UNIVERSITY OF DELHI

CNC-II/093/1(25)/2023-24/ 62
Dated: 29.05.2023

N O T I F I C A T I O N

Sub: Amendment to Ordinance V

[E.C Resolution No. 60/ (60-1-8) dated 03.02.2023]

Following addition be made to Appendix-II-A to the Ordinance V (2-A) of the Ordinances of the University;

Add the following:

Syllabi of Semester-III of the B.Tech (Information Technology & Mathematical Innovations) under Cluster Innovation Centre based on Under Graduate Curriculum Framework -2022 implemented from the Academic Year 2022-23.

CLUSTER INNOVATION CENTRE

B.Tech. (Information Technology and Mathematical Innovations)

DISCIPLINE SPECIFIC CORE COURSE -7 (DSC-7): Modeling continuous changes through ordinary differential equations

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical / Practice		
DSC-7 Modeling continuous changes through ordinary differential equations	4	3	0	1	Class XII pass	Mathematics till XII

Learning Objectives

Differential equations have the remarkable ability to translate the real-world problems in mathematical language. This course enables students to study many engineering systems, population dynamics in ecology and biology, mechanics of particles in physics, planetary models etc. involving differential equations. The main objective of the paper is to first analyze and understand the real-world problem through a mathematical lens and then develop the corresponding mathematical model with differential equations in the most realistic sense. Once governing equations are obtained, students should be able to solve them analytically and analyze the solution in physical situations. Students will use MATHEMATICA software for the purpose of simulation.

Learning outcomes

After completing this course, student should be able to:

- explain the fundamental concepts of ordinary differential equations (ODEs).
- use MATHEMATICA software to solve problems and applications of ordinary differential equations (ODEs) and complex analysis.
- formulate real life problems as ODEs.
- use concepts of ordinary differential equations to solve physical models such as mass spring, pendulum, alternating current circuits, etc.
- Use knowledge of ODEs, the general and particular structure of solutions and different methods for solutions.

SYLLABUS

Unit I: Review of first order differential equations - Variable separable, homogeneous, linear, exact differential equation - Integrating factors - Existence and uniqueness of solution **[12 hours]**

Unit II: General solutions of second order differential equation - Homogeneous and non-homogeneous differential equations with constant coefficients - Method of variation of parameters - Method of undetermined coefficients, higher order differential equations with constant coefficients **[12 hours]**

Unit III: Planar autonomous linear systems with graphical representation - Determination of stability and classification of equilibrium of a planar nonlinear system by linearization **[9 hours]**

Unit IV: Power series solution about a regular point of an analytic ordinary differential equation - Power series solution of Legendre and Bessel's equation - Laplace transform and its application to differential equations **[12 hours]**

Practical component – The following explorations would be carried out on matrix based numerical mathematics software [30 hours]

- Plotting of slope fields and solution curves of first order and higher order differential equations

- Graphical analysis of solution of Population model, Pollution Model, Acceleration – Velocity Models
- Projectile motion, Mechanical Vibrations – Motion of Simple Pendulum, Free undamped and damped motion, Forced undamped and damped motion
- Plotting of phase plane diagrams for predator – prey model, competing species, epidemic model and their analysis
- Innovation project

Essential/recommended readings

1. *Elementary differential equations*, W. E. Boyce and R. DiPrima, John Wiley, 2005.
2. *Differential equations and boundary value problems: Computing and modeling*, C.H. Edwards and D.E. Penny, Pearson education (Singapore), Pte. Ltd., 2005.
3. *Advanced engineering mathematics*, E. Kreyszig, John Wiley, 1999.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC CORE COURSE -8 (DSC-8): Operating Systems

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSC-8 Operating Systems	4	3	0	1	Class XII pass	DSC-3

Learning Objectives

The objective is to introduce students with basic concepts of Operating System, its functions and services and to familiarize the students with various views and management policies adopted by O.S.

as pertaining with processes, Deadlock, memory, File and I/O operations. To brief the students about the functionality of various OS like Unix, Linux and Windows XP as pertaining to resource management and to provide the knowledge of basic concepts towards process synchronization and related issues.

Learning outcomes

After completing this course, student should be able to;

- Analyze the structure of OS and basic architectural components involved in OS design.
- Analyze and design the applications to run in parallel either using process or thread models of different OS.
- Analyze the various device and resource management techniques for timesharing and distributed systems.
- Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
- Conceptualize the components involved in designing a contemporary OS.

SYLLABUS

Unit I: Overview: Operating systems – structure, operations, components, types, services, user interfaces. System calls, system programs, system boot**.** **[12 hours]**

Unit II: Process management - Processes: concept, scheduling, operations on processes, inter-process communications. Threads – single - and multi-threaded processes. CPU scheduling – criteria, algorithms, multiple-processor scheduling. **[12 hours]**

Unit III: Process synchronization – critical-section problem, semaphores, classic synchronization problems, monitors. Deadlocks – characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock. **[12 hours]**

Unit IV: Memory management: Main memory – memory allocation schemes. **[9 hours]**

Practical component: **[30 hours]**

Engineering Kitchen Activity [Laboratory]:

- Write a program for implementation of Priority scheduling algorithms.
- Write a program for implementation of Round Robin scheduling algorithms.
- Write a program for implementation of FCFS scheduling algorithms.
- Write a program for implementation of SJF scheduling algorithms.
- Write a program to implement the producer – consumer problem using semaphores.
- Write a program to implement IPC using shared memory.
- Write a program to implement banker's algorithm for deadlock avoidance.
- Write a program to implement Threading and Synchronization Applications.
- Write a simple Unix commands.
- Innovation Projects

Essential/recommended readings

1. Operating System Concepts, 10th Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons, 2009.
2. Manish Kumar Singh, Sachin Kumar, Saibal Kumar Pal, Operating Systems: Concept Building & Problem Solving Approach, Cengage Publication, 2022.
3. John. Lions' Commentary on UNIX® 6th Edition with Source Code. John Lion, San Jose, CA: Peer-to-Peer Communications, 1996.
4. Exokernel: An Operating System Architecture for Application-Level Resource Management., Engler, Dawson R., M. Frans Kaashoek, and James O'Toole Jr., ACM Press, 1995.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC CORE COURSE -9 (DSC-9): Computer Systems Architecture

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSC-9 Computer Systems Architecture	4	3	0	1	Class XII pass	Mathematics till XII

Learning Objectives

The objective is to introduce students with the basic concepts of Computer and the principles underlying systems organization, issues in computer system design, and contrasting implementations of modern systems and to familiarize the students with a fundamental knowledge of computer hardware and computer systems, with an emphasis on system design and performance.

Learning outcomes

After completing this course, student should be able to;

- have understanding of Computing Systems, Models & Logic, Organization & Architecture of Memory
- have understanding of CPU, I/O Devices

- have understanding of Distributed Computing, Parallel Architecture, Mobile Systems Architecture
- have understanding about Deconstructing Digital Architecture of a computing devices and study of components (Hardware/Software)
- have hands-on experience with Arduino/ARM Interface, Programming & interfacing with Sensors and Parallel Programming using OPENMP, OpenMPI & CUDA.

SYLLABUS

Unit I: Computer arithmetic: fixed point and floating-point representation and arithmetic, numbers conversion. Digitals circuits: Boolean algebra, logic gates, logical synthesis by minimization of Boolean functions **[12 hours]**

Unit II: Combinational circuits, sequential circuits (synchronous and asynchronous). Construction of the computer: Von Neumann Architecture **[12 hours]**

Unit III: Organization and architecture of memory systems, input/output systems **[12 hours]**

Unit IV: Construction of the simple processor. **[9 hours]**

Practical component: **[30 hours]**

Engineering Kitchen Activity [Laboratory]:

• Logic Gate Designs
• Deconstructing Digital Architecture of a computing devices and study of components (Hardware/Software)
• Hands on experiments with Arduino/ARM Interface
• Programming in Assembler: memory addressing, interrupts, operations on numbers bits and tables, conditional instructions, loops, input/output

Essential/recommended readings

1. Computer System Architecture, Morris Mano, Pearson Education, 2008
2. Computer Systems Architecture: a Networking Approach, Rob Williams, Pearson Education, 2006
3. Advanced Computer Architecture: Parallelism, Scalability, Programmability, K. Hwang, McGraw Hill, 2017.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

COMMON POOL OF GENERIC ELECTIVES (GE) COURSES

NOTE: The core papers offered in the B.Tech. Course at CIC are Mathematics and Information Technology. Therefore, the students will choose GE offered by Physics, Chemistry, Management and Computational Biology faculty members of CIC.

GENERIC ELECTIVES (GE-3.1): Economic Behaviour

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GE 3.1: Economic Behaviour	4	3	1	0	Class XII pass	NIL	Management Faculty of CIC

Learning Objectives

The purpose of this course is to familiarize the student with the present day modern economics that is both intuitive and relevant to the students. The course introduces the generally accepted concepts of economics both at the micro and macro level. In addition to this, the purpose of this course is to analyse how individual decision-makers, both consumers and producers and the government policies, behave in a variety of economic environments.

Learning outcomes

After completing this course, student should be able to:

- Understand of the basic structure of the economic ecosystem.
- Conception, of how individuals and firms allocate resources and how market prices are determined.
- Able to understand shifts in supply and demand and their implications for price and quantity sold.
- Understand of how to analyse firms' decisions mathematically using a production function and calculate their optimal level of production, costs, and profits.

- Learn to model the decisions made by firm in a monopoly and an oligopoly, and the implications of these alternate structures for consumer welfare.
- Learn to perceive the nation's economy as a whole and compare the views of Keynes and the classical economists.
- Learn various techniques measuring and tracking macroeconomics using GDP and CPI.
- Analyse the model of full employment and use it to examine important macroeconomic issues, such as the extent to which taxes may depress economic activity and lower the level of GDP.

SYLLABUS

Unit I: The Economic Problem: Scarcity and Choice; Market economies and the price system; Variables, correlation and causation; Recommending appropriate policies **[9 hours]**

Unit II: The supply and demand model; Elasticity of supply and demand; Market equilibrium; Demand curve and behaviour of consumers; Supply curve and behaviour of firms **[12 hours]**

Unit III: Efficiency of markets; Rise and fall of industries; Monopoly; Antitrust policy; Taxes, transfers and income distributions **[12 hours]**

Unit IV: Unemployment, inflation and interest rates; Macroeconomic theory and policies; Measuring theoretical and actual GDP **[12 hours]**

Essential/recommended readings

1. Principles of Economics, J.B. Taylor and A. Weerapana, Flatworld, 9th Edition, 2021.
2. Principles of Economics, K. E. Case, R. C. Fair and S. C. Oster, Pearson Education, 13th Edition, 2019.
3. Principles of Economics, N. G. Mankiw, Cengage, 9th Edition, 2021.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVES (GE-3.2): Electronic Circuit elements and innovation lab

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GE 3.2: Electronic Circuit Elements and Innovation Lab	**4**	**2**	**0**	**2**	**Class XII pass**	**Mathematics till XII**	**Physics/ Electronics Faculty of CIC**

Learning Objectives

This module involves interactive learning of A.C. fundamentals. It helps to understand the basic network analysis of electronic circuits. It also provides the interface to understand the working of various electronic devices and its characteristics. Working of electronic instruments will also be understood.

Learning outcomes

- After completing this course, student should be able to;
- Concepts of AC fundamentals
- Good knowledge of Network Analysis
- Basics of Diodes and Transistor based devices
- Knowledge of instruments like CRO, Function Generator, Multimeter, etc.

SYLLABUS

Unit I: AC Fundamentals - Concept of voltage and current sources - KVL and KCL - Node voltage analysis and method of mesh currents - Network theorems **[8 hours]**

Unit II: PN Junction: variants and applications - Bipolar Junction Transistor (BJT) biasing and amplifier design - Field Effect Transistor (FET) variants – FET biasing and amplifier design **[6 hours]**

Unit III: Structure and working of SCR. Structure and operation of LDR, Photo voltaic cell, Photo diode, Photo transitors & LED **[8 hours]**

Unit IV: Operational Amplifiers basics and practical circuits - Feedback and oscillator circuits - Voltmeters-Multimeters-Function generator- Cathode ray oscilloscope - Cathode Ray Tube **[8 hours]**

Practical component – **[60 hours]**

- Engineering Kitchen Activity (matrix based numerical mathematics software) [Laboratory]
- Characteristics of PN junction and Zener diode filters
- Half wave rectifier.
- Full wave rectifier with 2 diodes.
- LC and Pi filters
- Full wave rectifier with 4 diodes (Bridge rectifier). Input, Output and Transfer characteristics of CE and CC Amplifier.
- Amplifiers and Oscillator characteristics.
- Characteristics of LDR, Photo-diode and Phototransistor.
- Transfer characteristics of JFET.
- Transfer characteristics of MOSFET (with depletion and enhancement mode)
- Characteristics of LED with three different wavelengths.
- Series voltage Regulator.
- Shunt voltage Regulator.
- Characteristics of Thermistor.

Essential/recommended readings

1. Circuits and Networks - A.Sudhakar & Shyammohan S. Palli ,TMH, 2010
2. Principles of Electronics- V.K. Mehta and Rohit Mehta, S Chand &Co,2009
3. Electronic Devices and Circuit Theory-R.L.Boylestad and L.Nashelsky, Pearson Education, 2009.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVES (GE-3.3): Flow of information in Living Systems

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GE 3.3 Flow of Information in Living Systems	**4**	**2**	**0**	**2**	**Class XII pass**	**NIL**	**Chemistry / Biology Faculty of CIC**

Learning Objectives

This module is designed to:

- Introduce students to nuclear events such as replication, transcription, translation, condensation, repair and recombination etc.
- Introduce gene regulation in prokaryotes and eukaryotes
- Introduce various biophysical and biochemical techniques related to these nuclear events

Learning Outcomes

Upon completion of the course the students will be able to:

- Understand the structure and function of DNA and RNA
- Build concept about the processes of the Central Dogma of the living systems (replication, transcription, translation, recombination etc.)
- Develop an understanding of prokaryotic and eukaryotic gene regulation

SYLLABUS

Unit I: Structure of the nucleic acids **[8 hours]**

Structure and biophysical properties of the DNA and RNA, forms of DNA and RNA, DNA binding domains, the evolution of DNA

Unit II: Replication, Transcription and Translation **[8 hours]**

DNA replication models, Enzymes of DNA replication, DNA replication in prokaryotes and eukaryotes, regulation of DNA replication;

RNA polymerases, Transcription in prokaryotes, Eukaryotic transcription, Regulation of transcription in Prokaryotes and Eukaryotes, Eukaryotic chromatin

Ribosomes, translation in prokaryotes, translation in eukaryotes

Unit III: DNA repair and recombination **[8 hours]**

Energetics and accuracy of information transfer, DNA damage and repair, Molecular recombination

Unit IV: DNA packaging and chromatin structure, regulation of gene expression in eukaryotes **[6 hours]**

Practical Component **[60 hours]**

- Agarose gel electrophoresis of DNA/ Proteins
- SDS-PAGE Electrophoresis
- Polymerase Chain Reaction (PCR)
- Primer design
- Spectrometry
- Modelling of DNA and RNA forms and motifs through computational tools

Essential/recommended readings

1 Biology, Raven et al. Tata Mc Graw –Hill, 2013

2. Biology: Global Approach. Reece et al., Pearson Educations, Global edition, 2014

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVES (GE-3.4): Explorations in Living Systems

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
***GE 3.4 Explorations in Living Systems**	**4**	**2**	**0**	**2**	**Class XII pass**	**NIL**	**Chemistry / Biology Faculty of CIC**

***GE 3.4 can be opted by students in either 3rd or 4th semester.**

Learning Objectives

This module is designed to:

- Introduce students to the living system in terms of their hierarchal organization and their distinction from the nonliving.
- The specific objective of the module is to introduce biology even to students with no biology background and enable them to understand living systems.
- To enthuse students with tools and techniques for studying biology.
- Introduce students to the origin and evolution of living systems
- Introduce students to the essence of model organisms for studying biology

Learning outcomes

After studying this course, the students will be able to:

- Understand the diversity and complexity of living systems
- To comprehend different fields within Bio-Sciences
- To understand experimental processes undertaken in Biology
- Will develop a philosophical understanding of the origin and evolution of living systems, the nature of genetic materials etc.

SYLLABUS

Unit I: Introduction and organization of living systems [6 hours]

Introduction to living state: (living versus non-living), Hierarchy of organization of living systems and classification (cellular, multicellular and organismic and population levels), Cell as the unit of life.

Unit II: Origin and diversification of the living systems [8 hours]

Nature of the genetic material (DNA versus RNA), Introduction to molecular evolution, Origin of life, Evidence of evolution, Theories of evolution, Creating living systems (synthetic cell).

Unit III: Designing living systems [8 hours]

Nature of biological processes - Approaches to study Biology: Observational and Experimental, Physiology and Behaviour

Unit IV: Tools and materials for studying living systems [8 hours]

Observational, synthetic and reductionist approaches for studying living organisms, Microscopy, Centrifugation and separation techniques as basic tools for studying components of living systems, Model organisms.

Practical components [60 hours]

Basic equipment and techniques

a. Observation or permanent slides of pollens, microbes, hydra, Daphnia and bacteria under a microscope
b. Separation techniques:
    - Fraction of cell organelles through centrifugation
    - Separation of chlorophyll pigments by paper chromatography

Exploring different levels of organization (using model organisms)

a. Tissue organization and diversity in cell shapes: studying through plant and animal tissues sections
b. Inflorescence as a model of organization
c. Understanding parts of the flower

Studying cells:

a. Bacterial growth curve analysis
b. Genomic DNA isolation
c. Preparation of metaphase chromosome
d. Preparation of karyotypes using photographs of metaphase spreads
e. Demonstration of osmosis and plasmolysis

Essential/recommended readings

1. *Biology*, Raven et al., Tata McGraw-Hill, 2013.
2. *Biology: Global Approach*. Reece et al., Pearson Educations, Global edition, 2014.

SEMESTER – III
B.A. (Honors) Humanities & Social Sciences
Category II

B.A. (Honors) Humanities & Social Sciences is being run under the Meta-College concept wherein students go to constituent colleges of the University of Delhi to partly earn their credits in addition to earning their credits from the courses run at the Cluster Innovation Centre, towards completion of their degree.

In the 3rd semester the DSCs, VACs, SECs, AECs, will be chosen by the students in the constituent colleges/ centres/ departments of the University of Delhi. However, the students will be choosing the 3rd semester DSEs at CIC only. The purpose of offering these DSEs at the Centre is to encourage students to engage with diverse social problems and work towards their possible innovative solutions. The idea of introducing these modules is to make students work in the field with diverse stakeholders and various social groups. Following is the list of the DSE courses offered at the Centre.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01A): Socially Engaging with the Human World

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Socially Engaging with the Human World (DSE-01A)	4	1	0	3	Class XII Pass	Knowledge of problem identification, community engagement, assessment techniques & ethics.

Learning Objectives

- To make students learn to identify a social problem
- To make students understand the complexity and contours of a social problem.
- To design strategies and solutions using a multi-pronged trans-disciplinary approach towards social interventions.

Learning Outcomes

On completion of the course, students will be able to –

- learn the complexity of a social problem.
- identify relevant social problems for study.
- design strategies to address the identified social problem using innovative means.

OUTLINE OF DSE-01A

It has become imperative for us as a society to engage with issues arising out of social formations and their interaction with social institutions. This approach is useful from an individual's as well as society's perspective, specially keeping in view its implications for public policy, governance and larger social wellbeing. This is an intervention-based module and therefore the students will be guided to identify a problem arising out of any social, cultural, economic, political issue which has larger implications for human society in general and Indian demography in particular. After identifying the problem, the students will be mentored to design a feasible strategy to address the identified problem by suggesting and practicing innovative means and tools such as organising: seminars and workshops, awareness campaigns, dialogue with communities, publishing research and newspaper articles, producing mass media programmes such as blogs, vlogs, documentaries/filmmaking, theatre interventions and interventions through translations, creative writing and other creative mediums. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Practical component (if any) - 75 % **90 hours**

Indicative Themes:

- Understanding social formations
- Politics of identity
- Social Institutions: issues and challenges
- Public policy and the social groups
- Social and economic policies

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01B): Gender Issues and Challenges in India

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Gender Issues and Challenges in India (DSE-01B)	**4**	**1**	**0**	**3**	**Class XII Pass**	**Knowledge of problem identification, assessment techniques & ethics in gender studies.**

Learning Objectives

- To introduce students to the concept and issues of Gender and Gender Studies.
- To make students learn the issues around Gender and Gender Normativity.
- To make students learn to identify a social problem arising out of Gender issues.
- To train students to design strategies and solutions using a trans-disciplinary approach towards gender issues.

Learning Outcomes

On completion of the course, students will be able to –

- understand the concepts and issues around Gender and Gender Studies.
- critically analyze Gender Normativity.
- design strategies and solutions towards gender issues.

OUTLINE OF DSE-01B

As society it has become imperative for us to study the issues arising out of complexity of gender. To understand the complexity of gender the students not only need to engage with the recent debates related to gender but they are also required to practically examine the normative practices associated with the gender role. It is an intervention-based module and therefore the students will be guided to identify a problem arising out of the complexity of gender and its larger implications for the individual and society. After identifying the problem, the students will be mentored to design a feasible strategy to address the identified problem by suggesting and practicing innovative means and tools such as challenging stereotypes, organising seminars and workshops, sensitisation campaigns, dialogue with communities, publishing research and newspaper articles, producing mass media programmes such as blogs, vlogs, documentaries/ filmmaking, theatre interventions and interventions through translations, creative writing and other creative mediums. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Practical component (if any) - 75 % **90 hours**

Indicative Themes:

- Normative gender roles
- Issues and challenges of LGBTQ communities
- Gender rights movements
- Gender as a discourse
- Sexual abuse and sexual harassment
- Gender and economics
- Gender Identity

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01C): Engaging with Emerging Human Rights Challenges

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Engaging with Emerging Human Rights Challenges (DSE-01C)	4	1	0	3	Class XII Pass	Knowledge of problem identification, human rights and challenges, assessment techniques and ethics.

Learning Objectives

- To make students learn the concepts and paradigms of Human Rights and Rights-based movements.
- To mentor students in identifying causes and concerns of Rights-based movements.

- To mentor students towards ideating and proposing solutions by involving key stakeholders in the process concerning the issue at hand.

Learning Outcomes

On completion of the course, students will be able to –

- understand the concepts and paradigms of Human Rights and Rights-based movements.
- identify the causes and concerns of Rights-based movements.
- ideate and propose solutions by involving key stakeholders.

OUTLINE OF DSE-01C

'Engaging with Emerging Human Rights Challenges' is an intervention-based paper. In this paper the students will be guided to identify a problem arising out of Human Rights issues such as social conflicts, human-nature conflicts, politics of rights-based movements, and movements of identity. After identifying the problem, the students will be mentored to design a feasible strategy to address the identified problem by suggesting and practicing innovative means and tools like challenging stereotypes, organising seminars and workshops, sensitisation campaigns, dialogue with communities, publishing research and newspaper articles, producing mass media programmes such as blogs, vlogs, documentaries/filmmaking, theatre interventions and interventions through translations, creative writing and other creative mediums. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Practical component (if any) - 75 % **90 hours**

Indicative Themes:

- Paradigms of human rights-based movements
- Public policy and human rights
- The stateless people and the human rights issues

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01D): Social Challenges and Sensitizations Concerning Marginalised Communities

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Social Challenges and Sensitisations Concerning Marginalised Communities (DSE-01D)	**4**	**1**	**0**	**3**	**Class XII Pass**	**Knowledge of problem identification, rights of vulnerable groups, community engagement, assessment techniques & ethics.**

Learning Objectives

- To sensitize students about issues related to marginalized groups.
- To learn from the marginalized communities.
- To enable students to conceive and devise strategies and solutions using a trans-disciplinary approach towards issues of the marginalized.

Learning Outcomes

On completion of the course, students will be able to –

- understand the challenges faced by marginalized groups/ communities.
- understand the various traditions and socio-cultural practices that impact the well-being of marginalized communities.
- ideate and devise strategies and interventions aimed at achieving an inclusive society.

OUTLINE OF DSE-01D

To achieve the goal of social inclusion it is imperative for us to study the experiences of discrimination as well as the unequal power relationships of the society. This paper will introduce the students to not only the issues related to marginalised communities but they will also develop empathetic attitude towards such communities. It is an intervention-based module and therefore the students will be guided to identify a problem concerning marginalised communities such as the Scheduled Castes, Scheduled Tribes, Women, Persons with Disabilities, Gender-minorities, and the other subaltern groups. After identifying the problem, the students will be sensitised to understand the communication and other cultural barriers in order to establish a meaningful dialogue with the marginalised communities aimed at achieving a socially inclusive society. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Practical component (if any) – 75 % **90 hours**

Indicative Themes:

- Issues and challenges of scheduled castes and scheduled tribes
- Issues and challenges of persons with disabilities
- Issues and challenges of religious minorities and the other subaltern groups
- Public policy and the marginalised groups

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01E): Promoting Linguistic Plurality and Cultural Diversity in India

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Promoting Linguistic Plurality and Cultural Diversity in India (DSE-01E)	4	1	0	3	Class XII Pass	Knowledge of problem identification, concepts relating to culture and cultural diversity, culture and identity, assessment techniques and ethics.

Learning Objectives

- To engage students with various cultural and linguistic traditions of India.
- To make students learn to appreciate the cultural and linguistic diversity of our country.
- To make students conceptualize strategies to preserve the lesser-known cultural, linguistic and traditional practices of India.

Learning Outcomes

On completion of the course, students will be able to –

- appreciate the cultural and linguistic diversity of our country.
- engage with various cultural and linguistic traditions of India.
- conceptualize strategies to preserve the lesser-known cultural, linguistic and traditional practices of India.

OUTLINE OF DSE-01E

India is a country of diverse traditions with myriad of languages. The aim of this paper is to make students able to appreciate this rich cultural heritage and linguistic heterogeneity of India. Through this paper students will also learn about the various tools, techniques and practices to preserve the lesser-known cultures, languages and traditions of our country. This is an intervention-based module and therefore the students will be guided to find solutions to preserve various cultural and linguistic traditions of India in order to achieve a culturally heterogeneous and linguistically plural society. The students will be mentored to design a feasible strategy to engage with the identified tradition by suggesting and practicing innovative means and tools such as organising workshops, seminars and talks, awareness campaigns, dialogue with communities, publishing research and newspaper articles, producing mass media programmes such as blogs, vlogs, documentaries/filmmaking, theatre interventions and interventions through translations, creative writing and other creative mediums. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Practical component (if any) – 75% **90 hours**

Indicative Themes:

- Exploration and promotion of cultural festivals of India
- Preservation and practice of linguistic diversity of India
- Promotion of arts and crafts

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE (DSE-01F): Exploration and Promotion of Heritage of India

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Exploration and Promotion of Heritage of India (DSE-01F)	**4**	**1**	**0**	**3**	**Class XII Pass**	**Knowledge of problem identification and concepts relating to heritage of India.**

Learning Objectives

- To enable students explore the tangible and in-tangible Heritage of the Nation.
- To make students appreciate the rich heritage of India and its potential for our national growth.
- To mentor students-led intervention to restore, preserve and promote Heritage of India.

Learning Outcomes

On completion of the course, students will be able to –

- understand the tangible and in-tangible Heritage of India.
- gauge the possible role of our National Heritage in contributing towards our development and economy.
- design strategies that will aid in restoring, preserving and promoting Heritage of India.

OUTLINE OF DSE-01F

Through this paper the students will be able to appreciate the vast contours of our geographical, spiritual, religious, architectural, aesthetical, musical, culinary, handicraft, and folk traditions. This is an intervention-based module and therefore the students will be guided to explore the tangible and in-tangible heritage of India. They will work towards promotion of our rich heritage by designing and conducting events like Heritage Walks, Nature Walks, Curating Exhibitions, organising: workshops, seminars and talks, awareness campaigns, dialogue with communities, publishing research and newspaper articles, producing mass media programmes such as blogs, vlogs, documentaries/filmmaking, theatre interventions and interventions through translations, creative writing and other creative mediums. The students will be encouraged to involve various stakeholders, the concerting agencies and other communities pursuing similar goals.

Theoretical Component (01 Credit) **15 hours**

Theoretical concepts drawing from various strands of Humanities, Social Sciences, Science and Technology and Public Policy discussions related to the identified social problem will be introduced to the students through lectures, debates, seminars, workshops and classroom discussions, etc.

Indicative Themes:

- Promotion and preservation of lesser-known monuments
- Appreciating and promoting culinary traditions of India
- Exploration and awareness of folk arts and traditions
- Exploration and promotion of music and dance traditions of India
- Exploring biodiversity of India

Practical component (if any) - 75 % **90 hours**

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

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