



GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications					Branch/Spec.	Computer Application		
Semester	I					Version	1.0.0.0		
Effective from Academic Year			2026-27			Effective for the batch Admitted in		July 2026	
Subject Code	P11E5FSD		Subject Name			Full Stack Development			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CIA	SEE	Total
	L	TU	P	TW					
Credit	2	0	2	0	4	Theory	40	60	100
Hours	2	0	4	0	6	Practical	20	30	50

Objective:

Able to writing scripts to building, deploying, and maintaining secure, enterprise-grade web applications.

Pre-requisites:

Students should have basic knowledge of: Programming fundamentals of Python and HTML and CSS with Database concepts.

Course Outcomes:

- 1 = Slight (Low); 2 = Moderate (Medium); 3 = Substantial (High); “-” = No Correlation

Name of CO	Description							
CO1	Understand advanced concepts of Python full-stack application development using modern web technologies.							
CO2	Develop secure, responsive, database-driven web applications using Python frameworks and RESTful architecture.							
CO3	Implement authentication, API integration, deployment, and version control practices in full-stack applications.							
CO4	Evaluate and optimize application performance, scalability, maintainability, and deployment using contemporary development tools							
	Mapping of CO and PO							
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	-	-	2	-	-	1
CO2	3	3	3	2	3	-	-	1
CO3	2	3	3	2	3	2	-	2
CO4	2	3	3	3	3	2	2	3

Content:		
Unit	SECTION-I	Hours
01	Full-Stack Foundations Evolution of Full-Stack Development, Python Ecosystem for Web Development, MVC and MVT Architectures, Flask vs FastAPI vs Django Overview, Virtual Environment and Package Management, Project Structure, HTML5, CSS3, Bootstrap 5 Integration, JavaScript ES6 Fundamentals, Responsive UI Principles, Git & GitHub Workflow	7
02	FastAPI & Database Integration FastAPI Architecture, Routing, Request & Response Models, Pydantic Validation, CRUD Operations, SQLAlchemy ORM, SQLite and PostgreSQL, Environment Variables, Error Handling, JWT Authentication, Password Hashing, File Upload, API Documentation using Swagger	8
SECTION-II		
03	Integration & RESTful Applications REST API Consumption, Fetch API, Axios, JavaScript Modules, Dynamic DOM Manipulation, Form Validation, Session Management, Cookies, Local Storage, JSON Data Exchange, Responsive Dashboard, API Testing using Postman	8
04	Deployment, Testing & Optimization Application Testing, PyTest Basics, Logging, Exception Handling, Performance Optimization, Caching Concepts, Docker Fundamentals, Containerization, Introduction to GitHub Actions, CI/CD Concepts, Deployment on Render/Railway, Security Best Practices, OWASP Basics, Application Monitoring	7
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Text Books:		
1	Python Crash Course, Eric Matthes,No Starch Press,3rd Edition,2023	
2	Automate the Boring Stuff with Python, Al Sweigart,No Starch Press,2nd Edition,2023	
3	Mastering FastAPI with Python:A Practical Guide to High-Performance APIs & Microservices, Ayman Alheraki, February, 2025	
4	Architecture Patterns with Python, Harry J.W. Percival & Bob Gregory,O'Reilly Media,2nd Edition (Latest),2024	
5	Flask Web Development, Miguel Grinberg,O'Reilly Media,2nd Edition.	
Reference Books:		
1	Fluent Python, Luciano Ramalho, O'Reilly Media, 2nd Edition	
2	Python Cookbook, David Beazley & Brian K. Jones,O'Reilly Media,3rd Edition	
3	Django 5 by Example, Antonio Melé, Packt	
MOOC/Certification Courses:		
1	Python Web App with Flask https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0140053572905943046483/overview	
2	Python Web App with Django https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0140053568917176326482/overview	
3	Django Application Development with SQL and Databases	

	https://skills.yourlearning.ibm.com/credential/CREDLY-3dd9eac8-bbb1-4694-8d30-775570419fdc
4	Docker Essentials: A Developer Introduction https://skills.yourlearning.ibm.com/activity/CAI-COURSE-V1:IBMDEVELOPERSKILLSNETWORK+CO0101EN+V1

Question Paper Scheme:

University Examination Duration: 3 Hours

Note for Examiner: -

(I) Questions 1 and 4 are compulsory with no options.

(II) Internal options should be given in questions 2, 3, 5 and 6.

SECTION – I

Q.1 –8 Marks

Q.2 –10 Marks

Q.3 –12 Marks

SECTION - II

Q.4 –8 Marks

Q.5 –10 Marks

Q.6 –12 Marks