NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR

(AN AUTONOMOUS INSTITUTE)

Estd.2001
Get Future Ready

NIET
Greater Noida
An Autonomous Institute

Affiliated to

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

Evaluation Scheme & Syllabus

For

Bachelor of Technology

Electronics & Communication Engineering (ECE)

First Year

(Effective from the Session: 2026-27)

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

(AN AUTONOMOUS INSTITUTE)

Bachelor of Technology

Electronics & Communication Engineering (ECE)

Evaluation Scheme

SEMESTER-I

Sl. No.	Subject code	Subject Name	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	DAS0103	Calculus and Linear Algebra	Mandatory	3	1	0	30	20	50		100		150	4
2	DAS0102	Semiconductor Physics & Devices	Mandatory	3	0	0	30	20	50		100		150	3
3	DCSAI0101	Fundamentals of Artificial Intelligence	Mandatory	2	0	0	30	20	50		50		100	2
4	DASCC0101	Design Thinking-I	Mandatory	2	0	0	60	40	100				100	2
5	DAS0152	Semiconductor Physics & Devices Lab	Mandatory	0	0	2				25		25	50	1
6	DCSE0151	C Programming	Mandatory	0	0	4				50		50	100	2
7	DME0151	CAD and Digital Manufacturing Lab	Mandatory	0	0	2				25		25	50	1
8	DCSE0153	Linux and Scripting lab	Mandatory	0	0	2				25		25	50	1
9	DASL0151	Acquiring Business Communication (ABC) Lab	Mandatory	0	0	4				50		50	100	2
10	DNC0103/ DNC0102	Essence of Indian Traditional Knowledge / Constitution of India, Law and Engineering	Compulsory Audit	2	0	0	30	20	50				50	NA
		*Massive Open Online Courses (For B.Tech. Hons. Degree)	*MOOCs											
		TOTAL		**12**	**1**	**14**			**250**	**175**	**250**	**175**	**850**	**18**

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

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	DMC0005	Next Gen Technologies	Infosys Wingspan (Infosys Springboard)	10h 14m	0.5
2	DMC0006	Programming Fundamentals using Python - Part 2	Infosys Wingspan (Infosys Springboard)	40h 15m	3

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 - DNC0103/DNC0102)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The total and obtained marks are not added in the grand total.

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

Electronics & Communication Engineering (ECE)

Evaluation Scheme

SEMESTER-II

S. No.	Subject code	Subject Name	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
1	DAS0203B	Differential Equations and Fourier Transformations	Mandatory	3	1	0	30	20	50		100		150	4
2	DEC0202	Digital System Design	Mandatory	3	0	0	30	20	50		100		150	3
3	DCSE0203	Data Structure	Mandatory	3	0	0	30	20	50		100		150	3
4	DEC0203	Analog Circuits	Mandatory	3	0	0	30	20	50		50		100	3
5		Foreign Language	Core Elective	2	0	0	60	40	100				100	2
6	DEC0252	Digital System Design Lab	Mandatory	0	0	2				25		25	50	1
7	DCSE0253	Data Structures Lab	Mandatory	0	0	4				50		50	100	2
8	DCSE0252	Problem Solving using Python	Mandatory	0	0	6				50		100	150	3
9	DASL0251	Communication for Career Enhancement	Mandatory	0	0	4				50		50	100	2
10	DMB0201	Innovation and Entrepreneurship	Mandatory	2	0	0	60	40	100				100	2
11	DNC0202/ DNC0203	Constitution of India, Law and Engineering/ Essence of Indian Traditional Knowledge	Compulsory Audit	2	0	0	30	20	50				50	NA
		*Massive Open Online Courses (For B.Tech. Hons. Degree)	*MOOCs											
		TOTAL		**17**	**1**	**14**			**400**	**175**	**350**	**225**	**1150**	**24**

Foreign Language:

S. No.	Subject Code	Course Name	Types of Subjects
1.	DASL0202	French	Core Elective
2.	DASL0203	German	Core Elective
3.	DASL0204	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	No of Hours	Credits
1	DMC0007	Digital Electronics- Online Digital Electronics Courses	IIHT	8h 38m	0.5
2	DMC0008	English Communication for Tech Professionals/ Generative AI: Prompt Engineering Basics	Infosys Wingspan (Infosys Springboard)	73h 1m/7h 11m	4/0.5
3	DMC0001	Digital Edge 101	NASSCOM	30 h	2

PLEASE NOTE: -

- **Compulsory Audit (CA) Courses (Non-Credit - DNC0202/DNC0203)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The total and obtained marks are not added in the grand total.

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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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 to18 =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
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Course Code: DAS0103	Course Name: Calculus and Linear Algebra	L	T	P	C
Course Offered in: B.Tech- First Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/ AIML-TWIN/CYS/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		3	1	0	4

Pre-requisite: Knowledge of Mathematics up to 12th standard

Course Objectives: 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 Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	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	Apply the concept of vector calculus to evaluate line, surface and volume integrals.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	1	3	2	-	-	-	1	2		
CO2	3	3	2	3	3	-	-	-	-	1	3		
CO3	3	2	3	3	3	2	-	-	-	1	3		
CO4	3	2	3	3	2	2	-	-	-	1	2		
CO5	3	2	3	2	3	1	-	-	-	1	1		

Course Contents / Syllabus

Unit 1	**Matrices**	**9 hours**

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; Diagonalization of a Matrix.

Unit 2	**Differential Calculus -I**	**9 hours**

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.

Unit 3	**Differential Calculus -II**	**9 hours**

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.

Unit 4	Multivariable Calculus	9 hours
Multiple integration: Double integral, Triple integral, Change of order of integration, Change of variables, Application: Areas and volumes, Beta & Gama function and their properties, Dirichlet's integral and its applications.		
Unit 5	**Vector Calculus**	**9 hours**
Vector differentiation: Gradient, Curl and Divergence and their Physical interpretation, Directional derivatives, Tangent and Normal planes. Vector Integration: Line integral, Surface integral, Volume integral, Gauss's Divergence Theorem, Green's theorem, Stoke's theorem (without proof) and their applications.		
	Total Lecture Hours	**45 hours**

Textbook:

S.No	Book Title	Author
1	Higher Engineering Mathematics, Tata Mc Grew-Hill Publishing Company Ltd.	B. V. Ramana
2	Higher Engineering Mathematics, Khanna Publisher.	B. S. Grewal
3	Advance Engineering Mathematics, Narosa Publishing House.	R K. Jain & S R K. Iyenger
4	Advance Engineering Mathematics, University Science Press	N.P. Bali

Reference Books:

S.No	Book Title	Author
1	Advance Engineering Mathematics, John Wiley & Sons.	E. Kreyszig
2	Advance Engineering Mathematics, Thomson (Cengage) Learning.	Peter V. O'Neil
3	Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole.	D. Poole
4	Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi.	Veerarajan T.
5	Advanced Engineering Mathematics, Tata Mc-Grew-Hill; Sixth Edition.	Ray Wylie C and Louis C Barret
6	Engineering Mathematics, 1st Edition, Pearson India Education Services Pvt. Ltd.	P. Siva Ramakrishna Das and C. Vijayakumari
7	Advanced Engineering Mathematics.	Chandrika Prasad, Reena Garg.
8	Engineering Mathematics – I.	Reena Garg
9	Calculus, Eleventh Edition, Pearson.	Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas

Self-Study Content Links:		Duration (in Hrs)
MOOCs	https://www.coursera.org/specializations/mathematics-engineers#courses https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma133	30 Hrs 18 Hrs
Video Lectures	**Unit 1** https://sl1nk.com/x4pwhm1 https://sl1nk.com/hp4zh3q https://l1nq.com/tar0utj https://sl1nk.com/qx5w2s0 https://l1nq.com/bsa5tsz	 27.32m 33.44m 34.32m 30.35m 33.49m

	https://l1nq.com/krjyuz7	35.25m
	https://l1nq.com/nxmkv1j	26.51m
	https://l1nq.com/d5rjml3	34.05m
	https://sl1nk.com/u7t3pus	37.55m
	https://www.youtube.com/watch?v=U9LW_TWVNGw	19.40m
	Unit 2	
	https://l1nq.com/osdcq89	27.43m
	https://l1nq.com/o7scg0e	31.52m
	https://sl1nk.com/lin5ffj	33.23m
	https://l1nq.com/zwk339w	46.04m
	https://l1nq.com/yz99yyw	36.36m
	https://sl1nk.com/tx5go1h	31.04m
	https://l1nq.com/cf4q9j4	39.00m
	https://l1nq.com/hhv83kc	38.01m
	Unit 3	
	https://sl1nk.com/kck8o3w	32.41m
	https://l1nq.com/yb60xlp	39.00m
	https://l1nq.com/mxg66jf	33.56m
	https://sl1nk.com/842fc8v	15.55m
	https://l1nq.com/sagxjsv	19.39m
	https://l1nq.com/z8w15el	28.48m
	https://l1nq.com/eiby96a	26.36m
	https://l1nq.com/nldopta	25.28m
	https://l1nq.com/t07w04e	27.32m
	Unit 4	28.08m
	https://l1nq.com/m49dsnl	28.25m
	https://l1nq.com/ynv465n	26.40m
	https://sl1nk.com/wy1yimg	29.05m
	https://l1nq.com/y0f63oj	27.53m
	https://l1nq.com/wph06ly	29.36m
	https://sl1nk.com/3arnc7z	29.59m
	https://l1nq.com/e54jst9	33.05m
	https://sl1nk.com/v8wtn85	
	Unit 5	
	https://youtu.be/v3ZC4Mo1fS0?si=1YuVCjiJ7biZ3T2l	14:59m
	https://youtu.be/SZCsFS9izfQ?si=za8c9AZts1yFt4yh	51:01m
	https://youtu.be/M_Irtxhbq3E?si=_IZ8NUCpu7KtbN69	30:03m
	https://youtu.be/v5J_3o5AFoY?si=x5p4NQiIGTiUxWt5	28:40m
	https://youtu.be/hCkbBU9E_40?si=3URVgydtevlnjslR	30:38m
	https://youtu.be/8h3yY0im5XU?si=1f63BZgYIk_jiUsr	32:27m
	https://youtu.be/1qLb0B40YnA?si=QRQJTmVO3ZEqW8e_	53:56m
	https://youtu.be/1aS7nTIYMx0?si=jRDP8V4gsvKT7Oq2	52:34m
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DAS0102	Course Name: Semiconductor Physics and Devices	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		3	0	0	3

Pre-requisite:

1. Basic knowledge of semiconductors.
2. Basics concept of electrostatics.
3. Basics of matter waves, uncertainty principle**.**
4. Properties of matter.
5. Basic laws of electricity and magnetism.

Course Objectives:

1. To provide the knowledge of the phenomenon of semiconductors and its uses to engineering applications.
2. To provide the knowledge of the Bipolar Junction Transistor and its engineering application.
3. To provide the knowledge of the basic concept of Field Effect Transistor.
4. To provide the knowledge of Quantum Mechanics and its application in quantum computing.
5. To provide the basic knowledge of Superconductivity and Nanotechnology which is necessary to understand the working of modern engineering tools and techniques.

Course Outcome: After completion of the course, the student will be able to:		Bloom's Knowledge Level (KL)
CO1	Describe the phenomenon of semiconductor physics.	K2
CO2	Explain the working of Bipolar Junction Transistor.	K2
CO3	Identify the basic concept of Field Effect Transistor.	K2
CO4	Implement the concept of quantum mechanics.	K3
CO5	Define the basic phenomena of superconductivity and nanotechnology.	K2

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	-	2	1	-	-	-	-	2	-	-
CO2	3	2	1	-	2	1	-	-	-	-	2	-	-
CO3	3	2	1	-	2	1	-	-	-	-	2	-	-
CO4	3	2	2	-	1	1	-	-	-	-	2	-	-
CO5	3	2	2	-	1	1	-	-	-	-	2	-	-

Course Contents / Syllabus

Unit 1	**Introduction to Semiconductor Physics**	**9 hours**

Energy bands, Fermi Level, Direct and Indirect Band Gap Semiconductor, Diffusion and Drift Current, P-N Junction Diode and V-I Characteristics of Diode.

Special Diodes: Zener Diode, Photodiode, Solar Cell, Light Emitting Diode (LED), Organic-Light Emitting Diode (O-LE**D)**

Unit 2	**Bipolar Junction Transistor(BJT)**	**9 hours**
Transistor (PNP & NPN), Construction & Working of Transistor, Common Base, Common Emitter and Common Collector Configurations of Transistor, V-I Characteristics of Common Emitter, Operating Point, DC load lines, Voltage Divider biasing, BJT applications: Switch and amplifier.		
Unit 3	**Field Effect Transistor(FET)**	**9 hours**
Construction and Working Principle of Junction Field Effect Transistor **(**JFET), Comparison with BJT, V-I Characteristics of JFET, Pinch-off Voltage. Construction & Working Principle of MOSFET, V-I Characteristics in Enhancement and Depletion modes, CMOS (Qualitative)		
Unit 4	**Quantum Mechanics and Computing**	**9 hours**
Introduction to Quantum Physics, Born's Interpretation of Wave function, Operators, Schrodinger wave equation, Introduction to Quantum computing, Moore's law, Differences in classical and quantum computing, Concept of Qubits, Properties of Qubits, Bloch sphere.		
Unit 5	**Superconductivity and Nanotechnology**	**9 hours**
Superconductivity: Temperature dependence of resistivity, Meissner effect, Penetration depth, Type-I and Type-II superconductors, Critical field and High temperature superconductors. **Nanotechnology:** The nanoscale and nanomaterials, Surface to Volume ratio and its Importance in engineering, Bucky ball and its applications, Carbon nanotubes(CNTs) and their types, Applications of CNTs.		
	Total Lecture Hours	**45 hours**

Textbook:

S.No	Book Title	Author
1	Electronic Devices and Circuit Theory	Robert L.Boylestad and Louis Nashelsky

Reference Books:

S.No	Book Title	Author
1	Semiconductor Devices Physics and Technology 2ndEd	S. M. Sze
2	Optoelectronics an Introduction 3rd Edition	Wilson and Hawkes
3	Semiconductor Physics and Devices	Neamen
4	Solid State Electronics Devvices	Streetman and Banerjee
5	Engineering Physics	S.D. Jain and G.S. Sahasrabudhe
6	Nanotechnology	R. Booker and E. Boysen
7	Microelectronics Circuits	Adel S. Sedra and Kenneth Carless Smith

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://www.coursera.org/learn/semiconductor-physics https://www.coursera.org/learn/semiconductor-1 https://www.coursera.org/learn/diode-pn-junction-metal-semiconductor-contact?specialization=semiconductor-devices https://www.coursera.org/learn/transistor-field-effect-transistor-bipolar-junction-transistor?specialization=semiconductor-devices	15hrs 9hrs 16hrs 13hrs

Video Lectures	**Unit 1**	
	https://youtu.be/WIdfUWjXog?si=plmz8LEmKZl0mvfW	13.42m
	https://youtu.be/MovJj2ldIH0?si=zDsUvgwd_BGPd5nV	7.44m
	https://youtu.be/aEwojo5gtn8?si=K-m4TPWnjLQp5U8v	24.58m
	https://youtu.be/qgIRRi8wkmg?si=spoKbGBvdIqjj03l	18.43m
	https://youtu.be/sWOSPdZHj8o?si=ujnRDilxrYQ-8t-l	23.28m
	https://youtu.be/-ga2S2LOtjs?si=5l66qKsN_5r-vgY3	26.43m
	https://youtu.be/qDoUGNOMf3I?si=8B_mZz8Xdvp-LU1c	25.01m
	https://youtu.be/viw9qpSDQjc?si=EImowmInReSzPZTg	32.02m
	https://youtu.be/ZsOXhQemh10?si=TERBVhiNBCVDB3oh	16.02m
	https://youtu.be/0SnfR13p6Mc?si=K-mfafMZXO2rDbe-	22.12m
	https://youtu.be/8nyReoypSvM?si=mkMlnSOSvP5yQzY3	30.06m
	https://www.youtube.com/watch?v=BCfpLH41lAU	56.13m
	https://youtu.be/rsFMSyoNKZQ?si=hTYWOy7gy1g1OEM1	30.24m
	https://www.youtube.com/watch?v=tlnCkr6B6ZY	18.53m
	https://www.youtube.com/watch?v=S9jMMALKKKs	58.03m
	https://youtu.be/IZs7a2L5AZI?si=0NvFzhg6x56swHO0	32.15m
	https://www.youtube.com/watch?v=MC1zGEmrELA	54.08m
	https://www.youtube.com/watch?v=xhn188JafbM	53.12m
	https://www.youtube.com/watch?v=JA3sCmrv11M&list=PLgMDNELGJ1CaNcuuQv9xN07ZWkXE-wCGP&index=2	31.45m
	Unit 2	
	https://www.youtube.com/watch?v=UgOM9WXp57k	46.21m
	https://www.youtube.com/watch?v=0C4uxtS-tlQ	54.22m
	https://www.youtube.com/watch?v=ijNBnXhiy_w&t=458s	56.12m
	https://www.youtube.com/watch?v=M_Fti8OBTKo	54.07m
	https://www.youtube.com/watch?v=HfKd-Y2SBFA	56.08m
	https://www.youtube.com/watch?v=Ax87iYvsZ0A	35.20m
	https://www.youtube.com/watch?v=oXY9zUSulkg	53.28m
	https://www.youtube.com/watch?v=FP-mZF0h8vQ	57.38m
	https://www.youtube.com/watch?v=gYgT_WoI9v4	54.34m
	https://www.youtube.com/watch?v=QnjZQHB1hR0&t=109s	30.05m
	https://www.youtube.com/watch?v=1wJXvDGW-iQ	29.11m
	https://www.youtube.com/watch?v=hOT72IdQBbw	57.43m
	Unit 3	
	http://acl.digimat.in/nptel/courses/video/115102014/L22.html	54:08
	https://www.youtube.com/watch?v=MuBiC9yz2fc&t=265s	49:00
	http://acl.digimat.in/nptel/courses/video/115102014/L24.html	57:39
	http://acl.digimat.in/nptel/courses/video/115102014/L24.html	54.14
	https://www.youtube.com/watch?v=4m49vM0Ryt8	56:36
	http://acl.digimat.in/nptel/courses/video/115102014/L28.html	54:23
	Unit 4	
	http://www.digimat.in/nptel/courses/video/115101107/L01.html	49:12
	https://www.youtube.com/watch?v=_U6YamvF7BE	45:51
	http://digimat.in/nptel/courses/video/115104096/L34.html	21:18
	https://www.youtube.com/watch?v=KQzcFBXwKdM	30:47
	http://www.digimat.in/nptel/courses/video/115102023/L02.html	58.:12
	https://www.youtube.com/watch?v=vy-qStGSy0g	23:26
	http://digimat.in/nptel/courses/video/104104082/L01.html	35:52
	http://digimat.in/nptel/courses/video/104104082/L37.html	31:17
	https://www.youtube.com/watch?v=V9cADVFxToU	47:15
	https://www.youtube.com/watch?v=rEdGqUnD8eo&t=1522s	28:01
	https://www.youtube.com/watch?v=n2RsfkrWM7U	37:15
	Unit 5	
	http://www.digimat.in/nptel/courses/video/115103108/L01.html	56:40
	http://www.digimat.in/nptel/courses/video/115103108/L02.html	57:30
	https://www.youtube.com/watch?v=VHp2Ff5N_bs	41:12
	http://digimat.in/nptel/courses/video/115105131/L39.html	37:49
	http://digimat.in/nptel/courses/video/113106093/L01.html	57:30
	https://www.youtube.com/watch?v=BLNwNkdRiTI	48:30

	https://www.youtube.com/watch?v=9EKqNBvz4cA http://digimat.in/nptel/courses/video/113106093/L24.html https://youtu.be/RvtlBh_-_Rw?si=AUb2neWopHPFFxux	54:56 45:23 43:40
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
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Course Code: DCSAI0101	Course Name: Fundamentals of Artificial Intelligence	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite: Basic Programming, Basic Data Interpretation Skills

Course Objectives: This subject aims to introduce students to the core principles, branches, applications, tools, and ethical considerations of Artificial Intelligence, empowering them with essential theoretical knowledge and practical skills to explore intelligent systems and pursue advanced AI research and development.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Explain the foundations of Artificial Intelligence and its historical evolution	K2
CO2	Interpret and differentiate types of data	K3
CO3	Develop Python-based data processing workflows	K3
CO4	Analyze the impact and real-world applications of AI	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	2	-	-	-	-	-	-	1	1	2
CO2	2	3	-	-	2	-	-	-	-	-	-	1	1	2
CO3	2	2	2	2	3	-	-	-	-	-	-	1	2	2
CO4	2	2	2	2	3	2	1	2	-	-	-	1	1	2

Course Contents / Syllabus

Unit 1	**Introduction to AI**	**8 hours**

Introduction to AI – History, Approaches and Philosophy, Application of AI, Intelligent Agent, Types of Agent, Domains of AI- Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Generative AI

Unit 2	**Data Literacy and Analysis**	**8 hours**

Importance of Data, Information, Knowledge, Wisdom, Types of Data [Unstructured, Structured], Data Collection, Data Processing, Data Analysis – Descriptive and Inferential.

Unit 3	**Compute, Analysis and Visualization**	**10 hours**

Introduction to Python, Libraries (Pandas, NumPy, Matplotlib), Import and Export of Data, IDE, Google Colab, Kaggle Kernel.

Unit 4	**Applications of AI**	**4 hours**

AI in Healthcare, Finance, Agriculture, Transportation, Retail and E-commerce, Entertainment and Media, Smart Homes and IoT, Robotics and Automation.

Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1	Artificial Intelligence: A Modern Approach, Pearson Education, 4th Edition, 2020	Stuart Russell & Peter Norvig

2	Artificial Intelligence, McGraw-Hill Education, 3rd Edition, 2009	Elaine Rich, Kevin Knight, Shivashankar B. Nair

Reference Books:

S.No	Book Title	Author
1	Artificial Intelligence and Machine Learning, Dreamtech Press, 1st Edition, 2020	P. S. Deshpande
2	Python Data Analytics: With Pandas, Numpy, and Matplotlib, Apress; 2nd edition (1 January 2018)	Wolfgang Ertel

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	1. https://swayam-plus.swayam2.ac.in/courses/course-details?id=P_SMARTBRIDGE_01 2. https://www.udemy.com/course/artificial-intelligence-in-the-classroom/?utm_campaign=BG-Search_DSA_Beta_Prof_la.EN_cc.India&utm_source=bing&utm_medium=paid-search&portfolio=Bing-India&utm_audience=mx&utm_tactic=nb&utm_term=_._ag_1318316830212069_._ad__._kw_Teacher+Training+en&utm_content=o&funnel=&test=&utm_campaign_id=638596187&msclkid=df2935f4c5d1177d62255fb858b9eda4&couponCode=PMNVD2025 3.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01333063698060902494_shared/overview	90 Hrs 8 Hrs 45 Min 10 Hrs 45 Min
Video Lectures	1. https://www.youtube.com/watch?v=D1eL1EnxXXQ 2. https://www.youtube.com/watch?v=qrMnoY8qBJM 3.https://www.youtube.com/watch?v=GHpchgLoDvI&list=PLp6ek2hDcoNB_YJCruBFjhF79f5ZHyBuz	1 Hrs 6 Mins 1 Hrs 13 Min 32 Hrs
Web References	1. https://www.ibm.com/think/topics/artificial-intelligence	10 Hrs

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DASCC0101	Course Name: Design Thinking-I	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite:

Course Objectives: 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 Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Develop a strong understanding of the design process and apply it in a variety of business settings	K1
CO2	Analyze self, culture, and teamwork to work in a multidisciplinary environment and exhibit empathetic behavior	K3
CO3	Formulate specific problem statements of real time issues and generate innovative ideas using design tools	K4
CO4	Apply critical thinking skills 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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	2	2	1	1	1	2	1	2	2	2		
CO2	1	2	1	1	1	2	1	2	2	2	1		
CO3	1	2	1	2	2	1	2	1	2	2	1		
CO4	1	2	1	1	1	1	1	1	1	1	1		
CO5	1	2	1	1	1	1	1	1	1	1	1		

Course Contents / Syllabus

Unit 1	**Introduction**	**6 hours**

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.

Case Studies: Mumbai Dabbawallas, Gillette, Singapore, Bengaluru, Bahubali, Google, Embrace Incubator

Activity: Observation, Wicked Problem

Unit 2	**Ethical Values and Empathy**	**6 hours**

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 behavior: 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.

Understanding stakeholders, techniques to empathize with, identify key user problems. Empathy tools- Interviews, empathy maps, persona, emotional mapping, immersion and observations, Emotional Intelligence, customer journey maps, classifying insights after Observations, Classifying Stakeholders.

Case Studies: Pure-it, Royal Enfield, Big Basket, Air-bnb.

Activity: Moccasin Walk, Persona, Empathy map, Journey Map

Unit 3	**Problem Statement and Ideation**	**6 hours**

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 & Random Association Technique, Mind-Map, ideation activity games - six thinking hats, million-dollar idea, introduction to visual collaboration and brainstorming tools - Mural, JamBoard, Introduction to AI Tools.

Case Studies: The Good Kitchen, Flipkart, Uber, Redbus, Big Bazaar

Activity: 5 Why, HMW, Brainstorming, Six Thinking Hats, 30 Circles, paper prototype

Unit 4	**Critical Thinking**	**6 hours**

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.

Case Studies: Byju's, Maggi noodles, Tata Nano

Activity: debate, role play

Unit 5	**Logic and Argumentation**	**6 hours**

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.

Case Studies: Aadhaar Card, Demonetization, Odd-Even Policy, Jio

Activity: Logical Fallacy Detective, Fact-Checking Challenge

	Total Lecture Hours	**30 hours**

Textbook:

S.No	**Book Title**	**Author**
1.	UnMukt : Science & Art of Design Thinking	Arun Jain
2.	Solving Problems with Design Thinking – Ten Stories of What Works	Jeanne Liedta
3.	A Foundation Course in Human Values and Professional Ethics	R R Gaur, R Sangal, G P Bagaria
4.	Critical Thinking: An Introduction	Fisher

Reference Books:

S.No	Book Title	Author
1.	101 Design Methods	Vijay Kumar
2.	Change by Design	Tim Brown
3.	How to improve your critical thinking & reflective kills	McMillan
4.	Design of Business	Roger L. Martin

Self-Study Content Links:		Duration (in Hrs)
MOOCs	**1.**https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012785877065097216 1567_shared/overview **(Unit-1)** **2.**https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_014273116965789696 5/overview **(Unit-2)** **3.**https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013501581003620352 11528/overview **(Unit-3)** **4.**https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_014583275387928576 31522/overview **(Unit-4)** **5.** https://alison.com/course/problem-solving-and-critical-thinking-skills?utm_source	3hrs 31m 1hr 2 m 23m 32s 1hr 1m 3-4Avg. hrs
Video Lectures	**Unit-1** https://youtu.be/rUUuhnLkJ2s?si=_XCHnDbt_U1z0 Frx https://www.youtube.com/watch?v=ldYzbV0NDp8 https://www.youtube.com/watch?v=0Fi83BHQsMA **Unit-2** https://www.youtube.com/watch?v=q654-kmF3Pc http://www.uhv.org.in/ https://swayam.gov.in/nd1_noc19_mg60/preview **Unit-3** https://www.udemy.com/course/design-thinking-for-beginners/ https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them **Unit-4** https://www.youtube.com/watch?v=CLQd1wOS3mg&t=16s https://www.criticalthinking.org/pages/defining-critical-thinking/766 **Unit-5** https://swayam.gov.in/nd2_aic19_ma06/preview	5m 31s 1m 54 s 14m 26s 4m 19s 2m 49s (Way to Course) 47m 1d 14hrs 14m 10s Conference Paper 10 hrs
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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LAB Course Code: DAS0152	LAB Course Name: Semiconductor Physics and Devices Lab	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		0	0	2	1

Pre-requisite: Least count, Screw gauge, Vernier calipers

Course Objectives:

1. To provide the practical knowledge of the phenomenon blackbody.
2. To provide the practical knowledge of the characteristics of transistors.
3. To provide the practical knowledge of the characteristics of diodes.
4. To provide the practical knowledge of the characteristics of solar cell.
5. To provide the practical knowledge of dielectric constant.

Course Outcome: After completion of the course, the student will be able to:		Bloom's Knowledge Level (KL)
CO1	Apply the practical knowledge of the phenomenon of blackbody.	K3
CO2	Understand the characteristics of transistors.	K2
CO3	Analyze the characteristics of diodes.	K4
CO4	Analyze the characteristics of solar cell.	K4
CO5	Understand the dielectric constant.	K2

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	-	-	-	2	-	2	1	2	1	1	-	-
CO2	3	-	-	-	2	-	1	1	2	1	1	-	-
CO3	3	-	-	-	2	-	1	1	2	1	1	-	-
CO4	2	-	-	-	2	-	1	1	2	1	1	-	-
CO5	3	-	-	-	2	-	1	1	2	1	1	-	-

List Of Practical's (Indicative & Not Limited To)

1. To determine the energy band gap of a given semiconductor material.
2. To determine the Planck's constant using LEDs of known wavelength.
3. To study the Hall effect and determine the Hall coefficient, Carrier density and Mobility of a given semiconductor material using Hall effect setup.
4. To determine the resistivity of given material using four probe method.
5. To determine the dielectric constant of the material by charging and discharging of capacitor.
6. To determine the characteristics of photoelectric cell.
7. To verify Stefan's Law by electrical method.

8. To Plot V-I Characteristics of PN Junction diode.
9. Plot of gain in dB Vs frequency, measurement of bandwidth, input impedance, maximum signal handling capacity (MSHC) of Single stage common source FET amplifier.
10. To draw the static current-voltage (I-V) characteristics of a Zener diode.
11. To draw input and output characteristic of common base Bipolar Junction Transistor.
12. To draw input and output characteristic of common collector Bipolar Junction Transistor.
13. To draw input and output characteristic of common emitter Bipolar Junction Transistor.
14. To study FET as a Voltage Variable Resistor (VVR).
15. To plot the V-I Characteristics of the solar cell and hence determine the fill factor.
Total Hours: 30 hrs.

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LAB Course Code: DCSE0151	LAB Course Name: C Programming	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		0	0	4	2

Pre-requisite: Basic Mathematics and Number Systems

Course Objectives: 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. They will be able to develop complex real-world applications.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand the fundamentals, flowcharts, program structure, data types, operators, and the compilation process to develop error-free and logically correct programs.	K2
CO2	Apply modular and efficient programs using conditional branching, loops, functions (including recursion), input/output operations, storage classes, and pointers.	K3
CO3	Implement and manipulate one-dimensional and two-dimensional arrays and strings, applying them to solve problems like searching, sorting, matrix operations, structures, unions and file handling.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	2	2	1	1	1	3	1	2	3	2	1	2
CO2	3	2	3	2	2	1	1	1	1	1	2	3	2	1	2
CO3	3	3	3	2	3	2	1	1	1	1	1	3	2	1	2

Course Contents / Syllabus

Unit 1	Introduction to Algorithm and C Program	12 hours

Computer systems, Types of Software's, Linker, Loader Types of Computing Environments, Evolutional of Programming Languages Machine Language, Assembly Language, high level low level, Compilers etc,

Introduction to Algorithms: Definition, Properties of Algorithms, pseudocode and Flowchart, Algorithm vs Pseudocode. Programming Using C: C Tokens (Constants, variables, keywords), Datatypes, formatted and unformatted I/O functions, Structure of C program, Overview of compilation and execution process, Compiler vs Interpreter, Assembler, transition from algorithm to program, Syntax, logical errors, runtime errors, object and executable code, Application of C Programming.

Unit 2	Expression & Statements	12 hours

Operators and their types, Arithmetic expressions, and precedence: operators, operator precedence and associativity, type conversion. Control statements -Conditional Statements (if, else-if, nested if else, switch statements) use of break, and default with switch, Iteration and loops: Concept of loops, for, while, and do-while; while, multiple-loop variables; use of break and continue statements; nested loop, Expression statements-Null, Expression, Return, Compound statements.

Array notation and one-dimensional arrays, Declaration of one-dimensional arrays, initialization of one-dimensional arrays, Example programs: (searching and sorting), Two-dimensional arrays, declaration of Two-dimensional arrays, Initialization of Two-dimensional

Arrays, Example programs: Matrix multiplication, transpose of a matrix.

Strings: Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, String-handling Functions, Example Programs (with and without using built-in string functions).

Unit 3	**Functions & Pointers**	**12 hours**

Functions: Introduction to function, function, Built in Function, User defined functions, types of functions, passing parameters to techniques: call by value, call by reference. Recursion: Definition, Types of Recursive Functions, Attributes value, scope of variable, address, local and global variables, Nesting of scope Storage classes: Auto, Register, static, and External.

Pointers: defining and declaring pointer, & and * Operators, pointer arithmetic and scaling, Dangling Pointers, Void and Null Pointer, wild Pointer, Pointer and Array, Array of Pointer, Pointer & Structure.

Unit 4	**Structure & Union**	**12 hours**

Introduction, Initializing, defining, and declaring structure, Nesting Structures, accessing members, Operations on individual Structure within structures Array of structure, Structure Padding and Alignment

Union: Introduction, Initializing, defining, and declaring structure, Accessing members, Operations on individual members, Operations on the union, Difference between Structure and Union. Enumerations and typedef.

Unit 5	**Memory Allocation and File Handling**	**12 hours**

Dynamic Memory Allocation: Introduction, Library functions malloc, calloc, realloc, and free.

File Handling: Introductory Concepts of File Stream. File Types-text, Binary Files, File Openeing Modes, Input Output operations on File (getc() ,putc(),fprintf(),fscanf(),getw(), File Positioning functions -fseek.

	Total Lecture Hours	**60 hours**

Textbook:

S.No	**Book Title with publication agency & year**	**Author**
1	C: The Complete Reference, McGrawHill,4thEdition,2002.	Herbert Schildt
2	Computer Concepts and Programming in C, PHI Learning Pvt. Ltd., 2nd Edition, 2004.	E Balaguruswami,
3	Let Us C, BPB Publications, 19th Edition, 2022	Yashwant P.Kanetkar.
4	Mastering C, McGraw-Hill Education, 2nd Edition, 2010.	K.R Venugopal
5	**Working with C**, BPB Publications, 1996.	Yashwant P. Kanetkar

Reference Books:

S.No	**Book Title with publication agency & year**	**Author**
1	The C programming, Pearson Education	Kernighan Brain W.and Ritchie Dennis M
2	Computer Science-A Structured Programming Approach Using C,Third Edition, Cengage Learning-2007.	Behrouz A. Forouzan, RichardF. Gilberg, Thomson,
3	Computer Basics and C Programming, PHI Learning pvt. Limited,2015.	V. Rajaraman
4	Schrum's Outline of Programming with C,McGraw-Hill	Byron ,Gottfried
5	Computer Fundamentals and Programming in C,Oxford Publication	Reema Thareja

Self-Study Content Links:	**Duration (in Hrs)**

MOOCs	1. Programming in C https://onlinecourses.nptel.ac.in/ 2. Problem Solving Through Programming in C https://swayam.gov.in/ 3. Joy of Computing using Python (Algorithmic Thinking) https://swayam.gov.in/ 4. C Programming for Beginners https://www.udemy.com/topic/c-programming/ 5. C Programming Bootcamp https://www.udemy.com/	8 week 8 weeks 12 weeks 26 hours 44 hours
Video Lectures	**Unit 1**: Introduction to C Programming https://youtu.be/XM7f5x94068 **Unit 2**: Operators, Loops and Decision Making https://youtu.be/FYdYkiIHvRQ **Unit 3**: Functions and Pointers https://youtu.be/lVD74GSU-3w **Unit 4** : Structures and Unions https://www.youtube.com/results?search_query=structures+and+unions+in+c+neso+academy **Unit 5**: Dynamic Memory Allocation https://www.youtube.com/results?search_query=dynamic+memory+allocation+in+c+programming	3h 46m 31m 3hrs 47m 3hr 53m 31m
Web References	Wikibooks – C Programming https://en.wikibooks.org/wiki/C_Programming A Little C Primer https://en.wikibooks.org/wiki/A_Little_C_Primer	

Lab No.	Unit	Title of Program	CO Mapping
1.1	1	Write a C program to print "Hello, World!" and understand the basic structure of a C program.	CO1
1.2	1	Write a C program to demonstrate different data types (int, float, double, char) and use sizeof() operator.	CO1
1.3	1	Write a C program to demonstrate all arithmetic operators and understand operator precedence.	CO1
1.4	1	Write a C program using if, else-if, nested if-else to determine grade from marks.	CO1
1.5	1	Write a C program to implement a simple calculator using switch-case statement.	CO1
1.6	1	Write a C program demonstrating for, while, and do-while loops with break and continue.	CO1
1.7	1	Write a C Program to implement a half pyramid of *	CO1
1.8	1	Write a C Program to implement a Half pyramid of numbers	CO1
1.9	1	Write a C Program to implement a half pyramid of alphabets	CO1
1.10	1	Write a C Program to implement an inverted half pyramid of *	CO1
1.5	1	Write a C Program to implement an inverted half pyramid of numbers	CO1
1.6	1	Write a C Program to implement a full pyramid of *	CO1
1.7	1	Write a C Program to implement a full pyramid of numbers	CO1
1.8	1	Write a C Program to implement an inverted full pyramid of *	CO1
1.9	1	Write a C Program to implement Pascal's triangle	CO1
1.10	1	Write a C Program to implement Floyd's triangle	CO1
1.11	1	C Program to Print Diamond Pattern	CO1
1.12	1	C Program to Print Binary Triangle Pattern	CO1
1.13	1	C Program to Print Character Triangle	CO1
1.14	1	Star Pattern Programs in C	CO1
1.15	1	Pyramid Patterns in C	CO1

1.16	1	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. Rules for the game are as follows: There are 21 matchsticks. The computer asks the player to pick 1, 2, 3 or 4 matchsticks. After the person picks, the computer does its picking. – Whoever is forced to pick up the last matchstick loses the game.	CO1
1.17	1	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.	CO1
1.18	1	Design a calculator that performs Number system conversion	CO1
1.19	1	C Program to Simulate a Simple arithmetic Calculator	CO1
1.20	1	C Program to Evaluate the Given Polynomial Equation	CO1
1.21	1	C Program to Find Mean, Variance and Standard Deviation	CO1
1.22	1	C Program to Add Two Complex Numbers	CO1
1.23	1	C Program to Find Power of a Number	CO1
1.24	1	C Program to Calculate Pow (x,n)	CO1
1.25	1	C program to Find the Sum of Arithmetic Progression Series	CO1
1.26	1	C program to Find the Sum of Geometric Progression Series	CO1
1.27	1	C program to Find the Sum of Harmonic Progression Series	CO1
1.28	1	C Program to Find Sum of Series 1 + 1/2 + 1/3 + 1/4 + ……. + 1/N	CO1
1.29	1	C Program to Find Sum of Series 1^2 + 2^2 + …. + n^2	CO1
1.30	1	C Program to Find Sum of Series 1^3 + 2^3 + 3^3 + … + n^3	CO1
1.31	1	C Program to Find Sum of the Series 1/1! + 2/2! + 3/3! + ……1/N!	CO1
1.32	1	Design a program which displays following options on screen Figure Exit Enter Choice Once valid choice is entered it executes further. If choice one is entered, then it should display TRAINGLE SQUARE RHOMBUS TRAPEZIUM RETURN TO PREVIOUS MENU ENTER CHOICE 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	CO1
1.33	1	Do you wish to continue (Y/N)? And should work accordingly. Before every menu, the screen should be cleared.	CO1

1.34	1	C Program to Find the Largest Number Among Three Numbers	CO1
1.35	1	C Program to Find the Roots of a Quadratic Equation	CO1
1.36	1	C Program to Check Leap Year. Evaluate all the cases.	CO1
1.37	1	C Program to Check Whether a Number is Positive or Negative	CO1
1.38	1	C Program to Check Whether a Character is an Alphabet or not	CO1
1.39	1	C Program to Calculate the Sum of Natural Numbers	CO1
1.40	1	C Program to Find Factorial of a Number	CO1
1.41	1	C Program to Generate Multiplication Table	CO1
1.42	1	C Program to Display Fibonacci Sequence	CO1
1.43	1	C Program to Find GCD of two Numbers	CO1
1.44	1	C Program to Find LCM of two Numbers	CO1
1.45	1	C Program to Display Characters from A to Z Using Loop	CO1
1.46	1	C Program to Reverse a Number using looping concepts	CO1
1.47	1	C Program to Check Whether a Number is Palindrome or Not	CO1
1.48	1	C Program to Check Whether a Number is Prime or Not	CO1
1.49	1	C Program to Check Armstrong Number	CO1
1.50	1	C Program to Display Armstrong Number Between Two Intervals	CO1
1.51	1	C Program to Display Factors of a Number	CO1
1.52	1	C Program to Reverse a Number using looping concepts	CO1
1.53	1	C Program to Check Whether a Number is Palindrome or Not	CO1
1.54	1	C Program to Check Whether a Number is Prime or Not	CO1
1.55	1	C Program to Check Armstrong Number	CO1
1.56	1	C Program to Display Armstrong Number Between Two Intervals	CO1
1.57	1	C Program to Display Factors of a Number	CO1
1.58	1	C Program to Make a Simple Calculator Using switch...case	CO1
1.59	1	C Program to Check Whether a Number is Even or Odd	CO1
1.60	1	C Program to Check Whether a Character is a Vowel or Consonant	CO1
1.61	1	C Program to Find the Largest Number Among Three Numbers	CO1
1.62	1	C Program to Check Whether a Number is Positive or Negative	CO1
1.63	1	C Program to Calculate the Sum of Natural Numbers	CO1
1.64	1	C Program to Find Factorial of a Number	CO1
1.65	1	C Program to Generate Multiplication Table	CO1
1.66	1	C Program to Display Fibonacci Sequence	CO1
1.67	1	C Program to Display Prime Numbers Between Intervals Using Function	CO1
1.68	1	C Program to Check Prime or Armstrong Number Using User-defined Function	CO1
1.69	1	C Program to Check Whether a Number can be Expressed as Sum of Two Prime Numbers	CO1
1.70	1	C Program to Find the Sum of Natural Numbers using Recursion	CO1
2.1	2	Write a C program demonstrating formatted input and output using scanf() and printf() with various format specifiers and field widths.	CO2
2.2	2	Write a C program to find the roots of the equation $ax^2 + bx + c = 0$ using the discriminant.	CO2
2.3	2	Write C programs to (a) print Fibonacci series, (b) check prime number, (c) check Armstrong number.	CO2

2.4	2	Write a C program demonstrating function definition, call by value, and different types of functions (no-arg, with-arg, return value).	CO2
2.5	2	Write a C program to implement recursive functions for finding the reverse of a number and checking palindrome.	CO2
2.6	2	C Program to Find Factorial of a Number Using Recursion	CO2
2.7	2	C Program to Find G.C.D Using Recursion	CO2
2.8	2	C Program to Convert Binary Number to Decimal and vice-versa	CO2
2.9	2	C program to calculate the power using recursion	CO2
2.10	2	C Program to Check Prime or Armstrong Number Using User-defined Function	CO2
2.11	2	C Program to Find the Sum of Natural Numbers using Recursion	CO2
2.12	2	Design a calculator	CO2
2.13	2	Design a Menu Driven program which performs the functions as per the menu Add Details of students Search the student data Display the records Name must not be blank, and first letter should be alphabet Student details should contain Name. Age, Class, Roll-No Exit Enter the Choice: Note: Choice must be between 1-4 Only. Other than that, an error message must be displayed and entry should be done again	CO2
2.14	2	C Program to Add Two Numbers Using Recursion.	CO2
2.15	2	C Program to find the sum of digits of a number using recursion.	CO2
2.16	2	Write a method in C that will remove any given character from a string.	CO2
3.1	3	Write a C program demonstrating function definition, call by value, and different types of functions (no-arg, with-arg, return value).	CO3
3.2	3	C Program to Calculate Average Using Arrays	CO3
3.3	3	C Program to Find Largest Element in an Array	CO3
3.4	3	C Program to search an element	CO3
3.5	3	C Program to Add Two Matrices Using Multi-dimensional Arrays	CO3
3.6	3	C Program to Multiply Two Matrices Using Multi- dimensional Arrays	CO3
3.7	3	C Program to Find Transpose of a Matrix	CO3
3.8	3	Write a C program to declare a pointer, store the address of a variable in it, and display the value and address of the variable using the pointer.	CO3
3.9	3	C Program to Access Array Elements Using Pointer	CO3
3.10	3	Write a C program to swap two numbers using pointers and a user-defined function.	CO3
3.11	3	C Program to Calculate Average Using Arrays	CO3
3.12	3	C Program to Find Largest Number Using Dynamic Memory Allocation	CO3
3.13	3	C Program to Calculate Standard Deviation	CO3
3.14	3	C Program to Find the Frequency of Characters in a String	CO3
3.15	3	C Program to Count the Number of Vowels, Consonants and so on	CO3
3.16	3	C Program to Remove all Characters in a String Except Alphabets	CO3
3.17	3	C Program to Find the Length of a String	CO3
3.18	3	C Program to Concatenate Two Strings	CO3
3.19	3	C Program to Copy String Without Using strcpy()	CO3

3.20	3	C Program to Sort Elements in Lexicographical Order (Dictionary Order)	CO3
3.21	3	C Program to Find the Frequency of Characters in a String	CO3
3.22	3	Write a method in C which will remove any given character from a String.	CO3
3.23	3	Write a program in C to count occurrence of a given character in a String.	CO3
3.24	3	Write a program in C to check if two Strings are Anagram.	CO3
3.25	3	Write a program in C to check a String is palindrome or not.	CO3
3.26	3	C program to check given character is vowel or consonant.	CO3
3.27	3	C program to check given character is digit or not.	CO3
3.28	3	C program to replace the string space with a given character.	CO3
3.29	3	C program to convert lowercase char to uppercase of string.	CO3
3.30	3	C program to convert lowercase vowel to uppercase in string.	CO3
3.31	3	C program to delete vowels in a given string.	CO3
3.32	3	C program to count Occurrence Of Vowels & Consonants in a String.	CO3
3.33	3	C program to print the highest frequency character in a String.	CO3
3.34	3	C program to Replace First Occurrence Of Vowel With '-' in String.	CO3
3.35	3	C program to count alphabets, digits and special characters.	CO3
3.36	3	C program to separate characters in a given string.	CO3
3.37	3	C program to remove blank space from string.	CO3
3.38	3	C program to count blank space from string.	CO3
3.39	3	C program to concatenate two strings.	CO3
3.40	3	C program to remove repeated character from string.	CO3
3.41	3	C program to calculate sum of integers in string.	CO3
3.42	3	C program to print all non-repeating character in string.	CO3
3.43	3	C program to copy one string to another string.	CO3
3.44	3	C Program to sort characters of string.	CO3
3.45	3	C Program to sort character of string in descending order.	CO3
3.46	3	Write a program in C for, In array 1-100 numbers are stored, one number is missing how do you find it.	CO3
3.47	3	Write a program in C for, In a array 1-100 multiple numbers are duplicates, how do you find it.	CO3
3.48	3	Write a program in C to find first duplicate number in a given array.	CO3
3.49	3	Write a program in C to remove duplicate elements form array in C.	CO3
3.50	3	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
3.51	3	Write a program in C for, How to compare two array is equal in size or not.	CO3
3.52	3	Write a program in C to find largest and smallest number in array.	CO3
3.53	3	Write a program in C to find second highest number in an integer array.	CO3
3.54	3	Write a program in C to find top two maximum number in array?	CO3
3.55	3	C program to print array in reverse Order.	CO3
3.56	3	C program to reverse an Array in two ways.	CO3
3.57	3	C Program to calculate length of an array.	CO3
3.58	3	C program to insert an element at end of an Array.	CO3
3.59	3	C program to insert element at a given location in Array.	CO3
3.60	3	C Program to delete element at end of Array.	CO3
3.61	3	C Program to delete given element from Array.	CO3

3.62	3	C Program to delete element from array at given index.	CO3
3.63	3	C Program to find sum of array elements.	CO3
3.64	3	C Program to print all even numbers in array.	CO3
3.65	3	C Program to print all odd numbers in array.	CO3
3.66	3	C program to perform left rotation of array elements by two positions.	CO3
3.67	3	C program to perform right rotation in array by 2 positions.	CO3
3.68	3	C Program to merge two arrays.	CO3
3.69	3	C Program to find highest frequency element in array.	CO3
3.70	3	Write a C program to compute factorial and Fibonacci using recursion, and solve the Tower of Hanoi problem.	CO3
4.1	4	Write a C program to implement (a) linear search and (b) bubble sort on a 1D array.	CO3
4.2	4	Write a C program to perform matrix multiplication and find the transpose of a matrix using 2D arrays.	CO3
4.3	4	Write a C program to perform string operations: length, copy, concatenate, compare, reverse – both using and without using built-in functions.	CO3
4.4	4	C Program to Store Information of a Student Using Structure	CO3
4.5	4	C Program to Store Information of Students Using Structure	CO3
4.6	4	C Program to Store Data in Structures Dynamically	CO3
4.7	4	C Program to Store Information of a Student Using Structure	CO3
4.8	4	C Program to Add Two Distances (in inch-feet system) using Structures	CO3
4.9	4	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.	CO3
5.1	5	Write a C program to demonstrate dynamic memory allocation using malloc(), calloc(), realloc(), and free().	CO3
5.2	5	C Program to Write a Sentence to a File	CO3
5.3	5	C Program to Read the First Line From a File	CO3
5.4	5	C Program to showcase use of DMA	CO3
5.5	5	C Program to Write a record to a File	CO3
5.6	5	C Program to Read the last Line From a File	CO3
5.7	5	Program to create a file using command line argument	CO3
5.8	5	Program to copy one file into another	CO3
5.9	5	Implement macro handling	CO3
5.10	5	Program to write a structure into a file and display its content	CO3
5.11	5	Program to search a record in a file	CO3
5.12	5	Program to implement multi line macro and Conditional Macros	CO3
5.13	5	Program to draw Circle/Rectangle/Triangle/ A Hut/with colors in it	CO3
5.14	5	Program to shut down/ sleep a system if not component is being touched	CO3
5.15	5	Write a program in C to create and store information in a text file.	CO3
5.16	5	Write a program in C to read an existing file.:	CO3
5.17	5	Write a program in C to write multiple lines to a text file.:	CO3
5.18	5	Write a program in C to read the file and store the lines in an array.	CO3
5.19	5	Write a program in C to find the number of lines in a text file.	CO3

5.20	5	Write a program in C to find the content of a file and the number of lines in a text file.	CO3
5.21	5	Write a program in C to count the number of words and characters in a file.	CO3
5.22	5	C Program to list all files and sub-directories in a directory	CO3
5.23	5	C Program to count number of lines in a file	CO3
5.24	5	C Program to print contents of file	CO3
5.25	5	C Program to copy contents of one file to another file	CO3
5.26	5	C Program to merge contents of two files into a third file	CO3
5.27	5	C Program to read records from a data file	CO3
5.28	5	C Program to count number of lines, words, characters, blank space in a file	CO3
5.29	5	C Program to Illustrate how User Authentication is Done	CO3
5.30	5	C Program to Shutdown Computer in Linux	CO3
5.31	5	C Program to Compute First N Fibonacci Numbers using Command Line Arguments	CO3
5.32	5	C Program to Generate Fibonacci Series using Command Line Argument	CO3
5.33	5	Design an ATM Simulation using C 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.	CO3
5.34	5	The following modules are included in this project. Add Employee Details Edit Employee details Modify Employee Delete Employee Create a Database using C file structure	CO3
5.35	5	A Library in charge is facing problems in handling books and customers. Design a solution using C regarding his problem	CO3
5.36	5	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.	CO3

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)

LAB Code: DME0151	LAB Course Name: CAD & Digital Manufacturing	L	T	P	C
Course Offered in: B.Tech- First Semester ECE/ECE(VLSI)		0	0	2	1

Pre-requisite: NIL

Course Objectives: The objective of this lab is to enable students to understand and apply the fundamentals of CAD and digital manufacturing, including 2D drafting, 3D modeling, and 3D printing processes. Students will gain hands-on experience with design tools, slicing software, and post-processing techniques to develop functional digital-to-physical prototypes.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand the principles of 2D geometry and orthographic projection and apply them to manual and computer-aided drafting.	K3
CO2	Develop 3D models of components using CAD tools and apply appropriate dimensioning and modeling techniques.	K3
CO3	Identify the components of a 3D printer and understand the workflow from CAD file preparation to STL conversion for 3D printing.	K2
CO4	Use slicing software to generate G-code from 3D models and analyze the slicing parameters, support structures, and print previews.	K3
CO5	Perform 3D printing of parts and assemblies and demonstrate post-processing techniques to enhance surface finish, fit, and function.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	-	-	2	1	1	1	1	1	1	2	2	3
CO2	3	1	-	1	3	2	1	1	1	1	1	2	3	3
CO3	3	2	2	1	3	3	1	1	2	1	1	2	3	2
CO4	3	1	-	-	2	3	2	1	2	1	1	2	2	2
CO5	3	2	2	1	3	3	2	1	2	1	1	2	3	3

List Of Practical's (Indicative & Not Limited To)

1. To introduce the user interface of CAD software and its elements/tools/commands.
2. To draw the sheet layout and title block using aligned system of dimensioning.
3. To apply the Aligned Dimensioning System to precisely reproduce the given 2D drawings using CAD software.
4. To accurately create and represent the given 2D drawing in CAD, utilizing the Aligned System of dimensioning.
5. To design the given 3D Component in CAD software, utilizing the Aligned System of dimensioning.
6. To design the given 3D Component in CAD software, utilizing the Unidirectional System of dimensioning and Layer Properties.

7. Introduction to 3D printer and explore features and specifications like Machine setting (e.g., Nozzle, Print Bed, etc.) for FDM 3D printer.
8. To upload the part and set up the position and orientation of the model (use of various commands like Move, Scale, Rotate, Mirror etc.) in slicing software.
9. To use slicing software for converting a 3D CAD model into a G code on cloud based slicing software and adding the reinforcing of layers of composites within slicing software.
10. To create the G-code file for 3D printing purpose using raft, brim and skirt in the slicing software to fulfill the adaptive need of 3d printer.
11. A case study on different types of 3D printers.

Textbook:

S.No	Book Title	Author
1	CAD/CAM: Computer Aided Design And Manufacturing	Azhar Wahab and SSR Krishna
2	CAD/CAM: Computer Aided Design And Manufacturing	Pearson Publication

Reference Books:

S.No	Book Title	Author
1	Engineering Drawing	N. D. Bhatt
2	3D Printing: A practical and hands-on textbook for mastering 3D printing technology	BPB Publications

Self-Study Content Links:		Duration (in Hrs)
MOOCs	https://nptel.ac.in/courses/112104031	15 hrs
Video Lectures	https://nptel.ac.in/courses/113108632 https://www.youtube.com/watch?v=VtLXKU1PpRU	15 hrs
Web References	https://swayam-plus.swayam2.ac.in/courses/course-details?id=P_IITMPR_03 https://www.youtube.com/	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA-201306

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LAB Course Code: DCSE0153	LAB Course Name: Linux and Scripting Lab	L	T	P	C
Course Offered in: B.Tech.- First Semester ECE/ECE(VLSI)		0	0	2	1

Pre-requisite:

1. Linux Command Line Basics

2. Basic Programming Concepts:

3. Shell Scripting

4. Tools and Resources

Course Objectives:

1. To introduce the basics of the Linux operating system and its command-line interface.

2. To perform essential file, directory, and system operations using Linux commands.

3. To develop basic scripting skills using TCL for automation tasks.

4. To apply Linux and TCL scripting for solving real-world system problems.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand Linux basics, directory structure, and essential command-line utilities.	K2
CO2	Apply Linux commands for file handling, system monitoring, and disk management.	K3
CO3	Develop and execute TCL scripts for automation and basic system tasks.	K3
CO4	Analyse and differentiate Linux commands and TCL scripts to solve administrative problems.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	2	3	-	-	-	-	2	-	1	3	2
CO2	1	3	2	1	3	-	-	-	-	2	-	1	1	3
CO3	2	2	3	2	3	-	-	-	3	2	2	1	3	1
CO4	2	2	-	1	3	-	-	-	3	2	2	1	1	2

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013842472983568384153 54_shared/overview	12h 40m
Video Lectures	**Unit: 1** https://www.youtube.com/watch?v=TtGM9GfBuok&list=PL0tP8lerTbX3MeIyMxGW2sLhWnPdn_xhd **Unit:2** https://www.youtube.com/watch?v=ETF6CapGAvc&list=PL0tP8lerTbX3MeIyMxGW2sLhWnPdn_xhd&index=4 **Unit:3** **https://www.youtube.com/watch?v=Byx4sgLR88E&t**	2h 48m 24s 40m 52s 2h 49s

	Unit:4 **https://www.youtube.com/watch?v=TtGM9GfBuok&list=PL0tP8lerTbX3MeIyMxGW2sLhWnPdn_xhd:**	5h 10m 15s
Web References	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013295088520658944467 14_shared/overview https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01329136535424204 8145_shared/overview	3m 27s 24m 59s

List Of Practical's (Indicative & Not Limited To)

1. To Study Linux Basics
2. To implement and execute Linux Directory Structure.
3. To implement and execute Linux Basic Commands.
4. To implement and execute Copy, Remove, Move and Time Commands.
5. To implement and execute df, diff and Grep Commands and differentiate between df and diff commands.
6. To implement and execute Head, tail, sort and more commands.
7. To implement and execute tr and wc commands.
8. To Study Getting Help From Command Line user Interface (CLI).
9. To implement and execute rmdir and exit command.
10. To implement and execute date and more command.
11. To implement and execute cat, less and more command and explain the difference between cat and less command.
12. To implement and execute sort, scp command.
13. To implement and execute Disk utilities like fdisk, df and du commands.
14. To implement and execute w, who, hostnamem hostnamectl and uname commands.
15. To implement and execute Search for files and directories using find and locate commands
16. To implement and execute top command and its output explanation

TCL Scripting

17. To Write Example TCL script that takes a user's name as input and greets them.
18. To Write Example TCL script that do
    - String Comparison
    - Index creation
    - Calculation of Length of String
19. To Write Example TCL script demonstrating Handling Cases.
20. To Write Example TCL script that creates
    - Trimming of Characters.
    - Identification of Matching Strings.
21. To Write Example TCL script demonstrating Append Command
    - List Creation.
    - Appending Item to a List
    - Length of List
22. To Write Example TCL script that calculates the sum of integers from 1 to N using a loop.
23. To Write Example TCL script that searches for a specific word in a file and counts its occurrences.
24. To Write Example TCL script to illustrate 'for' loop.
25. To Write Example TCL script to illustrate Arithmetic operators.

26. To Write Example TCL script to display the structure of your file system directory.
27. To Write Example TCL script to modify all files in a directory.
28. To Write Example TCL script to Take Backup of a Particular File.
29. To Write Example TCL script to Connect to remote host and send the password (create automate login SSH).
30. To Write Example TCL script to Collect Multiple Servers CPU, MEM, DISK usage in single report.
Total Hours: 30 hrs.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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LAB Course Code: DASL0151	LAB Course Name: Acquiring Business Communication (ABC) Lab	L	T	P	C
Course Offered in: B.Tech- First Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		0	0	4	2

Pre-requisite: Comprehension of basic English language

Course Objectives:

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

Course Outcome: After completion of the course, the student will be able to

S. No	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Identify essential soft skills for the workplace	K1
CO2	Apply effective listening skills	K3
CO3	Acquire fluency and clarity of speech	K3
CO4	Understand and analyse written texts	K4
CO5	Create clear, correct, and concise written content	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	1	1	1	1	1	1	2	3	1
CO2	1	1	1	1	1	1	1	1	2	3	1
CO3	1	1	1	1	1	1	1	1	2	3	1
CO4	1	2	2	2	2	2	2	1	2	3	1
CO5	2	1	2	1	2	1	2	1	2	3	1

List Of Practical

1. **Orientation**

a. Introduction to the course

b. Introduction to the evaluation scheme & the British Council English Score Tests

Developing Communication Skills

- Confidence building activities
- Overcoming initial hesitations

2. ***Anubhav*** **Activity**

- The Students will share their own reservations and expectations from the course.

Showcasing talents

- Participants will gain confidence in expressing themselves through song/dance, overcome inhibitions, and develop a sense of freedom and creativity.

3. **Developing active listening and accurate communication skills**

- The students will enhance their listening skills, practice conveying information accurately, and understand the importance of clear communication and active listening.

4. **Language Toolbox 1: Vocabulary enrichment**

- The students 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.

5. **Think-Pair-Share for Reading Comprehension**

- The students will actively interact with the reading material by engaging in this activity, collaborating with their peers, and refining their comprehension skills.

6. **Essentials of Writing – Requisites of a good sentence** The students will learn to construct sentences which showcase clarity, consistency and correctness in structure, word usage and punctuation through activities like picture prompts and verbal clues.

7**. Professional Introductions (Video recorded)**

- The students will practice professional introductions with emphasis on clarity, correctness, voice modulation, and engaging content.

8**. Listen and write**

- The students will practice writing exactly what they hear.

Listen and Repeat

- The students will practice speaking, with correct pronunciation and intonation, what they hear.

9. **Pronunciation**

- Vowel & Consonant sounds which are difficult for Indian speakers
- Syllable division & accent

10. **Reading Techniques for Time Management**

- The students will be able to identify keywords, headings, and topic sentences. Further, they will be able to analyze and synthesize information from the selected texts.

11. **Paragraph Writing (Unity, Cohesion, Emphasis)**

- The students will learn to write with emphasis on correctness of grammatical structure, concord, voice, and tenses.

12. **Language Toolbox 3: Vocabulary Building – Homophones, homonyms, synonyms, antonyms, phrases & idioms**

- The students will be able to bring in variety in the usage of words.

13. **Building formal attitude through language, dress, and behavior**

- The students will understand the importance of formal dressing and professional behavior in academic and workplace settings.

14. **Clarity in articulation**

- The students will practice accent, rhythm, and intonation in connected speech (Ref. English Score – Speaking/ SVAR/ Versant/etc.)

15. **Listening to follow directions and instructions precisely**

- The students will improve their listening comprehension and enhance their ability to follow instructions & directions.

16. **Speaking in front of an audience**

JAM, Extempore

- The students will develop the ability to speak confidently and fluently in front of an audience by organizing their thoughts quickly, expressing ideas clearly, managing time effectively, and using appropriate body language, voice modulation, and eye contact to overcome stage fear and hesitation.

17. **Analysing Caselets**

- The students will improve their analytical and speaking skills by analysing & providing solutions to the issues in the caselets.

18. **Basics of Email Writing**

- The students will be able to write letters/applications on topics from real life scenarios.

19. ***Anubhav* Activity**

- The students will talk about their key takeaways from the sessions/test scores this far.

20. **Analysing Speech/ Ted Talks**

- The students will be able to improve their listening by analysing speeches by famous personalities/Ted Talks.

21. **Sharing views in a group discussion**

- The students will enhance their ability to express their opinions, actively listen to others, and engage in constructive discussions to develop well-rounded perspectives.

22. **Decoding infographics**

- The students will improve their ability to interpret and analyse information presented in diagrams, graphs, and pie charts.

23. **Writing Essay**

- The students will practice writing coherently, logically, precisely, and correctly on a wide variety of topics.

24. ***Anubhav* Activity**

The students will reflect on the semester and the road map ahead.

Total Hours: 60 hrs.

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	NPTEL – "Soft Skills" by Prof. Binod Mishra, IIT Roorkee (covers effective communication, group discussion, interviews & presentations) – onlinecourses.nptel.ac.in	15
	Coursera – "Improve Your English Communication Skills" Specialization, Georgia Institute of Technology – coursera.org	25
Video Lectures	NPTEL/YouTube – "Communication Skills" by Prof. T. Ravichandran, IIT Kanpur (reading, writing, listening & speaking modules)	14
	English Speaking & Grammar" series, Learn English with Let's Talk (pronunciation, vocabulary & fluency practice)	10
Web References	Purdue Online Writing Lab (OWL) – Business Writing & Professional Correspondence – owl.purdue.edu	5
	BBC Learning English – Business English & Pronunciation modules – bbc.co.uk/learningenglish	8

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DNC0103	Course Name: Essence of Indian Traditional Knowledge	L	T	P	C
Course Offered in: B.Tech- First Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		**2**	**0**	**0**	**NC**

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

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

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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	2	2	1	1	3	2	2	2	1	2		
CO2	1	1	2	1	1	3	2	2	2	1	2		
CO3	1	1	2	1	1	3	2	3	3	2	2		
CO4	2	2	3	2	2	3	3	2	2	1	2		
CO5	1	1	2	1	1	3	2	2	2	2	3		

Course Contents / Syllabus

Unit 1	**Society State and Polity in India**	**6 hours**

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.

Unit 2	**Indian Literature, Culture, Tradition, and Practice**	**6 hours**

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, **Sikh Literature**, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature.

Unit 3	Indian Religion, Philosophy, and Practices	6 hours
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.		
Unit 4	**Science, Management and Indian Knowledge System**	**6 hours**
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.		
Unit 5	**Cultural Heritage and Performing Arts**	**6 hours**
Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema		
	Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1.	Indian Art and Culture: for civil services and other competitive Examinations	Nitin Singhania

Reference Books:

S.No	Book Title	Author
1.	The Wonder that was India (34th impression)	A. L. Basham

Self-Study Content Links:		Duration (in Hrs)
MOOCs	https://www.classcentral.com/course/swayam-indian-popular-culture-292678 https://www.udemy.com/course/indian-history-chronology/	24.00 1.50
Video Lectures	https://youtu.be/xUphsn5b1w8?si=P8PqTnYUrNP3aWU7 https://youtu.be/SeTjQHzLci0?si=E-DEaKnWJEPN8yHj https://youtu.be/32XmLQxwhlQ?si=Ew7hFEL12E_3rPkh https://youtu.be/iof_dTG4cnQ?si=QWhHFeacVcYZ7mmR https://youtu.be/xmtM0ilhBIU?si=w9MQv8HSdzBXD321 https://youtu.be/7dT2eg3ekk0?si=YIDa9kfxJfTAyK1l https://youtu.be/xhqP7rPGNu4?si=WxdcjHKqmD3HGWge https://youtu.be/qE23vA4dHkk?si=6D9q-hKN57UVjUUV	1.00 0.09 0.23 1.05 1.09 1.26 0.26 0.33
Web References	https://en.wikipedia.org/wiki/Indian_religions	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DNC0102	Course Name: Constitution of India, Law And Engineering	L	T	P	C
Course Offered in: B.Tech- First Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		2	0	0	NC

Pre-requisite: Basic understanding of political science

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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	1	2	1	1	3	2	2	1	2	1		
CO2	1	2	2	1	1	3	2	2	2	2	1		
CO3	1	2	2	1	1	3	2	3	1	2	1		
CO4	2	2	3	2	2	3	3	3	2	2	2		
CO5	2	2	3	2	1	3	2	3	2	3	2		

Course Contents / Syllabus

Unit 1	**Introduction and Basic Information about Indian Constitution**	**6 hours**

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.

Unit 2	**Union Executive and State Executive**	**6 hours**

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.

Unit 3	Introduction and Basic Information about Legal System	6 hours
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.		
Unit 4	**Intellectual Property Laws and Regulation to Information**	**6 hours**
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.		
Unit 5	**Business Organizations and E-Governance**	**6 hours**
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 and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.		
	Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1.	Introduction to the Indian Constitution	Brij Kishore Sharma

Reference Books:

S.No	Book Title	Author
1.	The Indian Constitution	Madhav Khosla

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://www.google.com/url?sa=i&source=web&rct=j&url=https://onlinecourses.nptel.ac.in/noc25_lw02/preview&ved=2ahUKEwjL_K6Lt8KVAxUo3TgGHdmhN3oQy_kOegoIAggACAAIDxAJ&opi=89978449&cd&psig=AOvVaw3iygHhUeKYg3egnz62E-ST&ust=1783577767518000	10
Video Lectures	https://nptel.ac.in/courses/129106411?	10
Web References	https://www.legislative.gov.in/documents/constitution-of-india?	10

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DAS0203B	Course Name: Differential Equations and Fourier Transform	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		3	1	0	4

Pre-requisite: Knowledge of Mathematics I of B. Tech or equivalent.

Course Objectives: The objective of this course is to familiarize the engineering students with techniques of solving Ordinary Differential Equations, Fourier series expansion, Laplace Transform, Partial Differential Equation and Fourier transform 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 Outcome: After completion of the course, the student 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	Illustrate the solution of partial differential equation of second order	K3
CO5	Apply the concept of Fourier Transform to solve engineering problems.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	3	-	-	-	-	1	2		
CO2	3	3	3	2	2	-	-	-	-	1	2		
CO3	3	2	3	2	3	-	-	-	-	1	2		
CO4	3	2	3	2	3	-	-	-	-	1	2		
CO5	3	2	3	2	2	-	-	-	-	1	1		

Course Contents / Syllabus

Unit 1	Ordinary Differential Equation of Higher Order	9 hours

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.

Unit 2	Sequences and series	9 hours

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.

Unit 3	Laplace Transform	9 hours

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 differential equations.

Unit 4	Partial Differential Equation	9 hours
Solution of first order Lagrange's linear partial differential equations, Second order linear partial differential equations with constant coefficients (homogeneous and non-homogeneous), classification of second order partial differential equations. Solution of one-dimensional wave and heat equations.		
Unit 5	**Fourier Transform**	**9 hours**
Complex Fourier transform, Inverse Transforms, Convolution Theorems, Fourier sine and cosine transform.		
	Total Lecture Hours	**45 hours**

Textbook:

S.No	Book Title	Author
1	Higher Engineering Mathematics, Tata Mc Graw-Hill Publishing Company Ltd.	B. V. Ramana,
2	Higher Engineering Mathematics, Khanna Publisher	B.S. Grewal
3	Advance Engineering Mathematics, Narosa Publishing House.	R K. Jain & S R K. Iyenger
4	Advance Engineering Mathematics, University Science Press	N.P. Bali

Reference Books:

S.No	Book Title	Author
1	Advance Engineering Mathematics, John Wiley & Sons.	E. Kreyszig
2	Advance Engineering Mathematics, Thomson (Cengage) Learning.	Peter V. O'Neil
3	Calculus, Eleventh Edition, Pearson.	Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas
4	Calculus and Analytical Geometry, Ninth Edition Pearson.	G.B Thomas, R L Finney
5	Fourier Series and Boundary Value Problems, 8th Edition-Tata McGraw-Hill.	James Ward Brown and Ruel V Churchill
7	Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi.	Veerarajan T.
8	Ordinary Differential Equations, Application, Model and Computing, CRC Press T&F Group.	Charles E Roberts Jr
9	Advanced Engineering Mathematics, 6th Edition, Tata McGraw-Hill.	Ray Wylie C and Louis C Barret
11	Engineering Mathematics, 1st Edition, Pearson India Education Services Pvt. Ltd.	P. Sivaramakrishna Das and C. Vijayakumari
12	Advanced Engineering Mathematics By Khanna Publishing House, Delhi.	Chandrika Prasad, Reena Garg

Self-Study Content Links:		Duration (in Hrs)
MOOCs	https://www.coursera.org/learn/differential-equations-engineers#modules	17 Hrs
Video Lectures	**Unit 1** https://www.youtube.com/watch?v=1HKn9IvYiEM&list=PLU6SqdYcYsfI5CvOHMVOxxMWdAKWG67Xq&index=1	27:27m 27:27m

	https://www.youtube.com/watch?v=1HKn9IvYiEM&list=PLU6SqdYcYsfI5CvOHMVOxxMWdAKWG67Xq	34:28m
	https://www.youtube.com/watch?v=n_3ZmnVnrc4	19:14m
	https://www.youtube.com/watch?v=19Vt7ds8Lvw	
	Unit 2 https://www.youtube.com/watch?v=HUKR4LWrZ14&t=74s	13:44
	https://www.youtube.com/watch?v=uei7JPnPpVg	8:40
	https://www.youtube.com/watch?v=ummJvI0Ax2Q	11:43
	https://www.youtube.com/watch?v=bWTmUWWZnhQ	51:33
	https://www.youtube.com/watch?v=wpN1wn98XiA	12:49
	https://www.youtube.com/watch?v=gK1Y11UxOhw	9:30
	https://www.youtube.com/watch?v=Clwkvn77QrE&t=10s	9:05
	https://www.youtube.com/watch?v=LGxE_yZYigI	43:20
	Unit 3 https://www.youtube.com/watch?v=OA1OJrfpP20	17:57m
	https://www.youtube.com/watch?v=OA1OJrfpP20&list=PLU6SqdYcYsfIWugLkTq1nMoU3rDDx7xpG	17:23m
	Unit 4 https://youtu.be/NmRQ3sjp8Eo	21:34
	https://youtu.be/gG_bDhPibQo	29:47
	Unit 5 http://digimat.in/nptel/courses/video/111102129/L01.html	29:30
	http://digimat.in/nptel/courses/video/111102129/L22.html	24:05
	http://digimat.in/nptel/courses/video/111102129/L17.html	31:19
	http://digimat.in/nptel/courses/video/111102129/L21.html	27:16
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DEC0202	Course Name: Digital System Design	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		3	0	0	3

Pre-requisite: Number system

Course Objectives: The student will learn about

1. Boolean algebra, logic function minimization by K map, binary codes.
2. Designing and analysis of combinational circuit.
3. Designing and analysis of sequential circuits.
4. Synchronous & Asynchronous Sequential Circuits.
5. Semiconductor memories and programmable logic devices.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Verify the logic operations and apply the optimization techniques to implement logic functions.	K2,K3
CO2	Design and analyze combinational logic circuits.	K2,K3
CO3	Explain different types of flip-flops and apply to implement sequential circuits.	.K2,K3
CO4	Design and analyze Synchronous & Asynchronous Sequential Circuits.	K3,K4
CO5	Explain the concept of Semiconductor Memories and implement the digital logic functions using PLDs.	K3,K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	-	-	-	-	-	-	-	-	2	2	1
CO2	3	3	3	-	-	-	-	-	-	-	-	2	2	2
CO3	3	3	3	-	-	-	-	-	-	-	-	3	3	2
CO4	3	3	3	-	-	-	-	-	-	-	-	3	3	3
CO5	3	3	3	-	-	-	-	-	-	-	-	3	3	2
Average	3	3	2.8	-	-	-	-	-	-	-	-	2.6	2.6	2

Course Contents / Syllabus

Unit 1	**Logic Simplification and Binary Codes**	**9 hours**

Review of **n**umber systems, complements of numbers, Boolean algebra, Demorgan's theorem, logic gates, SOP & POS forms, canonical forms, Karnaugh maps, multilevel NAND/NOR realizations, binary codes.

Unit 2	**Combinational Logic Circuits**	**9 hours**

Code Converter, Comparators, Adders: half adder, full adder, subtractors: half subtractor, full subtractor, multiplexers, demultiplexers, encoders, priority encoder and decoders.

Unit 3	**Sequential Logic and Its Applications**	**9 hours**

Sequential Circuits Fundamentals: Latches **&** Flip Flops: SR, JK, D and T Type Flip Flops, JK master slave, excitation and characteristics table of all flip flops, conversion from one type of flip-flop to another. shift registers, universal shift register.

Unit 4	**Synchronous & Asynchronous Sequential Circuits**	**9 hours**

Synchronous Sequential Circuits: Design and analysis of clocked sequential circuits, state reduction and assignments, mealy and moore model, design of sequence detector and counters.

Asynchronous Sequential Circuits: Design and analysis of asynchronous sequential circuits, reduction of state and flow table, race-free state assignment, counters, hazards.

Unit 5	**Programmable Logic Devices**	**9 hours**

Semiconductor Memories: Basic concepts and hierarchy of Memory**,** Memory elements-ROM, RAM, comparison, designing and circuit implementation using programmable logic devices: PROM, PAL, PLA.

	Total Lecture Hours	**45 hours**

Textbook:

S.No.	**Book Title**	**Author**
1.	"Digital Design, 6th Edition", Pearson India 2018.	M. Morris Mano and Michael D. Ciletti
2.	"Modern digital Electronics", Tata McGraw Hill, 4th edition, 2009.	R.P. Jain

Reference Books:

S.No.	**Book Title**	**Author**
1.	Digital Design: Principles and Practices, Pearson, (2000).	John F Wakerly
2.	Theory and Logic Design, PHI, 2013.	A. Anand Kumar

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://www.coursera.org/learn/digital-systems	29hr
Video Lectures	**Unit 1**	
	https://www.youtube.com/watch?v=juJR_JDJRa0	60m
	https://www.youtube.com/watch?v=2cpl_HjcI3A	23m
	https://www.youtube.com/watch?v=hCmbZ0bWPfE&list=PL8aIjWXnCcnReye61TfoB02x81Be6Mh3D	100m
	https://www.youtube.com/watch?v=KergVtV3SxU	30m
	https://www.youtube.com/watch?v=xDARFvArIpc	16m
	https://www.youtube.com/watch?v=iogRGu7nbJw	14m
	Unit 2	
	https://www.youtube.com/watch?v=g1Lfz1XgrH8&list=PLw4vax4iD7VCB-bJiDL6dCWex6a4E-0Ih&index=2	5m
	https://www.youtube.com/watch?v=b0z7YKKCCyY&list=PLw4vax4iD7VCB-bJiDL6dCWex6a4E-0Ih&index=3	5m
	https://www.youtube.com/watch?v=uoBZZ53Okvo&list=PLw4vax4iD7VCB-bJiDL6dCWex6a4E-0Ih&index=7	5m
	https://www.youtube.com/watch?v=t3Ed13z9uz8	9m
	https://www.youtube.com/watch?v=4kgPMT9k3bg	6m
	https://www.youtube.com/watch?v=feBvhLFQEDk&list=PLw4vax4iD7VC0ztyX0MIQwkhDtHs81L-y	32m
	Unit 3	
	https://www.youtube.com/watch?v=ibQBb5yEDlQ	50m
	https://www.youtube.com/watch?v=kt8d3CYWGH4&t=876s	16m
	https://www.youtube.com/watch?v=HZg7fNu-l2	48m
	https://www.youtube.com/watch?v=uiKKRPZbuXA	8m

	https://www.youtube.com/watch?v=dnfXXpW7tIw&t=1s	4m
	https://www.youtube.com/watch?v=4c6z9RKrC8Q	7m
	https://www.youtube.com/watch?v=j6krFp511HA	9m
	https://www.youtube.com/watch?v=lnQD2_M9uDI	8m
	https://www.youtube.com/watch?v=trPGhO7MPnw	3m
	https://www.youtube.com/watch?v=wcfnEla_Y78	5m
	https://www.youtube.com/watch?v=9mh-2QwxmF4	7m
	https://www.youtube.com/watch?v=NytpDrESCV8	8m
	Unit 4	
	https://www.youtube.com/watch?v=0_OZKWdCixw	9m
	https://www.youtube.com/watch?v=vdZKehWMJSM	4m
	https://www.youtube.com/watch?v=LHAbLXfRYXk	77m
	https://www.youtube.com/watch?v=Gc3DL-tmr-g	90m
	https://www.youtube.com/watch?v=paFaxtTCkI&list=PLBln6fEyqRj-ed9IBEAAOrchYy4zgIMJ	77m
	https://www.youtube.com/watch?v=Cd19ohX0770	10m
	https://www.youtube.com/watch?v=p4R0Ej6FCn0&list=PLgwJf8NK-2e517yYqs3WF7VHUGtrIjKKk&index=1	13m
	Unit 5	
	https://www.youtube.com/watch?v=4GpWA_hmRhw	28m
	https://www.youtube.com/watch?v=p4R0Ej6FCn0&list=PLAuW6sm6dy0yRMXL47Kz4nfhB7tURK88p	13m
	https://www.youtube.com/watch?v=jrQ1YYgiOTo	10m
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DCSE0203	Course Name: Data Structure	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		3	0	0	3

Pr-requisite: Knowledge of data types and their organization.

Course Objectives: This course focuses on the basic concepts of algorithm analysis, along with implementation of linear and non-linear data structures and file structures.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Understand the concept of time and space complexity and demonstrate linear data structure array and linked lists.	K2, K3
CO2	Demonstrate the concept of stack and queue with their memory representations.	K1, K4
CO3	Apply the knowledge of the nonlinear data structure- tree and their operation.	K3
CO4	Explain the basics of graph with their different traversal ways.	K2
CO5	Analyze the concepts of searching and sorting and Understand file organization.	K2, K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	3	-	-	3	-	-	-	-	-	-	2	-	-
CO2	2	1	-	-	3	-	-	-	-	-	-	2	-	-
CO3	-	-	1	-	3	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	3	-	-	-	-	-	-	3	-	-
CO5	1	-	-	-	3	-	-	-	-	-	-	1	-	-

Course Contents / Syllabus

Unit 1	Introduction to Data Structures, Arrays and Linked lists	10 hours

Introduction: Basic Terminology, Elementary Data Organization, Built in Data Types in C/python. Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big Oh, Big Theta and Big Omega, Abstract Data Types (ADT)

Arrays: Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Index Formulae for 1-D,2-D,3-D and n-D Array Application of arrays, Sparse Matrices and their representations.

Linked lists: Array Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal. Polynomial Representation and Addition Subtraction & Multiplications of Single variable.

Unit 2	Stack and Queues	9 hours

Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Iteration and Recursion- Principles of recursion, Tail recursion, Removal of recursion Problem solving using iteration and recursion with examples of binary search, Fibonacci numbers, and Hanoi towers. Trade-offs between iteration and recursion.

Queues: Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, De-queue and Priority Queue.

Unit 3	**Trees**	**9 hours**
Basic terminology used with Tree, Binary Trees, Binary Tree Representation: Array Representation and Pointer (Linked List) Representation, Binary Search Tree, Strictly Binary Tree, Complete Binary Tree, An Extended Binary Trees. Tree Traversal algorithms: In-order, Pre-order and Post-order. Constructing Binary Tree from given Tree Traversal, Operation of Insertion, Deletion, Searching & Modification of data in Binary Search tree, Introduction of Binary Heaps, Threaded Binary trees, Traversing Threaded Binary trees, AVL Tree, B-Tree.		
Module 4	**Graphs**	**9 hours**
Graphs: Terminology used with Graph, Data Structure for Graph Representations: Adjacency matrices, Adjacency List. Graph Traversal: Depth First Search and Breadth First Search. Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prim's and Kruskal's algorithm. Shortest Path algorithms: Dijkstra Algorithm.		
Unit 5	**Searching and Sorting**	**8 hours**
Searching: Concept of Searching, Sequential search, Index Sequential Search, Binary Search. Concept of Hashing. Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Merge Sort, Heap Sort and Radix Sort. File Structure: Concepts of files, records and files, Sequential, Indexed and Random File.		
	Total Lecture Hours	**45 hours**

Textbook:

S.No	**Book Title**	**Author**
1	Data structures using C and C++	Aaron M. Tenenbaum, Yeedidyah Langsam, Moshe J. Augenstein
2	Data Structure using C	Reema Theraja

Reference Books:

S.No	**Book Title**	**Author**
1	Programming in ANSI C	E. Balagurusamy
2	Data Structures and Program Design in C	Robert L. Kruse, Bruce P. Leung Clovis L. Tondo
3	Data Structures With C	Lipschutz
4	Introduction to Algorithms	TH Koreman

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	1.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013986386997133312608/overview	55m
	2.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013986392492130304609/overview	55m 1hr 32m
	3.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013501574117474304107 09/overview	1hr 27m
	4.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013842751147220992224 76_shared/overview	

	5.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0135015662906327049522/overview 6.https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0132996226846556163 80/overview	1hr 19m 56 hr
Video Lectures	1.https://www.youtube.com/watch?v=qNGyI95E5AE&list=PLxCzCOWd7aiEwaANNt3OqJPVIxwp2ebiT 2. https://www.youtube.com/watch?v=0X-fV-1ir9c 3. https://www.youtube.com/watch?v=-DzowlcaUmE 4. https://www.youtube.com/watch?v=RpgyCJBbl5E&list=PLGjplNEQ1it-0w_PkFtKzH0ZExo6Lvm6R	10m 22m 1hr 22m 26m
Web References	1. https://www.geeksforgeeks.org/dsa/lmns-data-structures/ 2. https://www.w3schools.com/dsa/dsa_intro.php	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DEC0203	Course Name: Analog Circuits	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		**3**	**0**	**0**	**3**

Pre-requisite: Basic knowledge of Semiconductor devices.

Course Objectives: Students will learn about.

1. AC analysis of Transistors amplifiers.

2. Analysis of Power and Negative feedback amplifiers.

3. Operational Amplifier parameters.

4. Applications of Operational Amplifier.

Sinusoidal & non-sinusoidal oscillators.

Course Outcome:		Bloom's Knowledge Level (KL)
CO1	After completion of the course, the student will be able to Design and analyze the different transistor amplifier circuits.	K3, K4
CO2	Analyze the different power and negative feedback amplifiers.	K4
CO3	Explain the operation and characteristics of Operational amplifier.	K2, K3
CO4	Design and Explain the applications of Operational amplifier required in electronic systems.	K3, K4
CO5	Design and analyze the different types of sinusoidal and non- sinusoidal oscillators	K4, K5

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	2	-	-	-	-	-	2	3	1	2	2
CO2	3	3	3	2	2	-	-	-	-	-	2	3	1	2	2
CO3	3	2	2	2	3	-	-	-	-	-	2	3	1	2	2
CO4	3	2	3	2	3	-	-	-	-	-	-	-	-	-	-
CO5	3	2	3	2	3	-	-	-	-	-	-	-	-	-	-

Course Contents / Syllabus

Unit 1	**AC Analysis of Small Signal Amplifier**	**9 hours**

Review of BJT and FET, low frequency transistor models, estimation of voltage gain, current gain, input resistance, output resistance of single stage CE and CS amplifier. High frequency transistor models, Frequency response of single and multi-stage amplifiers.

Unit 2	**Large Signal and Negative Feedback Amplifiers**	**9 hours**

Power Amplifier: Various classes of operation (Class A, B, AB, C), Figure of merits, power efficiency and linearity issues.

***Negative Feedback Amplifiers*:** Block diagram, Advantages, Feedback topologies: Voltage series, current series, voltage shunt, current shunt, effect of feedback on gain, bandwidth etc

Unit 3	**Basics of Operational Amplifier**	**9 hours**

Block diagram of Op-amp, Equivalent circuit, Transfer characteristics, DC and AC parameters, Inverting and Non-inverting amplifiers, Voltage follower, Adder, Subtractor).

Unit 4	**Operational Amplifier Applications**	**9 hours**
Integrator, Differentiator, Comparator, Schmitt trigger. A/D and D/A converters: Successive- approximation, Integrating type, Weighted Resister, R-2R Ladder. **Active Filters:** Advantages of active filter, Types, Design of First and second order **Low** Pass and High Pass filters		
Unit 5	**Oscillators**	**9 hours**
Sinusoidal oscillators (Op-Amp Based)*:** Concept of positive feedback, Barkhausen criterion, RC oscillators (Phase shift, Wien bridge), LC oscillators (Hartley, Colpitt, Clapp). ***Non-sinusoidal oscillators: Square wave generator: A stable multivibrator using IC 555, Triangular wave generator		
	Total Lecture Hours	**45 hours**

Textbook:

S.no.	Book Title	Author
1	Microelectronic Circuits, Saunder's College Publishing, Edition IV	S. Sedra and K.C. Smith
2	Electronic Devices and Circuit Theory", Latest Edition, Pearson Education	Robert L. Boylestad / Louis Nashelsky

Reference Books:

S.no.	Book Title	Author
1	Design of Analog Circuits, Khanna Publishing House, 2022.	A.V.N. Tilak
2	Introduction to Operational Amplifier theory and applications, McGraw Hill, 1992	J.V. Wait, L.P. Huelsman and GA Korn

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://www.classcentral.com/classroom/youtube-analog-circuits-47867/60d2ba12d8efd	20 hrs
	https://www.classcentral.com/classroom/youtube-electronics-analog-circuits-47532	20.5hrs
Video Lectures	**Unit 1**	
	https://www.youtube.com/watch?v=6BKA-lLrXf	1.5m
	https://youtu.be/wbDUDRlmUuM	2m
	https://nptel.ac.in/courses/117101106	1.5m
	nptel.ac.in/courses/108102112	1.5m
	Unit 2	
	https://www.youtube.com/watch?v=__8f6AXenYo	3m
	https://youtu.be/7FYHt5XviKc?si=tFP2t-JG_3Gp6fXj	1m
	nptel.ac.in/courses/108104193	2m
	nptel.ac.in/courses/108105158	2m
	Unit 3	
	https://youtu.be/kiiA6WTCQn0?si=97I3CE3kZbs7vxDx	1m
	https://www.youtube.com/watch?v=n2wnyZv0rmc	1m
	https://youtu.be/zyryXbH6a5E?si=4pFf_HwPLuKoSOsd	2m
	nptel.ac.in/courses/108101094	1m
	nptel.ac.in/courses/108102095	3m

	Unit 4	
	https://www.youtube.com/watch?v=Uc2R7GND0Dk	2m
	https://www.youtube.com/watch?v=gEeF8sEQTE	2m
	https://youtu.be/_QZ7AUCY-GA	2m
	nptel.ac.in/courses/108106188	2m
	Unit 5	
	https://tinyurl.com/3nf75xeb	2m
	https://youtu.be/XVS8Puf4tiw	2m
	https://youtu.be/m-HpDPU2Nvs	2m
	nptel.ac.in/courses/117107094	2m
Web References		

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DASL0202	Course Name: French Language	L	T	P	C
Course Offered in: B.Tech- Second Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite: Basic understanding of the English language.

Course Objectives:

1. To help students learn to articulate in French language in day-to-day real-life situations.
2. To enable students acquire and develop the four fundamental language skills-Listening, Speaking, Reading, and Writing (LSRW).

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Identify and recall basic elements of the French language, including greetings, simple vocabulary, and expressions related to identity.	K1
CO2	Recall and reproduce common phrases used for self-introduction and basic everyday communication in French.	K1
CO3	Explain and use simple French expressions to ask questions and navigate everyday situations such as directions and locations.	K2
CO4	Describe routine activities and personal preferences using basic French vocabulary and sentence structures.	K2
CO5	Apply appropriate French language structures to describe people, family relationships, and personal interests in simple conversational contexts.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	1	1	-	-	-	-	-	-	2	-	-	-
CO2	-	1	-	-	-	1	-	-	1	3	-	-	-
CO3	-	2	-	-	-	2	-	-	2	3	-	-	-
CO4	-	-	-	-	-	2	-	-	2	3	-	-	-
CO5	-	-	-	-	-	3	1	2	2	3	-	-	-

Course Contents / Syllabus

Unit 1	**Basics of French language and Identity**	**6 hours**

- Culture & Civilization
- Salutations (formal and informal)
- Alphabets and Accents
- Numbers
- Definite articles
- Vocabulary: Countries and Nationalities; Professions
- Filling a registration Form/ ID card

Unit 2	**Introducing Oneself and Everyday Communication**	**6 hours**

- Subject pronouns; Use of 'tu' and 'vous'
- Verbs: Être and Avoir
- Possessive Adjectives

- Introduction (1st person, 3rd person)
- Give and take Personal Information
- Indefinite Articles
- Days of the Week, Months of the Year
- Vocabulary: Daily Life Objects
- Talk about Likes and Dislikes (Aimer, Adorer, Détester, Préférer + Noun/ Verb)
- Negation (ne…pas)

Unit 3	**Navigating the City and Asking Questions**	**6 hours**

- Vocabulary: Places in a city
- Prepositions
- Contracted Articles
- Vocabulary: Modes of Transports
- Verbs: Prendre, Déscendre, Aller
- Talk about one's city
- Interrogation (close-ended); Interrogation (open-ended)
- Directions; Time
- Invitation to a Place: Acceptance & Refusal

Unit 4	**Talking About Activities and Preferences**	**6 hours**

- Talk about activities, places, weather, etc
- Verbs: Venir, Faire
- Vocabulary: Professions, Sports and Cultural Activities
- Verbs: Faire, Aller + Contracted Articles + Activities

Unit 5	**Describing People, Family, and Interests**	**6 hours**

- Qualitative Adjectives
- Talk about interests and hobbies
- Vocabulary: Family
- Talk about a family

	Total Lecture Hours	**30 hours**

Text Book :

S.No	**Book Title**	**Author**
1.	Alter Ego	Annie Berthet, Catherine Hugot, Véronique M. Kizirian, Emmanuelle Daill

Reference Books :

S.No	**Book Title**	**Author**
1.	Edito 1 (Méthode de français/Cahiers d'exercices)	Lucie Mensdorff-Pouilly, Caroline Spérandio, Roxane Amoravain (et al.)
2.	Saison A1 (Méthode de français/Cahier d'exercices)	Marie-Noëlle Cocton, Delphine Ripaud, Anne-Laure Kieffer

Self-Study Content Links:	**Duration (in Hrs)**

MOOCs	https://www.udemy.com/share/103BEs3@_JNcFDcpMjZHwIefu_aoNEGRrOgcZH0W8oJB_366JGb14wajJLW7WoGRRe8j_JAwcg==/ https://www.udemy.com/share/101CD03@1rBLasBniB-WwikfO2XBbfgg050QZagfzpo6TEiBkSqIajUNMDfKsE9MSQCiAeELDg==/ https://www.coursera.org/learn/french-beginner#modules	**10hrs**
Video Lectures	https://www.youtube.com/playlist?list=PL8zlR8aXkW8E2RNQbZvLdprSzhvgBfmax https://apprendre.tv5monde.com/fr/exercices/premiere-classe	**6hrs**
Web References	https://www.ccubeacademy.com/french-grammar-quiz/ https://www.ccubeacademy.com/numbers-in-french-0-to-100/ https://archive.org/details/AlterEgo1.CahierDactivites/page/n11/mode/2up https://www.scribd.com/document/647857104/Edito-A1-Nouvelle-Edition-Cahier#page=15	**4hrs**

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
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Course Code: DASL0203	Course Name: German	L	T	P	C
Course Offered in: B.Tech- Second Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite: No prior knowledge of German language is required; willingness to learn a foreign language is encouraged.

Course Objectives:

- To develop basic proficiency in listening, speaking, reading and writing through structured beginner-levels tasks.
- To enable students to use basic German expressions effectively in familiar personal and social contexts.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Identify and recall elementary German sounds, expressions and basic vocabulary used in familiar everyday contexts.	K1
CO2	Explain and use foundational grammatical structures to form simple sentences and basic question forms in German.	K2
CO3	Use basic spoken German expressions to communicate effectively in routine situations, including self-introduction and everyday social interactions.	K3
CO4	Interpret and produce short beginner-level texts such as forms, simple messages and guided written responses in German.	K3
CO5	Demonstrate basic proficiency in listening, speaking, reading and writing through guided communicative tasks aligned with foundational CEFR A1 learning outcomes.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	1	-	-	-	-	1	1	2	3	1		
CO2	-	2	1	-	-	-	1	1	2	3	1		
CO3	-	2	2	-	-	1	1	1	3	3	1		
CO4	-	2	2	1	-	-	1	1	2	3	2		
CO5	-	2	2	1	-	-	1	2	3	3	2		

Course Contents / Syllabus

Unit 1	**Introductory Communication in German (Greetings, Introductions and Personal Information)**	**6 hours**

• Learning Objectives

- Greetings and farewells (Grüßen und Verabschieden)
- Spelling words and alphabet
- Self-introduction and introducing others (Sich und andere vorstellen)
- Asking about well-being (Nach dem Befinden fragen)
- Numbers 1-20 (Zahlen bis 20)
- Phone numbers and email addresses (Telefonnummer und E-Mail-Adresse)

Grammar Topics:

- W-questions (W-Fragen)
- Statement sentences (Aussagesätze)

- Verbs (regelmäßige Verben) and personal pronouns (Personalpronomen in Texten)
- Countries and languages

Skill Focus (LSRW):

- **Listening:** Understanding greetings, introductions and short exchanges involving personal information, numbers and contact details through guided audio input.
- **Speaking:** Self-introduction, spelling practice, and simple question–answer interactions using basic personal information.
- **Reading:** Reading short introductory dialogues and simple texts related to personal information and everyday interactions.
- **Writing:** Writing basic self-introductions and completing simple personal information forms.

Unit 2	Personal Interest and Social Interaction (Hobbies, Professions and Everyday Interaction)	5 hours

- **Learning Objectives:**

- Describing hobbies and free time activities
- Talking about professions and work
- Using numbers and time expressions
- Plural forms of nouns
- Zahlen ab 20(Numbers 20 onwards)

Grammar Topics:

- Unregelmäßige Verben (Irregular Verbs) und Personalpronomen
- Verben haben und sein
- Definite articles (der, die, das)
- Plural formation and endings
- Numbers and working hours
- Ja/Nein Fragen (Yes/NO questions)

Skill Focus (LSRW):

- **Listening**: Understanding short conversations related to hobbies, professions, numbers and simple time-related expressions.
- **Speaking:** Pair practice on introducing interests, talking about professions, asking and answering simple questions, and exchanging information about schedules and working hours.
- **Reading:** Reading short dialogues and simple texts related to work, hobbies and everyday activities.
- **Writing:** Constructing simple sentences and guided descriptive writing using basic vocabulary, numbers and time expressions.

Unit 3	Everyday Functional Communication (City Life, Directions and Orientation)	6 hours

- **Learning Objectives:**

- Describing cities and famous buildings
- Giving directions and talking about transportation
- Months and seasons
- Cultural sites and events

Grammar Topics:

- Indefinite articles (ein, eine)
- Negation with "nicht und kein"
- Imperativ mit Sie
- Adjektive mit sein(verb)

- Transportation vocabulary
- Prepositions for directions (links, rechts, geradeaus)

Skill Focus (LSRW):

- **Listening**: Understanding short conversations related to directions, transportation, time expressions (months and seasons) and place-related information.
- **Speaking**: Guided speaking practice for asking and giving directions, describing locations and places, and using polite imperative forms in simple interactions.
- **Reading**: Reading short notices, maps, signs and simple dialogues related to places, travel and cultural activities.
- **Writing**: Writing simple descriptions of places and short responses related to directions, travel and basic situational contexts.

Unit 4	Situational Interaction Skills (Food, Shopping and Daily Life Communication)	6 hours

Learning Objectives:

- Food and drink vocabulary
- Shopping for groceries
- Ordering in restaurants
- Talking about taste and preferences
- Daily eating habits and mealtimes

Grammar Topics:

- Accusative case
- Verbs with Akkusativ
- Articles in accusative case
- Food-related Verbs (essen, trinken, kosten, schmecken)
- Verben (mögen und möchten)
- Quantities and measurements

Skill Focus (LSRW):

- **Listening:** Understanding short conversations related to food, ordering in restaurants and simple shopping situations.
- **Speaking:** Guided speaking practice for ordering food, expressing preferences using mögen/möchten, and interacting in simple shopping situations.
- **Reading:** Reading short menus, price lists and simple dialogues related to food and shopping.
- **Writing:** Writing simple sentences and short messages describing food preferences, meal habits and basic shopping interactions.

Unit 5	Everyday Life (Family, Time and Routine Activities)	6 hours

Learning Objectives:

- Daily routines and schedules
- Family relationships
- Telling time (official and unofficial)
- Making telephonic appointments
- Expressing necessity and possibility by using Modal verbs

Grammar Topics:

- Time Expression and telling time
- Time Expression: am, um, von……bis
- Modal verbs (können, müssen, wollen)
- Possessive pronouns (mein, dein, sein, ihr) (Nominativ und Akkusativ)

Skill Focus (LSRW):

- **Listening:** Understanding short conversations related to daily routines, family interactions, time expressions and telephonic appointments.
- **Speaking:** Guided conversational practice describing daily activities, family members, telling time, and making simple appointments using modal verbs.
- **Reading:** Reading short texts and dialogues related to routines, schedules, appointments and family life.
- **Writing:** Writing simple sentences, short messages and brief paragraphs describing daily routines, time schedules and basic personal situations.

Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1.	Netzwerk Neu A1	Klett Sprachen

Reference Books:

S.No	Book Title	Author
1.	Studio D A1 (Cornelsen Verlag GmbH & Co.)	Hermann Funk, Christina Kuhn, Silke Demme
2.	Langescheidt Dictionary	

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	Alison – Beginner German 101 and 102 - Beginner German 101| Alison and Beginner German 102 | Alison NOC: German - I, IIT Madras - German - I | SWAYAM -IIT MADRAS VHS A1 Learn Deutsch - A1-Deutschkurs - A1-Deutschkurs DW Learn Deutsch – Harry gefangen in der Zeit – A1 DW Learn Deutsch – Nicos Weg A1- A1-Nicos Weg DW	10
Video Lectures	Goethe Institut - Deutsch für dich Goethe Institut - Goethe-Zertifikat A1: Start Deutsch 1 – Prüfungsteil Hören mit Lösungen Offical Deutsche Welle Deutsch lernen mit der DW - Officiall	6
Web References	Klett Netzwerk Neu A1 - Deutsch als Fremdsprache | Klett Sprachen Netzwerk Neu A1- Netzwerk neu - Start - Ernst Klett Sprachen GmbH Netzwerk A1 Interaktives Übungsbuch- Netzwerk neu A1.1 | Digital book VHS Lernportal - A1 Strat vhs-Lernportal Goethe Institut - Deutsch Üben- Goethe-Institut	4

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Course Code: DASL0204	Course Name: Japanese	L	T	P	C
Course Offered in: B.Tech- Second Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite: NA

Course Objectives:

1. To help the students learn to articulate in Japanese language in day-to-day real-life situations.
2. To enable the students acquire the four basic skills LSRW (Listening, Speaking, Reading, and Writing) of language learning.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	1	1	-	-	-	1	1	2	3	1	-	-
CO2	-	1	1	-	-	-	1	1	2	3	2	-	-
CO3	-	2	2	1	-	1	1	1	2	3	2	-	-
CO4	-	2	2	1	-	1	1	1	3	3	2	-	-
CO5	-	2	2	1	-	1	1	1	3	3	2	-	-

Course Contents / Syllabus

Unit 1	**Introduction to Japanese**	**6 hours**

General features of Japanese, Japanese scripts, Pronunciation of Japanese words, Classroom instructions, Daily greetings and expressions, Numerals, Months name Days of the week, Time & Calendar, Family members, Vocabulary lessons 1&2, Sentence pattern & Example sentences, Self-introduction (jikoshokai)

Unit 2	**Vocabulary building**	**6 hours**

Country, language, and people, Basic conversations, Vocabulary lessons 3&4, Use of patterns (KO, SO, AA, and DO), Conversations between guests and hosts, Conversations between customers and shopkeepers

Unit 3	**Everyday common simple sentences**	**6 hours**

Vocabulary lessons 5&6, Grammar explanation, Colour & taste, Conversations in post office, Conversations with friends, Making a request, Making an enquiry – Railway Station, Buying Fruits & Vegetables, Names of the Animals, Question formation.

Unit 4	**Reading and Writing**	**6 hours**

Scanning based Newspaper reading, Transportation, KANJI Form of Writing – 40 Characters, Shopping Counters, Basic Japanese grammar rules – particles: か (ka), は (wa),, の (no), と (to), を (o), に (ni), も(mo), が (ga), や (ya)., Kara, Soshite, Grammar - Present, Past, Future, Adjectives, Vocabulary Lessons 7&8

Unit 5	**Skilled Writing**	**6 hours**

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)**

Write short text on oneself., Grammar: Pronouns – subject, object, possessive, Modal verbs			
		Total Lecture Hours	**30 Hours**
Textbook:			
S.No	**Book Title**	**Author**	
1.	Minna no nihongo – N5	3A Corporation	
Self-Study Content Links:			**Duration (in Hrs)**
MOOCs	https://nptel.ac.in/courses/121104005https://nptel.ac.in/courses/121104005 https://www.coursera.org/learn/japanese-language-1 https://www.udemy.com/course/japanese-n5-course/ https://alison.com/course/japanese-language-introduction-to-japanese-scripts https://alison.com/course/japanese-for-beginners		10hrs
Video Lectures	https://youtu.be/c069yRMdPyY?si=nFtcvhjgx-kHCC6m https://youtu.be/RrCkS2PEL7I?si=zYC4RBIgWsiGDjQK https://youtu.be/3iSXUpA0wzY?si=VfE2YbAJVYgAX7Uv http://youtu.be/ArOfXbCC-WE?si=Jojvv_EXCuykl27F https://youtu.be/xcTI2rPN_BE?si=Zz40L7xE5UOT2XZK https://youtu.be/EDCbKMNalVc?si=5YcpD-rTFNAWsXnX https://youtu.be/jcGWIWgOmWw?si=bY-NPf6B61UvuNOW https://youtu.be/3nIKTbSsjvg?si=RS15u5NYDghDxYzM		6hrs
Web References	https://www.marugoto-online.jp/info/jp/sp/index.html#mainContents https://www.hikidasu.jpf.go.jp/en/corner/drama/		4hrs

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)

LAB Course Code: DEC0252	LAB Course Name: Digital System Design Lab	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		0	0	2	1

Pre-requisite:

Course Objectives: The student will learn about

1. Verification of truth table of various type of logic gates.
2. Designing and verification of different type of combinational circuits.
3. Implementation and verification of truth table of various type of flip-flops.
4. Designing and implementation of different types of sequential circuits.
5. Implementation of Programming in IoT development boards with IO sensors.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Verify truth table of various type of Logic Gates.	K2
CO2	Design, implement and verify combinational logic circuits.	K4
CO3	Implement and verify truth table of various types of flip-flops.	K3
CO4	Design and analyse different types of sequential logic circuits.	K4

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	3	2	2	1	2	2
CO2	3	3	3	-	-	-	-	-	3	2	2	1	2	2
CO3	3	2	3	-	-	-	-	-	3	2	2	1	2	2
CO4	3	3	3	-	-	-	-	-	3	2	2	1	2	2

List Of Practical's (Indicative & Not Limited To)

1. Verification of the truth tables of Basic Logic Gates and Universal Logic Gates using TTL ICs.

a) AND (7408)

b) OR (7432)

c) NOT (7404)

d) NAND (7400)

e) NOR (7402)

2. Implementation of the given Boolean function using TTL Logic Gates (NOT, AND and OR Gates) in SOP for following Boolean expressions:

a) Y1=AB' +A'B

b) Y2=ABC + A'B'C' + A'C

c) F(A,B,C,D)=∑(0,2,5,7,8,10,13,15)

3. Implementation of the given Boolean function using TTL Logic gates (NOT, AND and OR Gates) in POS forms for following Boolean expressions:

a) Y1=(A'+B)(A+B')

b)	Y2= (A+B+C)(A'+B'+C')(A'+C)
c)	F(A,B,C,D)= M(0,2,5,7,8,10,12,15)
4.	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.
5.	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.
6.	Implement 2 Bit magnitude comparator using logic gates and verify the truth table.
7.	Implement and verify F (A,B,C) = ∑ (3, 5, 6, 7) using a) 8:1 multiplexer. b) 4:1 multiplexer
8.	Verification of truth table of flip-flop using NAND gate (7400) & NOR gates (7402). a) RS Flip Flop b) JK Flip Flop c) D Flip Flop d) T Flip Flop
9.	Implement D flip flop using SR flip flop and verify the truth table.
10.	Design Mod – N Synchronous Up Counter & Down Counter using 7476 JK Flip-flop
	Total Hours: 30 hrs.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)

LAB Course Code: CCSE0253	LAB Course Name: Data Structure Lab	L	T	P	C
Course Offered in: B.Tech.- Second Semester ECE/ECE(VLSI)		0	0	4	2

Pre-requisite: Basic knowledge of programming concepts using C/C++ and understanding of fundamental algorithms.

Course Objectives: Objective of this course is implementing fundamental data structures such as arrays, linked lists, stacks, queues, trees, and graphs. It aims to enhance problem-solving abilities through efficient algorithm design and code optimization.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Implementing Single and Multi-dimensional array with their applications like searching and Sorting techniques.	K2, K3
CO2	Implement Link list, Stack and Queues with their applications.	K1, K4
CO3	Implementation of tree data structures for basic operations like insertion, deletion, searching and traversal.	K3
CO4	Implementation and analysis of various operation like searching, sorting, hashing in data structures for solving real world problems.	K2

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	3	-	-	3	-	-	-	-	-	-	2	-	-
CO2	2	1	-	-	3	-	-	-	-	-	-	2	-	1
CO3	-	1	1	-	3	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	3	-	-	-	-	-	-	3	-	1

List Of Practical's (Indicative & Not Limited To)

S.No	Program Description	CO
1	Construct a code to find the maximum element in an array	CO1
2	Construct a code to calculate the sum of all elements in an array	CO1
3	Construct a code to reverse the elements of an array	CO1
4	Construct a code to count the occurrence of a specific element in an array	CO1
5	Construct a code for creation and traversal of 2D array in row major and column major order	CO1
6	Program to find if a given matrix is sparse or not and print sparse matrix	CO1
7	Construct a code to represent a sparse matrix in triplet form	CO1
8	Construct a Python program to print Fibonacci series using recursion	CO2
9	Construct a code to implement Tower of Hanoi	CO2
10	Construct a program to implement priority queue	CO2
11	Construct a program to implement queue using array	CO2

12	Construct a code for implementing a circular queue	CO2
13	Construct a program to implement queue using stack	CO2
14	Create a single linked list and perform basic operations (insertion, deletion, traversal)	CO2
15	Create a double linked list and perform basic operations (insertion, deletion, traversal)	CO2
16	Create a circular linked list and perform basic operations (insertion, deletion, traversal)	CO2
17	Write a program to implement an in-order traversal of a binary tree and print the nodes.	CO3
18	Write a program to implement a pre-order traversal of a binary tree and print the nodes	CO3
19	Write a program to implement a post-order traversal of a binary tree and print the nodes.	CO3
20	Write a program to count number of nodes in a binary tree	CO3
21	Write a program to find the height of the tree	CO3
22	Write a Program to search a number in Binary Search Tree (BST)	CO3
23	Write a program to insert a node in a Binary Search Tree (BST).	CO3
24	Write a program to delete a node from a Binary Search Tree (BST).	CO3
25	Write a program to implement Prims Algorithm.	CO4
26	Write a program to implement Kruskal Algorithm.	CO4
27	Write a program to implement Dijkstra Algorithm.	CO4
28	Write a program to perform Depth-First Search (DFS) on a graph.	CO4
29	Write a program to perform Breadth-First Search (BFS) on a graph.	CO4
30	Construct a program to implement merge sort with recursion and iteration	CO5
31	Construct a program to implement quick sort with recursion and iteration	CO5
32	Construct a code to implement linear search	CO5
33	Construct a code to implement binary search	CO5
34	Construct a program to implement bubble sort	CO5
35	Write a program to implement a max-heap and perform heap sort on an array of integers.	CO5

Total Hours: 60 hrs.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA-201306

(An Autonomous Institute)

LAB Course Code: DCSE0252	LAB Course Name: Problem Solving using Python	L	T	P	C
Course Offered in: B.Tech- Second Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		0	0	6	3

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

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

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Apply basic Python constructs (variables, data types, control flow)	K2
CO2	Develop modular programs using functions, recursion, and modules.	K4
CO3	Use data structures, file operations, and exception handling in Python.	K5
CO4	Implement object-oriented concepts	K4
CO5	Build GUI applications using Tkinter and OOP techniques.	K3

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	1	1	-	2	-	-	1	-	-	2			
CO2	3	2	2	1	2	-	-	1	-	-	2			
CO3	2	2	2	1	1	-	-	1	-	-	2			
CO4	3	3	2	1	2	-	-	1	-	-	2			
CO5	3	3	2	-	2	-	-	1	-	2	2			

Course Contents / Syllabus

Unit 1	**Introduction**	**14 hours**

Introduction: A Brief History of Python, Applications areas of python, Keywords and Identifiers, variables, data types and type conversion, Indexing and Slicing, operators in python, Operator precedence and associativity, Conditional Statements: if statement, if-else statement, Nested-if statement and elif statements. Loops: Purpose and working of loops, while loop, for loop, else with loop statement, Nested Loops, break, continue and pass statement.

Unit 2	**Function and Modules**	**15 hours**

Function: Built in function, user defined function, Function arguments, passing functions to a function, recursion, Lambda functions, Namespaces. Functional Programming: higher order functions, Map, filter, Reduce. Closures and its characteristics, Decorators, decorating function with argument and iterator, Modules and Packages: Importing Modules, writing own modules, Standard library modules, Packages in Python.

Unit 3	**Basic Data structures, Exception and File Handling**	**14 hours**

Python Basic Data Structures: Strings, Basic operations of strings, comparing strings, string formatting, Built-in string methods and function, Lists, Tuples, Sets and Dictionaries with built-in methods, List Comprehension. Exception Handling: Errors, Run Time Errors,

Try-except statement, Raise, Assert. Files and Directories: Open a File, Reading and Writing data from files close a File, Read and Write operation.

Unit 4	**Object Oriented Concepts**	**14 hours**

Object-oriented programming: User-defined classes, Object as an argument, Class variables and Instance variables, Constructor, Parameterized constructor, Encapsulation: Introduction, Data hiding, Instance methods, Class method, Static methods, property method, Magic Methods in python, Instances as Return Values.

Unit 5	**Advanced Object-Oriented Techniques and GUI Programming**	**15 hours**

Introduction to inheritance, Types of inheritance, super () function, Abstract class, Polymorphism: Method overriding, Method Overloading. Tkinter: Creating a GUI Application, Widgets: Frame, Label, Button, Entry, Radio button, Check button, Canvas, and Menu.

Total Lecture Hours	**72 hours**

Textbook:

S.No	**Book Title**	**Author**
1	"Beginning Python-From Novice to Professional"—Third Edition, Apress	Magnus Lie Hetland
2	Python Programming using Problem solving approach by OXFORD Higher education	Reema Thareja

Reference Books:

S.No	**Book Title**	**Author**
1.	Introduction to Computation and Programming Using Python ‘‘, Revised and expanded Edition, MIT Press.	John V Guttag
2.	Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition.	Charles Dierbach
3.	“Think Python: How to Think Like a Computer Scientist”, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers.	Allen B. Downey,
4.	Introduction to Programming in Python: An Inter- disciplinary Approach, Pearson India Education Services Pvt. Ltd.,2016.	Robert Sedgewick, Kevin Wayne, Robert Dondero:
5.	An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd.	Guido van Rossum and Fred L. Drake Jr,

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	Unit 1: https://nptel.ac.in/courses/106106145 Unit 2: https://nptel.ac.in/courses/106106145 Unit 3: https://nptel.ac.in/courses/106106145 Unit 4: https://nptel.ac.in/courses/106106145 Unit 5: https://nptel.ac.in/courses/106106145	60hrs
Video Lectures	Unit 1: https://www.youtube.com/watch?v=PqFKRqpHrjw Unit 2: https://www.youtube.com/watch?v=oSPMmeaiQ68&t=2s Unit 3: https://www.youtube.com/watch?v=m9n2f9lhtrw https://www.youtube.com/watch?v=ixEeeNjjOJ0&t=4s https://www.youtube.com/watch?v=NMTEjQ8-AJM Unit 4: https://www.youtube.com/watch?v=JeznW_7DlB0	15m 39m 39m 31m 21m 53m

	Unit 5: https://www.youtube.com/watch?v=ibf5cx221hk	38m
Web References	1.https://www.python.org/ 2. https://www.w3schools.com/python/ 3. https://www.kaggle.com/learn/python	

List of Practical's

Sr. No	Program Title	CO Mapping
1	Print "Hello, World!" and perform basic arithmetic operations.	CO1
2	Display Python keywords and identifiers.	CO1
3	Program to demonstrate variable declaration and type conversion.	CO1
4	Demonstrate indexing and slicing on a list and string.	CO1
5	Use arithmetic, relational, and logical operators in a program.	CO1
6	Show operator precedence and associativity with example expressions.	CO1
7	Write a program using if and if-else conditions.	CO1
8	Implement nested if and elif statements to categorize age groups.	CO1
9	Write a program using a while loop to generate Fibonacci series.	CO1
10	Use a for loop to print the multiplication table of a number.	CO1
11	Create and call a user-defined function for factorial.	CO2
12	Write a function to compute GCD of two numbers using recursion.	CO2
13	Program with all types of function arguments (default, keyword, variable-length).	CO2
14	Use lambda function to sort a list of tuples by second element.	CO2
15	Implement higher-order functions: map, filter, and reduce.	CO2
16	Create a closure that captures the outer function's variable.	CO2
17	Write and use a simple decorator to log function execution.	CO2
18	Import and use built-in module math and datetime.	CO2
19	Create and import a user-defined module.	CO2
20	Create a package with multiple modules and use them in a script.	CO2
21	Perform basic operations on strings and demonstrate built-in string methods.	CO3
22	Compare strings and demonstrate different string formatting styles.	CO3
23	Create a list and demonstrate slicing, appending, and sorting.	CO3
24	Implement tuple packing and unpacking with basic operations.	CO3
25	Create a set, add/remove items, and perform set operations.	CO3
26	Create and manipulate a dictionary with nested structures.	CO3
27	Demonstrate list comprehension to generate a square number list.	CO3
28	Handle exceptions using try-except-finally blocks.	CO3

29	Raise custom exceptions with raise and validate input with assert.	CO3
30	Read a file line by line and count the frequency of each word.	CO3
31	Create a class with instance variables and methods.	CO4
32	Implement constructor and parameterized constructor in a class.	CO4
33	Show encapsulation using private attributes and getter/setter.	CO4
34	Demonstrate class method, static method, and property decorator.	CO4
35	Override __str__ and __len__ magic methods for a custom class.	CO4
36	Create and return class instances from another class.	CO4
37	Demonstrate single and multiple inheritance with method overriding.	CO4
38	Use super() to invoke parent methods from a subclass.	CO4
39	Create an abstract class and implement it in a derived class.	CO4
40	Show polymorphism with method overloading (via default args) and overriding.	CO4
41	Reuse inheritance examples and show hierarchical/multilevel inheritance.	CO5
42	Create a basic GUI window using Tkinter.	CO5
43	Add Labels, Buttons, and Entry fields to a GUI form.	CO5
44	Implement Radio buttons and Check buttons with event handling.	CO5
45	**Personal Expense Tracker:** A Python app to record and categorize daily expenses for better budgeting.	CO5
46	**Library Management System:** A GUI-based tool to manage book issue, return, and inventory for small libraries.	CO5
47	**Weather Forecast App:** A real-time weather dashboard using API to display city-wise conditions.	CO5
48	**Quiz Application:** An interactive Python quiz system with scoring and question randomization.	CO5
49	**File Organizer:** A desktop utility to auto-sort files into folders based on their extensions.	CO5
50	**Personal Expense Tracker:** A Python app to record and categorize daily expenses for better budgeting.	CO5

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA-201306

(An Autonomous Institute)

LAB Course Code: DASL0251	LAB Course Name: Communication for Career Enhancement	L	T	P	C
Course Offered in: B.Tech- Second Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		0	0	4	2

Pre-requisite: The students should have completed ABC course in semester I

Course Objectives:

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

Course Outcome: After completion of the course, the students will be able to

S. No	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Apply key concepts of soft 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.	K3
CO4	Understand and analyse main ideas of complex texts.	K4
CO5	Construct clear and detailed texts on a wide range of topics.	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	1	1	1	1	1	1	2	3	1
CO2	1	1	1	1	1	1	1	1	2	3	1
CO3	1	1	1	1	1	1	1	1	2	3	1
CO4	1	2	2	2	2	2	1	1	2	3	1
CO5	1	1	2	2	2	2	1	1	2	3	1

List of Practical

1. **Introduction**
   - To the course

   ***Anubhav* Activity**

   On score improvement

2. **Listening to a variety of accents in English**
   - The students will develop their ability to comprehend English conversations with diverse speakers.

3. **Vocabulary Games**
   - The students will enhance their vocabulary through various interesting exercises and word-games.

4. **Role Play**
   - The students will practice how to meet, greet, and converse in miscellaneous professional scenarios.

5. **Deciphering the main points and summarizing**
   - The students will develop the ability to grasp the main point and summarize lengthy documents

6.. **Writing professional emails**
   - The students will practice and develop ability to write clear and concise emails.

7. **Critiquing Films/Videos**
   - The students will improve their listening and critical thinking skills, and will revise rules of reported speech.

8. **News Reports**

- The students will practice speaking with correct pronunciation and intonation.

9. **Time Bound Case Study Analysis**
   - The students will learn to focus and analyze assigned content

10. **Essay Writing**
    - The students will practice writing essays on the domain specific topics with emphasis on corrective grammar (as per the need).

11. **Presentations based on the Essay**
    - The students will learn to organize the content logically and present their ideas coherently.

12. **Vocabulary Enhancement Exercise**
    - The students will acquire domain specific terms.

13. **Listen and Repeat (**Emphasis on accepted Accent, Rhythm, Intonation)
    Read out loud (Emphasis on pauses)

14. **Passage Writing Based on Pictures**
    The students will write passages on pictures and will discuss correct grammatical structures based on the passages.

15. **Peer Talk on specific topics of general interest**
    - The students will develop conversational skills by discussing topics in pairs and will record their response to general questions asked by their peers.

16. **Responding to general questions (**Ref: ES Test)
    - The students will develop the ability to respond spontaneously to general questions.

17. **Identifying Errors**
    - The students will learn to identify & rectify structural errors.

18. **Solving Para-Jumbles**
    - The students will learn to organize ideas in a passage

19. **Language Toolbox**
    - The students will do exercises on Active & Passive Voices and cloze tests.

20. **Goal setting & Self discovery**
    - The students will set their short-term & long-term goals and will explore adjectives that best describe themselves.

21. **Extempore speeches**
    - The students will hone their spontaneous public speaking skills.

22. **Group Discussions**
    - The students will improve their ability to express their views clearly while discussing a topic in a group.

23. **Role Play Activity**
    - The students will perform role plays on campus behaviour, language, and dress sense of students.

24. ***Anubhav* Activity**
    The students will reflect on the semester and the road map ahead.

Total Hours: 60 hrs.

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	**Listening:** https://www.youtube.com/watch?v=Snve4Y8dMno https://www.youtube.com/watch?v=d27bn5k9Mjw&t=101s **Speaking**: https://www.youtube.com/watch?v=pImF1JkpAjo&list=PLLy_2iUCG87Dz7sxcJrCV2xbjw-x46g7w&index=7 https://www.youtube.com/watch?v=STVxfk_relw&list=PLp02GGDX5DIoMkblgrYhq91rF7_JZsf4-&index=25 **Reading:** https://www.youtube.com/watch?v=2h1Oaifi8mw&list=PLzf4HHlsQFwIDV-HfgMEYY7f5Jw6FmxrK&index=3	37m 1 hr 39m 35m 39m

	https://www.youtube.com/watch?v=jJUXEcMR6Ys&list=PLzJaFd3A7DZtnTdtOxvjO3GLPd1WVe6oq&index=6 **Writing:** https://www.youtube.com/watch?v=RASpQtZI06E&list=PLLy_2iUCG87AuIWZ3qnjA1GriD-IGF3Za&index=9 https://www.youtube.com/watch?v=ekFRWnPV6lc&t=535s	36m 33m 1hr
Video Lectures	**Listening:** https://www.youtube.com/watch?v=Ra6L83XwLko https://www.youtube.com/watch?v=Qa0G_7RJ2go **Speaking:** https://www.youtube.com/watch?v=HAnw168huqA https://www.youtube.com/watch?v=F4Zu5ZZAG7I **Reading:** https://www.youtube.com/watch?v=Zm8CuJGLuXU https://www.youtube.com/watch?v=FMD-rHth3_g **Writing:** https://www.youtube.com/watch?v=gFXE9n7hrOI https://www.youtube.com/watch?v=o9aVjBHEEbU	 34m 37m 58m 15m 15m 41m 24m 14m
Web References	**Listening:** https://www.researchgate.net/publication/394276570_Developing_Listening_Comprehension_Using_Podcasts_in_Second_Language_Education_A_Systematic_Overview_of_Recent_Pedagogical_Innovations_2019-2025 https://www.tandfonline.com/doi/full/10.1080/10904018.2013.813234#d1e729 **Speaking:** https://files.eric.ed.gov/fulltext/EJ1460111.pdf https://www.jetir.org/papers/JETIR2410126.pdf **Reading:** https://ijrpr.com/uploads/V6ISSUE2/IJRPR38781.pdf https://files.eric.ed.gov/fulltext/EJ1332254.pdf **Writing:** https://www.sciencedirect.com/science/article/pii/S2405844024129076 https://files.eric.ed.gov/fulltext/EJ1329510.pdf	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)

Course Code: DMB0201	Course Name: Innovation and Entrepreneurship	L	T	P	C
Course Offered in: B.Tech- Second Semester ECE/ECE(VLSI)		2	0	0	2

Pre-requisite:

Course Objectives: This course is designed to ignite the innovative and entrepreneurial spirit within students by providing them with a foundational understanding of how ideas are transformed into impactful ventures. Students will learn to identify and define different types of innovation, employ creative problem-solving techniques, and grasp the core principles of entrepreneurship and the entrepreneurial mindset.

Course Outcome: After completion of the course, the student will be able to		Bloom's Knowledge Level (KL)
CO1	Explain the core concepts of innovation, the innovation process, and the fundamentals of entrepreneurship.	K2
CO2	Apply techniques for idea generation, opportunity recognition, and validation for potential tech-driven ventures.	K3
CO3	Develop a basic business model and value proposition for an innovative idea, and understand the principles of MVP development.	K.6.
CO4	Describe the basics of Intellectual Property Rights relevant to technology and the foundational elements of startup finance and team building.	K2
CO5	Formulate and present a concise pitch for a startup concept and describe the components of the entrepreneurial ecosystem.	K6

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2	-	1	1	1	1	-	2	1	2		
CO2	2	2	2	2	2	2	2	1	1	2	2		
CO3	3	1	2	3	2	2	1	1	1	1	1		
CO4	1	2	1	2	1	-	1	-	-	1	2		
CO5	2	1	1	1	1	1	-	1	2	2	1		

Course Contents / Syllabus

Unit 1	Introduction to Innovation	6 hours

Defining Innovation, Types (Product, Process, Service, Business Model), Importance in Technology, Disruptive vs. Sustaining vs. Incremental Innovation. Idea Generation Techniques (Brainstorming, SCAMPER), Design Thinking Overview, Problem Identification & Definition, Creative Problem Solving.

Unit 2	Entrepreneurship Development	6 hours

Defining Entrepreneurship, Entrepreneurial Mindset & Traits, Types of Entrepreneurs (Tech, Social), Myths, Role in Economic Development. Identifying Market Needs & Gaps, Sources of Ideas, Evaluating Ideas (SWOT, PESTLE basics), Basic Market Research, Customer Discovery Introduction.

Unit 3	Developing a Minimum Viable Product (MVP)	6 hours

Business Model Canvas (BMC) / Lean Canvas, Defining a Compelling Value Proposition, Understanding Target Customers, Basic Competitive Analysis. Concept of MVP for tech products/services, Prototyping (Lo-fi, Hi-fi), Importance of User Feedback, Lean Startup Principles (Briefly).		
Unit 4	**Intellectual Property Rights (IPR)**	**6 hours**
Basics of Patents (for inventions), Copyrights (for software/content), Trademarks (for brands), Trade Secrets. Importance for tech startups. Building a Founding Team, Bootstrapping, Sources of Early-Stage Funding (Angels, VCs - Conceptual), Basic Financial Terms (Revenue, Cost, Profit).		
Unit 5	**The Entrepreneurial Ecosystem**	**6 hours**
Go-to-Market Strategies (Basics), Elements of a Good Pitch, developing a Pitch Deck, Practicing the Elevator Pitch. Role of Incubators, Accelerators, Government Support Schemes, Networking. Challenges & Opportunities. Future of Tech Entrepreneurship.		
	Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1.	Entrepreneurship and Innovation: Theory, Practice and Context	Tim Mazzaro, Sophie Reboud
2.	Innovation and Entrepreneurship	Peter F. Drucker

Reference Books:

S.No.	Book Title	Author
1.	Entrepreneurship - New Venture Creation, Pearson Publications	David H Holt

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013842970876665856284 30_shared/overview	06
	https://www.coursera.org/learn/innovative-ideas?specialization=business-entrepreneurship	05
Video Lectures	https://www.youtube.com/watch?v=UEngvxZ11sw	
	https://www.youtube.com/watch?v=A6BktbsRPr4	03
Web References		
PBL	Capstone Project	16

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREATER NOIDA-201306

(An Autonomous Institute)

Course Code: DNC0202	Course Name: Constitution of India, Law And Engineering	L	T	P	C
Course Offered in: B.Tech- Second Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		**2**	**0**	**0**	**NC**

Pre-requisite: Basic understanding of political science

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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	1	2	1	1	3	2	2	1	2	1		
CO2	1	2	2	1	1	3	2	2	2	2	1		
CO3	1	2	2	1	1	3	2	3	1	2	1		
CO4	2	2	3	2	2	3	3	3	2	2	2		
CO5	2	2	3	2	1	3	2	3	2	3	2		

Course Contents / Syllabus

Unit 1	**Introduction and Basic Information about Indian Constitution**	**6 hours**

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.

Unit 2	**Union Executive and State Executive**	**6 hours**

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.

Unit 3	**Introduction and Basic Information about Legal System**	**6 hours**

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.

Unit 4	**Intellectual Property Laws and Regulation to Information**	**6 hours**

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.

Unit 5	**Business Organizations and E-Governance**	**6 hours**

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 and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.

	Total Lecture Hours	**30 hours**

Textbook:

S.No	**Book Title**	**Author**
1.	Introduction to the Indian Constitution	Brij Kishore Sharma

Reference Books:

S.No	**Book Title**	**Author**
1.	The Indian Constitution	Madhav Khosla

Self-Study Content Links:		**Duration (in Hrs)**
MOOCs	https://www.google.com/url?sa=i&source=web&rct=j&url=https://onlinecourses.nptel.ac.in/noc25_lw02/preview&ved=2ahUKEwjL_K6Lt8KVAxUo3TgGHdmhN3oQy_kOegoIAggACAAIDxAJ&opi=89978449&cd&psig=AOvVaw3iygHhUeKYg3egnz62E-ST&ust=1783577767518000	10
Video Lectures	https://nptel.ac.in/courses/129106411?	10
Web References	https://www.legislative.gov.in/documents/constitution-of-india?	10

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)

Course Code: DNC0203	Course Name: Essence of Indian Traditional Knowledge	L	T	P	C
Course Offered in: B.Tech- Second Semester CSE/CSE-TWIN/IT/IT-TWIN/CS/CSE(DS)/ CSE(IOT)/CSE(AI)/AI-TWIN /CSE(AIML)/CYS/ AIML-TWIN/ECE/ECE(VLSI)/ME/M.Tech(Integrated)		**2**	**0**	**0**	**NC**

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

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

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

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	2	2	1	1	3	2	2	2	1	2		
CO2	1	1	2	1	1	3	2	2	2	1	2		
CO3	1	1	2	1	1	3	2	3	3	2	2		
CO4	2	2	3	2	2	3	3	2	2	1	2		
CO5	1	1	2	1	1	3	2	2	2	2	3		

Course Contents / Syllabus

Unit 1	**Society State and Polity in India**	**6 hours**

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.

Unit 2	**Indian Literature, Culture, Tradition, and Practice**	**6 hours**

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, **Sikh Literature**, Kautilya's Arthashastra, Famous Sanskrit Authors, Telugu Literature, Kannada Literature,Malayalam Literature ,Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature.

Unit 3	Indian Religion, Philosophy, and Practices	6 hours
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.		
Unit 4	**Science, Management and Indian Knowledge System**	**6 hours**
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.		
Unit 5	**Cultural Heritage and Performing Arts**	**6 hours**
Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Pottery, Painting, Indian Handicraft, UNESCO'S List of World Heritage sites in India, Seals, coins, Puppetry, Dance, Music, Theatre, drama, Martial Arts Traditions, Fairs and Festivals, UNESCO'S List of Intangible Cultural Heritage, Calenders, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema		
	Total Lecture Hours	**30 hours**

Textbook:

S.No	Book Title	Author
1.	Indian Art and Culture: for civil services and other competitive Examinations	Nitin Singhania

Reference Books:

S.No	Book Title	Author
1.	The Wonder that was India (34th impression)	B. L. Basham

Self-Study Content Links:		Duration (in Hrs)
MOOCs	https://www.classcentral.com/course/swayam-indian-popular-culture-292678 https://www.udemy.com/course/indian-history-chronology/	24.00 1.50
Video Lectures	https://youtu.be/xUphsn5b1w8?si=P8PqTnYUrNP3aWU7 https://youtu.be/SeTjQHzLci0?si=E-DEaKnWJEPN8yHj https://youtu.be/32XmLQxwhlQ?si=Ew7hFEL12E_3rPkh https://youtu.be/iof_dTG4cnQ?si=QWhHFeacVcYZ7mmR https://youtu.be/xmtM0ilhBIU?si=w9MQv8HSdzBXD321 https://youtu.be/7dT2eg3ekk0?si=YIDa9kfxJfTAyK1l https://youtu.be/xhqP7rPGNu4?si=WxdcjHKqmD3HGWge https://youtu.be/qE23vA4dHkk?si=6D9q-hKN57UVjUUV	1.00 0.09 0.23 1.05 1.09 1.26 0.26 0.33
Web References	https://en.wikipedia.org/wiki/Indian_religions	