

GENERIC VALUE-ADDED COURSE: DATA SCIENCE AND STATISTICS WITH PYTHON

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								Internal	External	Total
GVAC2501	1	1	-	-	1	2	30	25	75	100

Pre-requisite:

Students should have basic knowledge of computers and programming concepts.

Learning Objectives

1. To introduce students to fundamental statistical concepts used in Data Science.
2. To provide hands-on experience in Python for data analysis and visualization.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	understand basic data science concepts and Python programming.	K1,K2
2.	apply statistical techniques for data analysis using Python.	K3
3.	work with NumPy, Pandas, and Matplotlib for data manipulation and visualization.	K3
4.	implement descriptive and inferential statistics in Python.	K1
5.	understand and apply machine learning basics for predictive analysis.	K1 & K3

K1 - Remember; K2 - Understand; K3 – Apply

Units	Contents	No. of Hours
I	Introduction to Data Science and Python Overview of Data Science – Applications and Importance – Introduction to Python – Setting up Python Environment – Jupyter Notebook – Basic Python Syntax – Variables, Data Types, Operators – Python Libraries for Data Science (NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn).	6
II	Data Handling with Python Introduction to NumPy – Creating Arrays – Indexing and Slicing – Introduction to Pandas – Series and DataFrames – Reading and Writing Data (CSV, Excel) – Data Cleaning and Preprocessing – Handling Missing Data – Data Transformation.	6
III	Descriptive and Inferential Statistics Measures of Central Tendency (Mean, Median, Mode) – Measures of Dispersion (Variance, Standard Deviation) – Probability Distributions – Hypothesis Testing – Correlation and Regression Analysis.	6
IV	Data Visualization with Python	6

	Introduction to Matplotlib and Seaborn – Line Plots, Bar Charts, Scatter Plots – Histograms and Density Plots – Box Plots and Violin Plots – Heatmaps – Data Visualization Best Practices.	
V	Introduction to Machine Learning Basics Introduction to Supervised and Unsupervised Learning – Linear Regression and Logistic Regression – Decision Trees and Random Forests – Clustering Techniques (K-Means, Hierarchical Clustering) – Model Evaluation and Validation.	6

Text Book

Yadav, A. (2020). *Data Science with Python* (1st Edition). BPB Publications.

Reference Books

1. Wes McKinney. (2018). *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython* (2nd Edition). O'Reilly Media.
2. Joel Grus. (2019). *Data Science from Scratch: First Principles with Python* (2nd Edition). O'Reilly Media.
3. Jake VanderPlas. (2016). *Python Data Science Handbook* (1st Edition). O'Reilly Media.
4. Sebastian Raschka and Vahid Mirjalili. (2019). *Python Machine Learning* (3rd Edition). Packt Publishing.
5. Allen B. Downey. (2014). *Think Stats: Exploratory Data Analysis in Python* (2nd Edition). O'Reilly Media.

Web Resources:

1. <https://www.geeksforgeeks.org/python-for-data-science/>
2. https://nustat.github.io/DataScience_Intro_python/Introduction%20to%20Python%20and%20Jupyter%20Notebooks.html
3. <https://www.geeksforgeeks.org/introduction-to-python/>
4. <https://www.geeksforgeeks.org/python-programming-language-tutorial/>
5. <https://www.dataquest.io/tutorial/introduction-to-python-programming/>

**GENERIC VALUE-ADDED COURSE: BASIC PYTHON WITH APP DEVELOPMENT
USING TKINTER**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								Internal	External	Total
GVAC2502	1	1	-	-	1	2	30	25	75	100

Pre-requisite:

Students should have basic knowledge of computers. No prior programming experience required.

Learning Objectives

1. To introduce students to Python programming fundamentals.
2. To provide hands-on experience in writing Python scripts and applications.
- 3.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	understand the basics of Python programming.	K1, K2
2.	write and execute Python scripts for problem-solving.	K3
3.	work with control structures, functions, and file handling in Python.	K3
4.	use Tkinter to create basic graphical user interfaces.	K1
5.	develop simple applications integrating Python and Tkinter.	K1 & K3

K1 - Remember; K2 - Understand; K3 – Apply

Units	Contents	No. of Hours
I	Introduction to Python and Programming Basics Overview of Python – Installing Python – Writing and Running Python Scripts – Variables and Data Types – Operators – Input and Output – Basic Syntax.	6
II	Control Structures and Functions in Python Conditional Statements (if, else, elif) – Loops (for, while) – Functions and Modular Programming – Lambda Functions – Introduction to Object-Oriented Programming (OOP).	6
III	File Handling and Exception Handling Reading and Writing Files – File Handling Modes – Exception Handling (try, except, finally)	6
IV	Introduction to Tkinter for GUI Development Introduction to GUI Programming – Tkinter Basics – Creating Windows – Working with Labels, Buttons, and Entry Widgets – Layouts (Pack, Grid, Place).	6
V	Building a Simple App with Tkinter Event Handling – Message Boxes and Alerts – Building a Simple Calculator App – Connecting Tkinter with File Handling – Packaging and Running the Application.	6

Textbook

Reema Thareja. (2017). *Python Programming: Using Problem Solving Approach* (1st Edition). Oxford University Press.

Reference Books

1. Mark Lutz. (2013). *Learning Python* (5th Edition). O'Reilly Media.
2. John Zelle. (2010). *Python Programming: An Introduction to Computer Science* (2nd Edition). Franklin, Beedle & Associates.
3. Al Sweigart. (2015). *Automate the Boring Stuff with Python* (1st Edition). No Starch Press.
4. Alejandro Rodas de Paz & Burkhard A. Meier. (2019). *Tkinter GUI Application Development*
5. Eric Matthes. (2019). *Python Crash Course* (2nd Edition). No Starch Press.

Web Resources:

1. <https://www.geeksforgeeks.org/introduction-to-python/>
2. <https://www.geeksforgeeks.org/python-programming-language-tutorial/>
3. https://www.w3schools.com/python/python_intro.asp
4. <https://www.kdnuggets.com/python-basics-syntax-data-types-and-control-structures>
5. <https://www.dataquest.io/tutorial/introduction-to-python-programming/>

GENERIC VALUE-ADDED COURSE: PYTHON THROUGH CHEMISTRY

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2503	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on computer.

Learning Objectives:

1. To provide hands-on experience in writing Python scripts for chemistry applications.
2. To enable students to use Python for chemical data analysis and visualization.

Course outcomes

On the successful completion of the course, student will be able to:		
1	learn the basics of Python programming.	K1
2	write and execute Python scripts for chemical calculations.	K2
3	use Python for molecular weight calculations and stoichiometry.	K3
4	analyze chemical data and visualize trends using Python.	K4
5	develop simple Python applications for chemistry-related simulations.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze , **K5**-Evaluate

Units	Content	No.of hours
I	Introduction to Python and Programming Basics Overview of Python – Installing Python – Writing and Running Python Scripts – Variables and Data Types – Operators – Input and Output – Basic Syntax.	6
II	Control Structures and Functions in Python Conditional Statements (if, else, elif) – Loops (for, while) – Functions and Modular Programming – Lambda Functions – Introduction to Object-Oriented Programming (OOP).	6
III	Chemical Data Handling and Computation Handling chemical data using Python – Lists, Tuples, and Dictionaries for storing molecular information – File Handling (CSV, Excel) – Data Cleaning and Processing.	6
IV	Molecular Weight and Stoichiometry Calculations Computing molecular weights using Python – Using Periodic Table Data – Automating Stoichiometry Calculations – Chemical Equations Balancing.	6
V	Visualization of Chemical Data using Python Introduction to Data Visualization – Matplotlib and Seaborn for plotting chemical trends – Spectral Data Analysis – Graphical Representation of Chemical Reactions.	6

Total	30
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Textbooks:

1. "Learning Python" by Mark Lutz.
2. "Python Programming for the Absolute Beginner" by Michael Dawson.

References:

1. "Effective Python: 90 Specific Ways to Write Better Python" by Brett Slatkin
2. "Python in a Nutshell" by Alex Martelli
3. "Flask Web Development" by Miguel Grinberg
4. "Head-First Python" by Paul Barry.
5. "A Byte of Python" by Swaroop C H.

Web Resources:

1. <https://realpython.com/>
2. <https://www.geeksforgeeks.org/python-programming-language/>
3. <https://docs.python.org/3/> • <https://www.w3schools.com/python/>
4. <https://stackoverflow.com/> • <http://pythontutor.com/>
5. https://www.w3schools.com/python/python_reference.asp

GENERIC VALUE-ADDED COURSE: POWER BI

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								Internal	External	Total
GVAC2504	1	1	-	-	1	2	30	25	75	100

Pre-requisite

Students should have the basic knowledge on computer.

Learning Objectives

- 1.To provide knowledge to the students on POWER BI
2. To give knowledge on Data Visualization.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	build relationships between tables and optimize data models for performance	K1
2.	apply techniques such as segmentation, trend analysis and forecasting to derive meaningful insights	K2
3.	import and transform data from various sources	K3
4.	use Power Query to clean, reshape and prepare data for analysis	K3
5.	use Data Analysis Expressions (DAX) to create calculated columns, measures and tables for advanced analytics	K3

K1 - Remember; **K2** - Understand; **K3** – Apply

Units	Contents	No. of Hours
I	Introduction to Data Analysis: Introduction to Excel interface - Basic Data Importing - Importing Data from other Sources - CSV, Word, Enter Data Directly - Importing from Websites, SQL Servers - Entering Data Directly - Importing from SQL Servers - Introduction to power BI - Power BI Architecture - Installing Power BI Desktop - Exploring the Power BI Desktop Interface	6
II	Getting Report in Power Bi Desktop: Data Sources & Visual Types - Canvas, Visualizations and Fields - Get Data and Memory Tables - In-Memory x velocity Database - Table and Tree Map Visuals - Format Button and Data Labels - Legend, Category and Grid - PBIX and PBIT File Formats - Visual Interaction, Data Points - Disabling Visual Interactions - Edit Interactions - Format Options - SPOTLIGHT & FOCUSMODE - CSV and PDF Exports. Tooltips - Power BI Eco System, Architecture	6
III	Graphs & Visualization: Stacked Charts and Clustered Charts - Line Charts, Area Charts, Bar Charts - 100% Stacked Bar & Column Charts - Map Visuals: Tree, Filled, Bubble-Cards, Funnel, Table, Matrix-Scatter Chart: Play Axis, Labels - Series Clusters & Selections - Waterfall Chart and ArcGIS Maps - Infographics, Icons and Labels - Color Saturation, Sentiment Colors - Column Series, Column Axis in Lines	6
IV	Dax Formulas: AVERAGEX and AVERAGE in DAX - KEEPFILTERS and CALCUALTE - COUNTROWS, RELATED, DIVIDE - PARALLELPERIOD, DATEDADD - CALCULATE & PREVIOUSMONTH - USERRELATIONSHIP, DAX Variables - TOTALYTD, TOTALQTD - DIVIDE, CALCULATE, Conditions - IF. ELSE. THEN Statement - SELECTEDVALUE, FORMAT - SUM, DATEDIFF	6

	Examples in DAX	
V	Power Bi Query Editor: Power Query M Language Purpose - Power Query Architecture and ETL - Data Types, Literals and Values - Power Query Transformation Types - Table & Column Transformations - Text & Number Transformations - Date, Time and Structured Data - List, Record and Table Structures	6
	TOTAL	30

Textbooks:

1. Greg Deckler, 2022, *Mastering Microsoft Power Bi*, Packt Publishing
2. Marco Russo & Alberto Ferrari, 2019 (2nd Edition), *The Definitive Guide to DAX: Business intelligence for Microsoft Power BI, SQL Server Analysis Services, and Excel*, Microsoft Press

Reference Books:

1. Russo, M., & Ferrari, A. (2019). *The Definitive Guide to DAX: Business Intelligence with Microsoft Excel, SQL Server Analysis Services, and Power BI*. Microsoft Press.
2. Powell, B. (2017). *Power BI Cookbook: Creating Business Intelligence Solutions of Analytical Data Models, Reports, and Dashboards*. Packt Publishing.
3. Powell, B. (2018). *Mastering Microsoft Power BI: Expert Techniques for Effective Data Analytics and Business Intelligence*. Packt Publishing.
4. Hopkins, W. (2021). *Power BI for the Excel Analyst: A Practical Guide to Self-Service Data Analytics with Excel 365 and Power BI Desktop*. Holy Macro! Books.
5. Ferrari, A., & Russo, M. (2016). *Introducing Microsoft Power BI*. Microsoft Press.

Web Resources

1. <https://learn.microsoft.com/en-us/training/powerplatform/power-bi>
1. <https://www.coursera.org/learn/power-bi-data-visualization>
2. <https://www.sqlbi.com/>
3. <https://www.edx.org/course/analyzing-and-visualizing-data-with-power-bi>
4. <https://www.curbal.com/blog>

GENERIC VALUE-ADDED COURSE: SAP FICO

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								Internal	External	Total
GVAC2505	1	1	-	-	1	2	30	25	75	100

Pre-requisite

Students should know the basic knowledge on computer.

Learning Objectives

1. To provide knowledge to the students on SAP
2. To give knowledge on ERP software

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	understand the Conditional Formatting and IF Conditions & Charts	K1
2.	understand and apply the various selection techniques	K2
3.	apply the data entry for creating, editing and saving	K3
4.	know to work with functions and formula	K3
5.	understand and apply advance of Pivot Table, Pivot Charts	K3

K1 - Remember; **K2** - Understand; **K3** - Apply

Units	Contents	No. of Hours
I	Introduction to SAP FICO An Overview of ERP & SAP - Importance of SAP FICO - SAP Architecture - Enterprise Structure (company, company code, business area, credit control)	6
II	Financial Accounting (FI) An overview of Financial Accounting - General Ledger Accounting - Account Payables and Receivables - Asset Accounting - Bank Accounting	6
III	Controlling (CO) An Overview on Controlling - Cost Element Accounting - Internal Orders - Profit Centers Accounting - Product Costing	6
IV	Integration and Advanced Topics Integration with MM and SD Modules - New General Ledger Features - Document Splitting Parallel Accounting - Tax Configuration	6
V	Reporting, Period End and Innovations Financial Reporting (Balance Sheet, P&L) - Period End Closing Activities - SAP Fiori Overview - Introduction to SAP S/4 HANA Finance	6
	TOTAL	30

Textbooks

- 1) Stefanie Welz and Manikant Singh.2024, "SAP S/4HANA Finance: The Comprehensive Guide", Third Edition.

- 2) Jörg Siebert, 2023. "Practical Guide to SAP FI-CO (Financial Accounting & Controlling)" Fourth Edition.

Reference books

- 1) SAP ERP Financial Accounting and Controlling: Configuration and Use Management , Author: Andrew Okungbowa. Edition: 1st Edition (2015) .
- 2) Managing FI-CO Master Data in SAP, Author: Babu Joseph. Edition: E-Bite (2016)
- 3) Configuring SAP R/3 FI/CO: The Essential Resource for Configuring the Financial and Controlling Modules, Authors: Quentin Hurst and David Nowak. Edition: 1st Edition (2013)
- 4) SAP FICO Beginner's Handbook, Author: Murugesan Ramaswamy. Edition: Revised Edition (2021)
- 5) Financial Accounting with SAP S/4HANA: Business User Guide, Authors: Jonas Tritschler, Stefan Walz, Reinhard Rupp, and Nertila Mucka. Edition: 2nd Edition (2023)

Web resources

- 1) SAP FICO Learning Journey: <https://learning.sap-press.com/learning-journey/sap-fico>
- 2) SAP FICO Training Overview: <https://training.sap.com/content/sap-fico-training-overview>
- 3) SAP FICO Tutorial: <https://www.guru99.com/sap-fico-training-tutorials.html>
- 4) SAP Certifications: <https://learning.sap.com/certifications>
- 5) SAP Help Portal: <https://help.sap.com/>

GENERIC VALUE ADDED COURSE
ADVANCED EXCEL AUTOMATION AND ANALYSIS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2506	1	-	1	-	1	2	30	25	75	100

Pre-requisite

Students should know the basic knowledge on computer.

Learning Objectives

1. To provide knowledge to the students on Excel
2. To give knowledge on Data entry.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	recall and understand various selection techniques.	K1,K2
2	apply the data entry for creating, editing and Savings	K3
3	know to work with functions and formula.	K3
4	understand the Conditional Formatting and IF Conditions & Charts.	K2
5	define and apply Advance of Pivot Table, Pivot Charts.	K1, K3

K1 - Remember; K2 - Understand; K3 - Apply

Units	Contents	No. of Hours
I	Excel Introduction Introduction to Excel interface - An Overview of the Screen, Navigation and Basic Spreadsheet Concept - Various Selection Techniques - Understanding rows and columns, Naming cells-Working with excel workbook and sheets Formatting excel work book.	6
II	Managing Excel Sheet Data entry-Creating, Editing, Saving -Page Settings - Sorting and Filtering data - Basic Calculation and Basic Formulas - Customizing Common options in Excel - Absolute and Relative referencing - Protecting and Un-Protecting worksheets and cells - Securing & Protecting Spreadsheets - Short cut Keys	6
III	Calculations with Functions Working with Functions & Formulas - Basic Calculation and Basic Formulas - Basic Functions - Lookup Functions [Hlookup & Vlookup] - Logical Functions -Financial Functions [PMT,IPMT,PPMT,RATE,NPER] - Statistical Functions -Maths & Trig. Functions - Text Functions - Date & Time Functions.	6
IV	Excel Data Tools Modifying worksheets with color - Auto Formats - Conditional Formatting and IF Conditions - Charts & Graphs - Pivot Table & Pivot Chart - Sort & Filter. Subtotal and What if Analysis - Cell References Formulas, Audit Formula, Define Name - Protect Workbook & Worksheet - Record Macro Freeze Panes - Advance Filter with Wild Card Character, Macros, Page Setup	6

	and Printing - Advance Conditional Formatting, Paste Special & Advance Number - Advance Tools – Solver, Advance Subtotal etc. - Advance Marcos.	
V	More Advanced Options Data - 1. Subtotal 2. Sorting Data 3. Filtering Data 4. Data Validation 5. Goal Seek - Advance of Pivot Table, Pivot Charts - Advance Date & Time Functions with Logical Functions - Lookup Functions with IF Error - Advance Logical Functions and Lookup Functions & etc.- Proofing and Printing	6

Text books

1. John Walkenbach (2023) *MS Excel Bible*, Wiley Publication, New Jersey, USA.
2. Ramesh Bangia, *Learning Microsoft Excel 2013*, Khanna Book Publishing, Bangalore.

Reference Books

1. Glyn Davis & Branko Pecar (2021) *Business Statistics using Excel*, Oxford publications, Chennai.
2. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons (2018) *Microsoft 2003*, Tata McGraw Hill, Noida.
3. Wayne L Winston, *Microsoft Excel, Data Analysis and Business Modelling*, Prentice Hall, New Jersey, USA.
4. Harjit Suman (2022) *Excel Bible for Beginners*, Kindle Editio, Chennai.
5. Greg Harvey (2023) *Excel 2016 for Dummies*, Chennai.

Web Resources

1. <https://www.freebookkeepingaccounting.com/using-excel-in-accounts>
2. <https://courses.corporatefinanceinstitute.com/courses/free-excel-crash-course-for-finance>
3. https://www.youtube.com/watch?v=Nv_Nnw01FaU
4. https://www.youtube.com/watch?v=Nv_Nnw01FaU
5. <https://www.udemy.com/course/office-automation-certificate-course/>

**GENERIC VALUE-ADDED COURSE
CYBER SECURITY**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2507	1	-	1	-	1	2	30	25	75	100

Prerequisite: Understanding the importance of cyber security

Learning Objectives:

1. To understand the basics of cyber crime
2. To understand how to utilize social media effectively

Course Outcomes

On the successful completion of this course, students will be able to		CL
1	gain knowledge on basics of cyber security	K1
2	understand the basics of cyber crime	K2
3	handle social media	K3
4	implement cyber law	K4
5	understand and evaluate the tools and techniques in cyber security	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate.

Units	Contents	No. of Hours
I	Introduction to Cyber security Definition – Crime, Cyber Crime, Information Security, Digital Forensics Uniqueness of Cyber Crime – Concept of cyber security, Issues and challenges of cyber security.	6
II	Forms of Cyber Crimes Hacking – types of hacking, hackers, Cracking, Dos, DDos, Cyber Bullying, Cyber Stalking, Pornography, Phishing, Intellectual Property Theft, Data Theft, Dada diddling, malwares, steganography, salami attacks, ATM and Credit card frauds, Telecom Frauds.	6
III	Social Media overview Definition, Types, advantages and disadvantages – Crimes through social media, victimization through social media – Do's and Don'ts in Social Media – Safe Surfing.	6
IV	Cyber crime and cyber law Classification of cyber crimes, Common cyber crimes- Cybercriminals modus-operandi, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences.	6
V	Tools and Technologies for Cyber Security Mobile phone security, Password policy, Device security policy, Cyber Security best practices, Significance of host firewall and Ant-virus, Wi-Fi security	6

Textbooks

1. Raef Meeuwisse, May 14, 2015, Cybersecurity For Beginners, Lulu Publishing Services
2. Christopher Hadnagy, June 25, 2018, Social Engineering: The Science Of Human Hacking, Wiley

Reference Books

1. Sumit Belapure and Nina Godbole 2012. *Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives*, Wiley India Pvt. Ltd.
2. Dorothy F. Denning, Addison Wesley 2013. *Information Warfare and Security*
3. Henry A. Oliver , 2003. *Security in the Digital Age: Social Media Security Threats and Vulnerabilities* , Create Space Independent Publishing Platform.
4. Natraj Venkataramanan and Ashwin Shriram, 2016. *Data Privacy Principles and Practice* by, CRC Press.
5. W. KragBrothy, 2004. *Information Security Governance, Guidance for Information Security Managers*, 1st Edition, Wiley Publication

Web Resources

1. https://cio-wiki.org/wiki/Cyber_Security
2. https://www.ftc.gov/system/files/attachments/cybersecurity-small-business/cybersecuirty_sb_factsheets_all.pdf
3. <https://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf>
4. https://www.researchgate.net/publication/335322600_Cyber_Security
5. https://www.niti.gov.in/sites/default/files/201907/CyberSecurityConclaveAtVigyanBhavanDelhi_1.pdf

**GENERIC VALUE-ADDED COURSE
JAVA SERVER FACES (JSF)**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2508	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on computer.

Learning Objectives

1. Grasp the phases of JSF application lifecycle and the role of UI components, converters, and validators.
2. Develop basic CRUD operations using managed beans, forms, data validation, and JSF navigation rules.

Course Outcomes

On the successful completion of the course, student will be able to:		
1	choose fundamental JSF concepts, such as managed Beans, Face lets, and component libraries, a foundational knowledge of the framework.	K1
2	understand and examine JSF applications, identifying performance bottle necks, usability issues, fostering strong analytical and problem solving skills.	K2
3	identify the role of JSF in web development, including its integration with other Java technologies, to create robust, user-friendly, and maintainable web applications that align with industry best practices.	K3
4	develop dynamic and responsive web applications using JSF, leveraging managed beans and lifecycle management.	K4
5	evaluate and optimize JSF applications for performance and scalability, employing best practices and design patterns.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze , K5-Evaluate

Units	Content	No. of hours
I	Introduction to Java Programming Overview of Java - Setting Up the Development Environment - Basic Syntax and Structure - Variables and Data Types - Operators and Expressions.	6
II	Control Flow Statements Conditional Statements – Loops - Control Flow in Loops – Arrays - String Handling.	6
III	Conversation and Pronunciation Practice Classes and Objects – Encapsulation – Inheritance – Polymorphism – Interfaces.	6
IV	Writing and Comprehension Exception Handling - Built-in Exceptions - File I/O Basics - Advanced File I/O - Java 8 I/O (NIO).	6
V	Advanced Language Skills and Projects Collections Framework – Generics – Multithreading – Networking - JavaFX Basics.	6
	Total	30

Text Books:

1. "Core JavaServer Faces" by David Geary and Cay S. Horstmann.
2. "JavaServer Faces: The Complete Reference" by Chris Schalk and Ed Burns

Reference Books:

1. "JavaServer Faces: Introduction by Example" by Josh Juneau
2. "Pro JSF and HTML5: Building Rich Internet Components" by Zubin Wadia
3. "JavaServer Faces 2.0, The Complete Reference" by Ed Burns and Chris Schalk

Web Resources:

1. <https://docs.oracle.com/javaee/7/tutorial/jsf-intro.htm>
2. (<https://www.d.umn.edu/~tcolburn/cs4531/corejsf/>)
3. (<https://www.oreilly.com/library/view/javaserver-faces-20/9780071625098/>)
4. (<https://www.manning.com/books/javaserver-faces-in-action>)

GENERIC VALUE-ADDED COURSE**PYTHON**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2509	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on computer.

Learning Objectives:

1. To understand and apply Python syntax, control structures, and data types such as lists, dictionaries, and sets.
2. To write and debug Python programs using functions, modules, and libraries for various applications.

Course outcomes

On the successful completion of the course, student will be able to:		
1	learn the advanced Python programming paradigms, such as multithreading, web development.	K1
2	understand data analysis, enabling them to create sophisticated Python applications that meet industry standards and best practices	K2
3	apply advanced python concepts, including object oriented programming data structures and libraries, establishing a solid knowledge of Python.	K3
4	analyze and solve complex problems using Python, including performance optimization, debugging and algorithm design, fostering strong analytical skills.	K4
5	evaluate Python code for efficiency and suitability, demonstrating proficiency in performance analysis and optimization	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze , K5-Evaluate

Units	Content	No. of hours
I	Advanced Python Programming Review of Python Fundamentals-List Comprehensions and Generators-Decorators and Metaprogramming-Context Managers and the with Statement-Advanced Functions and Closures.	6
II	Object-Oriented Programming (OOP) in Python Principles of OOP-Classes and Objects-Inheritance and Polymorphism-Advanced OOP Concepts (Abstract Classes, Mixins)-Design Patterns in Python.	6
III	Python Standard Library Exploring the Python Standard Library-Working with File I/O-Networking and Sockets-Multithreading and Multiprocessing-Unit Testing and Test-Driven Development (TDD)	6
IV	Data Manipulation and Analysis with Python NumPy for Numerical Computing-Pandas for Data Analysis-Data Visualization with Matplotlib and Seaborn-Working with JSON and XML Data-Introduction to Data Science Libraries (e.g., SciPy)	6

V	Web Development with Python Introduction to Web Frameworks (e.g., Flask, Django)-Building RESTful APIs with Flask-Integrating Databases (SQL and NoSQL)-Deploying Python Web Applications-Final Project: Building a Python Web Application.	6
	Total	30

Textbooks:

1. "Learning Python" by Mark Lutz.
2. "Python Programming for the Absolute Beginner" by Michael Dawson.

References:

- 1."Effective Python: 90 Specific Ways to Write Better Python" by Brett Slatkin
- 2."Python in a Nutshell" by Alex Martelli
- 3."Flask Web Development" by Miguel Grinberg
- 4."Head-First Python" by Paul Barry.
5. "A Byte of Python" by Swaroop C H.

Web Resources:

1. <https://realpython.com/>
2. <https://www.geeksforgeeks.org/python-programming-language/>
3. <https://docs.python.org/3/> • <https://www.w3schools.com/python/>
4. <https://stackoverflow.com/> • <http://pythontutor.com/>

**GENERIC VALUE-ADDED COURSE
DATA SCIENCE**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2510	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on statistics.

Learning Objectives:

1. Grasp fundamental concepts in statistics, data manipulation, and data visualization using tools like Python and R.
2. Develop and evaluate machine learning models for predictive analytics and data-driven decision-making.

Course Outcomes

On the successful completion of the course, student will be able to:		
1	define data science concepts, including statistical methods, data cleaning techniques and programming languages like Python establishing a knowledge of the field.	K1
2	classify the complex data sets, applying data visualization	K2
3	develop statistical techniques to extract meaningful insights and patterns.	K3
4	examine the ethical implications and limitations of data science, as well as the role of data in decision-making processes.	K4
5	evaluate them to make informed and responsible data-driven decisions in various contexts.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze , **K5**-Evaluate

Units	Content	No. of hours
I	Introduction to Data Science Overview of Data Science and its applications-Understanding the Data Science workflow-Basics of data collection, cleaning, and preprocessing-Introduction to data visualization and exploratory data analysis (EDA)	6
II	Data Manipulation and Analysis Data wrangling techniques using Python or R-Descriptive statistics and summary metrics-Hypothesis testing and statistical inference-Correlation and causation in data analysis	6
III	Machine Learning Fundamentals Introduction to machine learning and its types-Supervised learning: Regression and Classification-Unsupervised learning: Clustering and Dimensionality Reduction-Model evaluation and selection	6

IV	Advanced Topics in Data Science Feature engineering and selection-Time series analysis and forecasting- Natural Language Processing (NLP)-Introduction to deep learning and neural networks	6
V	Real-World Data Science Projects Guided project work applying concepts learned in previous units-Data- driven decision-making and problem-solving-Presentation and communication of data insights-Ethical considerations in Data Science	6
	Total	30

Textbooks:

1. "Introduction to Data Science" by Jeffrey Stanton
2. "Data Science for Business" by Foster Provost and Tom Fawcett
3. "Python for Data Analysis" by Wes McKinney

Reference Books:

1. "The Elements of Statistical Learning" by Trevor Hastie, Robert Tibshirani, and Jerome Friedman
2. "Data Science from Scratch" by Joel Grus

Web Resources:

1. <https://stackoverflow.com/questions/tagged/data-science>
2. <https://www.reddit.com/r/datascience/?rdt=54435>
3. <https://jupyter.org/>

**GENERIC VALUE-ADDED COURSE
.NET FRAMEWORK**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2511	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on computer applications.

Learning Objectives

1. Teach students to develop software applications using .NET technologies, including C# and ASP.NET, enabling them to create functional and scalable software solutions.
2. Provide learners with the skills to design, test and deploy .NET based applications, fostering proficiency in the complete software development lifecycle.

Course Outcome

On the successful completion of the course, student will be able to:		
1	list key, .NET framework components and concepts, such as C#, ASP.NET, and the .NET Framework libraries, establishing a solid foundational knowledge of the technology.	K1
2	infer and dissect .NET based applications, identifying performance bottlenecks, security vulnerabilities, and problem solving skills.	K2
3	make use of scalability, cross platform development and security within the .NET ecosystem, enabling them to create robust and secure software solutions that meet modern industry standards.	K3
4	develop robust web applications using .NET Framework, demonstrating proficiency in server-side programming, data access, and user interface design	K4
5	evaluate and implement .NET Framework technologies to develop efficient and secure enterprise applications, demonstrating proficiency in performance analysis and optimization techniques.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze , **K5**-Evaluate

Units	Content	No.of hours
I	Introduction to .NET Framework Overview of the .NET Framework and its components-Historical context and evolution of .NET-Common Language Runtime (CLR) and the .NET ecosystem-Installing and setting up the .NET development environment.	6
II	C# Programming Introduction to C# programming language-Data types, variables, and operators in C#-Control structures: loops and conditionals.-Object	6

	oriented programming (OOP) principles in C#Lab: Writing and debugging C# programs.	
III	Building Windows Applications Windows Forms applications with C#-Event driven programming and GUI design-Controls and user interface (UI) components-Handling user input and user interactions-Lab: Developing a simple Windows Forms application.	6
IV	Web Development with ASP.NET Introduction to ASP.NET web development-Creating web forms and web applications-Server side scripting with ASP.NET-Data access and database integration with ASP.NET-Lab: Building a basic ASP.NET web application	6
V	Advanced Topics and Project Advanced .NET features and technologies (e.g., ASP.NET Core, WPF, Xamarin)-Design patterns and best practices in .NET development-Building a complete .NET application project-Project presentations and peer review-Examining real world .NET applications and case studies.	6
	Total	30

Textbooks:

1. "Pro C# 9 with .NET 5" by Andrew Troelsen and Philip Japikse
2. "C# in Depth" by Jon Skeet
3. "Entity Framework Core in Action" by Jon P Smith

Reference Books

1. "Code Complete: A Practical Handbook of Software Construction" by Steve McConnell.
2. "Clean Code: A Handbook of Agile Software Craftsmanship" by Robert C. Martin
3. "Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides

Web Resources

1. <https://www.c-sharpcorner.com/learn/c-sharp-asynchronous-programming>
2. <https://www.c-sharpcorner.com/article/tutorial-working-with-windows-forms->
3. <https://www.javatpoint.com/c-sharp-tutorial>

GENERIC VALUE-ADDED COURSE**ENGLISH LANGUAGE TEACHING THROUGH CHAT GPT**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2512	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on language teaching tools.

Learning Objectives

1. To instruct educators in using Chat GPT as a supplementary tool for English language teaching, enabling them to effectively integrate technology into their language instruction methods.
2. Teach educators how to adapt and personalize Chat GPT interactions to meet the specific needs of English language learners, fostering language acquisition and communication skills.

Course outcomes

On the successful completion of the course, student will be able to:		
1	learn the evolving role of technology, like chat GPT, in language instruction, considering the pedagogical implications and ethical considerations.	K1
2	understand the innovative practices for enhancing English language teaching methodologies.	K2
3	apply foundational principles of English language teaching, including language acquisition theories, pedagogical strategies and Chat GPT utilization for language learning.	K3
4	analyze the effectiveness of chat GPT as a language teaching tool	K4
5	identifying its strengths, limitations, and appropriate contexts for use in language education.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze , **K5**-Evaluate

Unit	Content	No.of Hours
I	Introduction to ChatGPT and Language Teaching Overview of ChatGPT and AI in Language Teaching-Role of AI in Language Learning-Setting Up and Interacting with ChatGPT-Ethics and Responsible Use of AI-Language Teaching Strategies with ChatGPT	6
II	ChatGPT for Vocabulary and Grammar Vocabulary Building with ChatGPT-Grammar Correction and Practice-Contextual Language Learning-Interactive Language Quizzes and Drills-ChatGPT for Language Assessment	6

III	Conversation and Pronunciation Practice Role-Playing Conversations with ChatGP-Pronunciation and Accent Improvement-Building Confidence in Speaking-Real-Life Language Scenarios-Monitoring Progress and Feedback	6
IV	Writing and Comprehension Writing Exercises and Prompts-Proofreading and Editing with ChatGPT-Reading Comprehension and Analysis-Creative Writing with AI Assistance-Collaborative Writing Projects	6
V	Advanced Language Skills and Projects Advanced Language Proficiency Challenges-Research Projects with ChatGPT-Using AI for Language Teaching Assessment-Final Project: Developing Innovative Language Learning Activities-Reflecting on the Future of AI in Language Education	6
	Total	30

Textbooks:

1. “Touchstone” by Michael McCarthy and Jeanne McCarten:
1. “Outcomes” by Hugh Dellar and Andrew Walkley:
2. “Focus on Academic Skills for IELTS” by Morgan Terry:

Reference Books:

1. “Advanced Trainer” by Cambridge English:
1. “World English” by Martin Milner, Rebecca Traver Chase, and Kristin L. Johannsen:

Web Resources:

1. <https://chat.openai.com/>
2. <https://www.bbc.co.uk/learningenglish>
3. <https://www.eslgamesplus.com/>
4. <https://www.duolingo.com/>
5. <https://learnenglish.britishcouncil.org/>

GENERIC VALUE-ADDED COURSE**ADVANCED ARTIFICIAL INTELLIGENCE**

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2513	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on Artificial intelligence.

Learning Objectives

1. Understand and implement advanced AI algorithms, including deep learning, reinforcement learning and neural networks.
2. Design, train, and fine-tune complex AI models for real-world applications, focusing on performance and accuracy.

Course outcomes

On the successful completion of the course, student will be able to:		
1	know the role of advanced AI in various domains, including healthcare, robotics, and natural language processing.	K1
2	understand them to design and implement cutting edge AI solutions that align with industry standards and ethical considerations.	K2
3	apply advanced artificial intelligence concepts, including deep learning algorithms, reinforcement learning strategies, and neural network architectures, establishing a strong foundational knowledge in AI.	K3
4	analyze complex AI systems, evaluating their performance, ethical implications and areas for improvement fostering strong analytical and problem solving skills in advanced AI applications.	K4
5	evaluate advanced AI models and algorithms, demonstrating the ability to assess their effectiveness across diverse applications.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze **K5**-Evaluate

Units	Content	No.of hours
I	Fundamentals of Artificial Intelligence Introduction to Artificial Intelligence-Historical overview-Types of AI: Narrow vs General Intelligence-Ethical and societal implications-Machine Learning Basics-Supervised, Unsupervised, Reinforcement learning-Feature engineering and selection-Evaluation metrics-Deep Learning Foundations-Neural networks, activation functions-Backpropagation and gradient descent-Convolutional and recurrent neural networks	6
II	Advanced Machine Learning Techniques Advanced Deep Learning Architectures-Generative Adversarial Networks (GANs)-Transformers and attention mechanisms-Variational Autoencoders (VAEs)-Reinforcement Learning-Markov Decision Processes-Q-learning, Policy Gradient methods-Deep Reinforcement Learning-Natural Language	6

	Processing (NLP):-Tokenization, word embeddings-Sequence-to-sequence models-BERT, GPT, and other pre-trained models	
III	AI in Computer Vision Image Processing and Feature Extraction-Filters, edge detection-Image segmentation-Object detection and tracking-Convolutional Neural Networks (CNNs)-Architectures (VGG, ResNet, etc.) Transfer learning-Image generation using CNNs-Advanced Computer Vision-Semantic segmentation-Pose estimation-Object recognition in videos	6
IV	AI in Natural Language Processing Advanced NLP Techniques-Named Entity Recognition (NER)-Sentiment analysis-Text summarization and generation-Language Models-Transformer-based architectures-Training large-scale language models-Ethical considerations in language generation-Dialogue Systems and Chatbots-Rule-based vs Machine Learning-based approaches-Building interactive chatbots-Handling contextual conversations	6
V	Special Topics and Applications AI Ethics and Bias-Bias in AI algorithms-Fairness and accountability-Ethical guidelines and regulations-AI in Healthcare-Disease prediction-Drug discovery-Medical image analysis-AI in Robotics-Robot perception and decision-making-Autonomous navigation-Human-robot interaction-AI for Business and Industry-Predictive analytics-Process automation-Customer behavior analysis-AI and Future Technologies-Quantum computing and AI-AI in IoT (Internet of Things)-AI and blockchain	6
	Total	30

Textbooks:

1. "Deep Learning" by Ian Goodfellow, Yoshua Bengio, and Aaron Courville.
2. "Reinforcement Learning: An Introduction" by Richard S. Sutton and Andrew G. Barto.
3. "Natural Language Processing in Action" by Lane, Howard, and Hapke.
4. "Computer Vision: Algorithms and Applications" by Richard Szeliski.

Reference Books:

1. "Artificial Intelligence: A New Synthesis" by Nils J. Nilsson.
2. "Machine Learning: A Probabilistic Perspective" by Kevin P. Murphy.

Web Resources:

1. <https://www.ibm.com/topics/artificial-intelligence>
2. <https://www.techtarget.com/searchenterpriseai/definition/deep-learningdeep-neural-network>
3. <https://www.simplilearn.com/tutorials/machine-learningtutorial/reinforcement-learning>

GENERIC VALUE-ADDED COURSE

CHAT GPT AND AI TOOLS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
GVAC2514	1	-	1	-	1	2	30	25	75	100

Pre-requisite: Basic knowledge on the applications of Artificial Intelligence.

Learning Objectives

1. Understand and apply ChatGPT for various tasks such as text generation, conversation, and content creation.
2. Integrate and use AI tools for enhancing productivity, automating processes, and solving complex problems in diverse domains.

Course outcomes

On the successful completion of the course, student will be able to:		
1	know the concepts of chat GPT and AI tools including natural language processing techniques.	K1
2	understand the chatbot architectures and ethical considerations.	K2
3	use the Chat GPT and AI tools in enhancing human computer interactions, ethical considerations in AI design.	K3
4	evaluate AI tools for conversational applications, assessing their performance limitations, and potential improvements, fostering strong analytical and problem solving skills.	K4
5	analyse their practical applications across various industries, enabling them to design and implement effective AI driven chatbot solutions.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** – Analyze , **K5**-Evaluate

Units	Contents	No.of hours
I	<p>Introduction to AI and Chat GPT</p> <p>Overview of Artificial Intelligence-Definition, history, and key concepts of AI-Types of AI: Narrow AI vs. General AI-Introduction to Chatbots-Definition, applications, and types of chatbots-Importance of chatbots in modern business and customer service.-Understanding Chat GPT. Introduction to Chat GPT and its capabilities-How Chat GPT works: NLP, machine learning, and deep learning concepts.</p>	6
II	<p>NLP Fundamentals</p> <p>Basic Concepts of NLP-Tokenization, stemming, lemmatization-Part-of-speech tagging and named entity recognition-Word Embeddings and Vectorization-Word2Vec, GloVe, and other word embedding techniques-Vectorization of text data for machine learning models.</p>	6

III	Deep Learning and Neural Networks Introduction to Deep Learning-Neural networks architecture and working principles-Activation functions, loss functions, and optimization algorithms-Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM)-Understanding sequential data and the need for RNNs-LSTM networks for handling sequential data in NLP tasks.	6
IV	Chatbot Development Tools and Frameworks-Introduction to popular NLP libraries: NLTK, SpaCy and TensorFlow-Chatbot development frameworks: Dialogflow, Microsoft Bot Framework, Rasa, etc-Building a Basic Chatbot-Designing conversation flow and user interactions-Integrating NLP techniques for understanding user input-Implementing responses and feedback loops.	6
V	Advanced Topics and Applications Advanced NLP Techniques-Sentiment analysis, text summarization, and language translation-Sequence-to-sequence models for chatbots-Ethical Considerations and Bias in AI-Understanding ethical concerns in AI and chatbot development-Mitigating biases in training data and algorithms-Real-world Applications-Chatbots in customer service, healthcare, finance, and other industries-Case studies and success stories of AI-powered chatbot implementations.	6
	Total	30

Textbooks

1. "Speech and Language Processing" by Dan Jurafsky and James H. Martin.
2. "Deep Learning" by Ian Goodfellow, Yoshua Bengio, and Aaron Courville.
3. "Natural Language Processing in Action" by Lane, Howard, and Hapke.

Reference Books

1. "Natural Language Processing in Action" by Lane, Howard, and Hapke.
2. "Foundations of Machine Learning" by Mehryar Mohri, Afshin Rostamizadeh, and Ameet Talwalkar.

Web Resources

1. TalkAI: ChatGPT Without Registration - Free Use
2. ChatGPT (openai.com)
3. CodeDesign.ai | AI Website Builder
4. NLP Research Scientist:

GENERIC VALUE-ADDED COURSE: DATA ANALYTICS

Course Code	L	T	P	S	Credits	Total Hours	Marks		
							CIA	Internal	External
GVAC2515	1	-	1	-	1	30	25	75	100

Pre-requisite:

Basic knowledge of statistics and computers.

Learning Objectives:

1. Understand core concepts and lifecycle of data analytics.
2. Apply tools like Python or Excel to extract, clean, and visualize data.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	define data analytics concepts, types of data, and tools used.	K1
2	explain descriptive and inferential statistics for data interpretation.	K2
3	apply data cleaning, transformation, and visualization techniques.	K3
4	analyze real-world data to extract meaningful insights.	K4
5	evaluate data models and make data-driven decisions.	K5

K1 - Remember; K2 - Understand; K3 - Apply K4 – Analyze , K5-Evaluate

Unit	Contents	Hours
I	Introduction to Data Analytics, Types of Data, Analytics Lifecycle, Data Sources	6
II	Data Cleaning: Handling Missing Data, Outliers, Normalization, Encoding	6
III	Descriptive Statistics, Visualization using Charts and Graphs, Correlation	6
IV	Predictive Analytics: Regression, Classification, Model Evaluation	6
V	Real-World Applications and Ethical Use of Data	6
	Total	30

Text Book

Yadav, A. (2020). *Data Science with Python* (1st Edition). BPB Publications.

Reference Books

1. Wes McKinney. (2018). *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython* (2nd Edition). O'Reilly Media.
2. Joel Grus. (2019). *Data Science from Scratch: First Principles with Python* (2nd Edition). O'Reilly Media.
3. Jake VanderPlas. (2016). *Python Data Science Handbook* (1st Edition). O'Reilly Media.
4. Sebastian Raschka and Vahid Mirjalili. (2019). *Python Machine Learning* (3rd Edition). Packt Publishing.
5. Allen B. Downey. (2014). *Think Stats: Exploratory Data Analysis in Python* (2nd Edition). O'Reilly Media.

Web Resources:

1. <https://www.geeksforgeeks.org/python-for-data-science/>
2. https://nustat.github.io/DataScience_Intro_python/Introduction%20to%20Python%20and%20Jupyter%20Notebooks.html
3. <https://www.geeksforgeeks.org/introduction-to-python/>
4. <https://www.geeksforgeeks.org/python-programming-language-tutorial/>
5. <https://www.dataquest.io/tutorial/introduction-to-python-programming/>

GENERIC VALUE-ADDED COURSE: .NET CORE DEVELOPMENT

Course Code	L	T	P	S	Credits	Total Hours	Marks		
							CIA	Internal	External
GVAC2516	1	-	1	-	1	30	25	75	100

Pre-requisite:

Basic understanding of C# and OOP.

Learning Objectives:

1. Develop cross-platform apps using .NET Core.
2. Understand middleware, routing, and services.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	identify .NET Core components and framework tools.	K1
2	understand project structures, configuration, and DI.	K2
3	create simple console/web apps with .NET Core.	K3
4	analyze the role of middleware and services.	K4
5	evaluate application deployment and optimization.	K5

K1 - Remember; K2 - Understand; K3 - Apply K4 – Analyze , K5-Evaluate

Unit	Contents	Hours
I	Introduction to .NET Core, CLI, Project Templates	6
II	Console Apps, Control Statements, OOP with C#	6
III	Dependency Injection, AppSettings, Logging	6
IV	Middleware, Services, Routing, Exception Handling	6
V	Razor Pages / Blazor Basics, Deployment Tools	6
	Total	30

Textbooks:

1. "Pro ASP.NET Core Web API" by Adam Freeman
2. Pro .NET Core" by Andrew Troelsen

Reference Books:

1. Microsoft ASP.NET Docs: <https://learn.microsoft.com/en-us/aspnet/core/>
2. "C# 9 and .NET 5" by Mark J. Price
3. Microsoft Docs (<https://docs.microsoft.com/en-us/dotnet/core>)

GENERIC VALUE-ADDED COURSE: JAVASCRIPT PROGRAMMING

Course Code	L	T	P	S	Credits	Total Hours	Marks		
							CIA	Internal	External
GVAC2517	1	-	1	-	1	30	25	75	100

Pre-requisite:

Basic knowledge of HTML.

Learning Objectives:

1. Understand the syntax and structure of JavaScript.
2. Create interactive web pages using client-side scripting.

Course Outcomes

On the successful completion of the course, students will be able to:		
No.	Description	K-Level
1	define JavaScript data types, operators, and syntax.	K1
2	understand control flow, loops, and DOM manipulation.	K2
3	apply functions, events, and form validation in web pages.	K3
4	analyze browser behavior and debugging tools.	K4
5	evaluate client-side performance and interactive design techniques.	K5

K1 - Remember; K2 - Understand; K3 - Apply

Unit	Contents	Hours
I	JavaScript Basics: Variables, Data Types, Operators	6
II	Functions, Control Statements, Loops	6
III	Arrays, Objects, Events, Form Validation	6
IV	DOM Manipulation, Timers, Error Handling	6
V	Debugging Tools, Performance Tips, ES6 Basics	6
	Total	30

Text Books:

1. "Core JavaServer Faces" by David Geary and Cay S. Horstmann.
2. "JavaServer Faces: The Complete Reference" by Chris Schalk and Ed Burns
3. Eloquent JavaScript" by Marijn Haverbeke

Reference Books:

1. "JavaServer Faces: Introduction by Example" by Josh Juneau
2. "Pro JSF and HTML5: Building Rich Internet Components" by Zubin Wadia
3. "JavaServer Faces 2.0, The Complete Reference" by Ed Burns and Chris Schalk
4. JavaScript: The Definitive Guide" by David Flanagan
5. Mozilla Developer Network (<https://developer.mozilla.org>)

Web Resources:

1. <https://docs.oracle.com/javaee/7/tutorial/jsf-intro.htm>
2. (<https://www.d.umn.edu/~tcolburn/cs4531/corejsf/>)
3. (<https://www.oreilly.com/library/view/javaserver-faces-20/9780071625098/>)
4. (<https://www.manning.com/books/javaserver-faces-in-action>)