

**1.3.2(B) Brochure and Course content or syllabus along with course outcome of Value-added courses offered**

**Department of Information Technology**

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## **DEPARTMENT OF INFORMATION TECHNOLOGY**

### **CIRCULAR**

**Date: 10-01-2025**

This is to inform you that department of Information Technology is offering an industry driven value-added course for 3<sup>rd</sup> year B. Tech students titled "**Python for Data Science, AI & Development**" starting from Jan 20<sup>th</sup>, 2025 onwards. Eligible and interested students have to follow the course schedule properly.

**Course duration: 30 hours**

**Venue: Blended Mode**

**Coordinator**

  
**HOD-IT**  
10.01.2025

## **Course Outcomes**

1. Understand the basics of Python programming, including expressions, variables, and string operations.
2. Learn to work with Python data structures such as lists, tuples, dictionaries, and sets.
3. Apply programming fundamentals like conditions, loops, functions, exception handling, and object-oriented concepts.
4. Manage and manipulate data in Python using file operations, Pandas, and NumPy libraries.
5. Gain skills in accessing and using APIs through RESTful services and working with HTTP requests.
6. Explore techniques for web scraping and handling various data file formats to support data collection and analysis.

## **SYLLABUS/MODULES**

### **➤ Module 1 – Python Basics**

Introduction to Python

Getting Started with Jupyter

Expressions and Variable

String Operations

### **➤ Module 2 – Data Structures**

Lists and Tuples

Dictionaries

Sets

### **➤ Module 3 – Python Programming fundamentals**

Conditions and Branching

Loops

Functions

Exception Handling

Objects and Classes

➤ **Module 4 - Working with data in Python**

Reading, writing Files with Open

Pandas: Loading Data

Pandas: Working with and Saving Data

One Dimensional NumPy

Two Dimensional NumPy

➤ **Module 5 - API's and Data Collection**

Application Program Interface

REST APIs & HTTP Requests - Part 1

REST APIs & HTTP Requests - Part 2

(Optional) HTML for Web Scraping

(Optional) Web Scraping

Working with Different File Formats

Coordinator



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## **DEPARTMENT OF INFORMATION TECHNOLOGY**

### **CIRCULAR**

**Date: 7-06-2024**

This is to inform you that department of Information Technology is offering an industry driven value-added course for 2<sup>nd</sup> years titled "**Prompt Engineering for Educators Specialization**" starting from June 10<sup>th</sup>, 2024 onwards. Eligible and interested students have to follow the course schedule properly.

Total No. of Hours: 30 hours

Venue: Blended Mode

  
**Coordinator**

  
**HOD-IT** 7.6.24

## **COURSE OUTCOMES**

1. Understand the fundamentals of using ChatGPT and other AI tools for everyday life and professional tasks.
2. Develop the ability to write effective and structured prompts to get better AI responses.
3. Apply AI tools skillfully in areas such as learning, cooking, coding, planning, and security.
4. Implement few-shot prompting techniques by providing examples to guide AI behavior.
5. Utilize different prompt patterns like question refinement, rule-based prompts, and gameplay patterns to improve interaction with AI.
6. Gain hands-on experience in controlling AI outputs and preventing over-generation through structured prompting.

## **SYLLABUS/MODULES**

### **Module 1: Course Introduction**

How to use ChatGPT and other AI tools in daily life and work, How to write good prompts, Basic prompts, Usage of AI for writing, planning, coding, learning, and more.

### **Module 2: Introduction To Prompts**

ChatGPT with learning, cooking, coding, security, how to use AI tools like an expert, write better prompts to get smarter responses.

### **Module 3: Prompt Patterns I**

"Question refinement" pattern, ChatGPT to suggest a better version of a given question

### **Module 4: Few-Shot Examples**

Few-shot prompting, showing examples of what you want it to do, Model learning from the pattern and applies it to new inputs.

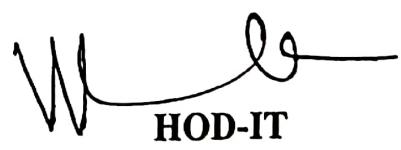
### **Module 5: Prompt patterns II**

Gameplay Pattern, Prompt Challenges, Learning by Doing, Pattern-Based Games

### **Module 6: Prompt patterns III**

Rule-Based Prompts, Ask-for-Input Pattern, Stops Over-Generation, User Control

Coordinator

 HOD-IT

## Department of Information Technology

Minimum Credits to be earned: 160 (for Regular Students)  
127 (for Lateral Entry Students)

First Semester							
No	Course Code	Course	POs	Contact Hours			
				L	T*	P	C
1	21HSX01	Communicative English	1,9,10,11,12	2	-	-	2
2	21MAX01	Engineering Mathematics I	1,2,3,4,12	3	-	-	3
3	21PYX01 21CYX01	Engineering Physics / Engineering Chemistry	1,2,12 / 1,2,6,7,12	3/3	-	-	3
4	21BEX01 21BEX06	Basics of Engineering / IT Workshop	1,3,6,7,9,11,12 / 1,12	3	-	-/3	3.5
5	21BEX02	Problem Solving and Programming Skills	1,2,3,12	3	-	-	3
6	21BEX03	Problem Solving and Programming Skills Lab	2,3,4,12	-	3	-	1.5
7	21BEX04/ 21BEX05	Engineering Drawing / Engineering Workshop	1,5,10,12 / 1,9,10,12	-	-	3/3	1.5/1.5
8	21PYX02/ 21CYX02	Engineering Physics Lab / Engineering Chemistry Lab	4,9,11 / 1,6,7,9,1,2	3	-	-	1.5
9	21HSX02/	Communicative English Lab / -	1,9,10,11,12	-	3	-	1.5
				<b>Total</b>	<b>14/11</b>	<b>0</b>	<b>12/12</b>
							<b>20/17</b>
Second Semester							
1	-	Language Elective	1,9,10,11,12	2	-	-	2
2	21MAX02	Engineering Mathematics II	1,2,3,4,12	3	-	-	3
3	21CYX01/ 21PYX01	Engineering Chemistry / Engineering Physics	1,2,6,7,12 / 1,2,1,2	3/3	-	-	3
4	21BEX01/ 21BEX06	Basics of Engineering / IT Workshop	1,3,6,7,9,11,12 / 1,12	-/3	-	3/3	1.5/3
5	21BEX07	Python Programming	1,2,3,12	3	-	-	3
6	21BEX08	Python Programming Lab	2,3,4,5,12	-	3	-	1.5
7	21BEX05/ 21BEX04	Engineering Workshop / Engineering Drawing	1,9,10/1,5,10	-	3/3	-	1.5/1.5
8	21CYX02/ 21PYX02	Engineering Chemistry Lab / Engineering Physics Lab	1,6,7,9,12/4,9,1	-	3	-	1.5/1.5
9	/21HSX02	Communicative English Lab	-/10,12	-	-/3	-	-1.5
				<b>Total</b>	<b>11/14</b>	<b>0</b>	<b>12/12</b>
							<b>17/20</b>
Third Semester							
1	21CS303	Data Structures	1,2,3,12,PS02	3	0	-	3
2	21CS304	Digital Logic Design	1,2,3,5	3	-	2	4
3	21CS305	Discrete Mathematical Structures	1,2,3,12,PS01	3	0	-	3
4	21IT304	Database Management Systems	1, 2, 3, 4, 12, PS02	3	0	-	3
5	21IT305	Data Communication Systems	1, 2, 3, 4, 7, 12, PS01	3	0	-	3
6	21IT306	Object Oriented Programming through Java	1,2,3,4,5,12, PS01, PS02	3	-	2	4
7	21CS307	Data Structures Laboratory	1,2,3,4,12	-	-	3	1.5
8	21IT308	Database Management Systems Laboratory	1, 2, 3, 4, 5, 9, PS02	-	-	3	1.5
9	21ESX01	Employability Skills I	1,2,5,8,10,12	-	-	2	-
10	21HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	-
				<b>Total</b>	<b>19</b>	<b>0</b>	<b>12</b>
							<b>23</b>
Fourth Semester							
1	21MA405	Probability and Statistics	1,2	3	0	-	3
2	21CS403	Computer Organization and	1,2,12, PS01	3	0	-	3

\* Hours suggested for tutorials

		Architecture					
3	21IT403	Operating Systems	1,2,3,4, 7,12	3	0	-	3
4	21IT404	Computer Networking	1,2,4,5,12,PSO1	3	0	-	3
5	21IT405	Web Technologies	1,2, 3, 5, PSO1, PSO2	3	-	2	4
6	21IT406	Computer Network Programming Laboratory	3,5,9	-	-	3	1.5
7	21IT407	Operating Systems Laboratory	1,2, 3, 5, 9	-	-	3	1.5
8	21ESX01	Employability Skills I	1,2,5,8,10,12	-	-	2	2
9	21HSX11	CC & EC Activities I	6, 7, 9, 10	-	-	1	1
				<b>Total</b>	<b>16</b>	<b>0</b>	<b>10</b>
							<b>22</b>

**Fifth Semester**

1	21CS404	Design and Analysis of Algorithms	1,2,3,4,PSO1	3	-	2	4
2	21IT502	Artificial Intelligence	1, 2,3,4, PSO1, PSO2	3	0	-	3
3	211T503	Cloud Computing	1,2,3,4 5, 6, 7, 8, PSO2	3	0	-	3
4	21IT504	Software Engineering Principles	1,2,3,4,5, PSO2	3	-	2	4
5		Elective I(Professional Elective)		3	0	-	3
6		Elective II (Open Elective I)		3	0	-	3
7	21IT507	Cloud Computing Laboratory	1, 2,3, 4, 5, 9, PSO1	-	-	3	1.5
8	21TPX01	Term Paper	1, 4, 10, 12	-	-	3	1.5
9	21ESX02	Employability Skills II	1,2,5,8,10,12	-	-	2	-
10	21HSX12	CC & EC Activities II	6, 7, 9, 10	-	-	1	-
11	21SIX01	Summer Internship #I	1, 2,,8, 10, 12				1
				<b>Total</b>	<b>19</b>	<b>0</b>	<b>12</b>
							<b>24</b>

**Sixth Semester**

1	21HSX10	Engineering Economics and Project Management	1,10,11	3	0	-	3
2	21IT602	Automata and Compiler Design	1,2,3,4, 12	3	0	-	3
3	21IT603	Machine Learning	1, 2,3,4, PSO1, PSO2	3	0	-	3
4		Elective III (Professional Elective )		3	-	2	4
5		Elective IV (Open Elective II)		3	0	-	3
6	21IT606	Machine Learning Lab using Python	1,2,3,4,5,9 PSO1, PSO2,	-	-	3	1.5
7	21MPX01	Mini Project	All	-	-	3	1.5
8	21ESX02	Employability Skills II	1,2,5,8,10,12	-	-	2	2
9	21HSX12	CC & EC Activities II	6, 7, 9, 10	-	-	1	1
10	21ATX01	Environmental Studies	1, 6, 7, 12	-	-	-	-
11	21ATX02	Professional Ethics and Human Values	-----	-	-	-	-
12		Audit Course	----	-	-	-	-
				<b>Total</b>	<b>16</b>	<b>0</b>	<b>8</b>
							<b>22</b>

**Seventh Semester**

1		Elective V(Professional Elective)		3	0	-	3
2		Elective VI (Professional Elective )		3	0	-	3
3		Elective VII (Open Elective III)		3	0	-	3
4	21PWX01	Project	All	-	-	16	8
5	21SIX02	Summer Internship #II	1, 2, 5, 6, 10, 12	-	-	-	1
				<b>Total</b>	<b>9</b>	<b>0</b>	<b>16</b>
							<b>18</b>

**Eighth Semester**

1		Elective VIII(Professional Elective )		-	-	-	3
2		Elective IX (Open Elective IV)		-	-	-	3
3	21FIX01	Full Semester Internship (FSI)	1, 2, 5, 8, 9,10, 11,PSO1,PSO2	-	-	-	8
				<b>Total</b>	-	-	-
							<b>14</b>

**List of Electives****Language Electives**

No.	Course Code	Course	POs	Contact Hours			
				L	T	P	C
1	21HSX03	Advanced Communicative English	10,12	3	0	-	3
2	21HSX04	Communicative German		3	0	-	3
3	21HSX05	Communicative French		3	0	-	3
4	21HSX06	Communicative Japanese		3	0	-	3
5	21HSX07	Communicative Spanish		3	0	-	3
6	21HSX08	Communicative Korean		3	0	-	3
7	21HSX09	Communicative Hindi		3	0	-	3

**Elective I****Career Path I, II, III and Other Core Electives**

1	21CSC11	Exploratory Data Analytics (AI&ML)	1,2,4,PSO2	3	0	-	3
2	21CSC21	Web Programming Languages (Full Stack Developer)	1, 2,3,5, PSO1,PSO2	3	0	-	3
3	21ITC31	Fundamentals of Security (Cyber Security)	1, 2, 5,PSO1,PSO2	3	0	-	3
4	21IT004	Computer Graphics and Multimedia	2, 3, 5	3	0	-	3
5	21IT005	Information Theory and Coding	1,2,3,6,8	3	0	-	3
6	21IT006	Data Warehousing and Data Mining	2, 3, 4, 5, PSO1	3	0	-	3
7		MOOCs		-	-	-	3

**Elective III****Career Path I, II, III and Other Core Electives**

1	21CSC12	Deep Learning (AI&ML)	1,2,4, PSO1	3	-	2	4
2	21CSC22	Web Application Developments Framework (Full Stack Developer)	1, 3, 4	3	-	2	4
3	21ITC32	Cybernet Security (Cyber Security)	1,3,4,12,PSO1,PSO2	3	-	2	4
4	21IT007	The Internet of Things	1, 2, 3, 5, 10	3	-	2	4
5	21CS008	Cryptography and Network Security	3, 6, 8	3	-	2	4
6	21IT008	User Interface/ User Experience	1, 2, 3, 5, 10	3	-	2	4

**Elective V****Career Path I, II, III and Other Core Electives**

1	21CSC13	Natural Language Processing (AI & ML)	1,2,3,4,12,PSO2	3	0	-	3
2	21CSC23	Web Application Databases (Full Stack Developer)	1,3,5,PSO2	3	0	-	3
3	21ITC33	Cloud Security (Cyber Security)	1,2,4,5,	3	0	-	3
4	21EC602	Digital Signal Processing	1,2, PSO2	3	0	-	3
5	21IT010	Information Retrieval Systems	3,6,8	3	0	-	3
6	21CS005	Mobile Computing	1,3,8	3	0	-	3
7		MOOCs		-	-	-	3

**Elective VI**

1	21IT017	Social Network Analysis	2,4,5,12	3	0	-	3
2	21IT011	Real Time Operating Systems	2,3,12	3	0	-	3
3	21IT012	Digital Image Processing	3,5,6	3	0	-	3
4	21IT014	Distributed Systems	2, 7, 12	3	0	-	3
5	21CS012	Wireless Ad hoc Networks	1,2,3,6,7,10	3	0	-	3
6	21CS015	Software Project Management	1,2,3,11,12, PSO2	3	0	-	3
7		MOOCs		-	-	-	3

**Elective VIII: Professional Elective**

1	21CS014	Green Computing	2,3,6,7	-	-	-	3
1	21IT013	Design Patterns	2,3,5	-	-	-	3
3	21IT016	Professional Ethics	1, 6,8,12	-	-	-	3
4		MOOCs	-	-	-	-	3

**Open Elective I, II, III, and IV (Elective II, IV, VII, and IX)**

1	21CE001	Disaster Management	2,7	3	-	-	3
2	21EE001	Electrical Installation, Safety and Auditing	2,3,6,8	3	-	-	3
3	21ME001	Fundamentals of Optimization Techniques	1,2,5,3	3	-	-	3

4	21EC001	Sensors for Engineering Applications	1,2	3	-	-	3
5	21CS001	Fundamentals of Artificial Intelligence	1,2,3	3	-	-	3
6	21CH001	Energy Conversion and Storage Devices	1,3,6,7	3	-	-	3
7	21IT001	Fundamentals of Multimedia	3,5,7	3	-	-	3
8	21BS001	Nano Materials and Technology	1,2	3	-	-	3
9	21DS001	Fundamentals of Data Science	1,2	3	-	-	3
10	21CE002	Air Pollution and Environmental Impact Assessment	6,7,12	3	-	-	3
11	21EE002	Renewable Energy Sources	2,7	3	-	-	3
12	21ME002	Principles of Entrepreneurship	1,5,8,11	3	-	-	3
13	21EC002	Electronics for Agriculture	1,2	3	-	-	3
14	21CS002	Fundamentals of Machine Learning	2,5	3	-	-	3
15	21CH002	Industrial Safety and Hazard Management	1,2,3,6,8	3	-	-	3
16	21IT002	Fundamentals of Cloud Computing	2,6,7,8,12	3	-	-	3
17	21BS002	Advanced Numerical Techniques	1,2	3	-	-	3
18	21BS003	Functional Materials and Applications	1,7	3	-	-	3
19	21CE003	Solid Waste Management	3,7,12	3	-	-	3
20	21EE003	Fundamentals of Electrical Vehicle Technology	2,3,12	3	-	-	3
21	21ME003	Industrial Engineering and Management	1,5,8	3	-	-	3
22	21CS003	Interfacing and Programming with Arduino	1,4	3	-	-	3
23	21DS003	Data Science for Engineering Applications	2,3,4	3	-	-	3
24	21CH003	Industrial Ecology for Sustainable Development	2,6,7	3	-	-	3
25	21IT003	Fundamentals of Mobile Computing	1,7	3	-	-	3
26	21BS004	Advanced Materials for Renewable Energy	1,2	3	-	-	3
27	21BS005	Applied Linear Algebra for Engineers	1,2	3	-	-	3
28	21CE019	Green Buildings	1,7,12	3	-	-	3
29	21EE017	Sustainable Energy	2,3,12	3	-	-	3
30	21ME019	Total Quality Management	1,2,5,8	3	-	-	3
31	21EC011	Communication Technologies	1,2	3	-	-	3
32	21CS020	Applications of Artificial Intelligence	2,3,6,7	3	-	-	3
33	21CH016	Green Technologies	2,6,7	3	-	-	3
34	21IT015	Human Computer Interaction	1,7	3	-	-	3
35	21BS006	Handling of Industrial waste and waste water	3,7	3	-	-	3
36	21OE001	Robotics and Automation	5,6,7	3	-	-	3
37	21OE002	Introduction to IoT	1,2	3	-	-	3
38	21OE003	Fundamentals of Image Processing	1,2	3	-	-	3
39	21OE004	Fundamentals of Data Acquisition Systems	1,2	3	-	-	3
40	21OE005	Airport Operations Management	2,4,11,12	3	-	-	3
41	21OE006	Fundamentals of Embedded Systems	1,2,10	3	-	-	3
42	21OE007	Remote Sensing and GIS	1,2,5,7,10	3	-	-	3
43	21OE008	Big Data Analytics	1,7	3	-	-	3
44	21OE009	Fundamentals of Cyber Security	3,6,8	3	-	-	3
45	21OE010	Smart Cities	1,7,12	3	-	-	3
46	21OE011	Nano Materials and Thin Film Technology	1,2	3	-	-	3
47	21CSMC1	Cloud Computing	1,2,3	3	-	-	3
48	21CSMC2	Ethical Hacking	1,2,3	3	-	-	3
49	21CSMC3	Fundamentals of Web Development	1,2,3	3	-	-	3
50	21OE012	Business Intelligence & Analytics	1,2	3	-	-	3
51	21OE013	Introduction to Industry 4.0 and Industrial IoT	2,3	3	-	-	3
52	21OE014	Natural Language Processing	2,3	3	-	-	3
53	21OE015	Affective Computing	1,2,3,4	3	-	-	3
54	21OE016	Principles of Data Science	1,2	3	-	-	3
<b>Audit Course</b>							
1	21AT001	Communication Etiquette in Workplaces					
2	21AT002	Contemporary India: Economy, Policy and Society					
3	21AT003	Design The Thinking					
4	21AT004	Ethics and Integrity					
5	21AT005	Indian Heritage and Culture					
6	21AT006	Intellectual Property Rights					

7	21AT007	Introduction to Journalism
8	21AT008	Mass Media Communication
9	21AT009	Science, Technology and Development
10	21AT010	Social Responsibility
11	21AT011	The Art of Photography and Film Making
12	21AT012	Gender Equality for Sustainability
13	21AT013	Women in Leadership
14	21AT014	Introduction to Research Methodology
15	21AT015	Climatic Change and Circular Economy