

**Programme Educational Objectives, Programme Outcomes,
Programme Specific Outcomes
and
Learning Outcomes
of
Artificial Intelligence and Robotics
Offered by**



Centre for Artificial Intelligence
Madhav Institute of Technology & Science
Gwalior, Madhya Pradesh-474005

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1. Programme Educational Objectives

PEO-I: Graduates will demonstrate proficiency in designing and developing intelligent robotic systems, integrating cutting-edge techniques in both Artificial Intelligence and Robotics to create innovative solutions.

PEO-II: Graduates will adhere to ethical considerations and safety standards in the design, development, and deployment of robotic systems. They will exhibit a keen awareness of the societal impact of AI-driven robotics, focusing on responsible and secure applications.

PEO-III: Graduates will cultivate interdisciplinary problem-solving technical skills with diverse perspectives, fostering robust leadership and entrepreneurial insight for impactful contributions, in the fast changing technological scenario.

2. Programme Outcomes & Programme Specific Outcomes

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis, and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and Leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes

At the end of the program, the student should be able to

PSO1. Apply artificial intelligence approaches to design and develop diverse control circuits for robotic solutions

PSO2. Design & implement solutions for robotics applications by applying the concept of data communication, sensors, virtual reality and Internet of Things.

2. Learning Outcomes of all courses/subjects

First Year:

Subject Code	Title of Subject	Semester	Subject Category
240101	Introduction to Artificial Intelligence	I	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define basic concepts of artificial intelligence.

CO2. relate various computer components used in artificial intelligence.

CO3. identify different logical and reasoning techniques used in ai techniques used in ai.

CO4. analyse the general approach of optimization, intelligent agent and expert system.

CO5. analyse the general approach of machine learning.

CO6. build AI enabled intelligent procedures for solving real world problems.

First Year:

Subject Code	Title of Subject	Semester	Subject Category
230102	Introduction to Computer Programming	I	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. identify situations where computational methods and computers would be useful.

CO2. develop algorithms and flowchart for a given problem.

CO3. understand the concepts of procedural programming.

CO4. explain the concepts of object oriented programming and its significance in the real world.

CO5. analyze the problems and choose suitable programming techniques to develop solutions.

CO6. develop computer programs to solve real world problems.

First Year:

Subject Code	Title of Subject	Semester	Subject Category
100022	Basic Electrical & Electronics Engineering	I	ESC

Learning outcomes:

After the completion of course students will be able to:

CO1. solve DC & AC circuits by applying fundamental laws & theorems.

CO2. analyze the response of linear electrical and magnetic circuits for given input.

CO3. explain working principle, construction, applications of single phase transformer & rotating electrical machines.

CO4. determine the performance parameters such as efficiency, voltage regulation by using equivalent circuit of single phase transformer.

CO5. select the logic gates for various applications in digital electronic circuits.

CO6. analyze characteristics of Diode and Transistor.

First Year:

Subject Code	Title of Subject	Semester	Subject Category
250100	Linear Algebra	I	BSC

Learning outcomes:

After the completion of course students will be able to:

CO1 determine the solution of Matrix

CO2 find the analytical solution of algebraic structures.

CO3 express the vector space

CO4 acquire the knowledge of linear transformation

CO5 illustrate the concept of Inner product spaces

First Year:

Subject Code	Title of Subject	Semester	Subject Category
100015	Energy, Environment, Ecology & Society	I	HSMC

Learning outcomes:

After the completion of course students will be able to:

CO1. describe various energy resources, their conversion to electrical power and role in technological & economic development.

CO2. update with national/international power status and renewable power development targets & missions

CO3. recognize the impact of pollution on the ecosystem and control policies adopted at national/international levels.

CO4. illustrate the concepts of ecosystems and their conservation.

CO5. solve practical problems of society in a sustainable and ethical manner

CO6. fulfil professional duties keeping in mind the environmental safety, health, and welfare of public

First Year:

Subject Code	Title of Subject	Semester	Subject Category
230201	Digital Logic Design	II	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. explain the basic components and functional units to define computer architecture.

CO2. explain different number systems and basic operations employed at machine level.

CO3. develop the understanding of combinational circuits.

CO4. analyse the basic concept of sequential circuits.

CO5. compare and differentiate various memories used in Computers.

CO6. reduce the Boolean functions to mitigate hardware complexity issues.

First Year:

Subject Code	Title of Subject	Semester	Subject Category
220202	Sensor Technology	II	DC

Learning outcomes:

After the completion of course students will be able to:

- CO 1. identify the different types of the sensors
- CO 2. design a project for ambient light, temperature and humidity measurement
- CO 3. develop a project for distance measurement
- CO 4. create a display to show the output of any sensor
- CO 5. cultivate teamwork abilities in order to operate well in groups

First Year:

Subject Code	Title of Subject	Semester	Subject Category
230202	Data structures	II	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. outline the basics of Algorithms and their performance criteria
- CO2. explain the working of linear/Non Linear data structures
- CO3. identify the appropriate data structure to solve specific problems
- CO4. analyze the performance of various Data Structures & their applications
- CO5. evaluate the time space complexities of various data structures & the applications
- CO6. design the optimal algorithmic solutions for various problems

First Year:

Subject Code	Title of Subject	Semester	Subject Category
230203	Object Oriented programming and Methodology	II	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. relate the concepts and significance of OOPs in real world.

CO2.demonstrate adeptness of object oriented programming to solve problems using Object oriented concepts.

CO3. apply object oriented programming to develop solutions of problems using standard language constructs.

CO4. analyze data flow diagrams and flow charts for small/moderate problems.

CO5. determine how to simulate the problem in field of Operating system, Computer networks and real world problems.

CO6. develop software using concepts of objects, associations and integrity constraint.

First Year:

Subject Code	Title of Subject	Semester	Subject Category
100016	Technical Language	II	HSMC

Learning outcomes:

After the completion of the course, students will be able to:

CO1. speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes.(LOT1)

CO2. prepare oral presentations and arguments within the Engineering Profession effectively. (LOT2)

CO3. demonstrate knowledge and comprehension of major text and traditions in language as well as its social, cultural, and historical context. (LOT3)

CO4. read a variety of Text analytically so as to demonstrate in writing and/or speech the interpretation of texts. (HOT4)

CO5. interpret text written in English assessing the results in written and oral arguments using appropriate material for support. (LOT3)

First Year:

Subject Code	Title of Subject	Semester	Subject Category
100017	Language Lab	II	HSMC

Learning outcomes:

After the completion of the course, students will be able to:

CO1. speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes. (LOT1)

CO2. deliver effectively oral presentations. (LOT3)

CO3. grasp knowledge and comprehensive skills to speak on a given topic on spot. (LOT2)

CO4. interpret English spoken by others and respond to situation. (LOT3)

CO5. analyse English Language as spoken by others in day to day life. (HOT4)

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240301	Design & Analysis of Algorithms	III	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. demonstrate a familiarity with major algorithms and data structures.

CO2. identify important algorithmic design paradigms and methods of analysis.

CO3. analyse the performance of algorithms.

CO4. compare various algorithm design techniques.

CO5. select the design technique to solve any real world problem.

CO6. design efficient algorithm using various design techniques.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
250106	Probability and Random Process	III	BSC

Learning outcomes:

After the completion of course students will be able to:

CO1. interpreting the theory of Probability and its distributions.

CO2. evaluating the Skewness Kurtosis, curve fitting, correlation and regression.

CO3. applying the various test to validate the hypothesis.

CO4. explaining the knowledge of random variables.

CO5. judging the various random process.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240302	Operating System	III	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define the basic concept of operating systems.

CO2. explain the working procedure of the operating system.

CO3. analyze the various operating system problems and issues.

CO4. determine the solutions for various operating system problems and issues.

CO5. evaluate the performance of various scheduling and allocation techniques.

CO6. elaborate the working of various scheduling and allocation techniques.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240303	Computer Networks and Protocols	III	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. explain the fundamental concepts of computer network.

CO2. illustrate the basic taxonomy & terminologies of computer network.

CO3. identify various parameters for affecting the performance of computer network.

CO4. analyze the concepts of communication using various layer of OSI model.

CO5. evaluate the performance of computer network in congestion and Internet.

CO6. design the network environment and applications for implementation of computer networking concept.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240304	Database Management System	III	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. demonstrate the concepts of different types of data base system.

CO2. apply relational algebra concepts to design database system.

CO3. make use of queries to design and access data base system.

CO4. analyze the evaluation of transaction processing and concurrency control.

CO5. determine the normal form of the relation.

CO6. design an ER diagram/database system for areal world application.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240305	Python Programming Lab	III	DLC

Learning outcomes:

After the completion of course students will be able to:

CO1. define basics syntax and features of python programming language

CO2. solve computational problem using python language

CO3. take part in online coding platforms

CO4. inspect the python program for errors

CO5. design a program using the features of object oriented concept

CO6. construct the python code for real world problem using the libraries

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240306	Seminar/Self Study	III	DLC

Learning outcomes:

- CO1 Refer various technical recourses available from multiple field
- CO2 Improve his/her performance in self-learning domain.
- CO3 Acquire additional knowledge of multi disciplinary domains
- CO4 Prepare oral demonstrations.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240307	Summer Internship Project-I	III	DLC

Learning outcomes:

- CO 1. Identify job skills, knowledge, and attitude requisite to constitute a professional identity.
- CO 2. Express the technical ideas, strategies & methodologies
- CO 3. Demonstrate profession ethics and awareness about general workplace behavior
- CO 4. Adhere to deadlines and commitment to complete the assignment.
- CO 5. Write professional work reports and presentations.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240401	Computer Architecture and Microprocessor	IV	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. demonstrate the computer architecture and microprocessor for defining basic component and functional unit.

CO2. develop the fundamental concept to understand the working of computer architecture and microprocessor

CO3. explain the basic concept of input output and memory organization.

CO4. develop the skill of writing assembly language programming.

CO5. build a system using peripheral devices and controllers for 8086 microprocessors

CO6. apply the concept computer architecture and microprocessor in solving real world problems.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240402	Cloud Computing	IV	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define various basic concepts related to cloud computing.

CO2. identify the architecture, infrastructure and delivery models of cloud computing

CO3. apply suitable virtualization concepts.

CO4. choose the appropriate programming models and public cloud platforms.

CO5. analyse various security issues in cloud computing.

CO6. compose virtualization, security and programming modules in cloud computing solutions.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240403	Software Engineering	IV	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. explain the various fundamental concepts of software engineering.
- CO2. develop the concepts related to software design & analysis
- CO3. compare the techniques for software project management & estimation.
- CO4. choose the appropriate model for real life software project.
- CO5. design the software using modern tools and technologies
- CO6. test the software through different approaches.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240404	Machine Learning and Optimization	IV	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. demonstrate a familiarity with major optimization algorithms.
- CO2. apply important optimization algorithmic and analyze the results.
- CO3. finding out the local and global optimum.
- CO4. formulation of design problems as mathematical programming problems.
- CO5. design supervised and unsupervised learning approaches for real-life problems.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240405	Network & Web Security	IV	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. explain cryptographic algorithms, hash algorithms and authentication mechanisms.
- CO2. illustrate fundamentals of number theory, attacks and security principles.
- CO3. apply number theory and various algorithms to achieve principles of security.

CO4. analyze the cause for various existing network attacks and describe the working of available security controls.

CO5. examine the vulnerabilities in IT infrastructure.

CO6. predict the attacks and controls associated with IP, transport-level, web and e-mail security.

Second Year:

Subject Code	Title of Subject	Semester	Subject Category
240406	Design and Thinking Lab	IV	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define the basic concept of embedded system.

CO2. describe the basic principles of Arduino programming and IDE.

CO3. design, implement, debug and test programs/ system.

CO4. design and develop smart systems applications

CO5. identify an opportunity from a Problem

CO6. build Arduino board using different sensors.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240501	Discrete Structures	V	BSC

Learning outcomes:

After the completion of course students will be able to:

CO1. explain the basic concept of set theory, propositional logic, graph theory, discrete numeric function and algebraic structure.

CO2. illustrate the knowledge of course content and distinguish between them in terms of their applications.

CO3. identify the concepts of graph and tree for solving problems in the computer science.

CO4. apply the concepts of studied topics with suitable technique faced in engineering problems.

CO5. analyze the set theory, propositional logic, graph theory, discrete numeric function and algebraic structure to examine the real world problem.

CO6. build analytical skill and interpret applications of engineering beneficial in real time troubleshooting.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240502	Data Science Using Python	V	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define the fundamentals of data science and its importance.

CO2. contrast the basics of python and libraries related to data science.

CO3. classify different types of data analytics

CO4. organize the data collected from various sources

CO5. analyze pre-processing and data reduction strategies.

CO6. create the graphical representation of the data through visualization tool on various applications.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
204503	Theory of Computation	V	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. explain the basic concepts of switching and finite automata theory & languages.

CO2. relate practical problems to languages, automata, computability and complexity.

CO3. construct abstract models of computing and check their power to recognize the languages.

CO4. analyze the grammar, its types, simplification and normal form.

CO5. interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata.

CO6. develop an overview of how automata theory, languages and computation are applicable in engineering application.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240504	Robotics System and Control	V	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. illustrate different basic terms related to robotics and their functions

CO2. summarize fundamentals of robot kinematics and control system.

CO3. classify different kind of sensor and actuators used in robotics.

CO4. explain basics of Trajectory planning in robotics and its end effectors.

CO5. know about Robot vision, motion planning and robot application

CO6. describe concept of algorithm for intelligent system and internet of robotics things.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240505	Soft Computing Techniques	V	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define basic concepts of neural network and fuzzy systems.

CO2. compare solutions by applying various soft computing approaches on a given problem.

CO3. develop and train different supervised and unsupervised learning.

CO4. classify various nature inspired algorithms according to their application aspect.

CO5. compare the efficiency of various hybrid systems.

CO6. design a soft computing model for solving real world problems.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240506	Minor Project-I	V	DLC

Learning outcomes:

CO1 Formulate the real-world problems.

CO2 Demonstrate critical thinking skills by evaluating different approaches, methodologies, or solutions

CO3 Utilize the new tools, algorithms, techniques to obtain solution of the project.

CO4 Write technical report

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240507	Seminar/Self Study	V	--

Learning outcomes:

CO1 Refer various technical recourses available from multiple field

CO2 Improve his/her performance in self-learning domain.

CO3 Acquire additional knowledge of multi disciplinary domains

CO4 Prepare oral demonstrations.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240508	Summer Internship Project-II	V	DLC

Learning outcomes:

- CO 1. Identify job skills, knowledge, and attitude requisite to constitute a professional identity.
- CO 2. Express the technical ideas, strategies & methodologies
- CO 3. Demonstrate profession ethics and awareness about general workplace behavior
- CO 4. Adhere to deadlines and commitment to complete the assignment.
- CO 5. Write professional work reports and presentations.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240601	Compiler Design	VI	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. define the concepts of finite automata and context free grammar.
- CO2. build the concept of working of compiler.
- CO3. examine various parsing techniques and their comparison.
- CO4. compare various code generation and code optimization techniques.
- CO5. analyze different tools and techniques for designing a compiler.
- CO6. design various phases of compiler.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240602	Data Mining & Pattern Warehousing	VI	DC

Learning outcomes:

After the completion of course students will be able to:

- CO1. explain various basic concepts of data mining and data warehousing.
- CO2. classify various database systems and data models / schemas of data warehouse.

CO3. compare various methods for storing & retrieving data from different data

Sources / repository.

CO4. apply data mining techniques for knowledge extraction from large amount of data.

CO5. analyze data for knowledge discovery & prediction using appropriate algorithms.

CO6. develop real world application using data mining techniques.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240603	AI In Robotics	VI	DC

Learning outcomes:

After the completion of course students will be able to:

CO1. define different basic terms related to artificial intelligence.

CO2. tell the fundamentals of the intelligent robot control system.

CO3. infer the basics of image processing used in robotics.

CO4. explain the basics of planning in robotics.

CO5. apply the concept of an algorithm for an intelligent system.

CO6. implement artificial intelligence in robotics.

Third Year:

Subject Code	Title of Subject	Semester	Subject Category
240604	Minor Project-II	VI	DLC

Learning outcomes:

CO1 Formulate the real-world problems.

CO2 Demonstrate critical thinking skills by evaluating different approaches, methodologies, or solutions

CO3 Utilize the new tools, algorithms, techniques to obtain solution of the project.

CO4 Write technical report

Forth Year:

Subject Code	Title of Subject	Semester	Subject Category
240703	Creative Problem Solving	VII	DLC

Learning outcomes:

- CO1 Identify real time problems
- CO2 Practice various methods to solve problems
- CO3 Produce solutions to various problems
- CO4 Demonstrate various problems solving skills

Forth Year:

Subject Code	Title of Subject	Semester	Subject Category
240704	Summer Internship Project-III	VII	DLC

Learning outcomes:

- CO 1. Identify job skills, knowledge, and attitude requisite to constitute a professional identity.
- CO 2. Express the technical ideas, strategies & methodologies
- CO 3. Demonstrate profession ethics and awareness about general workplace behavior
- CO 4. Adhere to deadlines and commitment to complete the assignment.
- CO 5. Write professional work reports and presentations.

Forth Year:

Subject Code	Title of Subject	Semester	Subject Category
1000007	Universal Human Values & Professional Ethics	VII	-

Learning outcomes:

After the completion of course students will be able to:

- CO1. to becomes more aware of their surroundings, society, social problems and their sustainable solutions.

CO2. to becomes sensitive to their commitment towards what they believe in (humane values. Humane Relationships and humane society).

CO3. to applies what they have learnt to their own self in different day-to-day settings in real life.

CO4. to sustains human relationships and human nature in mind.

CO5. to has better critical ability.

CO6. to negotiates living in harmony with self and others.

4. Scheme of Examination

Scheme of Evaluation (Artificial Intelligence and Robotics) I Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Information Technology
Scheme of Evaluation
B. Tech. in Information Technology (Artificial Intelligence and Robotics)
I Semester

(for batch admitted in academic session 2020 – 21)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted						Contact Hours per Week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.		
				Theory Slot				Practical Slot		Total Marks	L	T				P	
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation								
				End Sem. Exam.	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment		Lab work & Sessional								Skill Based Mini Project
1.	240101	DC	Introduction to Artificial Intelligence	50	10	20	20	-	-	-	100	4	-	-	4	Blended (3/1)	MCQ
2.	230102	DC	Introduction to Computer Programming	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	AO
3.	100022	ESC	Basic Electrical & Electronics Engineering	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	MCQ
4.	250100	BSC	Linear Algebra	50	10	20	20	-	-	-	100	3	1	-	4	Offline	PP
5.	100015	HSMC	Energy, Environment, Ecology & Society	50	10	20	20	-	-	-	100	3	-	-	3	Online	MCQ
Total				250	50	100	100	120	40	40	700	14	03	04	19	-	-

Induction program of first three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visit / Virtual Visit to local Areas, Familiarization to Dept./Branch & Innovations

⁵ proficiency in course/subject-includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

MCQ: Multiple Choice Question AO: Assignment + Ornl PP: Pen Paper SO: Submission + Oral

Mode of Teaching				Mode of Examination				Total Credits
Theory		Blended		Theory		Lab		
Offline	Online	Offline	Online	Offline	PP	A+O	MCQ	
04	03	07	03	02	04	03	10	02
21.05%	15.79%	36.84%	15.79%	10.53%	21.05%	15.79%	52.63%	10.53%

Scheme of Evaluation
(Artificial Intelligence and Robotics)
II Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Information Technology
Scheme of Evaluation
B. Tech. in Information Technology (Artificial Intelligence and Robotics)
II Semester

(for batch admitted in academic session 2020 – 21)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per Week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.
				Theory Slot				Practical Slot				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation								
				End Sem. Exam.	⁵ Proficiency in subject /course	Mid Sem. Exam.	Quiz/Assignment		Lab work & Sessional	Skill Based Mini Project							
1.	230201	DC	Digital Logic Design	50	10	20	20	-	-	-	100	2	1	-	3	Blended (2/1)	PP
2.	220202	DC	Sensor Technology	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
3.	230202	DC	Data Structures	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
4.	230203	DC	Object Oriented Programming and Methodology	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	AO
5.	100016	HSMC	Technical Language	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	PP
6.	100017	HSMC	Language Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline	SO
Total				250	50	100	100	240	80	80	900	14	01	08	19	-	-

Summer Internship Project – I (Institute Level) (Qualifier): Minimum two-week duration: Evaluation in III Semester.

⁵ proficiency in course/subject-includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.
MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral

Mode of Teaching				Mode of Examination					Total Credits
Theory		Lab		Theory			Lab		
Offline	Online	Offline	Online	Offline	PP	A+O	MCQ	SO	
-	-	10	05	04	12	03	-	04	19
-	-	51.63%	26.32%	21.05%	63.16%	15.79%	-	21.05%	Credits %

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Scheme of Evaluation
(Artificial Intelligence and Robotics)
III Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
 (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Information Technology
Scheme of Evaluation
 B. Tech. in Information Technology (Artificial Intelligence and Robotics)
III Semester **For batches admitted in academic session 2020-21 onwards**

No correction

S. No.	Subject Code	Course Code	Subject Name	Maximum Marks Allotted				Contact Hours per week			Total Marks	Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam
				Theory Slot		Practical Slot		L	T	P				
				End Term Evaluation	Continuous Evaluation	End Sem Exam	Continuous Evaluation							
				200	100	100	100							
				100%	100%	100%	100%							
1	IT101	IT101	Probability and Random Process	40	20	20	20				4	Offline	PP	
2	IT102	IT102	Design & Analysis of Algorithms	40	20	20	20				4	Blended (1:1)	PP	
3	IT103	IT103	Operating Systems	40	20	20	20				4	Blended (1:1)	PP	
4	IT104	IT104	Computer Networks and Protocols	40	20	20	20				4	Blended (1:1)	PP	
5	IT105	IT105	Database Management System	40	20	20	40				4	Blended (1:1)	PP	
6	IT106	IT106	Python Programming Lab			40	20				1	Offline	SO	
7	IT107	IT107	Self Learning Paradigms (MOOCs, NPTEL, SWAYAM)				40				1	Online and Monitoring	SO	
8	IT108	IT108	Project/Exposing Course (Industrial/Entrepreneurial/Innovation/Research Project/Thesis/Mini Project)			50					1	Interactive	SO	
9	IT109	IT109	Open ended Course			60					2	Offline	SO	
			Total	200	100	100	290	100	60	950	14	14	14	14
10	IT110	IT110	Workshop for 1 semester	20	20	20	20				2	Offline	MCQ	

Performance in course/subject includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject

Mode of Evaluation				Mode of Examination			
Theory	Lab	NET		Theory	Lab	NET	
Offline	Online	Offline	Interactive	PP	SO	SO	
60	60	60	60	16	60	60	
11.76%	11.76%	11.76%	11.76%	1.6%	6.3%	6.3%	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

Scheme of Evaluation (Artificial Intelligence and Robotics) IV Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Information Technology

Scheme of Evaluation

B. Tech. in Information Technology (Artificial Intelligence and Robotics)

IV Semester

for batches admitted in academic session 2020 – 21 onwards

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.	
				Theory Slot				Practical Slot			Total Marks	L	T				P
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation								
				End Sem. Exam.	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment		Lab Work & Seasonal	Skill Based Mini Project							
1.	240401	DC	Computer Architecture and Microprocessor	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
2.	240402	DC	Cloud Computing	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	APP
3.	240403	DC	Software Engineering	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	MCQ
4.	240404	DC	Machine Learning and Optimization	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
5.	240405	DC	Network & Web Security	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	PP
6.	240406	DLC	Design and Thinking Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline	SO
7.	200XXX	CLC	Novel Engaging Course (Informal Learning)	50	50	100	100	290	80	80	950	14	01	10	2	Interactive	SO
Total				250	50	100	100	290	80	80	950	14	01	10	2		
8.	1000001	MAC	Indian Constitution and Traditional Knowledge	50	10	20	20	-	-	-	100	2	-	-	GRADE	Online	MCQ

Summer Internship Project-II (Soft skills Based) for two weeks duration: Evaluation in V Semester

¹ proficiency in course/subject includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

MCQ: Multiple Choice Question AO: Assignment + Oral OB: Open Book PP: Pen Paper SO: Submission + Oral

Mode of Teaching				Mode of Examination							Total Credits
Theory		Lab		Theory			Lab		NEC		
Offline	Online	Blended	Offline	Interactive	PP	A+O	MCQ	SO	SO		
-	-	10	65	64	01	12	-	03	04	01	20
-	-	50.00%	25.00%	24.00%	5.00%	60%	-	15.00%	20.00%	5.00%	Credits %

Scheme of Evaluation (Artificial Intelligence and Robotics) V Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Information Technology
Scheme of Evaluation
B. Tech. in Information Technology (Artificial Intelligence and Robotics)
V Semester (for batch admitted in academic session 2020-21)

No correction

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam	
				Theory Slot		Practical Slot		Total	L		T	P					
				End Term Evaluation		Continuous Evaluation							Lab work & Seasonal				Skill Based Mini Project
				End Sem. Exam	Proficiency in subject course	Mid Sem. Exam	Quiz Assignment										
1.	240501	004	Discrete Structures	50	10	20	20	100	1	1	1	4	Offline	PP			
2.	240502	004	Data Science using Python	50	10	20	20	200	1	1	1	4	Blended (2:1)	MCQ			
3.	240503	004	Theory of Computation	50	10	20	20	200	1	1	1	4	Blended (2:1)	PP			
4.	240504	004	Robotics System and Control	50	10	20	20	200	1	1	1	4	Blended (2:1)	PP			
5.	240505	004	Soft Computing Techniques	50	10	20	20	100	1	1	1	3	Blended (2:1)	PP			
6.	240506	004	Minor Project I**	-	-	-	-	100	-	-	-	4	Offline	SO			
7.	240507	004	Self learning Programming (SWAYAM/NPTEL/MOOC)	-	-	-	-	40	-	-	-	1	Online and Blended	SO			
8.	200203	004	Workshop (Knowledge Industrial Learning)	-	-	-	-	50	-	-	-	1	Interactive	SO			
9.	240508	004	Industry Internship Project (Evaluation)	-	-	-	-	60	-	-	-	2	Offline	SO			
Total				250	50	100	100	550	140	40	1050	13	18	24			
10.	100000	MAT	Project Management & Planning	50	10	20	20	100	-	-	-	1	Offline	MCQ			
11.	100000	MAT	Quality Management	50	10	20	20	100	-	-	-	1	Offline	MCQ			

Additional Course for Honours or minor Specialization Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization

* Proficiency in course/subject includes the weights towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

** MCQ: Multiple Choice Question; AO: Assignment - Oral; PP: Pen-Paper; SO: Submission - Oral

*** The minor project-I may be evaluated by an internal committee for awarding seasonal marks

**** Compulsory registration for one online course using SWAYAM/NPTEL/MOOC, evaluation through attendance, assignments and presentation

Mode of Teaching						Mode of Examination				Total Credits
Theory		Blended		Lab	NEC	Theory		Lab	NEC	
Offline	Online	Offline	Online	Offline	Interactive	PP	A+O	MCQ	SO	SO
81	-	08	81	88	81	12	-	81	88	81
11.50%	-	11.33%	10.83%	33.33%	4.17%	38.04%	-	13.54%	35.33%	84.17%
										24
										Credits %

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE
DEAN (ACADEMICS)
M.I.T.S
GWALIOR

Scheme of Evaluation
(Artificial Intelligence and Robotics)
VI Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Information Technology
Scheme of Evaluation

B. Tech. in Information Technology (Artificial Intelligence and Robotics)
VI Semester

(for batch admitted in academic session 2020 – 21)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Teaching	Mode of Exam.	
				Theory Slot				Practical Slot		MOOCs			L	T	P				
				End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Continuous Evaluation		Assignment								Exam
				End Sem. Exam.	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment		Lab work & Sessional	Skill Based Mini Project									
1.	240601	DC	Compiler Design	50	10	20	20	60	20	20	-	-	200	2	1	2	4	Blended	PP
2.	240602	DC	Data Mining & Pattern Warehousing	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Blended	PP
3.	240603	DC	AI in Robotics	50	10	20	20	60	20	20	-	-	200	3	-	2	4	Blended	PP
4.	DE	DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ
5.	OC	OC	Open Category (OC-1)	50	10	20	20	-	-	-	-	-	100	3	-	-	3	Blended	PP
6.	240604	DLC	Minor Project-II**	-	-	-	-	60	40	-	-	-	100	-	-	4	2	Offline	SO
7.	200XXX	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	-	-	50	-	-	2	1	Interactive	SO
Total				200	40	80	80	290	100	60	25	75	950	14	01	12	21	-	-
8.	1000007	MAC	Intellectual Property Rights (IPR)	50	10	20	20	-	-	-	-	-	100	2	-	-	GRADE	Online	MCQ

Summer Internship-III (On Job Training) for Four weeks duration: Evaluation in VII Semester

Additional Course for Honours or minor Specialization

Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization

* proficiency in course/subject includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

MCQ: Multiple Choice Question AO: Assignment + Oral OB: Open Book PP: Pen Paper SO: Submission + Oral

** The minor project-II may be evaluated by an internal committee for awarding sessional marks.

Mode of Teaching						Mode of Examination					Total Credits
Offline	Online	Blended	Offline	Interactive	PP	AO	MCQ	SO	SO		
00	03	12	05	01	12	00	03	05	01	21	
00%	14.29%	57.14%	23.81%	4.76%	57.14%	00%	14.29%	23.81%	4.76%	Credits %	

Scheme of Evaluation
(Artificial Intelligence and Robotics)
VII Semester

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Information Technology

Scheme of Evaluation

B. Tech. in Information Technology (Artificial Intelligence and Robotics)

VII Semester

(for batch admitted in academic session 2020 – 21)

S. No.	Subject Code	Category Code	Subject Name	Maximum Mark: Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Teaching	Mode of Exam.		
				Theory Slot				Practical Slot		MOOCs		L	T	P					
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									Assignment	Exam
				End Sem. Exam	Proficiency in subject /course	Mid Sem. Exam	Quin/Assign ment		Lab work & Sessional	Skill Based Mini Project									
1.	DE	DE	Departmental Elective (DE-2)	50	10	20	20	-	-	-	-	100	3	-	-	3	Blended	PP	
2.	DE	DE	Departmental Elective* (DE-3)	-	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ
3.	DE	DE	Departmental Elective* (DE-4)	-	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ
4.	OC	OC	Open Category (OC-2)	50	10	20	20	-	-	-	-	100	3	-	-	3	Blended	PP	
5.	240701	DLC	Departmental Lab	-	-	-	-	60	20	20	-	100	-	-	4	2	Offline	SO	
6.	240702	DLC	Creative Problem Solving (Evaluation)	-	-	-	-	25	25	-	-	50	-	-	2	1	Offline	SO	
7.	240703	DLC	Summer Internship Project-III (04 weeks) (Evaluation)	-	-	-	-	60	-	-	-	60	-	-	4	2	Interactive	SO	
Total				100	20	40	40	145	45	20	50	150	610	12	-	10	17		
8.	1000007	MAC	Universal Human Values & Professional Ethics(UHVPE)	50	10	20	20	-	-	-	-	100	2	-	-	GRADE	Online	MCQ	
Additional Course for Honours or minor Specialization				Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization															

¹ proficiency in course/subject includes the weightage towards: ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral

** The minor project-II may be evaluated by an internal committee for awarding sessional marks.

Mode of Teaching					Mode of Examination					Total Credits
Theory		Lab	NEC		Theory		Lab	NEC		
Offline	Online	Blended	Offline	Interactive	PP	AO	MCQ	SO	SO	

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

Scheme of Evaluation (Artificial Intelligence and Robotics) VIII Semester

Madhav Institute of Technology & Science Gwalior (M.P.)
(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)
NAAC Accredited with A++ Grade

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Centre for Artificial Intelligence Scheme of Evaluation

B. Tech. VIII Semester (Information Technology (Artificial Intelligence and Robotics))

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted								Contact Hours per week			Total Credits	Mode of Teaching	Mode of Exam		
				Theory Slot				Practical Slot		MOOCs		Total Marks	L	T				P	
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation		Assign ment								Exam
				End Sem. Exam	Proficiency in subject course	Mid Sem. Exam	Quize/Assignm. cont.		Lab work & Skill Based Mini Project	Exam									
1.	DE	DE	Departmental Elective* (DE-5)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	
2.	OC	OC	Open Category* (OC-3)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	
3.	240801	DLC	Internship Research Project Innovation & Start-up	-	-	-	-	250	150	-	-	-	400	-	-	18	Offline	SO	
4.	240802	-	Professional Development	-	-	-	-	50	-	-	-	50	-	-	4	2	Interactive	SO	
Total				-	-	-	-	300	150	-	50	150	650	6	-	22	17	-	-

Additional Course for Honours or minor Specialization Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization

Proficiency in course/subject - includes the weightage towards ability/ skill/ competency/ knowledge level/ expertise attained etc. in that particular course/subject

MCQ: Multiple Choice Question	AO: Assignment + Oral	PP: Pen Paper	SO: Submission + Oral				
Mode of Teaching				Mode of Examination			
Theory	Lab	POC		Theory	Lab	SO	Total Credits
Online	Online	Blended	Online	Interactive	PP	AO	MCQ
6	-	-	9	2	-	-	6
-	-	-	-	-	-	-	11
35.29				64.71			
52.94				11.76			
35.29				64.71			
Credits %							