Detailed Syllabus
(Lecture-wise Breakup)

Course Code	15B11EC411	Semester EVEN (specify Odd/Even)	Semester 4th Session 2022 -2023 Month from Jan to June
Course Name	ANALOGUE ELECTRONICS		
Credits	3	Contact Hours	3-0-0
Faculty (Names)	Coordinator(s)	Dr. Ajay Kumar, Dr. Bhartendu Chaturvedi	
	Teacher(s) (Alphabetically)	Dr. Ajay Kumar, Dr. Bhartendu Chaturvedi, Mr. Shivaji Tyagi	

COURSE OUTCOMES		COGNITIVE LEVELS
C213.1	To analyse biasing and frequency response of different BJT and MOS based amplifiers.	Understanding Level (C2)
C213.2	Explain and analyze basic structures of differential amplifiers and current mirrors.	Analyzing Level (C4)
C213.3	Explain the effect of feedback on amplifier characteristics and design of various types of oscillators.	Understanding Level (C2)
C213.4	Apply basic understanding of operational amplifier to design various applications.	Applying Level (C3)

Module No.	Title of the Module	Topics in the Module (yellow highlighted part shows the content covered in PBL CO3, CO4, CO5)	No. of Lectures for the module
1.	BJT Amplifier	Single stage (CE, CB, CC), Small-Signal Model, Multistage: CE-CE, Cascode, Darlington-pair, high (hybrid-π) frequency model, Frequency Response of CE Amplifier, Gain-bandwidth product, CE short circuit current gain	10
2.	Introduction of MOSFET and analysis of MOS amplifier	Introduction of MOSFET, characteristics and basing (voltage and current), small signal models: common source, common gate and common Drain, high frequency model and Frequency Response of CS amplifier	8
3.	Basic Building Blocks of Op-amp (BJT and MOS)	Basic Building Blocks of Op-amp: Basic differential pair, large and small signal analysis of differential amplifier, differential amplifier with active load, current mirror	11
4.	Feedback	Four basic feedback topologies: series-shunt, series-series, shunt-shunt, shunt-series, Barkhausen stability criterion for oscillators, Sinusoidal oscillators, RC Phase shift oscillator, Wien bridge oscillator	6
5.	Measurement of Op-amp parameters	Measurement of Op-Amp: Output Offset Voltage, Input offset voltage, Input Bias, Offset Current, Input current, CMRR, Slew rate, Open loop and closed loop gain, PSRR.	3
6.	Application of Op-Amp	Comparators, Schmitt trigger, Waveform generator (square wave, triangular wave), Instrumentation amplifier.	4
		Total number of Lectures	**42**

Project based learning: In this course, using BJT and MOSFETs we analyse and design various circuits such as single stage, multi-stage amplifiers, operational amplifiers, oscillators and comparators and waveform generators. The PBL assignment is based on the simulation of above mentioned circuits using SPICE simulator. In this process, students may transform theory into their own knowledge and improve their ability of independent thinking, analyzing and solving various problems.

	Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)
1.	A. S. Sedra & K.C. Smith, Microelectronic Cicruits Theory and Application, 6th Edition, Oxford University Press, 2011
2.	Donald Neamen, Microelectronic Circuit Analysis and Design, 4th Edition, Mc Graw Hill
3.	R. A. Gayakwad, Op Amp and Linear Integrated Circuit Technology, 3rd Edition, Prentice-Hall India, 1999.

Course Code	15B17EC471	Semester: EVEN (specify Odd/Even)	Semester 4th Session 2022-23 Month from January to June
Course Name	Analogue Electronics Lab		
Credits	1	Contact Hours	0-0-2

Faculty (Names)	Coordinator(s)	Mr. Shivaji Tyagi and Dr. Bhartendu Chaturvedi
	Teacher(s) (Alphabetically)	Dr. Ajay Kumar, Dr. Archana Pandey, Dr. Bhartendu Chaturvedi, Dr. Garima Kapur, Mr. Shivaji Tyagi

COURSE OUTCOMES	DESCRIPTION At the end of the course, students will be able to:	COGNITIVE LEVELS
C275.1	Plot the transient, frequency response of the first-order RC circuit using SPICE/MULTISIM and analyze the bias points for BJT.	Analyzing Level (C4)
C275.2	Analyze and plot the frequency response of single-stage BJT/MOS amplifiers	Analyzing Level (C4)
C275.3	Analyze and implement the BJT based current mirrors	Analyzing Level (C4)
C275.4	Analyze and determine the differential gain, common-mode gain and CMRR of BJT based differential amplifier and implement the Op-Amp circuits to use it in different applications.	Evaluating Level (C5)

Module No.	Title of the Module	List of Experiments	CO
1.	Introduction and demonstration of Simulation tool with suitable example	Installation of PSPICE/MULTISIM light version on GPL with operating instructions. Simulate transient and frequency response of first-order RC circuit for the input of sine and square waveform.	C275.1
2.	Study and Analyzing Biasing Techniques	Implement/simulate the dependence of β_{dc} on the collector bias current for the given discrete BJT transistor BC547B/Q2N2222A using breadboard and/or SPICE/MULTISIM simulator.	C275.1
3.	Study and Analyzing Biasing Techniques	Implement/simulate using SPICE/MULTISIM simulator the voltage biasing techniques such as voltage divider, collector to base bias and fixed bias for DC "Q-point" stability using BJT transistor BC547B/Q2N222A.	C275.1
4.	Large signal and small-signal analysis of CE amplifier	Implement/simulate using SPICE/MULTISIM simulator the single-stage CE amplifier circuit to determine the instantaneous node voltages and branch currents for triangular input $v_{in} = 1.0V$ (p-p) using a discrete BJT transistor. Also, determine the maximum amplitude of v_{in} which is allowed to be used in the amplifier.	C275.2
5.	Design of BJT based amplifier	Implement/simulate using SPICE/MULTISIM simulator a single stage BJT amplifier for given specifications.	C275.2
6.	Frequency Response of	Implement/simulate using SPICE/MULTISIM simulator the frequency response of the Common Source amplifier using N-channel MOSFET. Determine	C275.2

		a) Upper, lower 3-dB frequency b) Bandwidth	
7.	Current Mirror	Design and implement/simulate a basic BJT current mirror using a discrete transistor for reference current of 1mA using SPICE/MULTISIM simulator.	**C275.3**
8.	Current Mirror	Implement/simulate a Wilson current mirror output current of 1mA using SPICE/MULTISIM simulator.	**C275.3**

9.*	Differential Amplifier	Implement/simulate using SPICE/MULTISIM simulator a single-stage differential amplifier and determine the following:
		    a) Frequency response of differential gain A_d.
		    b) Frequency response of common-mode gain $A_{CM.}$
		    c) Common Mode Rejection Ratio (CMRR).
			C275.4

10.	Applications of OP-AMP	Implement/simulate using SPICE/MULTISIM simulator and validate applicability of Op-Amp using 741 IC in different applications	**C275.4**
11.	Analyze RC Filters	**Virtual Lab**: Analyze and design RC circuit based Low pass and High Pass filters (http://vlabs.iitkgp.ac.in/be/exp14/index.html)	**C275.1**
12.	Study and Analyze BJT Amplifier	**Virtual Lab**: Study and analyze of BJT CE amplifier (http://vlabs.iitkgp.ac.in/be/exp13/index.html)	**C275.2**
13.	Applications of OP-AMP	**Virtual Lab**: Study of different applications of Op-Amp (http://vlabs.iitkgp.ac.in/be/exp17/index.html#) (http://vlabs.iitkgp.ac.in/be/exp18/index.html) (http://vlabs.iitb.ac.in/bootcamp/labs/ic/exp4/exp/simulation.php)	**C275.4**

Evaluation Criteria

Components	Maximum Marks
Mid Viva	20
End Viva	20
Day to Day	60
Total	**100**

Project-Based Learning: This Lab course starts with the introduction and demonstration of simulation tool(s) such as MULTISIM/PSPICE. Furthermore, the experiments of this Lab course also help students to analyze and design BJT and MOS based important analogue structures by means of simulation tools such as MULTISIM/PSPICE. Small groups of three or four students work in cooperation using PBL techniques to solve design-oriented experiments. Students' opinions have been obtained by means of a course exit survey at the end of the course.

* These are advanced-level experiments.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Textbooks, Reference Books, Journals, Reports, Websites etc. in the IEEE format)
1. A. S. Sedra & K.C.Smith, Microelectronic Circuits Theory and Application, 6th Edition, Oxford University Press, 2015(Text Book)
2. Marc Thompson, Intuitive Analog Circuit Design, 2nd Edition, Elsevier Publication, 2013

Course Code	15B11EC413		Semester Even		Semester IV Session 2022 –2023 Month from Jan to June
Course Name	DIGITAL SIGNAL PROCESSING				
Credits	4		**Contact Hours**		**4**

Faculty (Names)	Coordinator(s)	Sajaivir Singh , Vineet Khandelwal
	Teacher(s) (Alphabetically)	Madhu Jain

COURSE OUTCOMES		COGNITIVE LEVELS
C215.1	Recall the principles of z-transforms, explain the DFTs (Discrete Fourier Transform) and develop FFT (Fast Fourier Transform) algorithms for DFT.	Applying (C3)
C215.2	Construct and Analyze the digital FIR (Finite Impulse Response) and IIR (Infinite Impulse Response) filters.	Analyzing (C4)
C215.3	Demonstrate multi-rate signal processing and relate DSP (Digital Signal Processing) in various applications.	Understanding (C2)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	**Review of Discrete time Signals and Systems**	Review of discrete–time sequences and systems, discrete time system analysis using Z transform.	**3**
2.	**Discrete Fourier Transform and FFT**	Discrete Fourier Transform (DFT) and its properties, Linear filtering methods based on DFT, Frequency analysis of signals using the DFT, Fast Fourier Transform (FFT) algorithms using decimation in time and decimation in frequency techniques.	11
3.	**FIR Filter design**	Basic structures of digital filters; Significance of Linear phase response, FIR filters design - Frequency sampling and Windowing techniques, Computer aided design.	8
4.	**IIR Filter design**	Approximation of filter functions: Butterworth, Chebyshev, Elliptic; IIR filter design based on analog filter functions- Impulse Invariant and modified invariant response techniques, Bilinear transformation method.	10
5.	**Multi-rate Digital Signal Processing**	Decimation & Interpolation, Filter design with sampling rate conversion by a rational factor I/D	5
6.	**DSP Applications**	Applications in speech and image processing, and power	7

		spectrum estimation.	
		Total number of Lectures	44

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25
Total	**100**

Project based learning: Students will learn different techniques used for the generation, transformation, extraction and interpretation of information via discrete signals which is essential for smart phones, home appliances, healthcare devices, cameras and in general for many digital systems. Student shall be given various practical situation-based design exercises to be implemented in MATLAB or OCTAVE. This would enable them to recall and apply various techniques and algorithms taught in course to design and analyse the required system that meets the given technical specification.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	L. Tan and Jean Jiang , Digital Signal Processing Fundamentals and Applications, Third Edition, Academic Press, 2013
2.	J. G. Proakis & D. G. Manolakis, Digital Signal Processing, Principles, Algorithms and Applications, Fourth edition, PHI, 2007.
3.	S. K. Mitra, Digital Signal Processing: A Computer Based Approach, Fourth Edition, McGraw Hill, 2013.
4.	L. R. Rabiner, B. Gold, Theory and application of digital signal processing, Third Edition, PHI, 2012
5.	A. Antoniou, Digital Signal Processing: Signals, Systems, and Filters, TMH, 2006

Course Code	15B17EC473	Semester Even	Semester IV Session 2022 -2023 Month from Jan – Jun
Course Name	**Digital Signal Processing (DSP) Laboratory**		
Credits	1	Contact Hours	0-0-2

Faculty (Names)	Coordinator(s)	Dr. Madhu Jain, Dr. Kapil Dev Tyagi
	Teacher(s) (Alphabetically)	Dr. Vineet Khandelwal, Dr. Vijay Khare

COURSE OUTCOMES		COGNITIVE LEVELS
C277.1	Recall and interpret discrete time signals and systems in time domain and in frequency domain	Understanding [Level 2]
C277.2	Develop and demonstrate coding skills from basic mathematical operations to complex operations like DFT and FFT.	Applying [Level 3]
C277.3	Identify and examine different digital filter structures.	Analyzing [Level 4]
C277.4	Determine and observe magnitude and phase characteristics (Frequency response Characteristics) of digital IIR-Butterworth, Chebyshev filters and digital FIR filters using window techniques for various applications of DSP.	Evaluating [Level 5]

Module No.	Title of the Module	List of Experiments	CO
1.	Introduction to MATLAB	Introduction to the MATLAB and its features.	C277.1
2.	Introduction to applications of MATLAB	Introduction to the different applications of MATLAB.	C277.1
3.	Discrete-Time Signals	Generation of discrete time signals with different operation on independent and dependent variable.	C277.1
4.	LTI Systems	Write your own MATLAB function to implement linear convolution as an operation to analyze discrete time LTI system.	C277.1
5.	Z-transform	Compute z- transform and inverse z-transform of a discrete time signals and systems. Plot pole-zero map of the same using symbolic tool box.	C277.1
6.	Discrete Fourier Transform (DFT)	Write your own MATLAB function to compute DFT (Discrete Fourier Transform) and IDFT (Inverse Discrete Fourier Transform) for the spectral analysis of signals.	C277.2
7.	Spectral Analysis	To determine magnitude and power spectrum of given signal.	C277.2
8.	Circular Convolution	Write your own MATLAB function 'mycirconv' to compute circular convolution of two sequences.	C277.2
9.	FFT	Develop radix-2 butterfly FFT (Decimation in Time) algorithm for the computation of N-point dft.	C277.2

10.	FIR Filter	Write MATLAB program to design digital FIR filter employing windowing technique.	C277.4
11.	IIR Filter	Write MATLAB program to design IIR digital filter for a given specification using bilinear transformation and impulse invariant method.	C277.4
12.	IIR Structures	Write MATLAB program for realization of digital IIR filter using direct form-I & II, cascade and parallel method.	C277.3
13.	DFT Properties	Virtual Lab: Study of Transform domain properties and its use.	C277.2
14.	FIR Filter Study	Virtual Lab: Study of FIR filter design using window method.	C277.4
15.	IIR Filter Study	Virtual Lab: Study of Infinite Impulse Response (IIR) filter.	C277.4

Evaluation Criteria

Components	Maximum Marks
V1	20
V2	20
AC and Virtual Lab Exp	30
Attendance	15
Report	15
Total	**100**

Project based learning: Students will design Digital filters (FIR and IIR) for the given design specifications using MATLAB programming as well Filter Design Analysis tool. Additionally, students in group sizes of two-three will realize various applications of DSP employing digital filters.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Sanjit K. Mitra, Digital Signal Processing: With DSP Laboratory Using MATLAB: A Computer-Based Approach, *4th Edition, TMH,* 2013.
2.	Vinay K. Ingle, John G. Proakis, Digital Signal Processing Using MATLAB, *3rd Edition, Cengage Learning,* 2012.

Detailed Syllabii
Lecture-wise Breakup

Subject Code	18B11EC212		Semester EVEN	Semester 4th Session 2022-23 Month from Jan to June
Subject Name	ANALOG AND DIGITAL COMMUNICATION			
Credits	4		**Contact Hours**	3-1-0

Faculty (Names)	Coordinator(s)	Dr Ashish Goel, Dr Megha Agarwal
	Teacher(s) (Alphabetically)	Vishal saxena,

COURSE OUTCOMES		COGNITIVE LEVELS
C211.1	Understand need of modulation and differentiate among various amplitude modulation schemes and design simple systems for generating and demodulating amplitude modulated signals.	ApplyingLevel (C1)
C211.2	Analyze the generation and detection of FM signal and design basic systems for the indirect and direct generation of FM signals.	Analyzing Level (C4)
C211.3	Understand the concepts of transmitters and receivers for analog modulations, Sampling process, time division multiplexing and GSOP.	Understanding Level (C2)
C211.4	Understand the concepts of waveform coding techniques, Line coding schemes and analysis of ISI Mitigation Techniques	Analyzing Level (C4)
C211.5	Understand the concepts of digital modulation techniques and evaluate their probability of error and bandwidth efficiency.	Evaluating Level (C5)

Module No.	Subtitle of the Module	Topics	No. of Lectures
1.	Introduction	Elements of a communication system;Analog and digital signals, bandlimited signals and systems, bandwidth	2
2.	Amplitude modulation	Introduction to modulation; AMSC,DSB, SSB, VSB Communication. Detection of AM signals: Coherent detection, Envelope detection,Costas receiver.	7
3.	Angle modulation	Concepts of FM and PM,Narrowband and wideband FM, Direct and indirect methods of FM generation, Detection of FM signals	6
4.	Transmitters , Receivers and Multiplexing Techniques	AM and FM Transmitters, Superheterodyne AM and FM Receivers. FDM,TDM, Interchannel crosstalk and bandwidth effects	3
5.	Sampling and Quantization techniques	Time and frequency domain sampling with aperture effects, Reconstruction of signals, Quantization process and mean	5

		square quantization error, GSOP.	
6.	Speech Coding ,Line Coding and Baseband Digital Transmission	Pulse Code modulation,Line Codes: Unipolar-NRZ, polar-NRZ, Unipolar-RZ, Bipolar-RZ, Manchester Code, DPCM, DM, Bit rate and bandwidth of digital signals, ISI Mitigation Techniques	11
7.	Digital Modulation Techniques	ASK, FSK ,PSK, QPSK Modulation, 16-QAM, Demodulation, Constellation diagrams, BER and their BW calculation,	9
		Total number of Lectures	43

Evaluation Criteria

Components	Maximum Marks	
T1	20	
T2	20	
End Semester Examination	35	
TA	25	
	Total	**100**

Project based learning: Here, students will learn the process of analog and digital modulation schemes as it is of the utmost importance to understand the process of communication system and to design the same. Student will be able to design the communicationsystem as per requirements and some simulation on Matlab can also be performed to analyze the same . Understating of these techniques will further help to work in any communication based industry.

Recommended Reading(Books/Journals/Reports/Websites etc.: Author(s), Title, Edition, Publisher, Year of Publication etc. in IEEE format)	
1.	LathiB.P, Modern Digital and Analog CommunicationSystems, 5th /ed ,Oxford University Press,2018
2.	H. Taub, D. L. Schilling and GautamSaha, Principles of Communication Systems, 4th/ed,TMH, 2017
3.	S.Haykin, Digital Communication Systems,John Wiley & Sons, 2013

Detailed Syllabus
Lab-wise Breakup

Course Code	18B15EC212	Semester Even	Semester IV Session 2022-2023 Month from **Jan to June**
Course Name	*Analog and Digital Communication Lab*		
Credits	1	Contact Hours	2 Hrs. per week

Faculty (Names)	Coordinator(s)	Reema Budhiraja, Raghvendra Kumar Singh
	Teacher(s) (Alphabetically)	Ashish Goel, Neetu Joshi ,Rahul Kaushik, Ritesh Kumar Sharma

COURSE OUTCOMES		COGNITIVE LEVELS
C272.1	Design of circuits for analogue modulation/demodulation techniques.	Analyzing (C4)
C272.2	Understand the concepts of sampling process, and time division multiplexing.	Understanding (C2)
C272.3	Design and implement digital modulation techniques.	Analyzing (C4)
C272.4	Implementation of modulation techniques using MATLAB.	Applying (C3)

Module No.	Title of the Module	List of Experiments	CO
1.	**Analogue modulation/demodulation**	Implement amplitude modulation and DSB-SC modulation circuit using IC AD633 & calculate modulationindex for various modulating signals and study the over, exact and under modulation.	CO1
2.	**Analogue modulation/demodulation**	Demodulate amplitude modulated signal using Envelope detector.	CO1
3.	**Analogue modulation/demodulation**	Design a Frequency modulation (FM) circuit using IC XR 2206 and determine the frequency deviation and modulation index.	CO1
4.	**Frequency mixer**	Design a Frequency mixer circuit using ICAD633	CO1
5.	**Sampling**	Design a circuit to sample a given signal using IC LF398 and reconstruct the signal from sampled waveform	CO2
6.	**Multiplexing**	Study of TDM with different receiver synchronization techniques	CO2

7.	**Digital modulation/demodulation techniques**	Implement and Test Amplitude Shift Keying Circuit using IC LF 398	**CO3**
8.	**Digital modulation/demodulation techniques**	Implement and Test Frequency Shift Keying Circuit using IC LF 398	**CO3**
9.	**Digital modulation/demodulation techniques**	Implement and Test Phase Shift KeyingCircuit using IC LF 398.	**CO3**
10.	**Digital modulation/demodulation techniques**	Study of Pulse Code Modulator (PCM) and Demodulator.	**CO3**
11.	**Digital modulation/demodulation techniques**	Study of Delta Modulation and Demodulation	**CO3**
12.	**Digital modulation/demodulation techniques**	Generation & detection of ASK, FSK & PSK using trainer kit	**CO3**
13.	**Software implementation of digital modulation/demodulation techniques**	Implement amplitude modulation using MATLAB simulation	**CO4**
14.	**Software implementation of digital modulation/demodulation techniques**	Implement ASK and PSK modulation using MATLAB simulation	**CO4**

Evaluation Criteria		Assessment Components (ACs)	
Components **Maximum Marks** Viva 1(Mid Sem Viva) 20 Viva 2(End Sem Viva) 20 Assessment Components 30 Attendance 15 Lab Record 15 **Total 100**		**AC1.** Identification of components to be used & correct Implementation of circuit on bread board/KIT **AC2.** Reading and trace work **AC3.** Understanding of the experiment **AC4.** Lab Record Assessment	

Project Based Learning: This course provides practical exposure to communication system building blocks, such as filters, mixers etc. The students are trained for constructing the circuits for analog and digital communication. Students get hands on experience while working on bread board and design Modulation/Demodulation circuits using discrete components.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Lathi B.P, Modern Digital and Analog Communication Systems, 5th /ed ,Oxford University Press, 2018
2.	S.Haykin, Digital Communication Systems ,John Wiley & Sons, 2013
3.	Lab Manuals

Course Code	**15B1NHS431**	**Semester: EVEN**	**Semester IV** Session **2022-2023**
			Month: **January 2023 to June 2023**

Course Name	**Introduction to Literature**		
Credits	3	**Contact Hours**	**3 (2-1-0)**

Faculty (Names)	**Coordinator(s)**	Dr. Monali Bhattacharya (Sector 62) & Dr. Ekta Srivastava (Sector 128)
	Teacher(s) (Alphabetically)	Dr. Ekta Srivastava , Dr. Monali Bhattacharya

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-5.1	Understand figurative language to demonstrate communication skills individually and in a group.	CL-2 Understanding
C206-5.2	Develop a critical appreciation of life and society through a close reading of select texts.	CL-3 Applying
C206-5.3	Analyse a literary text thematically and stylistically and examine it as representing different spectrum of life, human behavior and moral consciousness of society.	CL-4 Analysing
C206-5.4	To interpret Literature as reflection of cultural and moral values of life and society.	CL-5 Evaluating

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Literature & Genres	Introduction Literary Genres Literary Devices Learning Communication Skills through Literature	5
2.	Poems	On His Blindness: John Milton My Last Duchess: Robert Browning "Hope" is the thing with feathers: Emily Dickinson A Prayer before Birth: Louis MacNeice Goodbye Party for Miss Pushpa T.S.: Nissim Ezekiel	6
3.	Prose & Short Stories	The Spectator Club: Richard Steele Evidence: Isaac Asimov Toba Tek Singh: Saadat Hasan Manto	6
4.	Plays & Drama	Andher Nagari Chaupat Raja: Bhartendu Harishchandra The Characters of Macbeth & Lady Macbeth as Universal Characters. Arms & The Man: G B Shaw	7
5.	Novel	To Sir with Love: E.R. Braithwaite	4

		Total number of Lectures	28

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment, Project and class description)
Total	**100**

Project Based Learning:

The students take up a project in a group of 4-5. The Project consists of 2 components: A Digital Poster & a Report. The students pick a text (Novel /Play) of their choice which has not been covered in the syllabus. The analysis of the text is to be submitted in the form of a Narrative Digital Poster. The analysis should include: Introduction, Objectives/Research Questions, Background Study / literature review, Method/ Discussion(Themes, Narrative Structure, Plot in the context of Conflicts, Freitag's model and any 3 Major Literary Devices used by the writer and application of Psychoanalysis) & Analysis. The students should identify the themes in context of the following: a)Different spectrum of life as explored in the text b) Human behavior as exhibited in the text c) Cultural aspects as portrayed in the text d) Moral consciousness of an individual and the society as analysed in the text. The project includes a brief 2-3 pages report which should highlight the following: a) The Names of the team members along with individual contribution in the whole. b) The channels undertaken for team coordination and for remote collaboration.c) Challenges faced and Lessons learnt in virtual coordination/communication. d) Rationale for choosing the particular text. e) Abstract of the entire poster in 250 words, highlighting introduction, objectives, methodology adopted, discussion, analysis and conclusion. f) Learning of the team from the poster based project work done. g) Relevance of the findings/ study for the society and future h) Limitations of the study done.

	Recommended Reading material:
1	John E. Eck, *'Writing with Sweet Clarity'* 1st Edition. Routledge. 2022 https://doi.org/10.4324/9781003167532
2	M.H. Abrams, Geoffrey Harpham *'A Glossary of Literary Terms'*, 11th Edition, Cengage Learning, 2014,
3	Mark William Roche, *'Why Literature matters in the 21st Century'*, 1st Edition, Yale University Press, 2004.
4	E.R. Braithwaite, *'To Sir With Live'*, First Edition, Bodley Head, UK, 1959. Susie Thomas(Ed), "E. R. Braithwaite: 'To Sir, with Love' – 1959", Available at http://www.londonfictions.com
5	Khalid Hasan (Translator), *'Saadat Hasan Maanto : Toba Tek Singh'* Reprint, Penguin Books, India, 2008.
6	G.B Shaw, *'Arms & The Man'*, Paperback, 2013 https://onemorelibrary.com/index.php/en/?option=com_djclassifieds&format=raw&view=download&task=download&fid=10428
7	Anon, (a.n.d.). *The Spectator Club. Sir Richard Steele.* 1909-14. Available at: https://www.bartleby.com/27/7.html
8	*All poems online: http://www.poetryfoundation .org*
9	Wolfgang Clemen, *'Shakespeare's Soliloquies'*, First Edition, Routledge, London, 1987.

Detailed syllabus
Lecture-wise Breakup

Subject Code	15B1NHS432	Semester: Even	Semester IV Session 2022-2023 Months: from Jan. to June 2023
Subject Name	**INTRODUCTION TO PSYCHOLOGY**		
Credits	3	Contact Hours	(2-1-0)
Faculty (Names)	Coordinator(s)	Dr. Badri Bajaj Dr. Shweta Verma	
	Teacher(s) (Alphabetically)	Dr. Badri Bajaj Dr. Shweta Verma	

COURSE OUTCOMES		COGNITIVE LEVELS
C206-6.1	Demonstrate a basic understanding of different perspectives and concepts of psychology	Understanding (Level 2)
C206-6.2	Apply the concepts of psychology in day to day life	Applying (Level 3)
C206-6.3	Examine the different theoretical perspectives and models of psychology	Analyzing (Level 4)
C206-6.4	Develop solutions for problems related to psychology using appropriate tools/models	Creating (Level 6)

Module No.	Subtitle of the Module	Topics in the module	No. of Lectures for the module
1.	**Introduction to Psychology**	Definition, Nature, and Scope of Psychology; Approaches: Biological, Psychodynamic, Behaviorist, and Cognitive. Methods: Experimental, Observation and Case study; Fields of application.	3
2.	**Basic Concepts**	Person, Consciousness, Behavior and Experience, Perception and learning	5
3.	**Memory**	Process of Memory: Encoding, Storage, Retrieval; Stages of Memory: Sensory, Short term and Long term	3
4.	**Motivation**	Motives: Intrinsic and Extrinsic Frame Work, Theories of Motivation; Techniques of Assessment of Motivations; Frustration and Conflict.	3
5.	**Emotions**	Concept, Development, Expression, Theories of Emotions.	2
6.	**Intelligence**	Nature, Theories, Measurement and Approaches - Genetic and Environmental	3
7.	**Personality**	Nature, Approaches, Determinants and Theories; Techniques of Assessment: Psychometric and Projective Techniques.	5

8.	**Psychology of Adjustment**	Psychological Disorders: Anxiety, Stress, Depression; Psychotherapies.	4
		Total:	28

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Assignment, Quiz)
Total	**100**

Project based learning: Students in a group will choose a research topic from the syllabi of psychology. Students will cover the following points to prepare project reports: Understanding of concept, related theories and perspectives; describe the relevance of the chosen concept for personal growth; discuss the application of chosen topic for their professional life; elaborate the relevance of the topic at group level and societal level. Discussions on these practical aspects will enhance students' understanding & application of concepts of psychology in day to day life.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	R.A. Baron and G. Misra, Psychology, 5th Ed., Pearson, 2015
2.	S. Nolen-Hoeksema, B. L. Fredrickson, G. R. Loftus, and C. Luts, Introduction to Psychology, 16th Ed., Cengage Learning, 2014.
3.	S. K. Ciccarelli and G. E. Meyer, Psychology, Pearson, 5th Ed., 2017.
4.	Clifford Morgan, Richard King, John Weisz, John Schopler, Introduction to Psychology, 7th Ed., McGraw Hill Education, 2017.
5.	S. Pandit, Introduction to Psychology, 1st Ed., SAGE Publications; 2022
6.	Gregory Feist and Erika Rosenberg, Psychology: Perspectives and Connections, 5th Ed., McGraw-Hill Education, 2021

Course Code	15B1NHS433	Semester EVEN (specify Odd/Even)	Semester IV Session 2022 -2023 Month Jan- June
Course Name	INTRODUCTION TO SOCIOLOGY		
Credits	3(2-1-0)	Contact Hours	3

Faculty (Names)	Coordinator(s)	Prof Alka Sharma
	Teacher(s) (Alphabetically)	Ms.Shikha Kumari

COURSE OUTCOMES		COGNITIVE LEVELS
C206-7.1	Demonstrate an understanding of sociological perspectives and concepts.	Remembering (C1)
C206-7.2	Explain the concept of social stratification and types of stratification as class, caste and gender.	Understanding (C2)
C206-7.3	Apply the major sociological perspectives, social concepts and methods in the systematic study of society	Applying(C3)
C206-7.4	Analyze the relevance of various social Institutions in societies and how it shapes and influences social interactions.	Analyzing (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction	Introduction to sociology as a discipline of social science, difference between common sense and sociology, Major sociological perspective and methods, the sociological imagination	5
2.	Basic Concepts of Sociology	Groups, sub-groups, society, characteristics of society, culture, institutions, Institutionalization, Conformity, Social Change	6
3.	Social stratification	Stratification-concept, theories and type. Basis of stratification caste, class, gender and race, status and Roles	5
4.	Sociology of Institutions	Kinship, Family ,Religion, Education &Economy in Society	6
5.	Process of Change and Mobility	Process of Social Change in Indian Society: Sanskritization, Westernization, Modernization, Urbanization	4
6.	Sociology of Collectivity	Collective Action and Social Movements	2
		Total number of Lectures	**28**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project basedpresentation, assignment and quiz)
Total	**100**

The students will find out which aspect of Organizational culture influences the employee' performance and formulate recommendations regarding organizational culture, which will help the organization to be

more inclusive of different cultural practices of the employees (tackle issues such as gender equity, respect for other languages, reduce racial identity crisis, reduce class and caste discrimination, promote respect for all religions etc) to increase their belongingness towards the organization.

	Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)
1	Johnson, Harry M. *Sociology: a systematic introduction*. Routledge, 2013.
2	Rawat, H. K. *Sociology: basic concepts*. Rawat Publications, 2007.
3	Macionis, John J. *Society: the basics*. Pearson/Prentice Hall, 2009.
4	C. Wright. And Mills, *The Sociological Imagination*, Oxford: Oxford University Press, 1959.
5	Peter L Berger, *The Social Construction of Reality: a Treatise in the Sociology of Knowledge. Garden City,* New York: Anchor, 1966.
6	Conley and Dalton, *You May Ask Yourself: An Introduction to Thinking Like a Sociologist*, 2nd Ed, W. W. Norton & Company New York, 2011. ISBN: 0393935175 or 978-0393935172
7	Ballentine and Roberts, *Our Social World: Introduction to Sociology*, 4th Edition, Sage. 2013.
8	Robert Parkinand Linda Stone, (ed.). *Kinship and Family: An Anthropological Reader*, U.S.A.: Blackwell, 2000, selected chapters

Course Code	15B1NHS434	Semester: Even	Semester IV Session 2022 -2023
			Month from Jan 2023 to June 2023

Course Name	Principles of Management
Credits	**3**	**Contact Hours**	2-1-0

Faculty (Names)	Coordinator(s)	Dr. Shirin Alavi
	Teacher(s) (Alphabetically)	Dr. Shirin Alavi

COURSE OUTCOMES		COGNITIVE LEVELS
C303-1.1	Describe the functions, roles and skills of managers and illustrate how the manager's job is evolving.	Understanding Level (C2)
C303-1.2	Examine the relevance of the political, legal, ethical, economic and cultural environments in global business.	Analyzing Level (C4)
C303-1.3	Evaluate approaches to goal setting, planning and organizing in a variety of circumstances.	Evaluating Level (C5)
C303-1.4	Evaluate contemporary approaches for staffing and leading in an organization.	Evaluating Level (C5)
C303-1.5	Analyze contemporary issues in controlling for measuring organizational performance.	Analyzing Level (C4)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Managers and Management	Management an Overview: Introduction, Definition of Management, Role of Management, Functions of Managers, Levels of Management, Management Skills and Organizational Hierarchy, Social and Ethical Responsibilities of Management: Arguments for and against Social Responsibilities of Business, Social Stakeholders, Measuring Social Responsiveness and Managerial Ethics, Omnipotent and Symbolic View, Characteristics and importance of organizational culture, Relevance of political,legal,economic and Cultural environments to global business, Structures and techniques organizations use as they go international .	7
2.	Planning	Nature & Purpose, Steps involved in Planning, Objectives, Setting Objectives, Process of Managing by Objectives, Strategies, Policies & Planning Premises, Competitor Intelligence, Benchmarking, Forecasting, Decision-Making.	5
3.	Organizing	Organizing ,Benefits and Limitations-De-Centralization and Delegation of Authority, Authority versus Power ,Mechanistic Versus Organic Organization ,Common Organizational Designs, Contemporary Organizational Designs and Contingency Factors, The Learning Organization Nature and Purpose, Formal and Informal Organization, Organization Chart, Structure and Process, Departmentalization by difference strategies, Line and Staff authority- Benefits and Limitations-De-Centralization and Delegation of Authority Versus, Staffing ,Human Resource	7

		Inventory, Job Analysis , Job Description, Recruitment and Selection, Selection Tools Staffing, Managerial Effectiveness,Staffing, Training, Employee Performance Management, Compensation and Benefits, Contemporary Issues in Managing Human Resources .	
4.	Directing	Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership, Types of Leadership,Directing, Managers as leaders, Early Leadership Theories…Trait Theories, Behavioral Theories, Managerial Grid, Contingency Theories of Leadership,Directing ...Path Goal Theory, contemporary views of Leadership, Cross Cultural Leadership, Leadership Training, Substitutes of Leadership	4
5.	Controlling	Controlling, Introduction to Controlling System and process of Controlling, Requirements for effective control, The planning Contol link, The process of control, types of control The Budget as Control Technique, Information Technology in Controlling, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Financial Controls , Tools for measuring organizational Performance ,Contemporary issues in control Workplace concerns, employee theft, employee violence	5
		Total number of Lectures	**28**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Attendance)
Total	**100**

Project Based Learning: The project is to be done in group size of 4-5 members each. Student groups can choose an organizationfrom one of the following themes-Staffing and Controlling in a virtual world, Staffing and controlling in the Banking Sector, Staffing and Controlling and the IT industry, Staffing and Controlling in Hospitality/Telecom/Airlines, Staffing and Controlling in Logistics, Staffing and Controlling in International Business and Staffing and Controlling in Consulting. Study the staffing and controlling processes of the chosen organization. Students were asked to submit their research analysis in the form of a project report. This adds to the management related employability skills in an organization as staffing and controlling are important aspects of overall management function.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Koontz H, Weihrich H. Essentials of management: an international, innovation, and leadership perspective. McGraw-Hill Education; 10th Edition 2018.
2.	Tripathi PC. Principles of management. Tata McGraw-Hill Education; 6th Edition 2017.
3.	Principles of Management Text and Cases, Pravin Durai , Pearson ,2015
4.	Robbins, S.P. & Decenzo, David A. Fundamentals of Management,7th ed., Pearson, 2010
5.	Robbins, S.P. & Coulter, Mary Management; 14 ed.,Pearson , 2009

Course Code	15B1NHS435	Semester: Even	Semester IV Session:2022-23
			Month from: Jan-June 2023

Course Name	Financial Accounting		
Credits	3	Contact Hours	3 (2-1-0)

Faculty (Names)	Coordinator(s)	Dr. Mukta Mani (Sec-62), Dr. Sakshi Varshney (Sec-128)
	Teacher(s) (Alphabetically)	Dr. Mukta Mani, Dr. Sakshi Varshney

COURSE OUTCOMES		COGNITIVE LEVELS
C206-8.1	Understand the basic concepts of Accounting.	Understanding level (C2)
C206-8.2	Apply accounting concepts for recording of business transactions.	Applying level (C3)
C206-8.3	Compare and reconcile the accounting records with other sources of information.	Analyzing level (C4)
C206-8.4	Evaluate the accounting records to identify and rectify the errors made during accounting process.	Evaluating level (C5)
C206-8.5	Construct the final accounts and cash flow statement of a business.	Creating (C6)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Accounting	Meaning of Accounting, Objectives of Accounting, Understanding Company Management, Stakeholders versus Shareholders, Financial Reporting Standards, Financial Reporting	2
2.	Understanding Accounting Elements	Elements of Financial Statements- Assets, Current assets, Liabilities, Current liabilities, Equity, Income, Expenses, Accounting Equation	2
3.	Accounting Concepts	Business entity concept, Money measurement concept, Going concern, Consistency, Matching concept, Cost concept, Dual aspect concept, Materiality, Full disclosure, Generally Accepted Accounting Principles (GAAP)	2
4.	Journal Transactions	Journal, Rules of Debit and Credit, Compound Journal entry, Opening entry	2
5.	Ledger Posting and Trial Balance	Ledger, Posting, relationship between Journal and Ledger, Rules regarding Posting, Trial balance	3

6.	Rectification of Errors	Different types of errors, their effect on trial balance, rectification and preparation of suspense account	5
7.	Bank Reconciliation Statement	Meaning of Bank Reconciliation Statement, technique of preparing BRS, Causes of difference	2
8.	Final Accounts	Trading account, Profit and Loss account, Balance sheet, Adjustment entries	6
9.	Cash Flow Statement	Introduction of Cash Flow Statement, Classification of Cash inflows and Cash Outflows Activities, Elements of the Cash Flow Statement, Methods of Cash Flow Statement, Limitations Of Cash Flow Statement	4
		Total number of Lectures	**28**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Project+ Class test/Quiz+ Class Participation)
Total	**100**

Project Based learning: Students form a group of 4-5 students. Each group is required to choose a company listed in Indian stock exchange and download its latest annual report. Students are required to describe the company, composition of board of directors, number of company's executives, independent directors, and background of independent directors. They are required to find out financing, investing and operating activities and examine the change in total assets, sales and net profit of the company. As per auditor's report, company's position and future plans for growth of the company is also analyzed.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Maheshwari, S. N., Maheshwari, S.K. Maheshwari, S.K., Financial Accounting, 6th Ed., S. Chand & Sons Publication, 2018.
2.	Narayanswamy, R., Financial Accounting: A Managerial Perspective, 7th Ed., Taxmann Publications, 2017
3.	Tulsian,P., Financial Accounting,2nd Ed., Pearson Education India,2017
4.	Bhattacharya, A., Financial Accounting for Business Managers, 5th Ed., Prentice Hall of India,2016
5.	Weygandt.J., Kimmel, P., Kieso,D., Accounting Principles, 12th Edition, John Wiley & Sons,2015
6.	Barton,M., Bhutta, P.,S. O'Rourke,J.,Satyam Computer Services Ltd: Accounting fraud in India,London,SAGE Publications Ltd, 2017
7.	Lal,J.,Srivastava,S., Financial Accounting : Principles and Practices, 1st Edition., S. Chand & Sons Publication, 2006.

Course Code	15B11MA301	Semester Even	Semester IV Session 2022-2023
			Month from Jan 2023- Jun 2023

Course Name	Probability and Random Processes		
Credits	4	**Contact Hours**	3-1-0

Faculty (Names)	Coordinator(s)	Prof. B. P. Chamola, Dr. Aradhana Narang, Dr. Neha Ahlawat
	Teacher(s) (Alphabetically)	Prof. B. P. Chamola, Dr. Pato Kumari, Dr. Yogesh Gupta, Dr. Manish Kumar Bansal, Dr. Nisha Shukla, Dr. Aradhana Narang, Dr. Amit Srivastava, Dr. Lakhveer Kaur, Dr. Neha Ahlawat

COURSE OUTCOMES:		COGNITIVE LEVELS
After pursuing the above mentioned course, the students will be able to:		
C201.1	explain the basic concepts of probability, conditional probability and Bayes' theorem	Understanding Level (C2)
C201.2	identify and explain one and two dimensional random variables along with their distributions and statistical averages	Applying Level (C3)
C201.3	apply some probability distributions to various discrete and continuous problems.	Applying Level (C3)
C201.4	solve the problems related to the component and system reliabilities.	Applying Level (C3)
C201.5	identify the random processes and compute their averages.	Applying Level (C3)
C201.6	solve the problems on Ergodic process, Poisson process and Markov chain.	Applying Level (C3)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Probability	Three basic approaches to probability, conditional probability, total probability theorem, Bayes' theorem.	5
2.	Random Variables	One dimensional random variables (discrete and continuous), distribution of a random variable (density function and cdf). MGF and characteristic function of a random variable and its utility.	8

		Bivariate random variable, joint, marginal and conditional distributions, covariance and correlation.	
3.	Probability Distributions	Bernoulli, binomial, Poisson, negative binomial, geometric distributions. Uniform, exponential,	8
4.	Reliability	Concept of reliability, reliability function, hazard rate function, mean time to failure (MTTF). Reliability of series, parallel, series-parallel, parallel-series systems.	6
5.	Random Processes I	Introduction, Statistical description of random processes, Markov processes, processes with independent increments. Average values of random processes. Strict sense and wide sense stationary processes, their averages. Random walk, Wiener process. Semi-random telegraph signal and random telegraph signal process. Properties of autocorrelation function.	7
6.	Random Processes II	Ergodic processes. Power spectral density function and its properties. Poisson processes. Markov chains and their transition probability matrix (TPM).	8
Total number of Lectures			**42**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: Each student in a group of 3-4 will apply the concepts probability distributions to various discrete and continuous problems arising in different real life situations.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**Veerarajan, T.,** Probability, Statistics and Random Processes, 3rd Ed. Tata McGraw-Hill, 2008.
2.	**Papoulis, A. & Pillai, S.U.,** Probability, Random Variables and Stochastic Processes, Tata McGraw-Hill, 2002.
3.	**Ross, S. M.,** Introduction to Probability and Statistics for Engineers and Scientists, 4th Ed., Elsevier, 2004.
4.	**Palaniammal, S.,** Probability and Random Processes, PHI Learning Private Limited, 2012.
5.	**Prabha, B. and Sujata, R.,** Statistics, Random Processes and Queuing Theory, 3rd Ed., Scitech, 2009.

Course Code	16B1NHS431	Semester **Even** (specify Odd/Even)	**Semester IV Session 2022-23** Month from **Jan-June 2023**
Course Name	HUMAN RESOURCE MANAGEMENT		
Credits	3	**Contact Hours**	3(LTP: 2-1-0)

Faculty (Names)	Coordinator(s)	Dr.Praveen Kumar Sharma
	Teacher(s) (Alphabetically)	Dr. Praveen Kumar Sharma

COURSE OUTCOMES		COGNITIVE LEVELS
C206-1.1	Demonstrate a basic understanding of different functions of human resource management: Employer Selection, Training and Learning, Performance Appraisal and Remuneration, Human Relations and Industrial Relations.	Understand Level (C2)
C206-1.2	Apply various tools and techniques in making sound human resource decisions.	Apply level (C3)
C206-1.3	Analyze the key issues related to administering the human resource management activities such as recruitment, selection, training, development, performance appraisal, compensation and industrial relation.	Analyze Level (C4)
C206-1.4	Critically assess and evaluate different human resource & industrial relation practices and techniques and recommend solutions to be followed by the organization	Evaluate Level (C5)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction	Introduction to Human Resource Management and its definition, HRM functions and its relation to other managerial functions, Nature, Scope and Importance of Human Resource Management in Industry, Role & position of Personnel function in the organization. Human Resource Planning	3
2.	Employer Selection	Recruitment Process; Selection Process - Job and Worker Analyses, Matching Job with the Person; Selection Methods - Application Blank, Biographical Inventories, References and Recommendation Letters, Interviews	8
3.	Training and Learning	Need Identification; Psychological Factors in Learning; Training Methods in the Workplace; Effective Training Programme	6
4.	Performance Appraisal and Remuneration	Different methods of Performance Appraisal, Basic concepts in wage administration, company's wage policy, Job Evaluation, Issues in wage administration, Bonus & Incentives	6

5.	Human Relations and Industrial Relations, Trends in Human Resource Management	Factors influencing industrial relations - State Interventions and Legal Framework - Role of Trade unions - Collective Bargaining - Workers' participation in management. Trends in Human Resource Management: Analytics, Artificial Intelligence	5
		Total number of Lectures	**28**

Evaluation Criteria	
Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25(Project, assignment, class performance, attendance)
Total	**100**

Project-based learning: Each student in a group 4 to 5 will select a company which is registered in India. To make subject application based, the student will analyze Human Resource management policies and employed performing different functions at various levels related to recruitment, training, development, performance appraisaland compensation.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	G. Dessler and B. Varrkey, *Human Resource Management, 15e*. Pearson Education India, 2005.
2.	V. S. P. Rao and V. H. Krishna, *Management: Text and cases*. Excel Books India, 2009.
3.	K. Aswathappa, *Human resource management: Text and cases*. Tata McGraw-Hill Education, 2013.
4.	P. M. Noe, R. A., Hollenbeck, J. R., Gerhart, B. A., & Wright, *Fundamentals of Human Resource Management*. Tata McGraw-Hill Education, 2019.
5.	B. Pattanayak, "Human Resource Management, PHI Learning Pvt," *Ltd., New Delhi*, vol. 2, 2018.
6.	D. A. DeCenzo, S. P. Robbins, and S. L. Verhulst, *Fundamentals of human resource management*. John Wiley & Sons, 2016.

Course Code	22B11CS241	Semester Even	Semester 4 Session 2022 -2023
			Month from January to June

Course Name	**Problem Solving using JAVA**		
Credits	4	**Contact Hours**	3+0+0

Faculty (Names)	Coordinator(s)	Ms. Kirit Aggarwal, Dr. Shruti Jaiswal
	Teacher(s) (Alphabetically)	Ms. Kirit Aggarwal, Dr. Shruti Jaiswal

COURSE OUTCOMES At the completion of the course, Students will be able to		COGNITIVE LEVELS
C250.1	Write Java programs using Java basic concepts of loops, switch-case and arrays.	Understand Level (Level II)
C250.2	Apply the concepts of Abstraction, Inheritance, Interfaces, Packages, Inner Class, Wrapper Class.	Apply Level (Level III)
C250.3	Apply concepts of Exception Handling, Java collection framework and Multithreading	Apply Level (Level III)
C250.4	Creation of software using Java programming constructs	Create Level (Level VI)

Module No.	Title of the Module	List of Experiments	CO
1.	Introduction to basic Java Programming	Data types, variable, arrays, expressions, operators, and Control flow (conditional statements, loop, etc), Objects and classes.	10
2.	Application of OPPs Concept	Inheritance, use of keywords such as Final, Static, etc. with variable, methods and classes. Abstract classes, Static classes, Inner classes, Packages, Wrapper classes, Interfaces, This, Super, Access control, Abstract class and methods.	12
3.	Java Collection Framework	Collection Overview, List, Map (hash Code& Equals), Set, Queue & other collections, Stream API to process collections of objects	10
4.	Exception Handling and Multithreading	Exception handling (try, catch, throw, throws, and finally),Simple thread program, Thread synchronization	10

Evaluation Criteria

Components	Maximum Marks
Lab Test 1	20
Lab Test 2	20
Day-to-Day(Evaluations, Viva, Quiz, Attendance, Project)	60
Total	**100**

Project based learning: Assignments on different topics are given to each student. They utilize the java concepts and try to solve different problems given as assignments.

The course emphasized on the Skill development of students in Java Programming. Topics like inheritance, classes, exception handling, collection frameworks, etc. are taught to enhance the programming skills of the students for making them ready for employability in software development companies.

	Recommended Reading material:
Text Books	
1.	Schildt, H. (2014). *Java: the complete reference*. McGraw-Hill Education Group.
2.	Bloch, J. (2016). *Effective java*. Pearson Education India.
Referenc Books	
1.	Sierra, K., & Bates, B. (2005). Head First Java: A Brain-Friendly Guide. " O'Reilly Media, Inc.".
2.	Mughal, K. A., & Rasmussen, R. W. (2003). A programmer's guide to Java certification: a comprehensive primer. Addison-Wesley Professional.

Course Code	22B11CS242		Semester Even		Semester 4 Session 2022 -2023 Month from Jan-June
Course Name	**JAVA Programming Lab**				
Credits	1		Contact Hours		2

Faculty (Names)	Coordinator(s)	Kirti Jain (J62), Dr. Shruti Jaiswal (J128)
	Teacher(s) (Alphabetically)	Kirti Jain (J62), Kirti Aggarwal (J62) & Dr. Shruti Jaiswal (J128)

COURSE OUTCOMES At the completion of the course, Students will be able to		COGNITIVE LEVELS
C280.1	Write Java programs using Java basic concepts of loops, switch-case and arrays.	Understand Level (Level II)
C280.2	Apply the concepts of Abstraction, Inheritance, Interfaces, Packages, Inner Class, Wrapper Class.	Apply Level (Level III)
C280.3	Apply concepts of Exception Handling, Java collection framework and Multithreading	Apply Level (Level III)
C280.4	Creation of software using Java programming constructs	Create Level (Level VI)

Module No.	Title of the Module	List of Experiments	CO
1.	Introduction to basic Java Programming	Data types, variables, arrays, expressions, operators, and Control flow (conditional statements, loop, etc), Objects and classes.	1
2.	Application of OPPs Concept	Inheritance, use of keywords such as Final, Static, etc. with variables, methods and classes. Abstract classes, Static classes, Inner classes, Packages, Wrapper classes, Interfaces, This, Super, Access control, Abstract class and methods.	2
3.	Java Collection Framework	Collection Overview, List, Map (hash Code & Equals), Set, Queue & other collections, Stream API to process collections of objects	3
4.	Exception Handling and Multithreading	Exception handling (try, catch, throw, throws, and finally),Simple thread program, Thread synchronization	3

Evaluation Criteria

Components	Maximum Marks
Lab Test 1	20
Lab Test 2	20
Day-to-Day(Evaluations, Viva, Quiz, Attendance, Project)	60
Total	**100**

Project based learning: A group of 3-4 students will develop a Java application using the concepts covered as part of this course. Students will be required to develop a Java application using advanced

Java and/ or Java frameworks, while handling the various facets of database handling. This will give students hands-on experience of working in the area of Java. The knowledge gained will enhance their employability in the IT sector.

Recommended Reading material:
Text Books
1. Schildt, H. (2014). *Java: the complete reference*. McGraw-Hill Education Group.
2. Bloch, J. (2016). *Effective java*. Pearson Education India.
Reference Books:
1. Sierra, K., & Bates, B. (2005). Head First Java: A Brain-Friendly Guide. " O'Reilly Media, Inc.".
2. Mughal, K. A., & Rasmussen, R. W. (2003). A programmer's guide to Java certification: a comprehensive primer. Addison-Wesley Professional.

Course Code	23B12HS211	Semester: Even	Semester IV Session 2022-2023
			Months: from Jan. to June 2023
Course Name	**Introduction to Political Science**		
Credits	3	Contact Hours	3(2-1-0)

Faculty (Names)	Coordinator(s)	Dr. Namreeta Kumari
	Teacher(s) (Alphabetically)	Dr. Namreeta Kumari

COURSE OUTCOMES		COGNITIVE LEVELS
C206-9.1	Demonstrate an understanding concept of Political Science.	Understand (C2)
C206-9.2	Assess the different political ideologies.	Evaluate (C5)
C206-9.3	Assess the concept of state and different theories of state.	Evaluate (C5)
C206-9.4	Demonstrate an understanding of democracy and models of democracy.	Understand (C2)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Understanding Political Science	- Evolution - Nature and Scope - Is Political Science a Science? - Importance of Studying Political Science	6
2.	Ideologies	- Liberalism & Conservativism - Socialism & Anarchism - Nationalism & Fascism - Feminism & Multiculturalism	8
3.	State	- What is State - Theories of State - Role of State	8

4.	Democracy	• Defining Democracy • Models of Democracy • Rival Theories of Democracy	6
Total number of Lectures			**28**

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
T3	35
TA	25 (Attendance, Quiz, Project)
Total	**100**

Project Based learning: Each student would form a group of 3-4 students and to make projects on issues related with Indian Political System. The project will facilitate students to comprehend the everyday politics of the country and issues around it. This will enhance the research skills of the students in regard to Indian politics and political system.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	A. Heywood, Political Ideologies: An Introduction, New York: Palgrave Macmillan, 2017.
2.	D. Held, Models of Democracy, Stanford: Standford University Press, 2006
3.	B. O'Leary and P. Dunleavy, Theories of the State: The Politics of Liberal Democracy, London: Macmillan Education Ltd., 1987.
4.	S. De. Beauviour, Second Sex, NewYork: Vintage Books, 1949
5.	A Y. Davis, Abolition Democracy: Beyond Empire, Prisons, and Torture, New York: Seven Stories Press. 2005