Sanjay Ghodawat University Kolhapur



School of Engineering and Technology

Department of Artificial Intelligence & Data Science

B. Tech. Artificial Intelligence & Data Science

Curriculum Structure (R25)

Semester: I-VIII

Programme Structure for B Tech.: First Year Artificial Intelligence & Data Science

Semester I: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total Credits
UADPC101	Web Application Development I	4	-	-	4	-	-	4
UADPC102	Computer Programming	4	-	-	4	-	-	4
UADPC103	Introduction to Generative AI	1	2	-	1	1	-	2
USTBS104	Mathematics for Computer Science	2	-	1	2	-	1	3
UADAE103	Quantitative Aptitude	2	2	-	2	1	-	3
UHSAE006	Communication English Foundation	1	2	-	1	1	-	2
UADPC104	Web Application Development I Laboratory	-	2	-	-	1	-	1
UADPC105	Computer Programming Laboratory	-	4	-	-	2	-	2
	Total	**14**	**12**	**1**	**14**	**6**	**1**	**21**

Semester I: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work / Tutorial	Practical Oral/ POE	
		T1	T2	FET	Total				
UADPC101	Web Application Development I	10	10	5	25	75	-	-	100
UADPC102	Computer Programming	10	10	5	25	75	-	-	100
UADPC103	Introduction to Generative AI	10	10	5	25	-	25	-	50
USTBS104	Mathematics for Computer Science	-	10	5	15	35	25	-	75
UADAE103	Quantitative Aptitude	-	10	5	15	35	25	-	75
UHSAE006	Communication English Foundation	10	10	5	25	-	25	-	50
UADPC104	Web Application Development I Laboratory	-	-	-	-	-	25	-	25
UADPC105	Computer Programming Laboratory	-	-	-	-	-	25	25	50
								Total	**525**

Programme Structure for B Tech.: First Year Artificial Intelligence & Data Science

Semester II: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total Credits
UADPC201	Web Application Development II	3	-	-	3	-	-	3
UADPC202	Database Management System	3	-	-	3	-	-	3
UADPC203	Data Structures	4	-	-	4	-	-	4
UADPC204	Building LLM Applications	1	2	-	1	1	-	2
UADAE201	Numerical Ability	2	-	-	2	-	-	2
UHSAE007	Communicative English Advanced	1	2	-	1	1	-	2
USTBS206	Modern Physics	2	-	-	2	-	-	2
UADPC205	Database Management Systems Laboratory	-	2	-	-	1	-	1
UADPC206	Web Application Development II Laboratory	-	2	-	-	1	-	1
UADPC207	Data Structures Laboratory	-	4	-	-	2	-	2
Total		**16**	**12**	**-**	**14**	**8**	**-**	**22**

Semester II: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work/ Tutorial	Practical Oral/POE	
		T1	T2	FET	Total				
UADPC201	Web Application Development II	10	10	5	25	50	-	-	75
UADPC202	Database Management System	10	10	5	25	50	-	-	75
UADPC203	Data Structures	10	10	5	25	75	-	-	100
UADPC204	Building LLM Applications	-	10	5	15	35	-	-	50
UADAE201	Numerical Ability	10	10	5	25	-	25	-	50
UHSAE007	Communicative English Advanced	10	10	5	25	-	25	-	50
USTBS206	Modern Physics	-	10	5	15	35	-	-	50
UADPC205	Database Management Systems Laboratory	-	-	-	-	-	25	-	25
UADPC206	Web Application Development II Laboratory	-	-	-	-	-	25	-	25
UADPC207	Data Structures Laboratory	-	-	-	-	-	25	25	50
								Total	**550**

Programme Structure R25 for B.Tech. :Second Year Artificial Intelligence and Data Science

Semester III: Teaching Scheme

Course code	Course name	Teaching scheme (Hrs/week)			Credits assigned			Total credits
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
UADPC301	Server Side Engineering	3	-	-	3	-	-	3
UADPC302	Design and Analysis of Algorithms	3	-	-	3	-	-	3
UADPC303	Probability and Statistics	3	-	-	3	-	-	3
UXXMM0XX	Multidisciplinary Minor I	2	-	-	2	-	-	2
UXXOE01X	Open Elective I	1	2	-	-	2	-	2
UADAE301	Logical Reasoning	2	-	-	2	-	-	2
UADPC304	Server Side Engineering Laboratory	-	2	-	-	1	-	1
UADPC305	Design and Analysis of Algorithms Laboratory	-	4	-	-	2	-	2
UADFP301	Field Project	-	4	-	-	2	-	2
UISCC0XX	Co-Curricular Courses I	-	4	-	-	2	-	2
Total		**14**	**16**	**-**	**13**	**9**	**-**	**22**

Semester III: Evaluation Scheme

Course code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work / Tutorial	Practical Oral/POE	
		T1	T2	FET	Total				
UADPC301	Server Side Engineering	10	10	5	25	50	-	-	75
UADPC302	Design and Analysis of Algorithms	10	10	5	25	50	-	-	75
UADPC303	Probability and Statistics	10	10	5	25	50	-	-	75
UXXMM0XX	Multidisciplinary Minor I	-	10	5	15	35	-	-	50
UXXOE01X	Open Elective I	-	-	-	-	-	50	-	50
UADAE301	Logical Reasoning	-	10	5	15	35	-	-	50
UADPC304	Server Side Engineering Laboratory	-	-	-	-	-	25	-	25
UADPC305	Design and Analysis of Algorithms Laboratory	-	-	-	-	-	25	25	50
UADFP301	Field Project	-	-	-	-	-	25	25	50
UISCC0XX	Co-Curricular Courses I	-	-	-	-	-	50	-	50
								Total	**550**

Programme Structure R25 for B.Tech. :Second Year Artificial Intelligence and Data Science

Semester IV: Teaching Scheme

Course code	Course Name	Teaching scheme (Hrs/week)			Credits assigned			Total credits
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
UADPC401	Operating Systems	2	-	-	2	-	-	2
UADPC402	Computer Networks	2	-	-	2	-	-	2
UADPC403	Advanced Algorithms & Optimization	3	-	-	3	-	-	3
UXXMM0XX	Multidisciplinary Minor II	2	-	-	2	-	-	2
UXXOE02X	Open Elective II	1	2	-	-	2	-	2
UADAE401	Advanced Aptitude	3	-	-	3	-	-	3
USTBS401	Linear Algebra and Calculus	3	-	-	3	-	-	3
UADPC404	Operating Systems Laboratory	-	2	-	-	1	-	1
UADPC405	Computer Networks Laboratory	-	2	-	-	1	-	1
UADPC406	Advanced Algorithms & Optimization Laboratory	-	2	-	-	1	-	1
UISCC0XX	Co-Curricular Courses II	-	4	-	-	2	-	2
Total		**16**	**12**	-	**15**	**7**	-	**22**

Semester IV: Evaluation Scheme

Course code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work / Tutorial	Practical Oral /POE	
		T1	T2	FET	Total				
UADPC401	Operating Systems	-	10	5	15	35	-	-	50
UADPC402	Computer Networks	-	10	5	15	35	-	-	50
UADPC403	Advanced Algorithms & Optimization	10	10	5	25	50	-	-	75
UXXMM0XX	Multidisciplinary Minor II	-	10	5	15	35	-	-	50
UXXOE02X	Open Elective II	-	-	-	-	-	50	-	50
UADAE401	Advanced Aptitude	10	10	5	25	50	-	-	75
USTBS401	Linear Algebra and Calculus	10	10	5	25	50	-	-	75
UADPC404	Operating Systems Laboratory	-	-	-	-	-	25	-	25
UADPC405	Computer Networks Laboratory	-	-	-	-	-	25	-	25
UADPC406	Advanced Algorithms & Optimization Laboratory	-	-	-	-	-	25	-	25
UISCC0XX	Co-Curricular Courses II	-	-	-	-	-	50	-	50
								Total	**550**

Exit Option:

- Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.
- Students exiting the Second Year Programme after securing minimum 80credits will be awarded UG Diploma in the relevant Discipline /Subject provided they secure additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc) offered during summer vacation after the second year.

Programme Structure for B Tech.: Third Year Artificial Intelligence & Data Science

Semester V: Teaching Scheme

Course code	Course name	Teaching scheme (Hrs/week)			Credits assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total Credits
UADPC501	Machine Learning	3	-	-	3	-	-	3
UADPC502	Practical Software Engineering	3	-	-	3	-	-	3
UADPC503	Data Visualisation Tools	3	-	-	3	-	-	3
UXXMM0XX	Multidisciplinary Minor III	2	-	-	2	-	-	2
UADPE001	Program Elective I	3	-	-	3	-	-	3
UXXOE03X	Open Elective III	2	-	-	2	-	-	2
UADPC504	Practical Software Engineering Laboratory	-	2	-	-	1	-	1
UADPC505	Machine Learning Laboratory	-	4	-	-	2	-	2
UADOT501	Project / Internship	-	8	-	-	4	-	4
UHSVE002	Universal Human Values-I	-	-	-	-	-	-	Audit
Total		**16**	**14**	**-**	**16**	**7**	**-**	**23**

Semester V: Evaluation Scheme

Course code	Course name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE			
		T1	T2	FET	Total		Term work / Tutorial	Practical Oral/POE	
UADPC501	Machine Learning	10	10	5	25	50	-	-	75
UADPC502	Practical Software Engineering	10	10	5	25	50	-	-	75
UADPC503	Data Visualization Tools	10	10	5	25	50	-	-	75
UXXMM0XX	Multidisciplinary Minor III	-	10	5	15	35	-	-	50
UADPE001	Program Elective 1	10	10	5	25	50	-	-	75
UXXOE03X	Open Elective III	-	10	5	15	35	-	-	50
UADPC504	Practical Software Engineering Laboratory	-	-	-	-	-	25	-	25
UADPC505	Machine Learning Laboratory	-	-	-	-	-	25	25	50
UADOT501	Project / Internship	-	-	-	-	-	75	25	100
UHSVE002	Universal Human Values-I	-	-	-	-	-	-	-	Audit
								Total	**575**

Programme Structure for B Tech.: Third Year Artificial Intelligence & Data Science

Semester VI: Teaching Scheme

Course code	Course name	Teaching scheme (Hrs/week)			Credits assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total credits
UADPC601	Cloud Computing	3	-	-	3	-	-	3
UADPC602	Deep Learning	4	-	-	4	-	-	4
UXXMM0XX	Multidisciplinary Minor IV	2	-	-	2	-	-	2
UADPE002	Program Elective II	3	-	-	3	-	-	3
UHSAE002	Communicative English B2 Proficiency	2	-	-	2	-	-	2
USTVE004	Environmental Science and Sustainability	2	-	-	2	-	-	2
UHSVE003	AI Ethics & Governance	2	-	-	2	-	-	2
UADPC603	Cloud Computing Laboratory	-	2	-	-	1	-	1
UADPC604	Deep Learning Laboratory	-	4	-	-	2	-	2
Total		**18**	**6**	**-**	**18**	**3**	**-**	**21**

Semester VI: Evaluation Scheme

Course code	Course name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE			
		T1	T2	FET	Total		Term work / Tutorial	Practical Oral/POE	
UADPC601	Cloud Computing	10	10	5	25	50	-	-	75
UADPC602	Deep Learning	10	10	5	25	75	-	-	100
UXXMM0XX	Multidisciplinary Minor IV	-	10	5	15	35	-	-	50
UADPE002	Program Elective II	10	10	5	25	50	-	-	75
UHSAE002	Communicative English B2 Proficiency	-	10	5	15	35	-	-	50
USTVE004	Environmental Science and Sustainability	-	10	5	15	35	-	-	50
UHSVE003	AI Ethics & Governance	-	10	5	15	35	-	-	50
UADPC603	Cloud Computing Laboratory	-	-	-	-	-	25	-	25
UADPC604	Deep Learning Laboratory	-	-	-	-	-	25	25	50
								Total	**525**

Exit Option:

- Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.
- Students exiting the 3-year UG program will be awarded B.Voc. in the relevant Discipline /Subject upon securing minimum 120 credits with additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc.) during summer vacation after the sixth semester.

Programme Structure for B Tech.: Fourth Year Artificial Intelligence & Data Science

Semester VII: Teaching Scheme

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Course code	Course name	Teaching scheme (Hrs/week)			Credits assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total Credits
UADPC701	Distributed Systems with High-Level System Design	4	-	-	4	-	-	4
UADPE003	Program Elective III	3	-	-	3	-	-	3
UADPE004	Program Elective IV	3	-	-	3	-	-	3
UXXMM0XX	Multidisciplinary Minor V	2	-	-	2	-	-	2
UADPC702	Distributed Systems with High-Level System Design Laboratory	-	4	-	-	2	-	2
UADPR701	Capstone Project	-	8	-	-	4	-	4
UHSVE001	Constitution of India	2	-	-	2	-	-	2
Total		**14**	**12**	**-**	**14**	**6**	**-**	**20**

Semester VII: Evaluation Scheme

Course code	Course name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work / Tutorial	Practical Oral/POE	
		T1	T2	FET	Total				
UADPC701	Distributed Systems with High-Level System Design	10	10	5	25	75	-	-	100
UADPE003	Program Elective III	10	10	5	25	50	-	-	75
UADPE004	Program Elective IV	10	10	5	25	50	-	-	75
UXXMM0XX	Multidisciplinary Minor V		10	5	15	35	-	-	50
UADPC702	Distributed Systems with High-Level System Design Laboratory		-	-	-	-	25	25	50
UADPR701	Capstone Project		-	-	-	-	50	50	100
UHSVE001	Constitution of India	10	-	5	15	35	-	-	50
								Total	**500**

Programme Structure for B Tech.: Fourth Year Artificial Intelligence & Data Science

Semester VIII: Teaching Scheme

Course code	Course name	Teaching scheme			Credits assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total credits
UADPC801	Productionisation of ML systems	4	-	-	4	-	-	4
UXXMM0XX	Multidisciplinary minor VI	2	-	-	2	-	-	2
UADPC802	Productionisation of ML systems Laboratory	-	4	-	-	2	-	2
UADOT801	Capstone Project/Internship	-	24	-	-	12	-	12
Total		**6**	**28**	**-**	**6**	**14**	**-**	**20**

Semester VIII: Evaluation Scheme

Course code	Course name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE			
		T1	T2	FET	Total		Term work / Tutorial	Practical Oral/POE	
UADPC801	Productionisation of ML systems	10	10	5	25	75	-	-	100
UXXMM0XX	Multidisciplinary minor VI	-	10	5	15	35	-	-	50
UADPC802	Productionisation of ML systems Laboratory	-	-	-	-	-	25	25	50
UADOT801	Capstone Project/Internship		-	-	-	-	200	100	300
								Total	**500**

Note:

- Minimum passing is 40% for all courses and evaluation head mentioned above. FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, Term Work , SEE - Semester End Examination, P/F – Pass/ Fail Course, AU – Audit Course
- The Program Elective V and Multidisciplinary Minor VI shall be conducted in online mode, by faculty of SGU or other institute/ University. Students can also opt a course from MOOCs platforms such as SWAYAM, NPTEL, Coursera etc. In case there is no assessment and examination conducted by the MOOCs platforms then the assessment and examination will be conducted by SGU.
- Additional Credits for Bachelor's Degree- with Double Minor :12 Credits.
  These are additional credits to be offered from the second year to the final year and will be offered as an option to students.
- Additional Credits for Bachelor's Degree- with Honors: 16-20 Credits.
  These are additional credits from same domain to be offered from the second year to the final year and will be offered as an option to students.
- Additional Credits for Bachelor's Degree- Honors with Research: Minimum 16-20 Credits.
  These are additional credits to be offered in the final year and will be offered as an option to students.

List of Co-curricular courses I & II	
Course Code	**Course Name**
UISCC011	Introduction to National Service Scheme
UISCC012	Regular & Special Camp Activity
UISCC021	Indian Music
UISCC022	Fine Arts
UISCC023	Indian Dance
UISCC031	Physical Fitness
UISCC032	Yoga & Meditation

Program Electives						
Program Elective	**Vertical I (Physical AI)**		**Vertical II (Data Analytics)**		**Vertical III (Avionics and Drone Technology)**	
	Code	**Course**	**Code**	**Course**	**Code**	**Course Name**
I	UADPE511	Applied IoT	UADPE521	Data Analytics using Tableau	UADPE531	Foundations of Agentic AI
II	UADPE611	Robot Operating System Essentials	UADPE621	Deep Learning for Computer Vision	UADPE631	Prompting & Tool-Using Agents
III	UADPE711	Autonomous Mobile Robots	UADPE721	Deep Learning for Natural Language Processing	UADPE731	Multi-Agent Systems & Planning
IV	UADPE712	Robot Learning	UADPE722	Data Analytics using Power BI	UADPE732	Agent Deployment & Autonomous Systems

Minor Tracks for School of Engineering & Technology (UG)

No.	Minor	School/Department	Credits
1.	Avionics Engineering	Aerospace Engineering	12
2	Space Technology		12
3	Drone Technology		12
4	Data Science	AIML	12
		Civil Engineering	12
		Computer Science and Engineering	12
		Electronics and Communication Engineering	12

Note:

- Students are advised to select the minor track from the above list.
- Students are not allowed to select the minor track from the same department offering the major courses.
- For the details of the Structure, **Syllabus**, Teaching, and Evaluation Scheme, Students should refer to the **Syllabus** section of the respective department offering the minor tracks.

Multidisciplinary Minor	Courses
I	AI Applications in Banking and Finance
II	Production of AI systems Using LLMs
III	Full stack AI Application
IV	AI for Product Management
V	Generative AI Models
VI	Physical AI & Embedded Systems

Open Elective I				
No.	**Course Code**	**Course**	**Faculty/School /Department**	**Credits**
1	UAEOE011	Basic Aeronautical Engineering	Department of Aerospace Engg.	2
2	UAIOE011	Software Models	Department of AIML	2
3	UCEOE011	Advanced Building Materials	Department of Civil Engg.	2
4	UCSOE011	Introduction to Latex	Department of Comp. Sc. & Engg.	2
5	UECOE011	Semiconductor Devices	Department of Elect. & Comm. Engg.	2
6	UCAOE012	Python Programming	School of Computer Applications	2
7	UPHOE011	World of Nano Science	School of Physical & Chemical Sciences	2
8	UFSOE012	Basics of Food Processing	Department of Food Science & Technology	2
9	UDCOE011	Selling Skills	Department of Commerce	2
10	UBAOE011	Basics of Marketing	Department of Management	2
11	UAROE011	Introduction To GIS	Department of Social Sciences	2
12	UAROE012	Applied Communicative English	Department of Social Sciences	2
13	UBTOE011	Introduction to Biotechnology	Department of Bio Technology	2
Open Elective II				
1	UAEOE021	Aircraft Systems and Instruments	Department of Aerospace Engg.	2
2	UAIOE021	Introduction to Python	Department of AIML	2
3	UCEOE021	Green Building	Department of Civil Engg.	2
4	UCSOE021	Advance Microsoft Office	Department of Comp. Sc. & Engg.	2
5	UECOE021	Fundamentals of Communication Engineering	Department of Elect. & Comm. Engg.	2
6	UCAOE022	Data Analytics Tools	School of Computer Applications	2
7	UPHOE021	Wonders in Nanotechnology	School of Physical & Chemical Sciences	2
8	UFSOE022	Bakery and Confectionary Skills	Department of Food Science & Technology	2
9	UDCOE021	Financial Literacy	Department of Commerce	2
10	UBAOE021	Export- Import Documentation and Procedures	Department of Management	2
11	UAROE021	Tourism & Travel Management	Department of Social Sciences	2
12	UAROE022	Language Analytics	Department of Social Sciences	2
13	UBTOE021	Basics in Bioinformatics	Department of Bio Technology	2
Open Elective III				
1	UAEOE031	Unmanned Aerial Vehicle	Department of Aerospace Engg.	2
2	UAIOE031	Introduction to Data Analytics	Department of AIML	2
3	UCEOE031	Disaster Management & Mitigation	Department of Civil Engg.	2
4	UCSOE031	Fundamental of C Programming	Department of Comp. Sc. & Engg.	2
5	UECOE031	Automotive Electronics	Department of Elect. & Comm. Engg.	2
6	UCAOE032	Data Visualization Techniques using Tableau	School of Computer Applications	2
7	UCHOE031	Green Chemistry & Sustainability	School of Physical & Chemical Sciences	2
8	UFSOE032	Basics of Food Adulteration	Department of Food Science & Technology	2
9	UDCOE031	Personal Financial Planning	Department of Commerce	2
10	UBAOE031	Event Management	Department of Management	2
11	UAROE031	English for Competitive Examinations	Department of Social Sciences	2
12	UAIOE032	Agentic AI	Department of AIML	2
13	UBTOE031	Microbial World and Its Applications	Department of Bio Technology	2

Note: For details of Syllabus, Teaching and Evaluation scheme, please refer to the structure and Syllabus of respective departments.