

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

NAAC Accredited with A++ Grade

Centre for Artificial Intelligence

BOARD OF STUDIES (BoS) PROCEEDING CENTRE FOR ARTIFICIAL INTELLIGENCE (Meeting Dated - 02 Dec., 2023)



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Summary of Board of Studies (BoS)

Courses where revision was carried out						
(Course/subject name)	Course Code	Year/Date of introduction	Year/Date of revision	Percentage of content added or replaced	Agenda Item No.	Page No.
Object Oriented Programming	3240223/ 3270223/ 3280223	Nov. 2020	Dec. 2023	10%	15	8

	Cour	ses focusing on employability/entrepreneurship/ skill development		
(Course/subject name)	Course/subject name) Course Code Activities/contents which have a bearing on increasing skill and employability		Agenda Item No.	Page No.
Al For Robotics	240605	Robotics Engineering, Algorithms used in Robotics, Path Planning, Search Approaches, Heuristic Approaches, Simultaneous Localization and Mapping. Swarm Robotics and Multi-Robot Systems, Bio-inspired Robotics, Integration of AI and Robotics in Industry 4.0	6	6
Image Processing	240606/ 270602/ 280602	Digital Image processing systems. Image Sampling and quantization, Image Enhancement. Image Segmentation. Spatial techniques and Frequency domain techniques, Image Restoration and Compression, Pseudo color Image Processing	6	6
Artificial Intelligence & Machine Learning	240607	Introduction to Artificial Intelligence, Searching Techniques, Supervised, Unsupervised Machine Learning Techniques.	5	6
Deep Learning	270603/ 280603	Neural Networks, Convolutional Neural Networks, Sequence Modelling, Autoencoders	6	6
Calculus and Optimization Techniques	2240421/2270421/ 2280421	Integrals, Optimization Mechanisms, Numerical Methods for Problem Solving.	- 12	8
Modern Computer Architecture	2240422/ 2270422/ 2280422/ 3240222/ 3270222/ 3280222	Single and multi core Computer Architectures, Distributed Computing, High Performance Computing, CUDA.	12	8
Control Systems	2240423	System Modelling, Time-Response analysis, Stability and State-variable Analysis.	12	8
Robot Kinematics	2240424	Forward Kinematic Modeling, Path Planning and Applications, Manipulator Differential Motion, Dynamics and Control.	12	8



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Information Security	2240425/2270425/ 2280425 -	Cryptography, Ciphers, Hashing, Network Attacks.	12	8
Java Programming Lab	2240426/ 2270426/ 2280426	Classes, Exception Handling, Multi-threading, JDBC, Sockets.	. 12	8
Software Engineering	2270423	Requirement Engineering, Software Design, Software Testing and Management.	12	8
Cloud Computing And Virtualization	2270424/ 2280424		12	8
Discrete Structures	3240221/3270221/ 3280221	Sets. Logic, Graphs, Generating functions.	15	8
Object Oriented Programming	3240223/ 3270223/ 3280223	Classes, Objects, Polymorphism, Abstraction, Inheritance, Templates	15	8
Data Structures	3240224/ 3270224/ 3280224	Stack. Queue, Linked List, Sorting Searching, Trees and Graphs.	15	8
Electronic Devices And Circuits	3240225	Semiconductor Components, Differential Amplifier, Integrated Circuits. Controllers.	15	- 8



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		New Courses added		San Aller
(Course/subject name) Course Code Activities/contents which have a bearing on employability		Activities/contents which have a bearing on increasing skill and employability	Agenda Item No.	Page No.
Image Processing	240606/ 270602/ 280602	Digital Image processing systems, Image Sampling and quantization, Image Enhancement, Image Segmentation, Spatial techniques and Frequency domain techniques, Image Restoration and Compression, Pseudo color Image Processing	6	6
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Stakeholder	Student	Faculty	Alumni	Employer
No. of responses	1049	21		-
Link of Analysis	https://drive.google.com/file/d/19flo7lZXWEOpc B1b14A61hwlFO8_15MZ/view?usp-sharing	https://drive.google.com/file/d/1131vq2UxVARN koMVd2TvqJvQAm3zJEnr/view?usp-sharing	*	-
ATR Link	https://drive.google.com/file/d/1UW4_Ev_oed5P PkeVRKWQua9BzZoMfMAo/view/usp-sharing	https://drive.google.com/file/d/H31vq2UxVARN koMVd2TvqJvQAm3zJEnr/view?usp-sharing	*/*	-
Link showing Excel sheet of Google Form details of stakeholders	https://drive.google.com/drive/folders/1w/9bGul/ wznXxzA7y-Ll6BVqose4HpGol4noz5_EBT-cR4 yF5_BkyNZL3txapLlFtw40Ga85*usp-sharing	https://drive.google.com/drive/folders/1u-Qvp_h mm2mf87G0HISKUnY3-56B1-dV?usp-sharing		-



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Date: 13.12.2023

Minutes of Meeting of Board of Studies (BoS) in Centre for Artificial Intelligence

The meeting of the Board of Studies (BoS) in the Centre for Artificial Intelligence was held on 02 Dec., 2023 at 11:00 AM in offline/online mode (though video conferencing). During the meeting following were present:

1.	Dr. R. R. Singh	Chairman
2.	Dr. Jitendra Agrawal Director and Associate Professor, School of Information Technology, RGPV Bhopal.	External Member (Academics) (Nominee of Hon'ble Vice Chancellor RGPV Bhopal)
3.	Mr. Giridhari Lal Gupta Associate at Goldman Sachs, Gwalior:	External Member (Alumnus)
4.	Mr. Aditya Marathe Founder and CEO, Nugenix Robotics, Ichalkaranji, Maharashtra.	External Member (Corporate Sector)
5.	Dr. Tej Singh	Member
6.	Dr. Pawan Dubey	Member
7.	Dr. Bhagat S. Raghuwanshi	Member
8.	Dr. Kritika Bansal	Member
9.	Ms. Shubha Mishra	Member
10.	Dr. Sunil Kumar Shukla	Member
11.	Dr. Vibha Tiwari	Member
12.	Mr. Mir Shahnawaz Ahmad	Member

The following external members could not attend the meeting:

1.	Dr. Dilip Singh Sisodia Associate Professor and HoD, Department of Computer Science, NIT Raipur	External Member (Academics)
2.	Dr. R. K. Pateriya Professor, Department of CSE, MANIT Bhopal	External Member (Academics)



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The following deliberation took place in the meeting:

Item 1	To confirm the minutes of the previous BoS meeting held in the month of May-June 2023. The minutes of the previous BoS meeting held on 02-June, 2023 were presented, discussed and confirmed.		
	The examination committees constituted vierconstituted this year.	de Dean Academics Notice no 1332 dated 20/4/2021 need to be	
	The examination committee has be reconstructed and includes the following members:		
Item 2	Ms. Shu Mr. Mir	. Singh a Tiwari bha Mishra Shahnawaz Ahmad Nominee	
	The same was also confirmed by all the Bo	S members.	
Item 3	To propose the scheme structure of VIII Semester with the provision of ONE DE & ONE OC course to be offered in online mode with credit transfer for the batch admitted in academic year 2020-21. (The total credit from I-VIII semester should not be less than 160 for this batch). The scheme structure of B. Tech. VIII Semester [Information Technology (Artificial Intelligence and Robotics)], batch admitted in academic session 2020 – 21 (under the flexible curriculum), was discussed and recommended. Also, it was confirmed that the total credits from I-VIII semester are equal to 160 for this batch. The scheme is annexed as Annexure-I.		
	discussed and recommended. Also, it was	as confirmed that the total credits from I-VIII semester ar	
Item 4	discussed and recommended. Also, it was equal to 160 for this batch. The scheme is To propose the list of courses which the studentiation (MITS) MOOC, to be offered in (DE-5) and open category (OC3) for credit admitted in academic year 2020-21). The list of Departmental Elective SWAYAM/NPTEL/MOOC based learning [Information Technology (Artificial Interest) 2020-21, were discussed and finalized, as present the scheme is	dents can opt from SWAYAM/NPTEL/ other MOOC Platforms online mode under Departmental Elective (DE) category course transfer in the VIII Semester under the flexible curriculum (Bate (DE-5 & OC-3) courses to be offered from platform (in online mode) for B. Tech VIII Semester elligence and Robotics)], batch admitted in academic year over the following details:	
Item 4	discussed and recommended. Also, it was equal to 160 for this batch. The scheme is To propose the list of courses which the stu Institution (MITS) MOOC, to be offered in (DE-5) and open category (OC3) for credit to admitted in academic year 2020-21). The list of Departmental Elective SWAYAM/NPTEL/MOOC based learning [Information Technology (Artificial Internation Internation Internation Internation Internation Internation Internat	dents can opt from SWAYAM/NPTEL/ other MOOC Platforms online mode under Departmental Elective (DE) category course transfer in the VIII Semester under the flexible curriculum (Bate et al., 1997). Courses to be offered from platform (in online mode) for B. Tech VIII Semester descriptions and Robotics), batch admitted in academic year the following details: OC-3 Data Analytics with Python Deep Learning - IIT Ropar Natural Language Processing	

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[These will be offered through SWAYAM/NPTEL/MOOC based Piatforms for the B.Tech. VIII semester students (for the batch admitted in 2020-21)] and for B.Tech. VI semester (for the batch admitted in 2021-22)]

The courses available on SWAYAM/NPTEL/MOOC based learning platforms for Honours Specialization for the B.Tech. VIII semester students [Information Technology (Artificial Intelligence and Robotics) (for the batch admitted in 2020-21)] were discussed and identified. Following track-wise list of honours courses were selected:

Foundations of	Cyber Physical Systems
Computer Visio	n and Image Processing-Fundamentals and Applications
Edge Computin	g
The Joy of Con	puting using Python
Artificial Intelli	gence: Knowledge Representation And Reasoning
GPU Architectu	res And Programming
Advanced Com	puter Architecture

Also, the courses available on SWAYAM/NPTEL/MOOC based learning platforms for Honours Specialization for the B.Tech. VI semester students [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], for the batch admitted in 2021-22, were discussed and identified. Following track-wise list of honours courses were selected:

Track 1: Information Security	Track 2: Internet of Things
Secure Computation: Part I	Sensors and actuators
Information Security- 5 - Secure Systems Engineering	Microprocessors and Microcontrollers
•	Introduction to Internet of Things
Track 3: High Perfe	ormance Computing
Parallel Computer Architecture	
GPU Architectures and Programming	

To review and finalize the scheme structure of B.Tech VI Semester under the flexible curriculum (Batch admitted in 2021-22)

Item 6 The scheme structure of B. Tech. VI Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], batch admitted in academic session 2021 – 22 (under the flexible curriculum), was discussed and recommended. The scheme is annexed as Annexure-II.

To review & finalize the syllabi for all Departmental Core Courses (DC) and Mandatory Course (MC) of B. Tech VI Semester (for batch admitted in 2021-22) under the flexible curriculum along with their COs.

The syllabi (along with course outcomes) of B. Tech. VI Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and

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Machine Learning, batch admitted in academic session 2021 - 22 (under the flexible curriculum), were discussed and recommended. The scheme is annexed as Annexure-III. To propose the list of courses from SWAYAM/NPTEL/MOOC Platforms to be offered (for batches admitted in 2021-22) in online mode under Departmental Elective (DE-1) Course with credit transfer, in the VI Semester. The list of Departmental Elective (DE-1) courses to be offered from SWAYAM/NPTEL/MOOC based learning platform (in online mode) for B. Tech VI Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning were discussed and finalized, as per the following details: DE-1 (Information DE-1 (Artificial Intelligence DE-1 (Artificial Intelligence Technology (Artificial (AI) and Data Science) (AI) and Machine Learning) Intelligence and Robotics)) Item 8 **Embedded System** Data Science for Data Analytics with Design with ARM Engineers Python · Robotics: Basics and Business Intelligence & Artificial Intelligence: Selected Advanced Analytics Knowledge Concepts Blockchain and its Representation and Blockchain and its Applications Reasoning Applications Compiler Design Blockchain and its Compiler Design Applications Compiler Design Foundation of Cloud IoT Edge ML To review and finalize the courses & syllabi to be offered (for batch admitted in 2021-22) under the Open Category (OC) Courses (in traditional mode) for VI semester students of other departments along with their COs. Item 9 The syllabi (along with course outcomes) of Open Category (OC) Courses (in traditional mode) for VI semester students of other departments, batch admitted in academic session 2021 - 22 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-IV. To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in B. Tech. VI semester (for batch admitted in 2021-22). Item 10 The Experiment list/ Lab manual for all the Laboratory Courses of B. Tech. VI Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (Al) and Machine Learning, batch admitted in academic session 2021 - 22 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-V. To review and finalize the suggestive list of projects which can be offered under the 'Skill based Item 11 mini-project' category in various laboratory components based courses to be offered in B.Tech. VI Semester (for the batch admitted in 2021-22).

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	The suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses of B. Tech. VI Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], batch admitted in academic session 2021 – 22 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-V.
	To review and finalize the scheme and syllabi of B. Tech. IV Semester (for batch admitted in 2022-23) under the flexible curriculum along with their COs. The scheme and syllabi (along with course outcomes) of B. Tech. IV Semester [Information Technology
Item 12	(Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], batch admitted in academic session 2022 – 23 (under the flexible curriculum), were reviewed and finalized. The scheme and syllabi are annexed as Annexure-VI.
	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in Batch IV semester (for batch admitted in 2022-23)
Item 13	The Experiment list/ Lab manual for all the Laboratory Courses of B. Tech. IV Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning , batch admitted in academic session 2022 – 23 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-VII.
	To review and finalize the suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses to be offered in B. Tech IV Semester (for the batch adm tted in 2022-23).
Item 14	The suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses of B. Tech. IV Semester [Information Technology (Artificial Intelligence and Robotics]/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning, batch admitted in academic session 2022 – 23 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-VII.
	To review and finalize the scheme and syllabi of B. Tech. II Semester (for batch admitted in 2023-24) under the flexible curriculum along with their COs.
Item 15	The scheme and syllabi (along with course outcomes) of B. Tech. II Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], batch admitted in academic session 2023 – 24 (under the flexible curriculum), were reviewed and finalized. The scheme and syllabi are annexed as Annexure-VIII.
Item 16	To review and finalize the Experiment list/ Lab manual for all the Laboratory Courses to be offered in Batch II semester (for batch admitted in 2023-24)
Ittili 10	The Experiment ist/ Lab manual for all the Laboratory Courses of B. Tech. II Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/
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	Artificial Intelligence (AI) and Machine Learning, batch admitted in academic session 2023 – 24 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-IX.
Item 17	To review and finalize the suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses to be offered in B. Tech IV Semester (for the batch admitted in 2023-24). The suggestive list of projects which can be offered under the 'Skill based mini-project' category in various laboratory components based courses of B. Tech. II Semester [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/ Artificial Intelligence (AI) and Machine Learning], batch admitted in academic session 2023 – 24 (under the flexible curriculum), were discussed and finalized. The scheme is annexed as Annexure-IX.
Item 18	To review the CO attainments, identify gaps and suggest corrective measures for the improvement in the CO attainment levels for the courses taught in Jan-June 2023 Session. The CO attainment levels of various courses were reviewed, along with the Gap identification and necessary action taken for not attained CO levels. The same is annexed as Annexure-X.
Item 19	To review the PO attainment, CO-PO mapping matrix and action to be taken to improve PO attainment level. Note: Currently, the senior batches of Information Technology (Artificial Intelligence and Robotics), Artificial Intelligence (AI) and Data Science and Artificial Intelligence (AI) and Machine Learning are in VII, V and V semesters respectively, and no batch has yet completed the degrees in these programs. So, the PO attainment will not be prepared in this semester.
Item 20	To review curricula feedback from various stakeholders, its analysis and impact. The curricula feedback from various stakeholders for B. Tech. II/IV/VI Semesters [Information Technology (Artificial Intelligence and Robotics)/ Artificial Intelligence (AI) and Data Science/Artificial Intelligence (AI) and Machine Learning] during Jan-June2023, were reviewed and discussed. The same is annexed in Annexure-XI
Item 21	To discuss and recommend the scheme structure & syllabi of PG Programme (M.E./M.Tech./MCA/MBA) along with their Course Outcomes (COs) Note: Currently, the Centre for Artificial Intelligence is not offering any PG Programme.
Item 22	To recommend the scheme structure and Syllabus of Ph.D. Course Work (specific to Doctoral Research Scholars, if any) Note: Currently, the Centre for Artificial Intelligence is not offering any Ph.D. Programme.
Item 23	Any other matter. The Syllabus, List of Experiments and Skill based mini Projects for Problem Solving and Programming (3240122/ 3270122/ 3280122) as a rectification to Computer Programming in the First

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Semester (batch admitted in academic session 2023 - 24) was discussed and finalized. The syllabus (along with List of Experiments and skill based mini projects) is annexed as Annexure-XII.

Suggestions by the external experts/members:

The external experts suggested that Robot Economics and Robot Esthetics and Design be included in the curriculum of the Artificial Intelligence and Robotics branch. It was also discussed in the meeting that seminars and skill based mini projects can suffice for this requirement.

The meeting ended with the vote of thanks to all the members.

Dr. Tej Singh

Dr. Pawan Dubey

Dr. Bhagat S. Raghuwanshi

Dr. Vibha Tiwari

Dr. Kritika Bansal

Ms. Shubha Mishra

Dr. Sunil Kumar Shukla

Mr. Mir Shahnawaz Ahmad

Alendad in Je Dr. Jitendra Agrawal

Director and Associate Professor, School of Information Technology, RGPV Bhopal.

Mr. Giridhari Lal Gupta

Associate at Goldman Sachs. Gwalior.

Dr. Dilip Singh Sisodia

Associate Professor and HoD, Department of Computer Science, NIT Raipur

Attended in

Opline Mode. Mr. Aditya Marathe

Founder and CEO,

Nugenix Robotics. Ichalkaranji, Maharashtra.

Dr. Rajni Ranjan Singh Coordinator, Center for Artificial Intelligence [Chairman, BoS]

Dr. R. K. Pateriya

Professor, Depart of CSE, MANIT Bhopal