SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

Program: **M. Tech. (Artificial Intelligence and Data Science) CBCS Scheme wef 2026-2027 onwards**

Faculty: Science and Technology (Engineering)

Program Educational Objectives (PEOs)

After successful completion of the programme, students would be able to

1. Build strong foundations in Artificial Intelligence and Data Science, so that they can contribute substantially in the area of research and innovation.
2. Develop highly competent professionals in the field of AI and Data Science to keep abreast of the latest trends and techniques.
3. Emerge as professionals and entrepreneurs to design and develop solutions for real world interdisciplinary problems having positive societal impacts.

Graduate Attributes prescribed by NBA for M-Tech Program

GA1: Scholarship of Knowledge

Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyse and synthesise existing and new knowledge, and integration of the same for enhancement of knowledge.

GA2: Critical Thinking

Analyse complex engineering problems critically, apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

GA3: Problem Solving

Think laterally and originally, conceptualise and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.

GA4: Research Skill

Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyse and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of engineering.

GA5: Usage of modern tools

Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations.

GA6: Collaborative and Multidisciplinary work

Possess knowledge and understanding of group dynamics, recognise opportunities and contribute positively to collaborative-multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

GA7: Project Management and Finance

Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors.

GA8: Communication

Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

GA9: Life-long Learning

Recognise the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

GA10: Ethical Practices and Social Responsibility

Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

GA11: Independent and Reflective Learning

Observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

The POs formulated for M. Tech. (AI and DS) are consistent with the NBA's Graduate Attributes (PG).

PROGRAMME OUTCOMES (POs)

Programme Outcomes: On successful completion of the programme, student would be able to:

PO1	Deep subject Knowledge and intellectual breadth (GA1)	**Develop** extensive knowledge in various areas of Artificial Intelligence and Data Science
PO2	Professional Ethics (GA10)	**Apply** ethical principles and commit to professional ethics and responsibilities and norms of the standard practices.
PO3	Creative & Critical Thinking (GA2)	**Take informed actions** after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO4	Innovation, Research and Problem Solving (GA3, GA4)	**Identify, formulate, review** research literature, and analyse problems using the first principles of mathematics andengineering sciences. **Apply** the knowledge of mathematics, science, engineering fundamentals, Artificial Intelligence and Data Science to the solution of real-world problems. **Design solutions** for intelligent systems, system modules or processes that meet the specified needs with appropriateconsideration for the public health and safety, and the cultural, societal, and environmental considerations. **Demonstrate** the knowledge of, and need for sustainable development.
PO5	Team work and Communication Skills (GA6, GA8)	**Function** effectively as an individual, and as a member or leader in diverse teams, and in collaborative - multidisciplinary scientific research settings. **Present/communicate** research at national/international level, write effective articles, reports and design documentation,make effective presentations, and give and receive clear instructions. **Communicate** disciplinary knowledge to the community and broader public.
PO6	Professionalism and Leadership Readiness (GA6, GA7)	**Demonstrate** personal accountability and effective work habits, e.g., punctuality, working productively with others, and time as well as workload management. **Use** the strengths of others to achieve common goals
PO7	Lifelong learning (GA9)	**Recognize** the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadestcontext of technological change.
PO8	Competence for Digital World (GA5)	**Prepare** well for living, learning and working in a Digital Society; **Choose and apply** appropriate modern tools/frameworks/platforms/instruments, software simulators, techniques, resources,and modern engineering and ICT tools to complex activities with an understanding of the limitations. **Use** existing digital technologies ethically and efficiently to solve problems, complete tasks, and accomplish goals.
PO9	Global Citizenship (GA10)	**Act** with an informed awareness of global issues. **Engage** in initiatives that encourage equity and growth for all.
PO10	Project Management and Finance (GA7)	**Demonstrate** knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors.
PO11	Independent and Reflective Learning (GA11)	**Observe and examine** critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

After successful completion of the M. Tech. (AI and DS) programme, students will be able to:

1. Develop solutions to real world problems in the diverse emerging areas
2. Systematically investigate and provide Artificial Intelligence and Data Science based solutions in multidisciplinary domains

Sant Gadge Baba Amravati University Amravati

Scheme of Teaching, Learning & Examination leading to the Degree Master of Technology (AI and DS)(Two Years- Four Semesters PG Programme)

C B C S S c h e m e (M. Tech. Part-I) Semester- I

S. N.	Course Number /Code	Subject/Course	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Scheme of Studies Per Week				Credits				Maximum Marks					MinimumPassing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Paper	Internal Assessment	Internal	External		Marks	Grade
1	1MTAIDS1	Program Core I- Machine Learning	3	0	0	3	3	-	3	3	80	20			100	50	P
2	1MTAIDS 2	Program Core II- Advanced Data Structures and practices	3	0	0	3	3	-	3	3	80	20			100	50	P
3	1MTAIDS 3x	Program Elective I- Pattern Recognition/Digital Image Processing/Data Science/Data Preparation and Analysis	3	0	0	3	3	-	3	3	80	20			100	50	P
4	1MTAIDS 4x	Programme Elective II- Advances in Artificial Intelligence/Natural Language Processing/Speech Processing and applications/Big Data Analysis	3	0	0	3	3	-	3	3	80	20			100	50	P
5	1MTAIDS5	Research Methodology and IPR	2	0	0	2	2	-	2	3	80	20			100	50	P
6	1MTAIDS 6x	Audit Course English for Research Paper Writing/Disaster Management/Sanskrit for Technical Knowledge/Value Education	2	0	0	0	0	0	0			50			50	25	P
7	1MTAIDS7	Laboratory 1 (Based on Machine Learning)	0	0	4	4	-	2	2	3			25	25	50	25	P
8	1MTAIDS8x	Laboratory 2 (Based on Program Elective- I)	0	0	4	4	-	2	2	3			25	25	50	25	P
9		#Internship @															
	TOTAL					**22**			**18**						**650**		

L: Lecture, T: Tutorial, P: Practical

Students may complete their Internship in First OR Second OR Third Semester of M. Tech.. (AI and DS) according to their convenience; @ denotes Ancillary Credit

Note : ***Students are encouraged to go to Industrial Training/Internship for at least 2-3 months during semester breaks, cumulatively.**

Internship (During vacations of Semester I to Semester III cumulatively) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Students will undergo internal evaluation (based on the report submitted, seminar presentation and viva-voce, etc.) by the assigned teacher from the department/college during the fourth semester, so that credits earned as applicable and grades obtained will be reflected in final semester IV credit grade report

Sant Gadge Baba Amravati University Amravati
Scheme of Teaching, Learning & Examination leading to the Degree Master of Technology (AI and DS)(Two Years- Four Semesters PG Programme)
C B C S S c h e m e (M. Tech. Part-I) Semester- II

S. N.	Course Number / Code	Subject/Course	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Scheme of Studies Per Week				Credits				Maximum Marks					MinimumPassing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Paper	Internal Assessment	Internal	External		Marks	Grade
1	2MTAIDS 1	Programme Core III – Deep Learning	3	0	0	3	3	-	3	3	80	20			100	50	P
2	2 MTAIDS 2	Programme Core IV –Computer Vision	3	0	0	3	3	-	3	3	80	20			100	50	P
3	2 MTAIDS 3x	Programme Elective III – Genetic Algorithms and applications/Text Processing/Data Visualization/ Advanced Data Mining	3	0	**0**	3	3	-	3	3	80	20			100	50	P
4	2 MTAIDS 4x	Programme Elective IV – Augmented Reality and Virtual Reality/Real time autonomous systems/Internet of Things/Neuromorphic Cognitive systems	3	0	0	3	3	-	3	3	80	20			100	50	P
5	2MTAIDS 5x	Audit Course: Constitution of India/Pedagogy Studies/Stress Management by Yoga/Personality Development through Life Enlightenment Skills.	2	0	0	0	0	-	0			50			50	25	P
6	2 MTAIDS 6	Laboratory 3 (Based on Deep Learning with TensorFlow)	0	0	4	4	0	2	2	3			25	25	50	25	P
7	2 MTAIDS 7x	Laboratory 4 (Based on Program Elective-III)	0	0	4	4	0	2	2	3			25	25	50	25	P
8	2 MTAIDS 8	Mini Project with Seminar	2	0	0	2	2	0	2	3			25	25	50	25	P
9		#Internship @															
	TOTAL					**24**			**18**						**600**		

L: Lecture, T: Tutorial, P: Practical

Students may complete their Internship in First OR Second OR Third Semester of M. Tech.. (AI and DS) according to their convenience; @ denotes Ancillary Credit

Note : ***Students are encouraged to go to Industrial Training/Internship for at least 2-3 months during semester breaks, cumulatively.**

Internship (During vacations of Semester I to Semester III cumulatively) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Students will undergo internal evaluation (based on the report submitted, seminar presentation and viva-voce, etc.) by the assigned teacher from the department/college during the fourth semester, so that credits earned as applicable and grades obtained will be reflected in final semester IV credit grade report

Sant Gadge Baba Amravati University Amravati
Scheme of Teaching, Learning & Examination leading to the Degree Master of Technology (AI and DS)(Two Years- Four Semesters PG Programme)
C B C S S c h e m e (M. Tech. Part-II) Semester- III

S. N.	Course Number /Code	Subject/Course	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Scheme of Studies Per Week				Credits				Maximum Marks					MinimumPassing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Paper	Internal Assessment	Internal	External		Marks	Grade
1	3 MTAIDS 1x	*Programme Elective V – Cognitive Robotics/Swarm Intelligence/Human Machine Interfaces/Edge and Fog Computing	3	0	0	3	3	-	3	3	80	20			100	50	P
2	3 MTAIDS 2x	Open Elective (any one From MOOCs SWAYAM) 1. Expert Systems 2. Blockchain 3. Social Network Analysis 4. Business Analytics 5. Stream analytics 6. Industry 4.0 7. Operations Research 8. Cost Management of Engineering Projects 9. Composite Materials 10. Waste to Energy 11. Any other Course as approved by the Department/College	3	0	0	3	3	-	3	3	80	20			100	50	P
3	3 MTAIDS 3	Dissertation-I /Industrial Project	0	0	20	20	0	10	10	3			100	100	200	100	P
4		#Internship @															
	TOTAL					**26**			**16**						**400**		

L: Lecture, T: Tutorial, P: Practical

Students may complete their Internship in First OR Second OR Third Semester of M. Tech.. (AI and DS) according to their convenience; @ denotes Ancillary Credit

Note : ***Students are encouraged to go to Industrial Training/Internship for at least 2-3 months during semester breaks, cumulatively.**
Internship (During vacations of Semester I to Semester III cumulatively) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Students will undergo internal evaluation (based on the report submitted, seminar presentation and viva-voce, etc.) by the assigned teacher from the department/college during the fourth semester, so that credits earned as applicable and grades obtained will be reflected in final semester IV credit grade report
*Students going for Industrial Project/Thesis will complete these courses through MOOCs as per the AICTE guidelines.

Sant Gadge Baba Amravati University Amravati
Scheme of Teaching, Learning & Examination leading to the Degree Master of Technology (AI and DS)(Two Years- Four Semesters PG Programme)
C B C S S c h e m e (M. Tech. Part-II) Semester- IV

S. N.	Course Number /Code	Subject/Course	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Scheme of Studies Per Week				Credits				Maximum Marks					MinimumPassing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Paper	Internal Assessment	Internal	External		Marks	Grade
1	4MTAIDS1	Dissertation II	0	0	32	32	0	16	16	3			100	200	300	150	P
2	4 MTAIDS 2	#Internship @											50		50	25	P
	TOTAL					**32**			**16**						**350**		

L: Lecture, T: Tutorial, P: Practical

Students may complete their Internship in First OR Second OR Third Semester of M. Tech.. (AI and DS) according to their convenience; @ denotes Ancillary Credit

Note : ***Students are encouraged to go to Industrial Training/Internship for at least 2-3 months during semester breaks, cumulatively.**
Internship (During vacations of Semester I to Semester III cumulatively) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Students will undergo internal evaluation (based on the report submitted, seminar presentation and viva-voce, etc.) by the assigned teacher from the department/college during the fourth semester, so that credits earned as applicable and grades obtained will be reflected in final semester IV credit grade report

PROGRAMME SCHEME FOR M.TECH. (AI AND DS) SEM-I. - C B C S S c h e m e

Course Number	Subject	Scheme Of Studies Per Week			Credits
		L	T	P	
1MTAIDS1	Program Core I- Machine Learning	3	0	0	3
1 MTAIDS 2	Program Core II- Advanced Data Structures and practices	3	0	0	3
1 MTAIDS 3x	Program Elective I- Pattern Recognition/Digital Image Processing/Data Science/Data Preparation and Analysis	3	0	0	3
1 MTAIDS 4x	Programme Elective II- Advances in Artificial Intelligence/Natural Language Processing/Speech Processing and applications/Big Data Analysis	3	0	0	3
1MTAIDS5	Research Methodology and IPR	2	0	0	2
1MTAIDS 6x	Audit Course English for Research Paper Writing/Disaster Management/Sanskrit for Technical Knowledge/Value Education	2	0	0	0
1MTAIDS7	Laboratory 1 (Based on Machine Learning)	0	0	4	2
1MTAIDS8x	Laboratory 2 (Based on Program Elective- I)	0	0	4	2
				Total Credits: 18	

M.TECH. (AI AND DS) SEM- II C B C S S c h e m e

Course Number	Subject	Scheme Of Studies Per Week			Credits
		L	T	P	
2 MTAIDS 1	Programme Core III – Deep Learning	3	0	0	3
2 MTAIDS 2	Programme Core IV – Computer Vision	3	0	0	3
2 MTAIDS 3x	Programme Elective III – Genetic Algorithms and applications/Text Processing/Data Visualization/ Advanced Data Mining	3	0	0	3
2 MTAIDS 4x	Programme Elective IV – Augmented Reality and Virtual Reality/Real time autonomous systems/Internet of Things/Neuromorphic Cognitive systems	3	0	0	3
2MTAIDS 5x	Audit Course Constitution of India/Pedagogy Studies/Stress Management by Yoga/Personality Development through Life Enlightenment Skills.	2	0	0	0
2 MTAIDS 6	Laboratory 3 (Based on Deep Learning with TensorFlow)	0	0	4	2
2 MTAIDS 7x	Laboratory 4 (Based on Program Elective-III)	0	0	4	2
2 MTAIDS 8	Mini Project with Seminar	2	0	0	2
		Total Credits: 18			

***Students be encouraged to go to Industrial Training/Internship for at least 2-3 months during semester break.**

M.TECH. (AI AND DS) III SEM* C B C S S c h e m e

Course No.	Subject	Scheme of Studies Periods Per Week			Credits
		L	T	P	
3 MTAIDS 1x	*Programme Elective V – Cognitive Robotics/Swarm Intelligence/Human Machine Interfaces/Edge and Fog Computing	3	0	0	03
3 MTAIDS 2x	Open Elective (any one From MOOCs SWAYAM) 1. Expert Systems 2. Blockchain 3. Social Network Analysis 4. Business Analytics 5. Stream analytics 6. Industry 4.0 7. Operations Research Cost Management of Engineering Projects 9. Composite Materials 10. Waste to Energy 11. Any other Course as approved by the Department/College	3	0	0	03
3 MTAIDS 3	Dissertation-I /Industrial Project	0	0	20	10
		Total Credits 16			

***Students going for Industrial Project/Thesis will complete these courses through MOOCs.**

M.TECH. (AI AND DS) SEM-IV- C B C S S c h e m e

Course No.	Subject	Scheme of Studies Per Week			Credits
		L	T	P	
4MTAIDS1	Dissertation II	0	0	32	16
		Total Credits: 16			

The Programme offers several elective courses, focusing on different aspects of AI and Data Science. A student can opt any course from the Programme Elective List.

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