software.          | AutoCAD | CO1 |
| 16 |   | To draw and design a phone stand/tripod in CAD software                 | AutoCAD | CO1 |
| 17 |   | To draw an orthographic projection view of Edge Flange in CAD Software  | AutoCAD | CO1 |
| 18 |   | To draw the orthographic projection view of Fork End of a Knuckle Shaft | AutoCAD | CO1 |
| 19 |   | To draw an orthographic projection view of Roller Stud in CAD Software  | AutoCAD | CO1 |
| 20 | 2 | To design a quadcopter drone on CAD                                     | AutoCAD | CO2 |
| 21 |   | To design a digital camera on CAD                                       | AutoCAD | CO2 |
| 22 |   | To design the layout of intent device connector on CAD                  | AutoCAD | CO2 |
| 23 |   | To model & design a motor coupling in CAD Software.                     | AutoCAD | CO2 |
| 24 |   | To design a 3D Model of a one-way mobile connector.                     | AutoCAD | CO2 |

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| 25 | To create 2D drawings of Helical Gear in AutoCAD Software.                          | AutoCAD | CO2 |
| 26 | To draw & design a socket welded produced elbow in CAD Software.                    | AutoCAD | CO2 |
| 27 | To create 2D model of crane hook  | AutoCAD | CO2 |
| 28 | Two-dimensional drawing of seal cover on AutoCAD software.                          | AutoCAD | CO2 |
| 29 | Two dimensional drawings of a Friction plate on AutoCAD.                            | AutoCAD | CO2 |
| 30 | To create 2D drawing of a threaded rod using AutoCAD Software.                      | AutoCAD | CO2 |
| 31 | Create 2D drawings of Cam and camshaft bearings in AutoCAD                          | AutoCAD | CO2 |
| 32 | To design a socket weld cross fitting model in CAD Software.                        | AutoCAD | CO2 |
| 33 | To draw orthographic view of engine cylinder head in CAD software                   | AutoCAD | CO2 |
| 34 | To demonstrate & draw a threaded rod using AutoCAD Software.                        | AutoCAD | CO2 |
| 35 | To design a wrench in AutoCAD Software.   | AutoCAD | CO2 |
| 36 | To design a wristwatch in AutoCAD Software.   | AutoCAD | CO2 |
| 37 | To design a slip-on flange in AutoCAD Software.                                     | AutoCAD | CO2 |
| 38 | To design a CAR Wheel in CAD Software.  | AutoCAD | CO2 |
| 39 | Modelling and designing of steering wheel of a car in CAD software                  | AutoCAD | CO2 |
| 40 | To create drawings of a Connecting Rod and Gudgeon pin on CAD software.             | AutoCAD | CO2 |
| 41 | To demonstrate a Butt-weld Straight Pipe Tee fitting and design it in CAD Software. | AutoCAD | CO2 |
| 42 | To create a 2D drawing of Cotter and Sleeve   | AutoCAD | CO2 |
| 43 | To create 2D drawing of Knuckle Pin, Taper Pin and Collar in CAD Software           | AutoCAD | CO2 |

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|----|---|--|---------|-----|
| 44 |   | To design a digital X-ray Machine on CAD   | AutoCAD | CO2 |
| 45 |   | To design & assemble a 3D pipe routing in CAD Software.  | AutoCAD | CO2 |
| 46 |   | To design an electric motor on CAD   | AutoCAD | CO2 |
| 47 |   | To create design of a CNC Lathe on CAD   | AutoCAD | CO2 |
| 48 |   | To create design of a Shaper Machine on CAD  | AutoCAD | CO2 |
| 49 |   | To create design of a Milling Machine on CAD   | AutoCAD | CO2 |
| 50 |   | To create design of a drilling Machine on CAD  | AutoCAD | CO2 |
| 51 |   | To create design of carpentry joints on CAD  | AutoCAD | CO2 |
| 52 |   | To create 2D drawings of Cam and followers on CAD  | AutoCAD | CO2 |
| 53 |   | To create design of a 3D printer machine on CAD  | AutoCAD | CO2 |
| 54 |   | To create layout of workshop on CAD  | AutoCAD | CO2 |
| 55 | 3 | To design & assemble a 3d model of Cotter and Sleeve Joint with all dimensions and allowances    | AutoCAD | CO3 |
| 56 |   | To design & assemble a 3d model of knuckle joint with dimensions and allowances in CAD Software. | AutoCAD | CO3 |
| 57 |   | To draw & model a spiral spring in AutoCAD Software.   | AutoCAD | CO3 |
| 58 |   | To design an edge flange on base flange using CAD Software.                                      | AutoCAD | CO3 |
| 59 |   | To model & design a Roller Stud in CAD Software.   | AutoCAD | CO3 |
| 60 |   | To model & design a Pulley used to transmit power.   | AutoCAD | CO3 |
| 61 |   | To model & design a 3D Model of a Study Chair in AutoCAD Software.                               | AutoCAD | CO3 |
| 62 |   | To design the 3D assembly of Cam and Rocker Arm on AutoCAD.                                      | AutoCAD | CO3 |

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| 63 | To create a 3D model of water bottle in CAD Software.                         | AutoCAD | CO3 |
| 64 | To create the 3D drawing of Differential on AutoCAD.                          | AutoCAD | CO3 |
| 65 | Modelling and designing of door lock handle in CAD software                   | AutoCAD | CO3 |
| 66 | To design & model a chain ring in CAD Software.                               | AutoCAD | CO3 |
| 67 | To create 3D model of crane hook  | AutoCAD | CO3 |
| 68 | Modelling and designing of a fry pan used in kitchen                          | AutoCAD | CO3 |
| 69 | To draw and modelling of Camshaft assembly used in multicylinder engines.     | AutoCAD | CO3 |
| 70 | Modelling and designing of a rotor of turbine                                 | AutoCAD | CO3 |
| 71 | 3D modelling of a kitchen sink in CAD Software.                               | AutoCAD | CO3 |
| 72 | To create 3D design of Auto headlight reflector on AutoCAD software.          | AutoCAD | CO3 |
| 73 | To design a 3d design of water pump fan in CAD Software.                      | AutoCAD | CO3 |
| 74 | To design a wristwatch in AutoCAD Software.                                   | AutoCAD | CO3 |
| 75 | Designing and modelling of wardrobe in CAD Software                           | AutoCAD | CO3 |
| 76 | Modelling and designing of English toilet seat in CAD software                | AutoCAD | CO3 |
| 77 | Modelling and designing of steering wheel of a car in CAD software            | AutoCAD | CO3 |
| 78 | Modelling and designing of a computer mouse by mesh modelling in CAD software | AutoCAD | CO3 |
| 79 | Modelling and designing of a chair wheel of revolving chair                   | AutoCAD | CO3 |
| 80 | Modelling and designing of transition duct in CAD software                    | AutoCAD | CO3 |
| 81 | Modelling and designing of exhaust manifold of engine                         | AutoCAD | CO3 |

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| 82     |   | To design a 3D Model of a bike suspension in CAD Software.   | AutoCAD           | CO3 |
| 83     |   | To model & design of a Drone Fan in CAD Software.  | AutoCAD           | CO3 |
| 84     |   | To demonstrate & design a Motorcycle front sprocket in CAD Software.                                   | AutoCAD           | CO3 |
| 85     |   | To draw elevation and plan of a home on CAD.   | AutoCAD           | CO3 |
| 86     |   | To draw elevation and plan of a town on CAD.   | AutoCAD           | CO3 |
| 87     |   | To create an assembly of a Connecting Rod on CAD software.   | AutoCAD           | CO3 |
| 88     |   | To design a water, tap in AutoCAD Software.  | AutoCAD           | CO3 |
| 89     |   | To design a Footstep Power Generator in Designing Software.  | AutoCAD           | CO3 |
| 90     |   | To create a Cam Follower assembly on CAD software.   | AutoCAD           | CO3 |
| 91     |   | Introduction and demonstration of manufacturing processes- Fitting, Carpentry                          | Virtual Simulator | CO4 |
| 9<br>2 | 4 | To simulate different fitting operations through simulation  | Process Simulator | CO4 |
| 9<br>3 |   | To Introduce students to basic wood carving techniques using carving chisels and gouges                | Process Simulator | CO4 |
| 94     |   | To practice carving simple designs or patterns on wooden blocks.                                       | Process Simulator | CO4 |
| 95     |   | Introduction and demonstration of manufacturing Processes- Forging, Casting                            | Virtual Simulator | CO4 |
| 96     |   | To teach students basic hammering techniques used in forging, such as drawing out, upsetting, bending. | Process Simulator | CO4 |



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| 97  | Demonstrate the process of punching holes or slots in a forged work piece using a punch and drift | Process Simulator | CO4 |
| 98  | To simulate forging process like punching, upsetting using process simulator                      | Process Simulator | CO4 |
| 99  | To perform casting experiments using materials like aluminium or bronze.                          | Process Simulator | CO4 |
| 100 | To investigate the effect of mold temperature on cast parts.                                      | Process Simulator | CO4 |
| 101 | To investigate the effect of pouring temperature on cast parts                                    | Process Simulator | CO4 |
| 102 | To investigate the effect of cooling rate on cast parts   | Process Simulator | CO4 |
| 103 | Introduction and demonstration of manufacturing Processes- Welding, Forming.                      | Virtual Simulator | CO4 |
| 104 | To study different welded joints using different welding techniques.                              | Virtual Simulator | CO4 |
| 105 | To simulate Electric arc welding through different welding techniques                             | Process Simulator | CO4 |
| 106 | To simulate MIG welding with the help of the processes simulator                                  | Process Simulator | CO4 |
| 107 | To simulate TIG welding with the help of the processes simulator                                  | Process Simulator | CO4 |
| 108 | To study basic metal forming techniques (rolling, extrusion, wire drawing)                        | Virtual Simulator | CO4 |

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| 109 |   | To simulate rolling process using virtual simulator              | Virtual Simulator                | CO4 |
| 110 |   | To simulate extrusion process using virtual simulator            | Virtual Simulator                | CO4 |
| 111 |   | To simulate wire drawing process using virtual simulator         | Virtual Simulator                | CO4 |
| 112 |   | Study of Machining Tools- Lathe, Milling                         | Virtual Simulator                | CO4 |
| 113 |   | Study of Machining Tools- Drilling, Shaper, Grinding             | Virtual Simulator                | CO4 |
| 114 |   | To simulate lathe machine to obtain desired shape and size.      | Process Simulator                | CO4 |
| 115 |   | To simulate drill machine to obtain holes of different diameter. | Process Simulator                | CO4 |
| 116 |   | To simulate lathe machine to obtain desired shape and size.      | Process Simulator                | CO4 |
| 117 |   | Study and demonstration of automation & robotics                 | Construction Equipment           | CO4 |
| 118 |   | To study the concepts of Industry 4.0                            | Simulator                        | CO4 |
| 119 | 5 | 3D Modelling and simulation of Machining in CAD                  | Construction Equipment Simulator | CO5 |

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| 120 | 3D Modelling and simulation of sheet bending in CAD                               | Construction Equipment Simulator | CO5 |
| 121 | Setting up of work piece zero position and tool adjustment in CNC Turning machine | Process Simulator                | CO5 |
| 122 | To write and simulate CNC Part program for turning operation as per drawing       | Control System Simulator         | CO5 |
| 123 | To write and simulate CNC Part program for facing operation as per drawing        | Control System Simulator         | CO5 |
| 124 | To write and simulate CNC Part program for drilling operation as per drawing      | Control System Simulator         | CO5 |
| 125 | To write and simulate CNC Part program for milling operations.                    | Control System Simulator         | CO5 |
| 126 | Study of FDM 3D Printing Technology.  | Process Simulator                | CO5 |
| 127 | Study of LDM 3D Printing Technology.  | Process Simulator                | CO5 |
| 128 | Study of SLA 3D Printing Technology.  | Process Simulator                | CO5 |
| 129 | Visualization and conversion of CAD model on a slicing software.                  | Process Simulator                | CO5 |

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| 130 | Create a product using a 3D printer machine tool through different 3D printing techniques  | Robotics Simulator            | CO5 |
| 131 | Study of different type of production systems used in industry- Job, Batch, Mass, Continuous (Case Studies and Examples)   | Process Simulator             | CO5 |
| 132 | Study of different types of industries (Case Studies and Examples)   | Process Simulator             | CO5 |
| 133 | Design and implementation of Smart factory for Industry Revolution 4.0   | Robotics Simulator            | CO5 |
| 134 | To create digital twins of given parts using smart manufacturing simulation software   | Smart manufacturing simulator | CO5 |
| 135 | Objective is to familiarize students with the operation of CNC machines, including their components, controls, and functionalities. Through hands-on experiments, students gain practical knowledge of setting up work pieces, tooling, and executing machining operations.  | Robotics Simulator            | CO5 |
| 136 | Objective is to enhance students' programming skills for CNC machines. By designing and executing different machining operations, students learn to write and debug CNC programs, understand G-code instructions, and create efficient tool paths.   | Robotics Simulator            | CO5 |
| 137 | Objective is to teach students how to optimize machining processes using CNC machines. Through experiments, students learn to analyse different parameters such as cutting speed, feed rate, and tool path strategies to achieve desired machining results, including surface finish, accuracy, and cycle time reduction | Robotics Simulator            | CO5 |
| 138 | Objective is to expose students to advanced CNC techniques and capabilities. Through experiments, students can explore topics such as multi-axis machining, high-speed machining, tool change management, and complex part production to expand their knowledge and skills in CNC machining.                             | Robotics Simulator            | CO5 |

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| 139 |   | Objective is to help students understand the impact of machining variables on the quality of machined parts. Through experiments, students can explore variables like tool geometry, tool material, cutting parameters, and machining strategies to analyse their effects on surface finish, dimensional accuracy, and tool life. | Robotics Simulator | CO5 |
| 140 |   | Objective is to teach students how to use simulation and verification tools to validate and optimize CNC programs before executing them on the machine. Through experiments, students can understand the importance of simulation in preventing collisions, verifying tool paths, and optimizing machining processes.             | Robotics Simulator | CO5 |
| 141 |   | Objective is to develop students' problem-solving and troubleshooting skills in CNC machining. Through experiments, students encounter and resolve issues such as tool breakage, incorrect tool paths, or machine errors, helping them develop critical thinking and decision-making abilities.                                   | Robotics Simulator | CO5 |
| 142 | 1 | 1.1 Introduction to basic electronic components like capacitors, resistors, LEDs, transistors, diodes, etc.   | IDEA Lab           | CO5 |
|     |   | 1.2 Describe and demonstrate the hands-on use of a multi-meter to check component and circuit status.   |                    |     |
|     |   | 1.3 Introduction to the Soldering Procedure along with hands-on practice.   |                    |     |
| 143 | 2 | 2.1 Design and implement the connection of a LED with a battery via Tinkercad and using hardware.   | IDEA Lab           | CO5 |
|     |   | 2.2 Design and implement the connection of a Buzzer with a battery via Tinkercad and using hardware.  |                    |     |
|     |   | 2.3 Design and implement the connection of a DC motor with a battery via Tinkercad and using hardware.  |                    |     |
|     |   | 2.4 Design and implement the connection of a potentiometer with an LED and a battery via Tinkercad and using hardware.  |                    |     |
| 144 | 3 | 3.1 Design and implement the connection of a potentiometer with a DC motor and a battery via Tinkercad and using hardware.  | IDEA Lab           | CO5 |
|     |   | 3.2 Design and implement the connection of a push button with an LED and a battery via Tinkercad and using hardware.  |                    |     |
| 145 | 4 | 4.1 Introduction and demonstration of 3D printing   | IDEA Lab           | CO5 |
|     |   | 4.2 Introduction and demonstration of 3D Scanning   |                    |     |

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| 146      | 5  | Design and implement the project of a traffic light via Tinkercad and using hardware.  | IDEA Lab | CO5 |
| 147      | 6  | 6.1 Introduction to Arduino Boards.  | IDEA Lab | CO5 |
|          |    | 6.2 Hands-on session on Arduino IDE basic components for automation.   |          |     |
| 148      | 7  | Design and implement the project of Basic Home Automation via Tinkercad and using hardware.  | IDEA Lab | CO5 |
| 149      | 8  | Understanding the working of MV Laser and performing engraving, cutting operation.   | IDEA Lab | CO5 |
| 150      | 9  | Understanding the working of CNC Router Machine and performing engraving using CNC Router.   | IDEA Lab | CO5 |
| 151      | 10 | Hands-on- training on different tools and making enclosure and support for the project.  | IDEA Lab | CO5 |
| Projects | 1  | <b>Home Automation using Voice Assistant (Alexa/Google Home):</b> In this project you will learn how you can control a lamp, fan, curtain or any other electrical appliance in your space using an Arduino. At the end of the project, you will be able to control the connected load from your smartphone.  | IDEA Lab | CO5 |
|          | 2  | <b>Line Follower Robot:</b> The concept of the line follower robot is related to light. Here, we use the behaviour of light on the black-and-white surface. The white colour reflects all the light that falls on it, whereas the black colour absorbs the light. In this line-follower robot, we use IR transmitters and receivers (photodiodes). | IDEA Lab | CO5 |
|          | 3  | <b>Obstacle Avoider Robot:</b> An obstacle avoiding robot is a fully autonomous robot which can be able to avoid any obstacle which it faces when it moves. Simply, when it met an obstacle while it is moving forward, automatically stops moving forward and makes a step back.  | IDEA Lab | CO5 |
|          | 4  | <b>Office Desk Decore displaying Time Temperature and Humidity:</b> This project aims to display the time, temperature and humidity using the DHT11 sensor and LCD display 1602 with an I2C module.  | IDEA Lab | CO5 |
|          | 5  | <b>Num pad-based door lock:</b> In this project, you can design an Arduino Keypad Door Lock which can be mounted to any of your existing doors to secure them with a digital password.   | IDEA Lab | CO5 |

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| 6  | <b>Traffic Light Simulation:</b> We will use three LEDs in this project to simulate the sequence of traffic lights (red, yellow and green). By starting with this project, we will be able to learn to control light sequentially and with different timing.   | IDEA Lab | CO5 |
| 7  | <b>Smoke Detecting IoT Device Using Gas Sensor:</b> Smoke Detecting IoT device is a smart fire detection system that can detect combustible gases and alert you to act immediately to control or stop the fire from breaking out. With the help of Arduino, an MQ-2 Smoke detection sensor, a breadboard, some jumper wires, a resistor, two LEDs, and a buzzer, one can quickly build this fire detection system using IoT. | IDEA Lab | CO5 |
| 8  | <b>Tank Water Monitoring System:</b> This device applies the power of the internet of things to build a water monitoring system to reduce water wastage. It notifies you when the water reaches the maximum or the minimum level. The primary components used in this project are Arduino UNO, Ultrasonic sensor, Buzzer, and Bolt Wi-Fi module.   | IDEA Lab | CO5 |
| 9  | <b>Gesture-Controlled Contactless Switch:</b> This IoT project aims to build a gesture-controlled switch that you can use in homes and public places to control all kinds of connected devices on an IoT network. Here are the components you need for the project, Arduino mini pro, OLED Display, Channel Relay, 5V adaptor, Gesture Sensor, and a bulb.   | IDEA Lab | CO5 |
| 10 | <b>Distance Measurement Using Ultrasonic Sensor:</b> The main part of this project is the ultrasonic sensor. We will be able to measure distances at high accuracy using sound waves.  | IDEA Lab | CO5 |
| 11 | <b>Temperature and Humidity Monitor:</b> With this project we can gain more knowledge how to connect humidity and temperature sensors to accurately monitor the environment.   | IDEA Lab | CO5 |
| 12 | <b>To control the speed of a railway barrier using servo motor:</b> This project introduces us to servo motors which is a fascinating motor that transforms electrical signal into accurate mechanical motion.   | IDEA Lab | CO5 |
| 13 | <b>To design on screen information LCD display:</b> In this project we will be able to learn how to interface an LCD with arduino and create an on-screen information system.  | IDEA Lab | CO5 |
| 14 | <b>To design a security-based alarm system using PIR based sensor:</b> This project helps us to develop a system that detects motion and sound. This arduino based alarm system combines a PIR motion sensor and a buzzer.   | IDEA Lab | CO5 |

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| 15 | <b>To design a visual display of multiple patterns using 8x8 LED matrix with arduino circuit:</b> LED matrices are very captivating, it creates a visual display, multiple patterns and simple animations                                      | IDEA Lab | CO5 |
| 16 | <b>To design an anti-theft alarm system using force sensor:</b> With this project we create a basic but effective security solution that can be used to protect valuables or any entry points in a place.                                      | IDEA Lab | CO5 |
| 17 | <b>To design a security system using RFID based access control:</b> This project has the power of RFID and arduino which provides us an advanced and futuristic way to manage access and increase security.                                    | IDEA Lab | CO5 |
| 18 | <b>To design a fluid flow rate and volume monitoring system:</b> This project guides us through interfacing a flow sensor with arduino to measure the rate at which the water flows through a pipe and also calculate the total volume passed. | IDEA Lab | CO5 |





**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
 Department of MBA

**Subject Name: Essence of Indian Traditional Knowledge** **L-T-P [2-0-0]**

**Subject Code: BNC0203** **Applicable in Department: B.Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Philosophical Systems, Spiritual Practices, Cultural Heritage, Ayurveda and Traditional Medicine, Architecture,

**Course Objective:** To enable the students to understand the importance of our surroundings and encourage them to contribute towards sustainable development.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to:   | <b>Bloom's Knowledge Level(KL)</b> |
|--|------------------------------------|
| <b>CO1</b> - Understand the basics of past Indian politics and state polity.   | K2                                 |
| <b>CO2</b> - Understand the Vedas, Upanishads, languages & literature of Indian society.   | K2                                 |
| <b>CO3</b> - Know the different religions and religious movements in India.  | K4                                 |
| <b>CO4</b> - Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and ayurveda. | K4                                 |
| <b>CO5</b> - Identify Indian dances, fairs & festivals, and cinema.  | K1                                 |

**Syllabus**

| <b>Unit No</b> | <b>Module Name</b> | <b>Topic covered</b> | <b>Pedagogy</b> | <b>Lecture Required (L+P)</b> | <b>Practical/ Assignment/ Lab Nos</b> | <b>CO Mapping</b> |
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|
|----------------|--------------------|----------------------|-----------------|-------------------------------|---------------------------------------|-------------------|

|        |   |  |              |   |              |            |
|--------|---|--|--------------|---|--------------|------------|
| Unit 1 | <b>Society State and Polity in India</b>                    | State in Ancient India: Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies, The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women. | PPT, Lecture | 8 | Assignment 1 | <b>CO1</b> |
| Unit 2 | <b>Indian Literature, Culture, Tradition, and Practices</b> | Evolution of script and languages in India: Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali,Prakrit And Sanskrit, <b>Sikh Literature</b> , Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature   | PPT, Lecture | 8 | Assignment 2 | <b>CO2</b> |
| Unit 3 | <b>Indian Religion, Philosophy, and Practices</b>           | Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines , Other Heterodox Sects, Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.   | PPT, Lecture | 8 | Assignment 3 | <b>CO3</b> |

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|--------------|--|--|--------------|-----------|--------------|------------|
| Unit 4       | <b>Science, Management and Indian Knowledge System</b> | Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India , Metallurgy in India, Geography, Biology, Harappan Technologies, Water Management in India, Textile Technology in India ,Writing Technology in India Pyrotechnics in India Trade in Ancient India/,India's Dominance up to Pre-colonial Times.  | PPT, Lecture | 8         | Assignment 4 | <b>CO4</b> |
| Unit 5       | <b>Cultural Heritage and Performing Arts</b>           | Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, <b>Indian Handicraft, UNESCO'S List of World Heritage sites in India</b> , Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, <b>UNESCO'S List of Intangible Cultural Heritage, Calenders</b> , Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema | PPT, Lecture | 8         | Assignment 5 | <b>CO5</b> |
| <b>Total</b> |  |  |              | <b>40</b> |              |            |

| <b>Textbooks</b>       |  |
|------------------------|--|
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | Nitin Singhania, Indian Art and Culture: for civil services and other competitive Examinations,3rd Edition,Mc Graw Hill  |
| 2.                     | Sharma, R.S., Aspects of Political Ideas and Institutions in Ancient India (fourth edition), Delhi, Motilal Banarsidass, |
| <b>Reference Books</b> |  |
| <b>Sr No</b>           | <b>Book Details</b>  |
| 1.                     | Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.   |

## Links

### Video Link:

<https://www.youtube.com/watch?v=wjepzXnEqYo>

<https://www.youtube.com/watch?v=AnGJ7zwyCAk>

[https://www.youtube.com/watch?v=5xpJeO\\_syN4&t=832s](https://www.youtube.com/watch?v=5xpJeO_syN4&t=832s)

<https://www.youtube.com/watch?v=IGOJMQC7Jy4>

<https://indianexpress.com/article/research/a-crackling-history-of-fireworks-in-india-4890178/>

<https://artsandculture.google.com/partner/national-council-of-science-museums>

<https://artsandculture.google.com/exhibit/QQLyzPzKbMIEKg>



**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**GREATER NOIDA-201306**  
 (An Autonomous Institute)  
 Department of MBA

**Subject Name: Constitution of India, Law and Engineering** **L-T-P [2-0-0]**

**Subject Code: BNC0202** **Applicable in Department: B.Tech.- Second Semester**  
**CSE/CSE-R/IT/CS/IOT/M.Tech.(Int.)**

**Pre-requisite of Subject:** Basic understanding of political science.

**Course Objective:** Acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.

**Course Outcomes (CO)**

| <b>Course outcome:</b> After completion of this course students will be able to:                                    | <b>Bloom's Knowledge Level(KL)</b> |
|---|------------------------------------|
| <b>CO1</b> - Identify and explore the basic features and modalities about Indian constitution.                      | K1                                 |
| <b>CO2</b> - Differentiate and relate the functioning of Indian parliamentary system at the center and state level. | K2                                 |
| <b>CO3</b> - Differentiate different aspects of Indian Legal System and its related bodies.                         | K4                                 |
| <b>CO4</b> - Discover and apply different laws and regulations related to engineering practices.                    | K4                                 |
| <b>CO5</b> - Correlate role of engineers with different organizations and governance models.                        | K4                                 |

**Syllabus**

| Unit No | Module Name | Topic covered | Pedagogy | Lecture Required (L+P) | Practical/ Assignment/ Lab Nos | CO Mapping |
|---------|-------------|---------------|----------|------------------------|--------------------------------|------------|
|---------|-------------|---------------|----------|------------------------|--------------------------------|------------|

|        |   |   |              |   |              |            |
|--------|---|---|--------------|---|--------------|------------|
| Unit 1 | <b>Introduction and Basic Information about Indian Constitution</b> | Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947, Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, Centre-State Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India. | PPT, Lecture | 8 | Assignment 1 | <b>CO1</b> |
| Unit 2 | <b>Union Executive and State Executive</b>                          | Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of Vice-President, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, LokPal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.                       | PPT, Lecture | 8 | Assignment 2 | <b>CO2</b> |

|        |   |  |              |   |              |            |
|--------|---|--|--------------|---|--------------|------------|
| Unit 3 | <b>Introduction and Basic Information about Legal System</b>    | The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace. | PPT, Lecture | 8 | Assignment 3 | <b>CO3</b> |
| Unit 4 | <b>Intellectual Property Laws and Regulation to Information</b> | Intellectual Property Laws: Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information, Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.       | PPT, Lecture | 8 | Assignment 4 | <b>CO4</b> |
| Unit 5 | <b>Business Organizations and E-Governance</b>                  | Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance,  | PPT, Lecture | 8 | Assignment 5 | <b>CO5</b> |

|              |  |   |  |           |  |  |
|--------------|--|---|--|-----------|--|--|
|              |  | Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development. |  |           |  |  |
| <b>Total</b> |  |   |  | <b>40</b> |  |  |

|                  |
|------------------|
| <b>Textbooks</b> |
|------------------|

| Sr No | Book Details   |
|-------|--|
| 1.    | Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd.              |
| 2.    | Granville Austin: The Indian Constitution: Cornerstone of a Nation (Classic Reissue), Oxford University Press. |

|                        |
|------------------------|
| <b>Reference Books</b> |
|------------------------|

| Sr No | Book Details   |
|-------|--|
| 1.    | Madhav Khosla: The Indian Constitution, Oxford University Press. |

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|--------------|
| <b>Links</b> |
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| <p><b>Video Link</b></p> <p><a href="https://www.youtube.com/watch?v=D3yQEOXkiAA">https://www.youtube.com/watch?v=D3yQEOXkiAA</a></p> <p><a href="https://www.youtube.com/watch?v=N8nRnralqiI">https://www.youtube.com/watch?v=N8nRnralqiI</a></p> <p><a href="https://www.youtube.com/watch?v=t96A1DrsZTw">https://www.youtube.com/watch?v=t96A1DrsZTw</a></p> <p><a href="https://www.youtube.com/watch?v=6CS3WwY2_h8">https://www.youtube.com/watch?v=6CS3WwY2_h8</a></p> <p><a href="https://www.youtube.com/watch?v=7hnKGOgjYNI">https://www.youtube.com/watch?v=7hnKGOgjYNI</a></p> <p><a href="https://www.youtube.com/watch?v=SXeKCB8WPGg">https://www.youtube.com/watch?v=SXeKCB8WPGg</a></p> |
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