SGT University, Chandu-Budhera, Gurugram

Faculty of Engineering & Technology

Department of Computer Science &Engineering

Bachelor of Computer Applications

Artificial Intelligence & Machine Learning

Scheme & Syllabus (2021-22 Onwards)

Vision of SGT University

"Driven by Research & Innovation, we aspire to be amongst the top ten Universities in the Country by 2022"

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Budhera, Gurugram

Bachelor of Computer Application(Artificial Intelligence & Machine Learning)

S. No.	Subject Code	Subject Name	Semester	L	T	P	C	Category A (Core/ ID/ VAC	Category B (Compulsory / DE/ BSC/ EAS/ OE/ MC/ II/ MOOC)	Internal	External	Theory/ Practical
1		Discrete Mathematics	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
2		Computer Fundamental	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
3		Entrepreneurship	1ST	3	0	0	3	ID	EAS	40	60	Theory
4		Object Oriented Programming	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
5		Artificial Intelligence-Present and Future	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
6		Computer Fundamental Lab	1ST	0	0	2	1	Core	Compulsory	60	40	Practical
7		Object Oriented Programming Lab	1ST	0	0	2	1	Core	Compulsory	60	40	Practical
8		Professional Communication Lab	1ST	0	0	2	1	ID	EAS	60	40	Practical
9		Mandatory Course- I	1st	2	0	0	2	ID	MC	40	60	Theory
10		Value Addition Courses-I	1st	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**19**	**0**	**6**	**22**					
1		Introduction to Artificial Intelligence & Machine Learning	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
2		Java Programming	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
3		Basics of Data Structure	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
4		Web Development	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
5		Computer Architecture	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
6		Medical Measurement & Measuring Instruments	2ND	3	0	0	3	ID	EAS	40	60	Theory
7		Java Programming Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
8		Basics of Data Structure Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
9		Web Development Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
10		Industrial Internship-I	2ND	0	0	4w	2	Core	I	60	40	Practical
		Total	2ND	**18**	**0**	**6**	**23**					
1		Database Management Systems	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
2		Software Engineering	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
3		Programming Language –Python	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-I	3RD	3	0	0	3	Core	DE	40	60	Theory
5		Open Elective-I	3RD	4	0	0	4	ID	OE	40	60	Theory
6		Database Management Systems Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
7		Software Engineering Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
8		Programming Language –Python Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
9		Department Electives Lab-I	3RD	0	0	2	1	Core	DE	60	40	Practical
11		Value Addition Course-II	3rd	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**18**	**0**	**8**	**22**					

1		Operating System	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Design and Analysis of Algorithm	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
3		Probabilistic modeling and reasoning with Python	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-II	4TH	3	0	0	3	Core	DE	40	60	Theory
5		Mandatory Course - II	4TH	2	0	0	2	ID	MC	40	60	Theory
6		Medical imaging techniques	4TH	3	0	0	3	ID	EAS	40	60	Theory
7		Operating System Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
8		Design and Analysis of Algorithm Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Probabilistic modeling and reasoning with Python Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
10		Department Electives Lab-II	4TH	0	0	2	1	Core	DE	60	40	Practical
11		Industrial Internship-II	4TH	0	0	4w	2	Core	II	60	40	Practical
		Total		**17**	**0**	**8**	**23**					
1		Theory of Computation	5TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Artificial Intelligence	5TH	3	0	0	3	Core	Compulsory	40	60	Theory
3		Machine learning and Pattern recognition	5TH	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-III	5TH	3	0	0	3	Core	DE	40	60	Theory
5		Open Elective-II	5TH	4	0	0	4	ID	OE	40	60	Theory
6		Medical informatics	5TH	3	0	0	3	ID	EAS	40	60	Theory
7		Artificial Intelligence Lab	5TH	0	0	4	2	Core	Compulsory	60	40	Practical
8		Machine learning and Pattern recognition Lab	5TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Department Electives Lab-III	5TH	0	0	2	1	Core	DE	60	40	Practical
10		Value Addition Course-III	5th	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**21**	**0**	**8**	**25**					
1		Compiler Design	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Data Science tools & Techniques	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
3		Machine learning with Python, sclkit-learn, Matplotlib, Tensor Flow	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-IV	6TH	3	0	0	3	Core	DE	40	60	Theory
5		Open Elective-III	6TH	4	0	0	4	ID	OE	40	60	Theory
6		Compiler Design Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
7		Data Science tools & Techniques Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
8		Machine learning with Python, sclkit-learn, Matplotlib,Tensor Flow Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Mandatory Course - III	6TH	2	0	0	2	ID	MC	40	60	Theory
		Total		**18**	**0**	**6**	**21**					
		Overall Total	**1st to 6th**				**136**					

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Note:
1. Mooc Course: Student will be offered various available SWAYAM MOOC Courses in leiu of various regular core (Compulsary and Department Electives) courses. A student can opt maximum of
2. Student can opt for Honours degree by earning 18 - 20 additional credits through SWAYAM MOOC courses but with prior permission of the department and limit to the courses related to the
3. A student can have Honours degree WITH SPECIALIZATION in the particular of his/her branch by earning 18-20 additional credits in particular specialization through MOOC or Departmental
4. Courses Highlighted in green need to be fixed according to the group (ME+CE in one group and CSE+ECE other group. Value added, RM and Mandatory courses also need to be fixed in numbers

Abbrevation Used:	
ID	Interdisciplinary
VAC	Value Addition Course
DE	Department Electives
BSC	Basic Science Courses
EAS	Engineering Applied Science
II	Industrial Internship
MC	Mandatory Courses

Credit	
Core	99
Other (Interdisciplinary	37
Total	**136**

Core Credits	
Compulsory	80
Department Electives	15
Industrial	4
Total	**99**

Other Credits	
Interdisciplinary	25
VAC	6
MC	6
Total	**37**

Interdisciplinary Credits	
Engineering Applied Science	13
Open Elective	12
Total	**25**

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Bachelor of Computer Application(Artificial Intelligence & Machine Learning with Research)

S. No.	Subject Code	Subject Name	Semester	L	T	P	C	Category A (Core/ ID/ VAC	Category B (Compulsory/ DE/ BSC/ EAS/ OE/ MC/ II/ MOOC)	Internal	External	Theory/ Practical
1		Discrete Mathematics	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
2		Computer Fundamental	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
3		Entrepreneurship	1ST	3	0	0	3	ID	EAS	40	60	Theory
4		Object Oriented Programming	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
5		Artificial Intelligence-Present and Future	1ST	3	0	0	3	Core	Compulsory	40	60	Theory
6		Computer Fundamental Lab	1ST	0	0	2	1	Core	Compulsory	60	40	Practical
7		Object Oriented Programming Lab	1ST	0	0	2	1	Core	Compulsory	60	40	Practical
8		Professional Communication Lab	1ST	0	0	2	1	ID	EAS	60	40	Practical
9		Mandatory Course- I	1st	2	0	0	2	ID	MC	40	60	Theory
10		Value Addition Courses-I	1st	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**19**	**0**	**6**	**22**					
1		Introduction to Artificial Intelligence & Machine Learning	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
2		Java Programming	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
3		Basics of Data Structure	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
4		Web Development	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
5		Computer Architecture	2ND	3	0	0	3	Core	Compulsory	40	60	Theory
6		Medical Measurement & Measuring Instruments	2ND	3	0	0	3	ID	EAS	40	60	Theory
7		Java Programming Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
8		Basics of Data Structure Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
9		Web Development Lab	2ND	0	0	2	1	Core	Compulsory	60	40	Practical
10		Industrial Internship-I	2ND	0	0	4w	2	Core	I	60	40	Practical
		Total	2ND	**18**	**0**	**6**	**23**					
1		Database Management Systems	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
2		Software Engineering	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
3		Programming Language –Python	3RD	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-I	3RD	3	0	0	3	Core	DE	40	60	Theory
5		Open Elective-I	3RD	4	0	0	4	ID	OE	40	60	Theory
6		Database Management Systems Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
7		Software Engineering Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
8		Programming Language –Python Lab	3RD	0	0	2	1	Core	Compulsory	60	40	Practical
9		Department Electives Lab-I	3RD	0	0	2	1	Core	DE	60	40	Practical
10		Value Addition Course-II	3rd	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**18**	**0**	**8**	**22**					

1		Operating System	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Design and Analysis of Algorithm	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
3		Probabilistic modeling and reasoning with Python	4TH	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-II	4TH	3	0	0	3	Core	DE	40	60	Theory
5		Mandatory Course - II	4TH	2	0	0	2	ID	MC	40	60	Theory
6		Medical imaging techniques	4TH	3	0	0	3	ID	EAS	40	60	Theory
7		Operating System Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
8		Design and Analysis of Algorithm Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Probabilistic modeling and reasoning with Python Lab	4TH	0	0	2	1	Core	Compulsory	60	40	Practical
10		Department Electives Lab-II	4TH	0	0	2	1	Core	DE	60	40	Practical
11		Industrial Internship-II	4TH	0	0	4w	2	Core	II	60	40	Practical
		Total		**17**	**0**	**8**	**23**					
1		Theory of Computation	5TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Artificial Intelligence	5TH	3	0	0	3	Core	Compulsory	40	60	Theory
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7		Artificial Intelligence Lab	5TH	0	0	4	2	Core	Compulsory	60	40	Practical
8		Machine learning and Pattern recognition Lab	5TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Department Electives Lab-III	5TH	0	0	2	1	Core	DE	60	40	Practical
11		Value Addition Course-III	5th	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**21**	**0**	**8**	**25**					
1		Compiler Design	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
2		Data Science tools & Techniques	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
3		Machine learning with Python, sclkit-learn, Matplotlib, Tensor Flow	6TH	3	0	0	3	Core	Compulsory	40	60	Theory
4		Department Electives-IV	6TH	3	0	0	3	Core	DE	40	60	Theory
5		Open Elective-III	6TH	4	0	0	4	ID	OE	40	60	Theory
6		Compiler Design Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
7		Data Science tools & Techniques Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
8		Machine learning with Python, sclkit-learn, Matplotlib,Tensor Flow Lab	6TH	0	0	2	1	Core	Compulsory	60	40	Practical
9		Mandatory Course - III	6TH	2	0	0	2	ID	MC	40	60	Theory
		Total		**18**	**0**	**6**	**21**					

1		Programming in Python	7th	3	0	0	3	Core	Compulsory	40	60	Theory
2		Research Methodology	7th	3	0	0	3	ID	EAS	40	60	Theory
3		DE-V	7th	3	0	0	3	Core	DE	40	60	Theory
4		OE-IV	7th	4	0	0	4	ID	OE	40	60	Theory
5		Mobile App Development	7th	3	0	0	3	Core	Compulsory	40	60	Theory
6		Programming in Python Lab	7th	0	0	4	2	Core	Compulsory	60	40	Practical
7		DE-V Lab	7th	0	0	2	1	Core	DE	60	40	Practical
8		Mobile App Development Lab	7th	0	0	2	1	Core	Compulsory	60	40	Practical
9		Value Addition Course-IV	7th	2	0	0	2	VAC	VAC	40	60	Theory
		Total		**18**	**0**	**8**	**22**					
1		DE-VI	8th	3	0	0	3	Core	Compulsory	40	60	Theory
2		Embedded systems in Medicine	8th	3	0	0	3	ID	EAS	40	60	Theory
3		DE-VI Lab	8th	0	0	4	2	Core	Compulsory	60	40	Practical
4		Dissertation	8th	0	0		12	Core	Research Track	100	100	Practical
		Total		**6**	**0**	**4**	**20**					
		Overall Total	**1st to 8th**				**178**					

Note:

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2. Student can opt for Honours degree by earning 18 - 20 additional credits through SWAYAM MOOC courses but with prior permission of the department and limit to the courses related to the
3. A student can have Honours degree WITH SPECIALIZATION in the particular of his/her branch by earning 18-20 additional credits in particular specialization through MOOC or Departmental
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Abbrevation Used:

ID	Interdisciplinary
VAC	Value Addition Course
DE	Department Electives
BSC	Basic Science Courses
EAS	Engineering Applied Science
II	Industrial Internship
MC	Mandatory Courses

Credit	
Core	129
Other (Interdis	49
Total	**178**

Core Credits	
Compulsory	94
Department Electives	19
Industrial Internship	4
Research Track	12
Total	**129**

Other Credits	
Interdis ciplinar	41
VAC	8
Total	**49**

Interdisciplinary Credits	
Engineering Applied Science	19
Open Elective	16
MC	6
Total	**41**

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List of Program Elective

Specialization	IoT	Blockchain	Data Analytics	Cyber Security & Forensics
DE-I	Wireless Ad-hoc and sensor Networks	Cryptography Fundamentals	Applied Statistical Analysis	Cryptography Fundamentals
DE-II	Embedded System Architecture	Introduction to Blockchain	Data Mining and Predictive Modeling	Network Security
DE-III	Privacy & Security in IoT	Blockchain Architecture Design and Use Cases	Data Warehouse & Multidimensional Modeling	Android Security
DE-IV	Sensors and Actuator Devices	Public Blockchain-Ethereum	Business Intelligence	Disaster recovery and business continuity management
DE-V	Software defined Networks	Blockchain and Distributed Ledger Technology	R programming	Digital Watermarking and Steganography
DE-VI	Architecting smart IoT Devices	Crypto Currency Technologies	Social, Web & Mobile Analytics	Biometrics
DE-VII	Design of Smart Systems	Design and Development of Blockchain Applications	Programming forData Science	Cyber Forensicsand investigation
DE-VIII	Application of IoT in Robotics	Programming Fundamentals : Golang and Solidity	Big Data Technologies	Mobile ApplicationSecurity & PenetrationTesting

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