SVSU CSE/2025/424(6)

Scheme and Syllabus of

Program

on

Diploma Computer

(Generative AI/ Cyber Security)

By

Skill Department of Computer Science/ IT
Under
Skill Faculty of Engineering and Technology

SVSU

Shri Vishwakarma Skill University
Dudhola, Palwal-121102, Haryana

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1.1 VISION and MISSION

Vision of the University

To emerge as one of the foremost institutions of quality in skill education acknowledges by industry, nationallyand internationally.

Mission of the University

To focus on quality of skill education, aspired by students and admired by industry, nationally andinternationally.

Vision of the Department

To build highly skilled and competent professionals with a futuristic outlook for research and innovation whocan also generate sustainable employment with virtuous professional values.

Mission of the Department

1. To impart skill education and training as per industry needs in the domain of Computer Science & Engineering.
2. To develop and maintain the state of art infrastructure for building sustainable skilled IT ecosystem inthe domain.
3. To cultivate the environment for fostering new ideas, research and innovations leading to emergence ofskilled entrepreneurs, leaders, innovators and professionals.

1.2 PROGRAM OBJECTIVE

This program is aimed at skilling the students for the jobs in IT industry at diploma level and aimsat building the following key competencies amongst the learner.

PO-1 Engineering Knowledge: Apply the knowledge of mathematics, science, engineering and technology to the solution of complex mechanical engineering problems.

PO-2 Problem Analysis: Identify, formulate, review existing literature, and analyze complex engineering problems to reach substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3 Design/Development Of Solutions: Design solutions for mechanical engineering problems and design system components or processes that meet the specified needs with appropriate consideration for societal, economical and environmental considerations.

PO-4 Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5 Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex mechanical engineering activities with an understanding of the limitations.

PO-6 The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO-7 Environment And Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9 Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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PO-10 Communication: Communicate effectively with the engineering community and with society at large, including the ability to comprehend, create effective reports, make effective presentations, and give and receive clear instructions.

PO-11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12 Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

1.3 PROGRAM SPECIFIC OUTCOMES

PSO1: Solve problems analytically and logically via programming.

PSO2: Apply acquired knowledge and practical skills to develop computer applications and start new business ventures.

PSO3: Communicate effectively in oral or written.

PSO4: Work under closed supervision with some responsibility defined within limits.

1.4 PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To impart science-based engineering education in addition with professional and entrepreneurship skills that will prepare the students for immediate employment or employer in IT sector and to pursue higher education in the field.

PEO2: To develop an ability to work in teams, innovate, design and project implementation. Communicate effectively, work under closed supervision, assist seniors and to prepare reportsas per requirement.

PEO3: To understand the responsibility towards society, environment, and sustainability and remember professional ethics.

The PO and PSO mapping, PO and PEO mapping are given in table 3 and table 4.

The mapping is defined such as 0: no mapping; 1: Low mapping; 2: Average mapping; 3: Completemapping.

Table 3. PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	1	0	3	0	2	0	0	0	0	0	0	0
PSO2	1	2	0	0	3	0	0	0	0	0	2	0
PSO3	0	0	0	0	0	0	0	0	2	3	0	0
PSO4	0	0	0	0	0	1	1	1	3	0	0	2

Table 4. PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	2	3	1	3	0	0	0	0	0	0	0
PEO2	0	0	0	0	0	0	0	3	3	3	0	1
PEO3	0	0	0	0	0	1	2	0	0	0	0	0

1.5 DOMAIN WISE CREDIT BREAKUP

Sr. No.	Category	AICTE Suggested Breakup of Credits	SVSU Diploma Program Credits
1	Humanities & Social Sciences courses	8	10
2	Basic Science courses	19	16
3	Engineering Science courses	15	18
4	Program Core courses (Branch specific)	45	43
5	Program Elective courses (Branch specific)	12	12
6	Open Elective courses (from other technical and /or emerging subjects)	9	9
7	Project work, seminar and internship in industry or elsewhere	12	13
8	Audit Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge etc.]	(non-credit)	(non-credit)
	Total	**120**	**128**

1.6 SEMESTER WISE SCHEME

The semester wise scheme is given as

SEMESTER I

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DENG001	English and Communication Skills	1	0	0	1	HS
24DGEN01	English and Communication Skills Lab	0	0	4	2	HS
24DGEN02	Applied Mathematics - I	3	0	0	3	BS
24DGEN03	Applied Physics - I	3	0	0	3	BS
24DGEN04	Applied Physics -I Lab	0	0	2	1	BS
24DGEN05	Fundamentals of IT	3	0	0	3	ES
24DGEN06	Fundamentals of IT Lab	0	0	2	1	ES
24DGEN07	Computer Workshop	0	0	6	3	ES
24DGEN08	Electronics Workshop	0	0	4	2	ES
24DYHS01	Yoga and Health Skills-I	2	0	0	2	HS
24DGEN09	Basics of Prompt Engineering	2	0	0	2	ES
Total Credits		**13**	**0**	**18**	**23**	
Total Hours		**31**				

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SEMESTER II

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DGEN10	Advances in IT	3	0	0	3	ES
24DGEN11	Advances in IT Lab	0	0	2	1	ES
24DGEN12	Applied Mathematics-II	4	0	0	4	BS
24DGEN13	Applied Physics - II	4	0	0	4	BS
24DGEN14	Applied Physics - II Lab	0	0	2	1	BS
24DGEN15	Engineering Graphics	0	0	6	3	ES
24DGEN16	Multimedia Applications	4	0	0	4	PC
24DGEN17	Multimedia Applications Lab	0	0	2	1	PC
24DEVS01	EVS	2	0	0	2	AU
24DCSE66	Human Values and Ethics	2	0	0	2	
Total Credits		**17**	**0**	**12**	**25**	
Total Duration		**31**				

SEMESTER III

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DGEN18	Applied Prompt Engineering	3	0	0	3	PC
24DGEN19	Applied Prompt Engineering Lab	0	0	2	1	PC
24DGEN20	Program Elective -I	3	0	0	3	PE
24DGEN21	Program Elective-I Lab	0	0	2	1	PE
24DGEN22	Programming in C	3	0	0	3	PC
24DGEN23	Programming in C Lab	0	0	2	1	PC
24DGEN24	Basics of Database Management	3	0	0	3	PC
24DGEN25	Basics of Database Management Lab	0	0	2	1	PC
24DCSE65	Indian Constitution	2	0	0	2	AU
24DGEN26	Summer Internship - I (3 weeks)	-	-	-	2	Project
Total Credits		**16**	**0**	**8**	**20**	
Total Hours		**22**				

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SEMESTER IV

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DGEN28/29/30	Program Elective- II	3	0	0	3	PE
24DGEN31/32/33	Program Elective- II Lab	0	0	2	1	PE
24DGEN34	Python Programming Fundamentals	3	0	0	3	PC
24DGEN35	Python Programming Fundamentals Lab	0	0	4	2	PC
	Open Elective I	3	0	0	3	OE
	Entrepreneurship	2	0	0	2	HS
24DGEN36	Minor Project	0	0	4	2	Project
24DGEN37	Data Structure	3	0	0	3	PC
24DGEN38	Data Structure Lab	0	0	2	1	PC
24DGEN60	Essence of Indian Knowledge and Tradition	2	0	0	2	AU
Total Credits		**16**	**0**	**12**	**22**	
Total Duration		**28**				

SEMESTER V

Subject Code	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C	Category
		L	T	P		
24DGEN39	Introduction to Machine Learning	3	0	0	3	PC
24DGEN40	Introduction to Machine Learning Lab	0	0	2	1	PC
24DGEN41	Cryptography and Network Security	3	0	0	3	PC
24DGEN42	Cryptography and Network Security Lab	0	0	2	1	PC
	Open Elective II	3	0	0	3	OE
24DGEN43	Basics of Data Analytics	3	0	0	3	PC
24DGEN44	Basics of Data Analytics Lab	0	0	2	1	PC
24DGEN45	Summer Internship (4 weeks)	-	-	-	3	Project
24DGEN46	Major Project	0	0	2	0	Project
	Employability	2	0	0	2	HS
Total		**14**	**0**	**12**	**20**	
Total Hours		**26**				

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SEMESTER VI

SUBJECT CODE	SUBJECTS	Hours per Week			Credits (C) L +T+ P = C
		L	T	P	
	Open Elective III (MooC)	3	0	0	3
24DGEN49	Seminar	2	0	0	2
24DGEN50/51/52/53	Program Elective III	3	0	0	3
24DGEN54/55/56	Program Elective III Lab	0	0	2	1
24DGEN57	AI Fundamentals	3	0	0	3
24DGEN58	AI Fundamentals Lab	0	0	4	2
24DGEN59	Sem V Major Project Evaluation (1 credit from semester V)	0	0	6	4
Total Credits		**11**		**12**	**18**
Total Hours		**23**			

1.7 LIST OF ELECTIVES*

Program Elective I		Program Elective II		Program Elective III	
Mathematical foundations for AI	Basics of Networking	Cloud computing	Risk Analysis and Management	Ethical Hacking	Natural Language Processing
Introduction to Data Science	Server Configuration and Security	DevOpS Basics	Intrusion Detection Systems	Digital Forensics	Human Computer Interface
Computer Graphics	Security Auditing and Management	MLOPs Basics	Mathematical foundations for Cryptography	Cyber Law and Cyber Policy	Large Language Models and tools

*More elective courses may also be added to the list of open electives and elective (Domain Specific) at the time of offering of courses by the Department.

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SEMESTER WISE SYLLABUS

24DGEN01: English and Communication Skills Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:			23.07.24				
Prerequisite							

Course Objectives

The course aims to inculcate skills among students with following objectives:

- Ability to be comfortable with English in use while reading or listening.
- Ability to use receptive skills through reading and listening to acquire good exposure to languageand literature.
- Ability to write and speak good English in all situations.
- The course should provide exposure to the learners in Good Prose texts and Poems and exposethe learners to value based ideas.
- Students should enhance their language skills especially in the areas of grammar andpronunciation.

Course Learning Outcomes:

After undergoing this subject, the students will be able to:
CO1: Define the nuances of Communication, both Oral and Written.
CO2: Apply knowledge to practice communication, communication process and speaking skills.
CO3: Use understanding of Grammatical Structures in the communication.
CO4: Apply knowledge to practice oral and written communication.
CO5: Perform the techniques to improve non-verbal communication.

Practical Exercises

1 Reading

1.1 Reading Practice of lessons in the Lab Activity classes.
1.2 Comprehension exercises of unseen passages along with the lessons prescribed.
1.3 Vocabulary enrichment and grammar exercises based on the selected readings.
1.4 Reading aloud Newspaper headlines and important articles.

2 Fundamentals of Communication

2.1 Introducing oneself, others and leave- taking(talking about yourself)
2.2 Just a minute (JAM) sessions: Speaking extempore for one minute on given topics
2.3 Situational Conversation: Offering-Responding to offers; Congratulating; Apologising and Forgiving; Complaining; Talking about likes and dislikes, Self-introduction Mock Interviews.

3 Grammar and Usage

3.1 Written and Oral Drills will be undertaken in the class to facilitate holistic linguistic competency among learners.
3.2 Exercises on the prescribed grammar topics.

4 Writing Skills

4.1 Students should be given Written Practice in groups so as to inculcate team-spirit and collaborative learning.
4.2 Group exercises on writing paragraphs on given topics.

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24DGEN02: Applied Mathematics -I							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	0	0	3		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire understanding of the geometric shapes, Co-ordinate Geometry and Trigonometryfor engineering problems.
- Define problems into mathematical formats.
- Apply binomial and other theorems to solve engineering problems.
- Explore relationship among different variables.
- Use software tools for basic mathematical calculations.

Course Outcomes:

After undergoing this subject, the students will be able to:

CO1: Understand the geometric shapes used in engineering problems by Co-ordinateGeometry and Trigonometry.
CO2: Formulate engineering problems into mathematical formats with the use matrices, co-ordinate geometry and trigonometry
CO3: Solve the approximate value of roots of certain expressions in engineering problems byapplication of binomial theorem.
CO4: Explain the idea of location, graph, and linear relationships between two variables.
CO5: Understand basic fundamentals about MATLAB/ SciLab and mathematical calculationwith MATLAB/ SciLab software.

Detailed Contents:

UNIT I: Number Theory

1.1 Number Theory

1.2 Logarithms and its basic properties

1.3 Application of Number Theory

UNIT II: Linear Algebra

2.1 Matrices, its types and operations

2.2 Determinants and Matrices – Evaluation of determinants

2.3 Solutions of equations

UNIT III: Trigonometry

3.1 Concept of angle, measurement of angle in degrees, grades, radians and their conversions.

3.2 T-Ratios of Allied angles (without proof), Sum, Difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa

3.3 Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.

UNIT IV: Co-ordinate Geometry

4.1 Cartesian and Polar co-ordinates (two dimensional), Distance between two points, mid- point, centroid of vertices of a triangle.

4.2 Slope of a line, equation of straight line in various standards forms (without proof); (slope intercept form, intercept form, one-point form, two-point form, symmetric form, normal form, general form), intersection of two straight lines, concurrency of lines, parallel and perpendicular lines, perpendicular distance formula

UNIT V: Geometry of Circle and Software Circle

5.1 General equation of a circle and its characteristics. To find the equation of a circle, given:

- Centre and radius
- Three points lying on it
- Coordinates of end points of a diameter

Software

- **MATLAB Or SciLab software** – Theoretical Introduction, MATLAB or Scilab as Simple Calculator (Addition and subtraction of values –Trigonometric and Inverse Trigonometric functions) – General Practice

Text Books:

1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses", Dhanpat RaiPublications.

Recommended Books:

2. "Mathematics for Class XI", NCERT Publication, New Delhi.
3. "Mathematics for Class XII", NCERT Publication, New Delhi.
4. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributers.
5. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics – I", CBS Publisher, New Delhi.
6. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics –II", CBS Publisher, New Delhi.
7. G. B. Thomas, R. L. Finney, "Calculus and Analytic Geometry", Addison Wesley, Ninth Edition.
8. B S Grewal, "Elementary Engineering Mathematics", Khanna Publishers, Delhi, Thirty- fifth edition.
9. R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, New Delhi, Second Edition, 2003.
10. SS Sabharwal & Dr Sunita Jain, "Applied Mathematics Vol. I & II", Eagle Parkashan, Jalandhar.
11. S Kohli, "Engineering Mathematics Vol. I & II", IPH, Jalandhar.
12. Reena Garg & Chandrika Prasad, "Advanced Engineering Mathematics", Khanna Publishing House, New Delhi
13. R. Pratap, "Getting Started with MATLAB 7", Oxford University Press, Seventh Edition.
14. E-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

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24DGEN03: Applied Physics -I							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
3	**0**	**0**	**3**		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Identify and measure physical quantities with accuracy.
- Represent physical quantities, understand the concepts of energy conservation and itsapplications.
- Acquire scientific skills to solve problems.
- Comprehend matter and environmental effects on it.
- Apply physical principles in different fields.

Course Learning Outcomes:

After completing this subject, student should be able to:

CO1. Describe physical quantities, select their units and make measurements with accuracy.

CO2. List physical quantities as scalar and vector and identify type of motions, various forms of energy, their conversion and applications.

CO3. Solve problems related to scientific work, energy and power, norms of friction.

CO4. Explain properties of matter and effect of temperature on various matter and phenomenon.

CO5. Demonstrate the use of physical principles and analysis in various technical fields.

Detailed Contents:

UNIT I: Unit and Dimensions

1.1 Definition of Physics, physical quantities- fundamental and derived
1.2 Units: fundamental and derived
1.3 System of units: CGS, FPS, MKS, SI

UNIT II: Force and Motion

2.1 Scalar and vector quantities– definition and examples, representation of vector, types of vector (unit vector, position vector, co-initial vector, collinear vector, co-planar vector)
2.2 Vector algebra- addition of vectors, Triangle & Parallelogram law (statement and formula only),
2.3 Scalar and vector product (statement and formula only)
2.4 Force and its units, resolution of force (statement and formula only)
2.5 Newton's laws of motion (statement and examples)

UNIT III: Work, Power and Energy

3.1 Work- definition, symbol, formula and SI unit, types of work (zero work, positive work and negative work) with example
3.2 Friction– definition and its simple daily life applications
3.3 Power- definition, formula and units
3.4 Energy- definition and its SI unit, examples of transformation of energy.

UNIT IV: Properties of Matter

4.1 Elasticity and plasticity
4.2 Definition of stress and strain
4.3 Pressure- definition, atmospheric pressure, gauge pressure, absolute pressure
4.4 Surface tension

4.5 Viscosity

UNIT V: Heat and Temperature

5.1 Definition of heat and temperature (on the basis of kinetic theory)
5.2 Difference between heat and temperature
5.3 Principle and working of mercury thermometer

Text Books:

1. "Text Book of Physics for Class XI (Part-I, Part-II)", N.C.E.R.T., Delhi.

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I and Vol. II", TTTI Publications, Tata McGraw Hill, Delhi.
2. AS Vasudeva, "Applied Physics – I", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics – I", Eagle Prakashan, Jalandhar.
4. E-books/e-tools/relevant software to be used as recommended by AICTE/ HSBTE/ NITTTR.
5. C. L. Arora, "Practical Physics", S Chand Publication.

Suggested Websites:

1. http://swayam.gov.in
2. The Physics Classroom
3. https://www.khanacademy.org/science/physics



24DGEN04: Applied Physics Lab-II							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**	**2**	**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- to be familiarized with the physical property measuring tools.
- reading values and understanding their parts.
- to read values from the measuring tools.
- to compute physical properties of objects.
- to verify the laws of force.
- to compute atmospheric properties.
- to apply physical principles in different fields.

Course Outcomes:

After completing this subject, student should be able to:

CO1: Recognize the tool to measure the physical properties of the objects.

CO2: Use tools such as Vernier calliper, screw gauge, spherometer, etc. to measure physicalproperties of objects.

CO3: Investigate parallelogram law of force.

CO4: Investigate the force constant, atmospheric pressure, room temperature, etc.

CO5: Solve problems to convert temperature into different scales.

PRACTICAL EXERCISES

1. Familiarization of measurement instruments and their parts (for example - vernier calliper, screw gauge, spherometer, travelling microscope etc.), and taking a reading. (compulsory to all students)
2. To find diameter of solid cylinder using a vernier calliper
3. To find internal diameter and depth of a beaker using a vernier calliper and hence find its volume.
4. To find the diameter of wire using screw gauge
5. To find thickness of paper using screw gauge.
6. To determine the thickness of glass strip using a spherometer
7. To determine radius of curvature of a given spherical surface by a spherometer.
8. To verify parallelogram law of force.To determine the atmospheric pressure at a place using Fortin's Barometer
9. To determine force constant of spring using Hooke's law
10. Measuring room temperature with the help of thermometer and its conversion in differentscale.

24DGEN05: Fundamentals of IT							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0	0	3		External Examination	:	70
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24	Duration of Exam	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire the basic knowledge of computer system, internet and WWW.
- Handling of input/ output devices and installing Operating System.
- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

Course Outcomes:

At the end of the course student will be able to

CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks oninformation and computers.

CO2: Describe handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/ConfigureOS.

CO3: List steps to assemble a PC and connect it to external devices.

CO4: Explain features of Office practiced Automation Tools.

CO5: Understand Office tools to develop worksheets and Prepare presentations.

Detailed Contents:

UNIT I: Basics of Computer

1.1 Brief history of development of computers

1.2 Definition of Computer, Block diagram of a Computer, Hardware, Software,

1.3 Booting: Cold and Hot Booting

1.4 Interaction between the CPU and Memory with Input / Output devices

1.5 Function of CPU and major functional parts of CPU.

1.6 Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB , Functions of memory

1.7 use of storage devices in a Computer, List types of memory used in a Computer, Importance of cache memory, CPU speed and CPU word length.

UNIT II: Basic Internet Skills

2.1 Understanding browser, Introduction to WWW, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

2.2 Advantages of Email, Various email service providers, Creation of email id, sending and receiving emails, attaching documents with email and drive.

2.3 Effective use of Gmail, G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of communication using Google Meet & WebEx.

Unit III: Basic Logic building

3.1 Introduction to Programming

3.2 Steps involved in problem solving

3.3 Definition of Algorithm, Definition of Flowchart, Steps involved in algorithm development, differentiate algorithm

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and flowchart, symbols used in flowcharts, algorithms for simple problems, flowcharts for simple problems,

3.4 Practice logic building using flowchart/algorithms

Unit IV: Office Tools

4.1 Importance, methods and procedure of data entry

4.2 Office Tools like MSOffice.

4.3 MS Word-Typesetting Text and Basic Formatting ,Inserting Images, Hyperlinks, Bookmarks, Tablesand Table Properties in Writer

4.4 MS Excel :Working with Cells, Sheets, data, tables, usingformulae and functions, using charts and graphics.

4.5 MS Power Point – Creating and Viewing Presentations, Inserting Pictures and Tables, Slide Master and Slide Design, Custom Animation.

Unit V: Social Media and Digital Marketing

5.1 Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing

5.2 Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.

5.3 Features of Social media, Advantages and Disadvantages of Social Media.

Text Books:

1. R.S. Salaria, "Computer Fundamentals" Khanna Publishing House
2. Ramesh Bangia, "PC Software Made Easy – The PC Course Kit" Khanna Publishing House

RECOMMENDED BOOKS

1. Online Resources, Linux man pages, Wikipedia
2. Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew MallettVikas Gupta, "Comdex Hardware and Networking Course Kit" Dream Tech press, New Delhi, 2008
3. Sumitabha Das,"UNIX concepts and applications" Tata McGraw Hill, New Delhi, 4th Edition, 2008

24DGEN06: Fundamentals of IT Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	60
0	0	2	1		**External Examination**	:	40
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire the basic knowledge of computer system, internet and WWW.
- Handling of input/ output devices and installing Operating System.
- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

Course Outcomes:

At the end of the course student will be able to

CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks oninformation and computers.

CO2: Execute handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/ConfigureOS.

CO3: Assemble a PC and connect it to external devices.

CO4: Use and Manage Office practiced Automation Tools.

CO5: Apply knowledge of Office tools to develop worksheets and Prepare presentations.

Practical Exercises:

1. Browser features, browsing, using various search engines, writing search queries
2. Visit various e-governance/Digital India portals, understand their features, services offered.
3. Read Wikipedia pages on computer hardware components, look at those components inlab, identify them, recognize various ports/interfaces and related cables, etc.
4. Using Administrative Tools/Control Panel Settings of Operating Systems
5. Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and theirdevice driver software.
6. Explore features of Open Office tools and MS-Office, create documents, create presentation, create spread sheet,using these features, do it multiple times
7. Working with Conversion Software like pdf To Word, Word To PPT, etc.
8. Working with Mobile Applications – Searching for Authentic Mobile app, Installation and Settings, Govt. of India Mobile Applications
9. Creating email id, sending and receiving mails with attachments.
10. Using Google drive, Google calendar

Monika Madhuri

24DGEN07: Computer Workshop							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	6	3		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Handling of computer devices and assembling of devices.
- Identify requirement of software.
- Configuring and installing required software.
- Troubleshooting for problems.
- maintaining laptops

Course Outcomes:

At the end of the course student will be able to

CO1: Describe and Handle various hardware components.

CO2: Apply knowledge to install different types of software and use them appropriately.

CO3: Assemble computer components

CO4: Execute interfacing of various devices to PC/Laptop

CO5: Execute Troubleshooting and Maintainenace of PC/Laptop

Practical Exercises

UNIT I: Introduction

1.1 Anatomy of a Computer, Foundations of Modern Information Technology, The Central Processing Unit, How Microprocessors and Memory Chips are Made, Memory, Buses for Input and Output, communication With Peripherals.

1.2 Desktop: Identification of desktop and its parts, Hardware, Software andFirmware

1.3 Introduction to Mother board, IO and memory expansion slots, Drives, front panel and rearpanel Processors& Bus: Introduction and types of Processor, Introduction to BUS

1.4 Laptop: Introduction to Laptop, advantages overDesktops

1.5 Laptop components: Adapter – types, Battery – types, Laptop Keyboard andTouchpad

1.6 Power Supply: Introduction to online and offline UPS, Difference between online and offline UPS

1.7 SMPS: Introduction to SMPS, Study of SMPS Connectors

UNIT II: Memory Storage Devices

2.1 Primary Memory: Introduction and types of primary memory (SDRAM, DDRRAM)

2.2 Secondary Storage: Hard Disk –Working Principle of IDE, HDD Partition –

2.3 Formatting, Introduction to SATA and Solid-State Drives (SSD)

2.4 Removable Storage: Introduction to CD, DVD, reading & writing operations; Introductionto Blue-ray devices

2.5 Flash memory: Flash drives (pen drives), Memory cards and itstypes

UNIT III: I/O Devices and Interfacing

5.1 Inputting Text and Graphics, State of the Art, Input and Output, Pointing Devices

5.2 Foundations of Modern Output, Display Screens, Printers, Foundations of Modern Storage,Storage Media, Increasing Data Storage Capacity, Backing up your Data, The Smart Card

5.3 Keyboard: Types of keyboards (wired and wireless Keyboard), keyboards connectors, troubleshooting

5.4 Mouse: types, connectors, operation of Optical mouse and Troubleshooting.

5.5 Printers: Introduction – Types of printers- Dot Matrix, Inkjet, LaserJet, MFP (Multi-Function Printer), advantages, disadvantages, cables and connectors, Troubleshooting.

5.6 I/O Ports: Introduction and identification of Serial, Parallel, USB,HDMI.

5.7 Displays: Introduction to LED, LCD and TFT Displays, cables and connectors

5.8 Graphic Cards: Introduction to different types of Graphics cards

UNIT IV: Maintenance and Trouble Shooting of Desktop and Laptops

4.1 Bios-setup: Standard CMOS setup, Advanced BIOS setup, advanced chipset features, PC Bioscommunication, upgrading BIOS, Flash BIOS -setup.

4.2 POST and BOOTING: Definition, POST Test sequence – beepcodes.

4.3 Diagnostic Software and Viruses: Computer Viruses, Precautions, Anti-virus Software,Working of Antivirus software's

4.4 General troubleshooting of various peripheral devices (printer, pc, laptop, keyboard,mouse, monitor, hard disk)

UNIT V: Assembling and Installation of Hardware/Software

5.1 Assembling and Disassembling of PC

5.2 Installation and Troubleshooting: Formatting, Partitioning and Installation of OS: Windows and Linux

5.3 Installation of peripheral devices: Printers, scanner

5.4 Installation of software's: application software, systems software

Text Books:

1. Stephen J, Bigelow, "Trouble shooting, maintaining and repairing PCs", Tata McGraw-Hill, New Delhi, 2005.

Recommended Books:

1. Stanley & Hall, "PC Data Handbook, BPB Publications, New Delhi, 2007.
2. Govindarajulu, "IBM PC and clones Hardware trouble shooting and maintenance, TataMcGraw-Hill, New Delhi, 2007.
3. Scott Muller, "Upgrading and Repairing PCs", Microtech Publications, Dubai, 2006.
4. Ronald L.Krutz, "Interfacing Techniques in Digital Design with Emphasis on Microprocessors", John Wiley & Sons New York, 2004.

Suggested Websites:

1. PC Hardware — Open & Free – OLI (cmu.edu)
2. https://www.classcentral.com/course/build-a-computer-3234 : Free Online Course: Build a Modern Computer from First Principles: From Nand to Tetris (Project-Centered Course) from Coursera/Class Central

Monika Medhwi

24DGEN08: Electronic Workshop							
Diploma Computer (Generative AI/Cyber Security) Semester – I							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	4	2		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Outcomes:

The course aims to inculcate skills among students with following objectives:

- Identifying different types of electronic components and their characteristics.
- Acquire skills of soldering and de-soldering.
- Assembling of circuits on breadboards.
- Identify and utilize different type of measuring tools.
- Testing and validation of circuits and batteries.

Course Learning Outcomes:

After undergoing the subject, the students will be able to:

CO1: Describe electronics components like resistors, capacitors, diodes, transistors etc.
CO2: Execute soldering and de-soldering on electronic circuit interconnections.
CO3: Explain different active electronic components and assemble circuits on breadboard.
CO4: Use measuring instruments like Multimeter, Function generator, Power Supply & DSO.
CO5: Test various electronic circuitry and batteries.

Practical Exercises

COURSE OBJECTIVE

The course aims to inculcate skills among students with following objectives

- Verification of logic gates practically.
- Designing gates using universal gates.
- Verify Demorgan's theorem of logic gates.
- Designing different sequential and digital circuits.
- Verifying Digital circuits.

COURSE LEARNING OUTCOME

After completion of the course, the student will be able to

CO1: Verify logic gates.

CO2: Apply knowledge to realize the all logic gates using NAND and NOR gate.

CO3: VerifyDemorgan's theorem.

CO4: Design Adders and subtractors.
CO5: Verify designed logic circuits.

LIST OF EXPERIMENTS

1. Verify Truth Table of Logic Gates (AND, OR, NOT, NAND & NOR Gates)
2. Design Basic Gates Using NAND gates
3. Design Basic Gates Using NOR gates
4. Verify Demorgan's theorem.
5. Design Half Adder. (a) Using AND/OR/NOT Gates. (b) Using NAND/NOR Gates.
6. Design full Adder
7. Design full subtractor

Manisha Madhuri

8. Verify the Truth Table of RS Flip-flop, JK F/F, D F/F & T type F/F
9. Design shift Register & verify truth table. used as a serial/parallel shift Resistor
10. Design 3/4 bit Counter & verify truth table

Suggested Websites:

1. www.electronics.wisc-online.com
2. www.electronicsforu.com
3. https://www.electronics-tutorials.ws/design

24DGEN09: Basics Prompt Engineering							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
02	**0**	**0**	**2**		**External Examination**	:	70
Effective from Session:				w.e.f. 2023-2024	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs.
Prerequisite							

Course Objectives:

- Basic understanding of artificial intelligence and machine learning concepts.
- Familiarity with the concept of large language models (LLMs) such as GPT-3 or GPT-3.5.
- Comfort with basic computer usage and navigating online platforms.
- Ability to read and comprehend technical English language.
- Interest in learning how to interact with AI systems effectively.
- Some exposure to any programming or scripting language is beneficial but not mandatory.
- Willingness to experiment and explore new technological tools and applications.

Course learning Outcome

- Clearly communicate what content or information is most important.
- Structure the prompt: Start by defining its role, give context/input data, then provide the instruction.
- Use specific, varied examples to help the model narrow its focus and generate more accurate results.
- Use constraints to limit the scope of the model's output. This can help avoid meandering away from the instructions into factual inaccuracies.
- Break down complex tasks into a sequence of simpler prompts.
- Instruct the model to evaluate or check its own responses before producing them.

Course Content:

Unit I

LARGE LANGUAGE MODELS

1.1 Introduction to Large Language Models (LLMs)
1.2 Introduction to ChatGPT
1.3 Overview of GPT 4 Architecture
1.4 Common Use cases and applications of ChatGPT
1.5 Limitations and ethical considerations
1.6 Comparative study of ChatGPT and recent LLMs

UNIT II

INTRODUCTION TO PROMPTING

2.1 Basics of Prompting and Prompt Elements

2.2 Types of Prompts
2.3 Examples of Prompting
2.4 Benefits and Challenges of Prompt Engineering
2.5 Natural Language Processing and Prompting
2.6 Introduction: AI, Gen AI and Prompts for Gen AI
2.7 Case Studies and Roles of Prompting in different sectors

Unit III

THE ART OF WELL-CRAFTED PROMPTS

3.1 The principles of Prompting
3.2 The 5Ws: What, Where, When, Why and Who?
3.3 The art of open-ended Questions
3.4 The Role of Active Listening and Paraphrasing
3.5 Leveraging Context and Background Information
3.6 General Mistakes: Mistakes related to Book Writing, Mistakes related to SEO, Mistakes related to Copywriting Task.

Unit IV

PROMPTING TECHNIQUES

4.1 Systematic Review Process: The Pipeline
4.2 Text Based Prompting
4.3 Multilingual Prompting
4.4 Multimodal Prompting

UNIT V

RISK AND MISUSES

5.1 Prompting Issues: Security and Alignment
5.2 Addressing Prompt Misuses
5.3 Factuality and Verbosity
5.4 Biases
5.5 Mitigating Biases
5.6 Making adjustments and tailoring Prompts for different Use Cases
5.7 Future of Prompting

RECOMMENDED READINGS

1. Schulhoff, S., Ilie, M., Balepur, N., Kahadze, K., Liu, A., Si, C., ... & Resnik, P. (2024). The Prompt Report: A Systematic Survey of Prompting Techniques. *arXiv preprint arXiv:2406.06608*.
2. Getting Great Answers Chat GPT's The art of Prompting.
3. Prompting mistakes that are killing your productivity.
4. The Prompt Engineers handbook.

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24DGEN10: Advances in IT							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0	0	3		External Examination	:	70
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24	Duration of Exam	:	3 Hrs.
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- The course aims to inculcate skills among students with following objectives acquire skills to develop webapplications using HTML.
- Developing interactive internet applications.
- Learning syntax and structure of XML languages.
- Designing XML codes.
- Developing and testing web codes.

Course Outcomes:

At the end of the course student will be able to

CO1: Describe the need of HTML
CO2: Understand its applications in Web Development
CO3: Design and Develop Websites using HTML
CO3: Apply acquired knowledge to develop interactive Internet applications
CO5: Design XML web Pages

Detailed Contents

UNIT I: HTML Introduction

1.1 Introduction to HTML

1.2 Characteristics of HTML language

1.3 Structure of a HTML page.

1.4 Describing Tags.

1.5 How to create a HTML document? Viewing HTML document

UNIT II: HTML Syntax

2.1 Using tags, Heading, Paragraph

2.2 Changing appearance of text (bold, italics, underline, and subscript, superscript); Changing font size, text color and background

2.3 Changing the background color and background of HTML page

2.4 Top marging, left margin, & nbsp,<hr> and its attributes.

2.5 Marquee

UNIT III: HTML Lists and Links

3.1 Using list and images: Unordered lists: type attribute. Ordered lists: start attribute, type attribute, value attribute.

3.2 Nested lists. Inserting images, aligning an image, centering image, adding border to a image, alternate text, setting height and width, adding space around the image.

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3.3 Working with links: Anchor elements, creating hyperlink to a document. Internal linking and external linking.

UNIT IV: HTML Tables and Frames

4.1 Creating tables: Creating a table, attributes of table tag (BORDER, BORDERCOLOR,BGCOLOR, ALIGN, CELLSPACING, CELLPADING, WIDTH) Attributes of table row <tr> and table data <td> tag (BORDERCOLOR, BGCOLOR, ALIGN, VALIGN,HEIGHT). Row span and Colspan.

4.2 Working with Frames. Use and creating frames. Introduction to FormsSteps for developing a Website.

UNIT V: XML

5.1 Introduction to XML

5.2 Creating XML pages

5.3 HTML vs XML

Text Books:

1. Thomas A.Powell, "HTML&XHTML –The Complete Reference", Tata McGraw Hill,2006

Suggested Websites:

1. https://nptel.ac.in/courses/117/106/117106113/
2. https://nptel.ac.in/courses/106/105/106105084/



24DGEN11: Advances in IT Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Understanding syntax and structure of mark-up languages for web development.
- Applying knowledge to tags to create different types of web pages.
- Creating interlinking of web documents to navigate across webpages.
- Incorporating multimedia content in web pages.
- Developing online forms.

Course Learning Outcomes:

At the end of the course student will be able to:

CO1: Develop basic HTML document.
CO2: Apply knowledge of different HTML tags to format web document.
CO3: Implement heading, paragraphs, tables, lists, frames, etc. in the web document.
CO4: Create web page that contains inter and intra hyperlinks.
CO5: Create forms and controls using web development applications or languages.

Practical Exercises

1. Creating an HTML document
2. Working with Mark up Tags
3. Working with Heading-Paragraphs
4. Working with Text
5. Working with Lists
6. Working with Tables
7. Working with Frames
8. Working with Hyperlinks
9. Working with Images and Multimedia
10. Designing Marquee and changing its colors

24DGEN12: Applied Mathematics-II							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	T	P	Credits	Core Course	Internal Examination	:	30
4		0	4		External Examination	:	70
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23.07.24	Duration of Exam	:	3 Hrs
Prerequisite							

Course Objective:

The course aims to inculcate skills among students with following objectives

- acquire ability to formulate engineering problems using differential equations.
- apply the knowledge of differentiation and integration to solve problems.
- apply the acquired knowledge of integrals to approximate area under curve.
- analysing and describing data using methods of central tendency and mean/median/mode.
- use of mathematical software tools.

Course Outcomes:

After undergoing the subject, the students will be able to:

CO1. Formulate the engineering problems into mathematical format with the use of differential equations and differential.

CO2. Use the differentiation and Integration in solving various Mathematical and Engineering problems.

CO3. Solve the approximate area under a curve by applying integration andnumerical methods.

CO4. Understand the purposes of measures of central tendency and calculate themeasures of central tendency (mode, median, mean) for a set of data.

CO5. Understand the MATLAB/ SciLab and mathematical calculation with MATLAB/SciLab software.

Detailed Contents:

UNIT I: Limit

1.1 Definition of function

1.2 Concept of limits (Introduction only)

1.3 problems related to four standard limits only.

UNIT II: Differentiation

2.1 Definition of Differentiation

2.2 Its application in Engineering

2.3 Basic differentiation practices

UNIT III: Integration

2.1 Definition of Integration

2.2 Its application in Engineering

2.3 Basic Integration practices

UNIT IV: Statistics and Software Statistics

5.1 Measures of Central Tendency: Mean, Median, Mode

5.2 Measures of Dispersion: Mean deviation, Standard deviation

UNIT V: Softwares

5.3 SciLab software – Theoretical Introduction.

5.4 Basic difference between MATLAB and SciLab software,

5.5 Calculations with MATLAB or SciLab - (a) Representation of matrix (2×2 order),Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab

Recommended Books:

1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses",Dhanpat Rai Publications.

Reference Books:

2. "Mathematics for Class XI", NCERT Publication, New Delhi.
3. "Mathematics for Class XII", NCERT Publication, New Delhi.
4. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributers.
5. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics –I", CBS Publisher, New Delhi.

Monika Madhuri

24DGEN13: Applied Physics II							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
4	0	0	4		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives

- Understanding different types of wave forms.
- Learn laws of reflection and refraction of light.
- Demonstrating electrostatics and electricity phenomena.
- Categorizing properties of materials and create new materials.
- Apply knowledge of Modern Physics for different technical applications.

Course Outcomes

At the end of this course, the students will be able to:

CO1: Differentiate between types of waves and their motion.

CO2: State laws of reflection and refraction of light.

CO3: Demonstrate competency in phenomena of electrostatics and electricity.

CO4: Classify properties of material to prepare new materials for various technicalapplications.

CO5: Demonstrate a strong foundation on Modern Physics to use at various technicalapplications.

Detailed Contents:

UNIT I: Wave Motion and its Applications

1.1 Waves: definition, types (mechanical and electromagnetic wave)

1.2 Wave motion- transverse and longitudinal with examples, terms used in wave motionlike displacement, amplitude, time period, frequency, wavelength, wave velocity; relationship among wave velocity, frequency and wave length

1.3 Sound waves: types (infrasonic, audible, ultrasonic) on the basis of frequency, noise,coefficient of absorption of sound, echo

UNIT II: Optics

2.1 Reflection and refraction of light with laws, refractive index

2.2 Lens: introduction, lens formulae (no derivation), power of lens

2.3 Introduction to Microscope, Telescope and their applications

UNIT III: Electrostatics and Electricity

3.1 Electric charge, unit of charge, conservation of charge

3.2 Coulomb's law of electrostatics

3.3 Definition of electric flux, Gauss law (statement and formula)

3.4 Capacitor and capacitance (with formula and unit)

3.5 Electric current and its SI Unit, direct and alternating current

3.6 Resistance, conductance (definition and unit)

3.7 Series and parallel combination of resistances

3.8 Ohm's law (statement and formula)

UNIT IV: Classification of Materials and their Properties

4.1 Definition of energy level, energy bands

4.2 Types of materials (conductor, semiconductor, insulator and

Monika
Medhwi

dielectric) with examples, intrinsic and extrinsic semiconductors (introduction only)

UNIT V: Magnetic Fields

5.1 Introduction to magnetism, type of magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials with examples

5.2 Magnetic field, magnetic lines of force, magnetic flux

5.3 Electromagnetic induction (definition)

Text Books

1. "Text Book of Physics for Class XII (Part-I, Part-II)", N.C.E.R.T., Delhi

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I & II", TTTI Publications, Tata McGraw Hill,Delhi.
2. AS Vasudeva, "Applied Physics –II", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics – II", Eagle Prakashan, Jalandhar.
4. N Subrahmanyam, Brij Lal and Avadhanulu, "A text book of OPTICS", SChand Publishing, New Delhi. E-books/e-tools/relevant software to be used as recommended by AICTE/ HSBTE/NITTTR.
5. M H Fulekar, "Nanotechnology: Importance and Applications", IK International Publishing House (P) Ltd., New Delhi.
6. C. L. Arora, "Practical Physics", S Chand Publication.



24DGEN14: Applied Physics Lab II							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Identifying different types of apparatus/ instruments for measuring properties.
- Analyzing time and time variations of varying different objects.
- Demonstrating elctrostatics and electricity phenomena.
- Plot voltage, current and study colour coding scheme of resistance.
- Verify different laws and phenomena of physics.

COURSE LEARNING OUTCOMES

At the end of this course, the students will be able to:

CO1: Identify the apparatus to be used and understand their components.

CO2: Analyse time variations of pendulum and cantilever.

CO3: Test laws of reflection, refraction, ohms law and laws of resistance.

CO4: Examine physical properties of objects.

CO5: Examine focal length of concave and convex lens.

PRACTICAL EXERCISES

1. Familiarization with apparatus (resistor, rheostat, key, ammeter, voltmeter,telescope, microscope etc.)
2. To find the time period of a simple pendulum.
3. To study variation of time period of a simple pendulum with change in lengthof pendulum.
4. To determine and verify the time period of Cantilever.
5. To verify Ohm's laws by plotting a graph between voltage and current.
6. To study colour coding scheme of resistance.
7. To verify laws of resistances in series combination.
8. To verify laws of resistance in parallel combination.
9. To find resistance of galvanometer by half deflection method.
10. To verify laws of reflection of light using mirror.
11. To verify laws of refraction using glass slab.
12. To find the focal length of a concave lens, using a convex lens.

Navitha madhuri

24DGEN15: Engineering Graphics							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	6	3		**External Examination**	:	30
Effective from Session:				w.e.f. 2023-2024	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Creating orthographic views of objects from different angles.
- Creating sectional views of objects.
- Creating isomorphic of solids.
- Identification of conventions for different engineering materials, symbols, etc. inengineering applications.
- Apply knowledge of AutoCAD for orthographic views.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

CO1: Sketch Orthographic views of different objects viewed from different angles.

CO2: Sketch and interpret sectional views of an object which are otherwise not visible innormal view.

CO3: Sketch Isometric views of different solids and develop their surfaces.

CO4: Identify conventions for different engineering Materials, symbols, sections of regularobjects and general fittings used in Civil and Electrical household appliances /fittings.

CO5: Sketch orthographic views of different objects by using basic commands of AutoCAD.

DETAILED CONTENTS

UNIT I

Introduction to Engineering Drawing and Graphics, Technical writing

1.1 Introduction to use and care of drawing instruments, drawing materials, layout and sizesof drawing sheets and drawing boards.

1.2 Symbols and conventions-Conventions of Engineering Materials, Sectional Breaks and Conventional lines. Civil Engineering Sanitary fitting symbols, Electrical fitting symbols for domestic interior installations.

1.3 Geometrical construction-geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagons, pentagons bisecting a line and arc , division of line and circle with the help of drawing instruments.

1.4 Definition and classification of lettering

1.5 Free hand (of height of 5,8,12 mm) and instrumental lettering (of height 20 to 35 mm):upper case and lower case, single and double stroke, vertical and inclined (Gothic lettering) at 75 degree to horizontal and with suitable height to width ratio 7:4.

Neeraja Madhuri

UNIT II

Orthographic Projections and Sectioning

2.1 Theory of orthographic projections (Elaborate theoretical instructions).

2.2 Three views of orthographic projections of different objects of given pictorial view ofa block in 1st and 3rd angle.

2.3 Projection of Points in different quadrant

2.4 Projection of Straight Line (1st angle)

2.5 Line parallel to both the planes.

2.6 Line perpendicular to any one of the reference planes and parallel to others

2.7 Line inclined to any one of the references and parallel to another plane.

2.8 Projection of Plane – Different lamina like square rectangular, triangular, circleand Hexagonal pentagon. Trace of planes (HT and VT).

2.9 Identification of surfaces.

2.10 Importance and salient features

2.11 Drawing of full section, half section, partial or broken out sections, Offset sections,revolved sections and removed sections (theoretical only).

2.12 Orthographic sectional views of different objects.

UNIT III

3.1 Introduction of projection of right solids such as prism & pyramid (square, Pentagon,Hexagonal) cube, cone & cylinder (Axes perpendicular to H.P and parallel to V.P.)

3.2 Introduction of sections of right solids - Section planes, Sections of Hexagonal prism,

3.3 pentagon pyramid, cylinder and cone (Section plane parallel to anyone reference planesand perpendicular to V.P. and inclined to H.P.)

3.4 Development of Surfaces – Development of lateral surfaces of right solids like cone,cylinder, pentagonal prism, pyramid and hexagonal pyramid (Simple problems)

UNIT IV

Isometric Views

4.1 Fundamentals of isometric projections and isometric scale.

4.2 Isometric views of different laminas like circle, pentagon and hexagon.

4.3 Isometric views of different regular solids like cylinder, cone, cube, cuboid, pyramidand prism.

4.4 Isometric views from given different orthographic projections(front, side and topview)

UNIT V

Introduction to AutoCAD

5.1 Basic introduction and operational instructions of various commands in AutoCAD.

5.2 At least two sheets of different objects on AutoCAD (given pictorial/isometric view ofa block

5.3 AutoCAD skill of student is evaluated in internal assessment only not in external exam.

Text Books

A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co.,Delhi

RECOMMENDED BOOKS

1. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi

2. Elementary Engineering Drawing in First Angle Projection by ND Bhatt;Charotar Publishing House Pvt. Ltd.,Anands

3. Engineering Drawing and Graphics using AutoCAD by T. Jeyapoovan,VikasPublishing House Pvt, Ltd Noida.

4. A Text Book of Engineering Drawing by S.R.Singhal and O.P.Saxena, AsianPublisher, Delhi

5. Engineering Drawing by RB Gupta, Satya Prakashan, New Delhi

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24DGEN16: Multimedia Applications							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	30
4	0	0	4		**External Examination**	:	70
Effective from Session:				w.e.f. 2024-2025	**Total**	:	100
Date of BoS approval:				23.07.24	**Duration of Exam**	:	3 Hrs
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Developing interactive websites.
- Applying multimedia tools knowledge to create applications.
- Determine the appropriate use of interactive verses standalone Web applications
- identifying use of interactive and standalone applications.
- Identifying challenges during deploying web based applications.

COURSE OUTCOMES

At the end of the course student will be able to

CO1: Develop a well-designed, interactive Web site with respect to current standards andpractices

CO2: Demonstrate in-depth knowledge in an industry-standard multimedia developmenttool and its associated scripting language

CO3: Recognize the appropriate use of interactive verses standalone Web applicationsCO4: Design time-based and interactive multimedia components

CO5: Identify issues and obstacles encountered by Web authors in deploying Web-basedapplication

DETAILED CONTENTS

UNIT I

Definitions and Classification

1.1 Multimedia Hardware
1.2 Multimedia Software
1.3 Meetings the analog signals
1.4 Search of Digital recording
1.5 CD ROMs.

UNIT II

Digital Audio Technologies

2.1 Sound Cards
2.2 Playback and Recording
2.3 MIDI – working with MIDI.

UNIT III

Multimedia texts

3.1 Coloring
3.2 Digital Imaging Fundamentals
3.3 Digital Image Development and Editing.

UNIT IV

Animation fundamentals

4.1 Animation Software tools
4.2 Animation Techniques
4.3 Digital video fundamentals
4.4 Digital video production techniques.

UNIT V

M/M Project Design Concepts

5.1 Authoring
5.2 Project Planning and Costing
5.3 Multimedia team.

TEXT BOOKS

1. Multimedia Magic – S.Gokul - BPB Publications, 2008.

RECOMMENDED BOOKS

2. Multimedia – Making it work – T. Vaughan – Osborne McGraw Hill - 2005.
3. Fundamentals of Multimedia – Drew – Pearson Education – 2006.
4. Multimedia Systems – Buford – Pearson Education – 2007.

SUGGESTED WEBSITES

1. https://nptel.ac.in/courses/117/105/117105083/
2. https://nptel.ac.in/courses/106/106/106106200/

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24DGEN17: Multimedia Applications lab							
Diploma Computer (Generative AI/Cyber Security) Semester – II							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0	2	1		**External Examination**	:	30
Effective from Session:				w.e.f. 2023-2024	**Total**	:	100
Date of BoS approval:				23.07.24			
Prerequisite							

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Understanding Multimedia tools.
- Applying knowledge of flash tools for the multimedia operations.
- Understanding action scripts for basic operations and event handling.
- Understanding animation techniques
- Apply tools and techniques for the image and video editing.

COURSE OUTCOMES

At the end of the course student will be able to

CO1: Identify capabilities of Multimedia

CO2: Apply to perform multimedia operations.

CO3: Develop animations

CO4: Understand audio, video, text editing

CO5: Apply latest tools to perform image editing operations.

PRACTICAL EXERCISES

1. Introduction to Multimedia tools
2. Performing Image Editing & Graphic Design Techniques
3. Performing Audio Editing Techniques
4. 2D Animation Principles & Techniques
5. Performing Video editing and special effects
6. 3D Animation Techniques
7. Practice Web Page Design & Development
8. Creating artwork to be used in video games
9. Visual Effects in Multimedia Design
10. Visual Design Elements and its methodologies

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SVSU CSE/2025/424 (d)

Core Courses Syllabus

of

DIPLOMA GENERATIVE AI/CYBER SECURITY

By

Skill Department of Computer Science & Engineering

Skill Faculty of Engineering & Technology

SVSU

w.e.f. Academic Session 2025-26

Shri Vishwakarma Skill University

Dudhola, Palwal-121102, Haryana

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It is certified that this Syllabus, developed and checked by us, is completed in all respects.

Dr. Monika Jangra

Skill Assistant Professor, Skill Dept. of CS/IT

Ms. Madhuri

Skill Instructor, Skill Dept. of CS/IT

Prof. Usha Batra

Chairperson, Skill Associate Professor,

Skill Department of CS/IT, SFET

Prof. Ashish Shrivastava

Dean, Skill Faculty of Engineering and Technology, SVSU

Prof. Suresh Kumar

Dean, Academic, SVSU

24DGEN18 Applied Prompt Engineering							
Diploma Computer (Generative AI/Cyber Security) **Semester – III**							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
3	0	0	3		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. Define key terms related to prompt engineering such as prompt, model, token, context length, etc
2. Explain how large language models (LLMs) interpret and respond to prompts.
3. Construct effective prompts for different tasks (text generation, summarization, translation, classification, etc.).
4. Compare different prompting techniques and evaluate their effectiveness.
5. Assess the quality of a prompt based on the relevance, coherence, and accuracy of model output.
6. Design custom prompt templates for specialized use cases or applications.

Course Learning Outcomes

At the end of the course, student will be able to

CO1: Select and apply advanced prompting techniques such as least-to-most, chain-of-thought, and ReAct based on task complexity.

CO2: Construct prompt chains and agent workflows for dynamic, multi-turn interactions.

CO3: integrate LLM tools using no-code platforms and APIs for automation and deployment.

CO4: Conduct systematic prompt evaluation by tuning model settings and applying self-critique methods.

CO5: Diagnose and resolve ethical issues in LLM responses, including biases, hallucinations, and prompt injection vulnerabilities.

Unit I: Advanced Prompt Techniques

Few-Shot & In-Context Learning,Deep-dive into performance factors and SG-ICL ,Hands-on: selecting effective examples.Chain-of-Thought Family,CoT, Thread-of-Thought, Contrastive CoT, Tabular CoT .Tree-of-Thought: guided multi-step reasoning .Problem Decomposition.Techniques like Least-to-Most, Plan-and-Solve, Program-of-Thoughts

Unit II: Self-Reflection & Evaluation.Self-Criticism and Refinement

Self-Evaluation, Self-Refine, Chain-of-Verification, System-2 prompting, Re-reading. Self-Consistency and Verification. Explore inconsistent outputs and ensemble self-consistency methods .

Unit III: Prompt Chaining & Agentic Chatbots.

Prompt Chaining Tools.Flowise AI: build complex chat flows.LangChain + Python/templating (Jinja2, f-strings).Building Agent WorkflowsReAct (Reasoning + Acting), PAL (Program-Aided Language), RAG setups. Real-world project: task-specific chatbot or information agent.

Unit IV: Ethics, Security, and Reliability.

Bias & Hallucination Mitigation.Identify biases and design defensive prompting.Prompt Injection & Adversarial Attacks.Understand prompt vulnerabilities and anti-jailbreak strategies.Reliability Engineering.Tuning sampling parameters (temperature, max_tokens), multi-turn context retention

Unit V: Integration & Deployment.

Embedding Retrieval with RAG.Synthetic data workflows and API-based retrieval .API & Tool Integration.Using OpenAI API or flow tools; developing simple Python agents.Testing & Evaluation.Prompt A/B tests, automation, quality metrics (accuracy, consistency).Capstone Project.Design and deploy a tool (e.g., chatbot, RAG system, evaluation bot) demonstrating full pipeline and ethical evaluation.

Textbooks

1. Nathan Hunter, Prompt Engineering Guide, Independently Published (2023)

Reference Books

1. Harrison Chase, LangChain Guide, O'Reilly Media (Early Release, 2024)
2. Jules White, Lin Zhong, Prompt Engineering for AI, Available on: Coursera / Open Access

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3. James Briggs, Mastering LangChain, Packt Publishing (2024)

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24DGEN19 Applied Prompt Engineering Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**	**2**	**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives

The course aims to inculcate following to skills to the students:

1.Introduces basics of prompt engineering for interacting with LLMs.

2.Explains key terms: prompt, model, token, and context length.

3.Teaches how LLMs interpret and respond to user inputs.

4.Guides in creating effective prompts for text generation, summarization, and classification.

5.Compares prompting methods: zero-shot, few-shot, and chain-of-thought.

List of Experiments:

1. Compare performance varying # and quality of examples on summarization or classification tasks. Measure accuracy gains.

2.Use logic/maths questions and compa

re CoT prompts to simple prompts—evaluate clarity and correctness boosts.

3.Create branching thought prompts with options; test decision flows in multi-step problem-solving. davenport.edu+2learnprompting.org+2coursera.org+2

4. Present two reasoning paths and ask model to pick the better—examining reasoning differences.

5. Break complex tasks (e.g. essay planning) into steps; compare output quality vs. single-step prompts. coursera.org+8learnprompting.org+8careercatalyst.asu.edu+8



6. Program-of-Thought Prompting: Simulate programming logic within prompt (e.g. stepwise algorithm) and evaluate model's adherence.

7. Self-Evaluation & Refinement: Have the model self-critique its answer and ask it to improve—itself before final submission.

8.Generate multiple answers, then prompt "Which is best?" to pick the most consistent response.

9. Use LLM to iterate on its own prompt to maximize performance—a meta-learning loop. coursera.org+15arxiv.org+15arxiv.org+15

10. Build a 3-stage pipeline: (a) summarize article, (b) extract topics, (c) generate quiz questions—evaluate overall quality.

Reference Study Material:

1.learnprompting.org/docs/intermediate/chain_of_thought

2.learnprompting.org/docs/intermediate/zero_shot_cot

3.learnprompting.org/docs/advanced/thought_generation/automatic_chain_of_thought

4.learnprompting.org/docs/advanced/thought_generation/contrastive_cot

5.learnprompting.org/docs/advanced/thought_generation/step_back_prompting

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24DGEN24: BASICS OF DATABASE MANAGEMENT							
Diploma Computer (Generative AI/Cyber Security) Semester – III							
L	T	P	Credits	Core Course	Internal Examination	:	70
3	0	0	3		External Examination	:	30
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. Define key database concepts, terminology, and architecture.
2. Identify types of data models and database languages.
3. Explain the advantages of DBMS over traditional file systems.
4. Describe the three-level DBMS architecture and data abstraction.

Course Learning Outcomes:

After undergoing the subject, the students will be able to:

CO1: understand the concept of Database system and Client Server Architecture

CO2: understand and develop the concepts of Data Modeling, Security and Integrity.

CO3: convert and compare the designs and differentiate between the keys

CO4: understand and execute different SQL queries and PL / SQL programs

CO5: convert database in the form of table

Unit 1:Database System Concept & Data Modeling

Basic concepts, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Data Independence. , Components of a DBMS and overall structure of a DBMS. ,Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence, , Client Server Architecture.

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Unit 2: Data Model

Define data model, Data Models : Network Model Hierarchical Model, E-R Model, Advantage & Disadvantages of each Data Model

Unit 3: ER Model

Entity sets and relationship sets- Attributes - Keys in entity and relationship sets : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key - Mapping constraints, Participation Constraint, E-R diagram, Notations. Strong Entity Set and Weak Entity Set 14. Relation Model (10 Periods) Advantages, Disadvantages,

Unit 4: Codd's 12 rules

Definition of Relations, Schema, Sub schema. Relational Model Constraints (Domain, Tuple Uniqueness, Key Constraints, Integrity Constraints, Entity constraints). Relations algebra (Basic operation: Union intersection difference and Cartesian product), Additional Relational Algebraic Operations (Projection, Selection rows, Division, rename and join) , Converting ER Model to Relational Model.

Unit 5: Relational Database Design

Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF , Forth Normal Form, Fifth Normal Form, 16. MYSQL/SQL (11 Periods) Data definition language, Data manipulation language, SQL, Object naming conventions, Object naming guidelines, Data types, Tables (Creating , Inserting,Updating and deleting tables and using constraints), Views, Indexes, SQL Command :- DESCRIBE, SELECT, WHERE CLAUSE, DISTINCT CLAUSE, ORDER BY,HAVING, LOGICAL OPERATIONS, SQL OPERATORS, JOIN.

TEXT BOOK

1. Database System Concepts - A. Silberschatz, S. Sudarshan& H. F. Korth

RECOMMENDED BOOKS

2. An Introduction to Database System - C. J. Date

3. Database Concepts and Systems - LvanBayroos/SPD

4. Fundamental of Database System - R. Elmashri& S. B. Navathee-books/etools/relevant

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24DGEN25: BASICS OF DATABASE MANAGEMENT LAB							
Diploma Computer (Generative AI/Cyber Security) Semester – III							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**		**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

This course aims to provide students with a foundational understanding of prompt engineering and

1. Its role in working with large language models (LLMs).
2. It covers key concepts such as prompts, tokens, and context length, and explains how LLMs interpret user input.
3. Students will learn to design effective prompts for various tasks, compare different prompting approaches, and assess model responses based on relevance, coherence, and accuracy to enhance the quality and reliability of AI-generated output.

List of Experiments:

1 Create a database and tables using SQL CREATE and ALTER commands

2 Insert records into a table using INSERT INTO

3 View all records using SELECT * FROM

4 Retrieve specific columns and rows using SELECT, WHERE

5 Use comparison and logical operators in WHERE clause

6 Sort data using ORDER BY (ascending and descending)

7 Use pattern matching with LIKE, IN, BETWEEN, IS NULL

8 Perform aggregate functions like COUNT(), SUM(), AVG(), MAX(), MIN()

9 Group data using GROUP BY and apply conditions using HAVING

10	Modify table data using UPDATE and delete records using DELETE
11	Use constraints like PRIMARY KEY, UNIQUE, NOT NULL, CHECK, DEFAULT
12	Implement table relationships using FOREIGN KEY and REFERENCES
13	Perform INNER JOIN, LEFT JOIN, RIGHT JOIN between two tables
14	Write subqueries using IN, ANY, ALL, EXISTS

Reference Study Material:

1. software to be used as recommended by AICTE/UPBTE/NITTTR.
2. Reference: http://swayam.gov.in http://spoken-tutorial.orgs

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24DGEN39 Introduction to Machine Learning							
Diploma Computer (Generative AI/Cyber Security) Semester – V							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To introduce the basic concepts and types of Machine Learning.

2.To understand supervised, unsupervised learning, and their algorithms.

3. To learn how to preprocess data and apply dimensionality reduction techniques.

4. To build and evaluate machine learning models using accuracy metrics.

5. To provide hands-on experience with real-world ML problems using tools.

Course Learning Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the principles and types of Machine Learning techniques.

CO2: Apply supervised and unsupervised learning algorithms to solve problems.

CO3: Preprocess datasets and apply dimensionality reduction methods.

CO4: Evaluate model performance using confusion matrix, precision, recall, and F1- score.

CO5: Implement basic ML models using tools like Python and scikit-learn.

UNIT – I: Introduction to Machine Learning

Machine Learning definition, history and importance, types of Machine Learning – supervised, unsupervised, and reinforcement learning, applications of Machine Learning, parametric vs. non-parametric models, difference between statistical modelling and machine learning, steps in developing a machine learning model,

bias-variance tradeoff, underfitting and overfitting, train-validation-test data split, cross-validation, grid search, machine learning losses, and when to stop tuning a model.

UNIT – II: Data Representation & Preprocessing

Definition of dataset, representation of data using row and column vectors, representing a dataset as a matrix, data preprocessing techniques, feature normalization, mean of data matrix, standardization, covariance of data matrix, dimensionality reduction using Principal Component Analysis (PCA).

UNIT – III: Supervised Learning Algorithms

Definition and working of supervised learning, types of supervised learning algorithms – k-Nearest Neighbours, Naïve Bayes Classifier, Decision Trees, Linear Regression, Logistic Regression, Support Vector Machines, basic applications of classification and regression.

UNIT – IV: Unsupervised Learning and Ensemble Methods

Unsupervised Learning introduction, clustering basics, K-means algorithm, ensemble learning introduction, boosting basics, bagging basics, random forests overview.

UNIT – V: Dimensionality Reduction and Model Evaluation

Dimensionality reduction techniques – PCA, LDA, ICA, SVD, model performance measurement – accuracy, confusion matrix, precision, recall, F1-score, ROC curve, AUC, median absolute deviation (MAD), error distribution.

Textbooks

1. Introduction to Machine Learning Author: Ethem Alpaydin Publisher: MIT Press
2. Machine Learning (Fundamentals and Applications) Author: Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das Publisher: Pearson Education

Reference Books

1. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Author: Aurélien Géron Publisher: O'Reilly MediaAmazon Web Services in Action
2.Pattern Recognition and Machine Learning Author: Christopher M. Bishop Publisher: Springe.

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24DGEN40: Introduction to Machine Learning Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – V							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**		**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:							
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

2. To introduce the basic concepts and types of Machine Learning.

2.To understand supervised, unsupervised learning, and their algorithms.

3. To learn how to preprocess data and apply dimensionality reduction techniques.

4. To build and evaluate machine learning models using accuracy metrics.

5. To provide hands-on experience with real-world ML problems using tools.

List of Practical

1. Write basic Python programs (variables, lists, loops, functions).
2. Load and explore a dataset using Pandas (head, tail, describe).
3. Perform data preprocessing: missing value handling, scaling, encoding.
4. Implement Linear Regression to predict values (e.g., marks vs. hours).
5. Apply K-Nearest Neighbors (KNN) for classification tasks.
6. Use Naïve Bayes algorithm for binary classification.
7. Train and visualize a Decision Tree Classifier.
8. Perform K-Means Clustering for unsupervised learning.
9. Apply Principal Component Analysis (PCA) for dimensionality reduction.
10. Evaluate model performance using accuracy, confusion matrix, precision, recall, and F1-score.

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Reference Study Material:

1. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Author: Aurélien Géron Publisher: O'Reilly MediaAmazon Web Services in Action

2.Pattern Recognition and Machine Learning Author: Christopher M. Bishop Publisher: Springe.

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24DGEN41 Cryptography and Network Security							
Diploma Computer (Generative AI/Cyber Security) Semester – V							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Learning Objectives:

This course will provide students with a practical and theoretical knowledge of cryptography and network security.

1. Understand the fundamental principles of access control models and techniques, authentication and secure system design.
2. Have a strong understanding of different cryptographic protocols and techniques and be able to use them.
3. Apply methods for authentication, access control, intrusion detection and prevention.
4. Identify and mitigate software security vulnerabilities in existing systems

Course Learning Outcomes:
The student who successfully completes this course will be able to:

CO1: Analyze and design classical encryption techniques and block ciphers.

CO2: Understand and analyze data encryption standard.

CO3: Understand and analyze public-key cryptography, RSA and other public-key cryptosystems such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc.

CO4: Understand key management and distribution schemes and design User Authentication Protocols.

CO5: Analyze and design hash and MAC algorithms, and digital signatures.

UNIT – I: Introduction to Security and Classical Encryption
Introduction to computer and network security, security threats and trends, basics of security services – confidentiality, integrity, authentication, types of attacks (active and passive), OSI Security architecture, basic model of network security, Classical encryption techniques – substitution ciphers, transposition ciphers, symmetric key concepts, steganography basics.

UNIT – II: Block Ciphers and Symmetric Key Cryptography

Introduction to block cipher concepts, basic structure and design principles, working of Data Encryption Standard (DES), introduction to AES and its features, Triple DES, multiple encryption techniques, block cipher modes – ECB, CBC, CFB, OFB, stream ciphers – basic concepts, introduction to RC4, Basics of number theory – prime numbers, modular arithmetic, Fermat's and Euler's theorem (only concept level), Chinese Remainder Theorem (concept only).

UNIT – III: Public Key Cryptography and Authentication

Basics of public key cryptography, concept of key pairs, Diffie-Hellman key exchange (idea only), RSA algorithm working, Elliptic curve cryptography – simple overview, Message authentication – MAC, hash functions, SHA (Secure Hash Algorithm), HMAC, CMAC – only applications and purpose, Digital signatures – purpose, working principle, digital signature standard, simple authentication protocols.

UNIT – IV: Authentication and Network Security Applications

Kerberos – concept and working, X.509 certificates and Authentication services – introduction, Public Key Infrastructure (PKI) – concept and components, Email security – basics of PGP (Pretty Good Privacy) and S/MIME, IP Security – overview of IPsec, authentication header, security payload basics, concept of key management in IPsec.

UNIT – V: Web Security and Firewalls

Web security requirements – confidentiality, integrity, authentication, Overview of Secure Socket Layer (SSL) and Transport Layer Security (TLS), Introduction to Secure Electronic Transaction (SET), Types of threats – intruders, malware, viruses, worms, trojans, Firewalls – concept, types, design principles, introduction to trusted systems.

TEXT BOOKS:

1. William Stallings (2006), Cryptography and Network Security: Principles and Practice, 4th edition, Pearson Education, India.
2. William Stallings (2000), Network Security Essentials (Applications and Standards), Pearson Education, India.

Manika Mathur

REFERENCE BOOKS:

1. Charlie Kaufman (2002), Network Security: Private Communication in a Public World, 2nd edition, Prentice Hall of India, New Delhi.

2. Atul Kahate (2008), Cryptography and Network Security, 2nd edition, Tata Mc Grawhill, India.

3. Robert Bragg, Mark Rhodes (2004), Network Security: The complete reference, Tata Mc Grawhill, India.

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24DGEN57 : AI Fundamentals							
Diploma Computer (Generative AI/Cyber Security) Semester – VI							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-05-2025			
Prerequisite							

Course objectives:

The course inculcuate following skills among students:

1. To introduce the basic concepts, history, and goals of Artificial Intelligence.
2. To familiarize students with various AI problem-solving approaches and techniques.
3. To understand foundational algorithms like search, knowledge representation, and reasoning.
4. To provide insight into machine learning, natural language processing, and AI applications.
5. To develop the ability to design simple AI-based solutions using Python and AI libraries.

Course outcome:

By the end of this course, you should be able to:

CO1: Create AI solutions for various business problems.

CO2: Build and deploy production grade AI applications.

CO3: Apply methods, techniques and tools immediately.

CO4: Gain experience of doing independent study and research.

CO5: Design AI based solution.

Unit 1: INTRODUCTION

AI - Problems and Search: Introduction: The Artificial Intelligence (AI) Problem – What is an AI technique - Criteria for success. Problems, Problem Spaces, Search: Defining Problems, Problem Spaces, Search State space search.

Unit 2: SEARCH TECHNIQUES

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First search – Problem

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reduction – constraint satisfaction - Means-end analysis.

Unit 3: KNOWLEDGE REPRESENTATION

AI - Knowledge Representation: Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

Unit 4: PREDICATE LOGIC

Using Predicate logic: Representing simple facts in logic – Representing Instance and ISA relationships - Computable functions and predicates -Resolution. Representing knowledge using rules: Procedural Vs Declarative knowledge –Logic programming - Forward Vs Backward reasoning - Matching – Control knowledge.

Unit 5: AI LEARNING TECHNIQUES

AI –Learning: What is learning – Rote learning - Learning by taking advice – learning in problem solving.Learning from examples: Induction - Explanation-based learning – discovery – analogy – formal learning theory – Neural Net Learning and Genetic Learning.

TEXT BOOKS:

1. Dan W. Patterson, "Introduction to AI and ES", Pearson Education.
2. Dheeraj Mehrotra (2019), Basics of Artificial Intelligence & Machine L earning, Notion Press.
3. Elaine Rich and Kevin Knight (1991)," Artificial Intelligence", Second Edition, Tata McGraw Hill, Publishers company Pvt Ltd.

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24DGEN57 AI Fundamentals Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – VI							
L	T	P	Credits	Core Course	Internal Examination	:	30
0	0		1		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course objectives:

The course aims to inculcate following skills among students:

1. To introduce the basic concepts, history, and goals of Artificial Intelligence.
2. To familiarize students with various AI problem-solving approaches and techniques.
3. To understand foundational algorithms like search, knowledge representation, and reasoning.
4. To provide insight into machine learning, natural language processing, and AI applications.
5. To develop the ability to design simple AI-based solutions using Python and AI libraries.

Course outcome:

By the end of this course, student will be able to:

CO1: Create AI solutions for various business problems.

CO2: Build and deploy production grade AI applications.

CO3: Apply methods, techniques and tools immediately.

CO4: To gain experience of doing independent study and research.

List of Practical –

1. Explore and demonstrate the use of basic Python libraries used in AI and ML (NumPy, Pandas, Matplotlib, Scikit-learn).
2. Develop a program to perform Breadth First Search (BFS) algorithm.
3. Develop a program to perform Depth First Search (DFS) algorithm.
4. Design a solution using A* Search algorithm.
5. Design a solution using AO* (And-Or) Search algorithm.
6. Construct a program to apply the Hill Climbing algorithm.
7. Develop a solution using Minimax and Alpha-Beta Pruning algorithms.
8. Create a basic chatbot application using Python.
9. Solve the N-Queens problem using backtracking technique in Python.
10. Solve the Missionaries and Cannibals problem using logic-based programming in Python.

REFERENCE STUDY MATERIAL:

1. Kevin Night, Elaine Rich, Nair B.(2008), "*Artificial Intelligence (SIE)*", McGraw Hill.
2. Stuart Russel, Peter Norvig (2007), "*AI – A Modern Approach*", 2nd Edition, Pearson Education.
3. Venugopal C.K(2019), *Artificial Intelligence and Machine Learning*, Pacific Books International.

24DGEN42: Cryptography and Network Security Lab							
Diploma Computer (Generative AI/Cyber Security) Semester – V							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	0		1		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

This course will provide students with a practical and theoretical knowledge of cryptography and network security.

1. Understand the fundamental principles of access control models and techniques, authentication and secure system design.
2. Have a strong understanding of different cryptographic protocols and techniques and be able to use them.
3. Apply methods for authentication, access control, intrusion detection and prevention.
4. Identify and mitigate software security vulnerabilities in existing systems

List of Practical –

1. Implement Caesar Cipher.
2. Implement Affine Cipher using the equation C = (3x + 12) mod 26.
3. Implement Playfair Cipher using key "LDRP"
4. Implement Polyalphabetic Cipher (Vigenère Cipher).
5. Implement AutoKey Cipher.
6. Implement Hill Cipher using any matrix and manually find its inverse.
7. Implement Rail Fence Cipher technique.
8. Implement Simple Columnar Transposition Cipher.
9. Implement RSA Algorithm using small prime numbers.
10. Implement Euclidean and Extended Euclidean Algorithm.

REFERENCES STUDY MATERIAL:

http://www.nptel.iitm.ac.in/courses/106105031/

Monika
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SVSU/CSET/2025/424 (E)

Elective course Syllabus

of

DIPLOMA GENERATIVE AI/CYBER SECURITY

By

Skill Department of Computer Science & Engineering

Skill Faculty of Engineering & Technology

SVSU

w.e.f. Academic Session 2025-26

Shri Vishwakarma Skill University

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Monika Madhuri

It is certified that this Syllabus, developed and checked by us, is completed in all respects.

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Dean, Skill Faculty of Engineering and Technology, SVSU

Prof. Suresh Kumar

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Program Elective I: Introduction to Data Science (25DGEN01)							
Diploma Computer (Generative AI/Cyber Security)							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
3	**0**	**0**	**3**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives

The course aims to inculcate the following skills to students:

1. Define key concepts in data science including data types, variables, statistics, and distributions.
2. Explain the data science process from data collection to visualization and decision-making.
3. Apply basic data wrangling, cleaning, and exploration techniques using Python or spreadsheet tools.
4. Use introductory statistics and visualization methods to analyze and interpret data.
5. Implement simple machine learning models and evaluate their performance.

Course Learning Outcomes

At the end of the course, students will be able to:

CO1: Identify and describe the role of data in real-world decision making and analytics.
CO2: Apply Python and libraries like Pandas, NumPy, and Matplotlib for basic data analysis.
CO3: Clean and pre-process data using filtering, transformation, and handling missing values.
CO4: Perform exploratory data analysis using descriptive statistics and visualization tools.
CO5: Build basic supervised learning models such as linear regression and decision trees.

Detailed Syllabus

Unit I: Introduction to Data Science and Data Types

What is Data Science?, Applications in industry, Types of data: structured, unstructured, semi-structured, Variables: categorical, numerical, Data life cycle, Roles in data science: analyst, scientist, engineer

Unit II: Data Collection and Preprocessing

Sources of data: files, web, sensors, APIs, surveys, open datasets, Importing data from CSV

and Excel files into spreadsheets for analysis, Handling missing values, duplicates, outliers using spreadsheet functions and filters, Data type conversion, Encoding categorical data using lookup tables or numeric labels, Basic cleaning techniques in Excel or Google Sheets: sorting, filtering, find and replace, text-to-columns, conditional formatting, data validation

Unit III: Exploratory Data Analysis (EDA) and Visualization

Summary statistics: mean, median, mode, standard deviation, Frequency distribution, Histograms, Boxplots, Correlation, Scatter plots, Visualization tools: Matplotlib, Seaborn (basic), Excel Charts

Unit IV: Introduction to Machine Learning (Conceptual)

Overview of AI, ML, and Data Science pipeline, Supervised Learning, Unsupervised Learning, Train-test split, Model evaluation metrics

Unit V: Ethics and Responsibility in Data Science

Importance of data privacy and confidentiality, Understanding bias in datasets and analysis, Fairness, Representation, Transparency in reporting, Ethical dilemmas in data use: consent, manipulation, plagiarism, Accountability, Social impact of data-driven decisions

Textbooks

1. Joel Grus, Data Science from Scratch: First Principles with Python,O'Reilly Media, 2023 Edition

Reference Books

1. Jake VanderPlas, O'Reilly Media, Python Data Science Handbook Covers: Numpy, Pandas, Matplotlib, Scikit-learn, real data workflows
2. Aurélien Géron, O'Reilly Media (2023), Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow

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Program Elective I: Introduction to Data Science Lab (25DGEN02)							
1. Diploma Computer (Generative AI/Cyber Security)							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**	**2**	**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives

The course aims to inculcate the following skills to students:

1. Introduce students to the fundamentals of data handling.
2. to analyze data using spreadsheet tools like MS Excel or Google Sheets.
3. Provide hands-on experience with real and simulated datasets.
4. Help students learn how to: Organize data, Analyze data, Visualize data
5. Draw meaningful insights from data
6. Develop skills for data-driven decision-making.

List of Experiments:

1. Introduction to data types using sample datasets: classify numeric, categorical, date, and text data

2 Enter and organize tabular data in Excel: rows, columns, headers, formatting

3 Perform basic statistical operations: mean, median, mode, min, max using Excel functions

4 Identify and handle missing values and errors using Excel formulas (IF, ISBLANK, CLEAN)

5 Filter, sort, and apply conditional formatting to highlight specific data patterns

6 Create bar charts and column charts to compare categorical data (e.g., sales, gender, city)

7 Create pie charts and doughnut charts to visualize percentage distribution

8 Create line graphs to show trends over time (e.g., monthly temperature or sales)

9 Use pivot tables in Excel to summarize large datasets and calculate grouped totals

10 Explore correlation using scatter plots and trendlines (e.g., height vs weight)

11 Work with real-world data (e.g., COVID cases, weather, student scores) and generate visual insights

12 Perform basic probability calculations using frequency tables (Excel COUNTIF, percentage formula)

13 Introduction to classification using decision tree templates or flowcharts (paper-based or Excel)

14 Create an interactive dashboard using charts, slicers, and pivot tables in Excel or Google Sheets

15 Mini Project: Clean and analyze a public dataset (e.g., student marks, sports data), create summary charts and present insights in a report or slide deck

Recommended Study Material:

1. Data Science for Engineers: https://nptel.ac.in/courses/106/106/106106179/
2. Excel for Beginners: https://nptel.ac.in/courses/110/105/110105141/
3. CBSE Skill Course: IT 402 & AI 417 curriculum PDFs
4. https://cbseacademic.nic.in/skill-education.html.

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Program Elective I: Mathematical Foundations of AI (25DGEN03)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	70
3	0	0	3		External Examination	:	30
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives

The course aims to inculcate the following skills to students:

1. Build essential mathematical skills required for understanding AI concepts.
2. Introduce students to logical thinking through practical problems.
3. Develop data handling skills using real-life data and simple tools.
4. Strengthen understanding of basic algebra for computational thinking.
5. Promote pattern recognition skills through visual and number-based activities.
6. Use real-life examples and hands-on activities to make learning engaging and practical.

Course Learning Outcomes

After completing this course, students will be able to:

CO1: Understand and apply basic logic and set operations used in AI decision-making.
CO2: Solve simple linear equations and perform matrix operations.
CO3: Analyze data using averages, graphs, and basic statistics.
CO4: Identify mathematical patterns and sequences relevant to AI models.
CO5: Relate basic math tools to real-world AI applications like classification, prediction, and decision-making.

Detailed Syllabus

Unit I: Introduction to AI and Mathematical Basics

Meaning and applications of AI in everyday life (e.g., mobile assistants, smart homes), importance of mathematics in AI, basic revision of numbers, operations (addition, subtraction, multiplication, division), introduction to variables and simple expressions.

Unit II: Logic and Set Theory

Statements and truth values, basic logic operations (AND, OR, NOT), truth tables, real-life decision-making using logic, introduction to sets, types of sets, Venn diagrams, union, intersection, complement, and simple applications in classification problems.

Unit III: Algebra, Linear Equations, and Graphs

Review of algebraic expressions, solving simple linear equations in one or two variables, coordinate plane, plotting points, drawing lines, understanding slope, interpreting simple graphs for trend analysis.

Unit IV: Matrices, Vectors, and Functions

Concept of matrices (rows and columns), matrix addition and multiplication (limited to 2×2), concept of vectors with direction and magnitude, introduction to functions and simple input-output tables, real-life examples (image data as matrices, movement as vectors).

Unit V: Data Handling, Statistics, and Patterns in AI

Organizing data in tables, calculating mean, median, mode, and range, using bar graphs, pie charts, and line graphs for visualization, basic probability (events, outcomes), number sequences and pattern recognition, application of patterns in AI (e.g., face recognition, language prediction), mini project using real or collected data.

Textbooks

1. Deepak Khemani, Mathematical Foundations of Artificial Intelligence, McGraw Hill Education, 2023 Edition

Reference Books

1. Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science, PHI Learning
2. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley India
3. Shai Shalev-Shwartz & Shai Ben-David, Understanding Machine Learning: From Theory to Algorithms, Cambridge University Press

Monika Madhuri

Program Elective I: Mathematical foundations of AI Lab (25DGEN04)							
Diploma Computer (Generative AI/Cyber Security)							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**	**2**	**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives

The course aims to inculcate the following skills to students:

1. Equip students with essential mathematical and logical reasoning skills.
2. Enable the use of spreadsheet tools like Excel for data handling and analysis.
3. Build a strong foundational understanding of concepts used in Artificial Intelligence.
4. Teach students how to organize and interpret data effectively.
5. Introduce students to basic algebra for AI-related problem-solving.
6. Develop understanding of statistics such as mean, median, mode, and range.

List of Experiments

1. Create a table in Excel listing AI applications and categorize them by domain (e.g., education, health, agriculture)

2 Use Excel to build truth tables for logical operators (AND, OR, NOT) with real-life conditions (e.g., exam passed, attendance)

3 Create and visualize set operations using Venn diagram-style charts in PowerPoint or Excel shapes

4 Input student data (e.g., names, marks) into Excel and calculate mean, median, mode, and range using formulas

5 Create bar graphs and pie charts in Excel using survey or collected data (e.g., favorite food, mobile brand)

6 Create a line graph showing daily temperatures or student performance over time

7 Solve simple linear equations (e.g., $y = 2x + 3$) using Excel formulas and generate corresponding values

8 Plot linear equations by generating x-y values and using scatter plots with trendlines

9 Create an input-output table in Excel to demonstrate functions and identify number patterns

10 Perform matrix addition and multiplication in Excel using basic cell references and formulas

11 Create a simple dataset of coordinates and use Excel to represent vectors with arrow charts (or simulate direction using cells)

12 Simulate probability experiments (e.g., rolling a die 50 times) using RANDBETWEEN() function and plot results

13 Use conditional formatting to visually highlight students who scored above/below a certain mark

14 Create a simple decision model using IF() function in Excel to classify results (e.g., pass/fail, low/medium/high)

Recommended Study Material:

1. https://nptel.ac.in/courses/106/106/106106213/
2. https://nptel.ac.in/courses/111/105/111105174/
3. https://nptel.ac.in/courses/111/106/111106136/
4. https://cbseacademic.nic.in/skill-education.html
5. https://www.khanacademy.org/math

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Program Elective II Risk Analysis and Management(25DGEN05)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To understand the fundamental concepts of risk, uncertainty, and their impact on decision-making.
2. To identify, assess, and prioritize various types of risks in business and technical environments.
3. To apply quantitative and qualitative risk analysis techniques effectively.
4. To develop strategies for risk mitigation, transfer, acceptance, and avoidance.
5. To build skills for implementing and monitoring risk management plans within organizations.

Course Learning Outcomes:

At the end of the course, student will be able to:

CO1: Identify and classify different types of risks in projects and organizations.

CO2: Analyze the impact of risks using qualitative and quantitative techniques.

CO3: Apply risk assessment tools to evaluate potential threats and vulnerabilities.

CO4: Develop effective risk mitigation and response strategies.

CO5: Monitor, review, and update risk management plans for continuous improvement.

Unit 1: Introduction to Risk

Concept of risk, difference between risk and uncertainty, examples of everyday risks (accidents, online threats, exam-related stress), importance of risk analysis and management, making safer and smarter decisions

Unit 2: Types of Risks

Natural risks (floods, earthquakes), human-made risks (cyberbullying, fire, theft), personal risks (health issues, financial problems), social risks (peer pressure, online reputation damage), observing and categorizing risks

Unit 3: Identifying and Assessing Risk

Identifying potential risks, assessing impact of risks, basic risk assessment questions ("What could go wrong?", "How likely is it?", "What can be done?"), introduction to risk matrix (low, medium, high), practice with real-life examples

Unit 4: Risk Prevention and Mitigation

Avoiding and reducing risks, planning and safe behavior, road safety, fire safety, online safety, importance of precautions (secure passwords, first aid kit), tools for managing risk (insurance, savings)

Unit 5: Risk Management in Daily Life

Applying risk management in daily situations, responsible decision-making, school event planning, safe internet use, group activity to create risk management plan, recap and quiz on key concepts

Textbooks

1. Introduction to Machine Learning, Ethem Alpaydin, MIT Press
2. Machine Learning (Fundamentals and Applications), Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, Pearson Education

Reference Books

1. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Aurélien Géron O'Reilly Media
2. Pattern Recognition and Machine Learning, Christopher M. Bishop,Springer

Monika Madhuri

Program Elective II: Risk Analysis and Management(25DGEN06)							
Diploma Computer (Generative AI/Cyber Security)							
L	**T**	**P**	**Credits**	**Core Course**	**Internal Examination**	:	70
0	**0**		**1**		**External Examination**	:	30
Effective from Session:				w.e.f. 2025-2026	**Total**	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To understand the fundamental concepts of risk, uncertainty, and their impact on decision-making.
2. To identify, assess, and prioritize various types of risks in business and technical environments.
3. To apply quantitative and qualitative risk analysis techniques effectively.
4. To develop strategies for risk mitigation, transfer, acceptance, and avoidance.
5. To build skills for implementing and monitoring risk management plans within organizations.

Course Learning Outcomes:

At the end of the course, student will be able to:

CO1: Identify and classify different types of risks in projects and organizations.

CO2: Analyze the impact of risks using qualitative and quantitative techniques.

CO3: Apply risk assessment tools to evaluate potential threats and vulnerabilities.

CO4: Develop effective risk mitigation and response strategies.

CO5: Monitor, review, and update risk management plans for continuous improvement.

List of Experiment

1. Identify 5 Everyday Risks: Make a list of five risks you face daily (e.g., forgetting homework, slipping on wet floors, etc.) and suggest ways to manage each.
2. Create a Risk Matrix: Choose a school activity (like a sports day or picnic) and list possible risks. Classify them as Low, Medium, or High using a simple risk matrix.
3. Risk Survey in School: Conduct a short survey among classmates or teachers about common risks in school and how they are handled.
4. Online Safety Checklist: Create a checklist for staying safe online (strong passwords, not sharing personal info, avoiding suspicious links, etc.).
5. Fire Safety Drill Observation: Participate in or observe a school fire drill and note down safety measures and risk management techniques.
6. Emergency Kit Project: Prepare a small emergency kit for your home or classroom. List all items and explain how each item helps reduce risk.
7. Role Play Activity: Perform a role-play on managing a risky situation (e.g., someone gets hurt during a school event) and how to respond calmly and safely.
8. Poster-Making on Risk Types: Design a colorful poster showing different types of risks (natural, personal, cyber, social) with examples.
9. Report Writing on Real Incident: Write a short report about a real-life incident (e.g., a natural disaster or online scam) and how better risk management could have helped.

10. Group Activity – Risk Plan: In groups, choose a school event and create a basic risk management plan including potential problems and safety measures.

Textbooks

1. Ethem Alpaydin, Introduction to Machine Learning, MIT Press
2. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, Machine Learning (Fundamentals and Applications), Pearson Education

Reference Books

1. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly Media
2. Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer

Monika Medhwi

Program Elective II CLOUD COMPUTING (25DGEN07)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	70
3	0	0	3		External Examination	:	30
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To introduce the core concepts, models, and services of cloud computing.
2. To familiarize students with virtualization and resource management in the cloud.
3. To explore cloud service providers and platforms such as AWS, Azure, and Google Cloud.
4. To understand the challenges related to cloud security, privacy, and compliance.
5. To develop skills for designing and deploying applications on cloud infrastructure.

Course Learning Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the fundamental concepts and architecture of cloud computing.

CO2: Analyze various cloud service models (IaaS, PaaS, SaaS) and deployment models (Public, Private, Hybrid).

CO3: Apply virtualization techniques in cloud environments.

CO4: Identify and address security and privacy issues in cloud computing.

CO5: Deploy and manage applications using popular cloud platforms.

Unit 1: Introduction to Cloud Computing

Definition, features, benefits of Cloud Computing, Difference between traditional and cloud computing, Cloud Deployment Models: Public, Private, Hybrid, Community, Service Models: IaaS, PaaS, SaaS

Unit 2: Virtualization

Basics, significance of virtualization, Types of Hypervisors: Type-1, Type-2, Introduction to Virtual Machines (VMs), Containers (Docker), Resource management, scalability

Monika Mathur

Unit 3: Cloud Service Providers

Overview of cloud providers: AWS, Microsoft Azure, Google Cloud, AWS Services: EC2, S3, RDS, Azure Services: Virtual Machines, Blob Storage, GCP Services: Compute Engine, Cloud Storage, Open-source platforms: Overview of OpenStack

Unit 4: Cloud Storage and Security

Types of cloud storage: Block, File, Object, Data redundancy, backup, disaster recovery, Cloud security concepts: IAM, authentication, firewalls, Encryption, VPNs, secure access control

Unit 5: Emerging Trends and Use Cases

Serverless computing, Function-as-a-Service (FaaS), DevOps tools, CI/CD pipelines, Real-world applications of cloud in healthcare, education, governance, Cloud monitoring, SLAs, cost optimization

Textbooks

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, Mastering Cloud Computing: Foundations and Applications Programming, McGraw Hill Education
2. Kailash Jayaswal, Cloud Computing, Oxford University Press

Recommended Book

1. Gautam Shroff, Enterprise Cloud Computing: Technology, Architecture, Applications, Cambridge University Press

Mamika Madhuri

Program Elective II: CLOUD COMPUTING LAB (25DGEN08)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	70
0	0		1		External Examination	:	30
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

2. To introduce the core concepts, models, and services of cloud computing.
3. To familiarize students with virtualization and resource management in the cloud.
4. To understand the challenges related to cloud security, privacy, and compliance.
5. To develop skills for designing and deploying applications on cloud infrastructure.

Course Learning Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the fundamental concepts and architecture of cloud computing.

CO2: Analyze various cloud service models (IaaS, PaaS, SaaS) and deployment models (Public, Private, Hybrid).

CO3: Apply virtualization techniques in cloud environments.

CO4: Identify and address security and privacy issues in cloud computing.

CO5: Deploy and manage applications using popular cloud platforms.

Practical List

1. Install VirtualBox/VMware and set up a Linux/Windows virtual machine
2. Set up a private cloud using OpenStack or simulate cloud using CloudSim
3. Launch and manage an EC2 instance on AWS with proper security configuration
4. Create and manage an Amazon S3 bucket to upload and access files
5. Host a static website on a cloud virtual machine
6. Implement IAM (Identity and Access Management) roles in AWS
7. Containerize a web application using Docker
8. Deploy a basic serverless function using AWS Lambda
9. Monitor cloud service usage and estimate cost using AWS billing tools
10. Mini Project: Deploy a 2-tier or 3-tier application (frontend + backend) on cloud

Reference Study Materials

1. Rajkumar Buyya, Rodrigo N. Calheiros, Amir Vahid Dastjerdi Publisher: McGraw-Hill

2. Amazon Web Services in Action Author: Michael Wittig, Andreas Wittig Publisher: Manning Publications

Program Elective III: Cyber Law and Cyber Policy (25DGEN09)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:				14-07-2025			
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To provide a foundational understanding of cyber laws governing the digital space, including national and international legal frameworks.
2. To familiarize students with key legislations such as the Information Technology (IT) Act, 2000 and amendments related to cybercrimes, digital signatures, and electronic governance.
3. To analyze various types of cybercrimes like hacking, identity theft, phishing, cyber terrorism, and data breaches, along with legal remedies and penalties.
4. To explore the role of policy-making bodies in shaping cyber policy and understanding their influence on privacy, data protection, surveillance, and internet governance. •

Course Learning Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the fundamental concepts of cyber laws and their applications in the digital world.

CO2: Analyze various types of cybercrimes and related legal frameworks under the IT Act, 2000.

CO3: Apply knowledge of cyber ethics and security policies in real-world scenarios.

CO4: Evaluate national and international cyber policies and data protection regulations.

CO5: Draft legal documents and complaints related to cyber offences professionally.

Unit 1: Introduction to the Cyber World

Basics of the internet, computer networks, digital world, cyber law, importance of cyber law, role of cyber law in online safety

Unit 2: What is Cyber Crime

Common cyber crimes, hacking social media accounts, misusing photos, sending threats online, cheating through fake websites, staying safe online, how to report cyber crimes

Unit 3: IT Act 2000 and Legal Protection

Information Technology Act 2000, Section 66 (hacking), Section 67 (obscene content), Section 72 (privacy violation), legal protection against cyber crimes

Unit 4: Safe Use of Internet and Policies

Safe and responsible internet use, strong passwords, avoiding fake links, protecting devices, introduction to government cyber policies

Unit 5: Online Rights and Responsibilities

Right to privacy, not spreading fake news, avoiding online bullying, honesty in digital behavior, good conduct in the cyber world

Textbooks

1. Pavan Duggal, Cyber Law and Ethics, Universal Law Publishing
2. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co.
3. Saurabh Sharma, Information Technology and Cyber Law, Vikas Publishing House

Recommended Books

1. Alfred Basta, Nadine Basta, S.C. Sharma (Indian Adaptation), Cyber Security and Cyber Laws, Cengage Learning
2. Rohas Nagpal, Cyber Law: Simplified for Students, Asian School of Cyber Laws
3. Prof. Farooq Ahmad, Cyber Crime and Law in India, Pioneer Books

Monika. Mathur

Program Elective III: Cyber Law and Cyber Policy Lab (25DGEN10)							
Diploma Computer (Generative AI/Cyber Security)							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0		3		External Examination	:	70
Effective from Session:				w.e.f. 2025-2026	Total	:	100
Date of BoS approval:			14-07-2025				
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

1. To provide a foundational understanding of cyber laws governing the digital space, including national and international legal frameworks.
2. To familiarize students with key legislations such as the Information Technology (IT) Act, 2000 and amendments related to cybercrimes, digital signatures, and electronic governance.
3. To analyze various types of cybercrimes like hacking, identity theft, phishing, cyber terrorism, and data breaches, along with legal remedies and penalties.
4. To explore the role of policy-making bodies in shaping cyber policy and understanding their influence on privacy, data protection, surveillance, and internet governance.

Course Learning Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the fundamental concepts of cyber laws and their applications in the digital world.

CO2: Analyze various types of cybercrimes and related legal frameworks under the IT Act, 2000.

CO3: Apply knowledge of cyber ethics and security policies in real-world scenarios.

CO4: Evaluate national and international cyber policies and data protection regulations.

CO5: Draft legal documents and complaints related to cyber offences professionally.

List of Experiment:

1. Identify the type of cyber crime from real-life scenarios.
2. Check and compare fake vs real websites.
3. Spot fake or phishing links from a given list.
4. Create and test strong passwords.
5. Make a poster on IT Act sections (66, 67, 72).
6. Sort online actions into right and wrong behavior.
7. Fill a sample cyber complaint form.

8. Write and take a cyber safety pledge.
9. Perform a role-play of good vs bad digital behavior.
10. Participate in a quiz on cyber safety and laws.

Recommended Study Material:

1. https://legislative.gov.in/actsofparliamentfromtheyear/information-technology-act-2000
2. https://www.meity.gov.in/content/cyber-laws
3. https://www.india.gov.in/spotlight/cyber-safety-and-cyber-security-tips
4. https://www.cert-in.org.in/
5. https://ncpcr.gov.in/showfile.php?lang=1&level=2&sublinkid=1970&lid=2046
6. https://cbseacademic.nic.in/skill-education.html

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