

भारतीय प्रौद्योगिकी संस्थान मण्डी  
कमांद-175075, हिमाचल प्रदेश

**INDIAN INSTITUTE OF TECHNOLOGY MANDI  
KAMAND – 175075, HIMACHAL PRADESH**



कार्य सूची

**AGENDA**

**बयालीसवीं सीनेट बैठक सूची**

**AGENDA FOR THE 42<sup>nd</sup> SENATE MEETING**

बैठक सं०	:	बयालीसवीं
MEETING NO.	:	FORTY TWO
स्थान	:	सभा कक्ष, सी. वी. रमन अतिथि गृह, आई. आई. टी. मण्डी
VENUE	:	CONFERENCE ROOM, C. V. RAMAN GUEST HOUSE, IIT MANDI
दिनांक	:	जनवरी 23, 2024
DATE	:	January 23, 2024
समय	:	03:00 मध्याह्न
TIME	:	03:00 P.M.

**INDIAN INSTITUTE OF TECHNOLOGY MANDI  
KAMAND, HIMACHAL PRADESH**



**42<sup>nd</sup> SENATE MEETING  
TUESDAY, JANUARY 23, 2024**

**AGENDA**

Item No.	Agenda items	Page No.
<b>PART – A</b>		
42.1	To confirm the minutes of the 41 <sup>st</sup> Senate meeting held on October 8, 2023.	4
42.2	To receive a report on the actions taken for the decisions taken in the 39 <sup>th</sup> , 40 <sup>th</sup> and 41 <sup>st</sup> Senate meetings were held on April 25, 2023, September 17, 2023, and October 8, 2023.	4
42.3	To consider the proposal to establish a new Centre for Climate Change and Disaster Management.	5
42.4	To consider the proposal of a Research Methodology (RM-600) course to be floated at the school level	5
42.5	To consider the proposal for Early Induction in M.Tech./Ph.D. programmes	5
42.6	To consider the revision of the new CSE curriculum and change in course for minor in Intelligent Systems	5
42.7	To consider the proposal of crediting of independent study course for graduate students	5
42.8	To consider the new courses for BS Chemical Sciences in 2 <sup>nd</sup> Year Curriculum	6
42.9	To consider the proposal for inclusion of HSS paper in JAM for admission to MA program	6
42.10	To consider the new courses from IKSMHA	6
42.11	To consider the proposal of new Master of Arts in IKS programme	6
42.12	To consider the proposal for M.S. (Research) in Music and Musopathy and Ph.D. program	6
42.13	To consider the revision of M.Tech. (Biotechnology) Curriculum	6-7
42.14	To consider the revision of MBA DS&AI and IMBA curriculum	7
42.15	To consider reservation applicability in Ph.D. admission from CFTIs B.Tech. Candidates	7
42.16	To consider the proposal to create an Entrepreneurship-Practicum Program for UG students in the Institute	7
42.17	To consider the proposal to start a new Minor in Japanese language	7
42.18	Any other agenda item with the permission of the Chairman, Senate.	8
42.19	To report decisions/action taken by the Chairman, Senate.	8-34
<b>PART – B</b>		
42.20	Issues to be discussed by the Senate without Student Members being present.	36

# **PART – ‘A’**

**Item No. 42.1: To confirm the minutes of the 41<sup>st</sup> Senate meeting held on October 8, 2023.**

The minutes of the 41<sup>st</sup> Senate meeting held on October 8, 2023, at IIT Mandi were circulated to members of the Senate on October 11, 2023 (through email) for comments. No comments have been received on the minutes.

In view of the above, the Senate may consider confirming the minutes of the 41<sup>st</sup> Senate meeting of the Institute.

**Item No. 42.2: To receive a report on the actions taken for the decisions taken in the 39<sup>th</sup>, 40<sup>th</sup> and 41<sup>st</sup> Senate meetings were held on April 25, 2023, September 17, 2023 and October 8, 2023.**

Given below are the details of actions taken for the decisions taken in the 39<sup>th</sup>, 40<sup>th</sup> and 41<sup>st</sup> Senate meetings were held on April 25, 2023, September 17, 2023 and October 8, 2023.

Item No.	Particulars	Status of Action Taken
39.3	To consider the proposal of BS credit structure	Kept in abeyance for further clarification.
39.4	To consider the proposal of B.Tech. in General Engineering branch	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/4965-66 dated 18-12-2023
39.5	To consider the proposal of five years Integrated MBA programme	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/4967-68 dated 18-12-2023
39.6	To consider the guidelines for eligibility of Ph.D. programme and its scholarship	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2196-2201 dated 17-07-2023
39.7	To consider the proposal of Committee on guidelines of B.Tech. (Honours) in UG Programme	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2067-71 dated 13-07-2023
39.8	To consider the proposal of attendance criteria in classes	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2072-76 dated 13-07-2023
39.9	To consider the proposal of Thesis credit structure for M.Tech.(R) programme	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2077-82 dated 13-07-2023
39.10	To consider the proposal to establish a new Centre Human-Computer Interaction (HCI) at IIT Mandi	BoG approved the same and notified
39.11	To consider the proposal of revision of Comprehensive Examination in Ph.D. programme	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2085-86 dated 13-07-2023
39.12	To consider the proposal of revision in Early Induction of M.Tech.(Rsh)/Ph.D. programme for Young Researchers	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/2088-94 dated 13-07-2023
39.13	To consider the proposal of minor revision in B.Tech. Ordinances and Regulations	The Senate deferred for consideration in subsequent Senate meeting
39.14	To consider the proposal of B.Tech. in Maths and Computing branch	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/4969-70 dated 18-12-2023
39.15	Any other agenda item with the permission of the Chairman, Senate	Proposal of start a new branch B.Tech in Microelectronics and VLSI Engineering (Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/4971-72 dated 18-12-2023
40.2	NIL	Special Meeting of the Senate
41.2	NIL	Convocation Meeting of the Senate

**Item No. 42.3: To consider the proposal to establish a new Centre for Climate Change and Disaster Management.**

In the 50<sup>th</sup> meeting of the Board of Academics held on July 14, 2023, Dr. Venkata Uday Kala, presented a proposal to establish a new Centre for Climate Change and Disaster Management at IIT Mandi. After discussions, the BoA recommended the proposal, as placed at **Annexure – A; Page No. 37 to 40** to the Senate for consideration and approval.

**Item No. 42.4: To consider the proposal of a Research Methodology (RM-600) course to be floated at the school level:**

In the 50<sup>th</sup> meeting of the Board of Academics held on July 14, 2023, Dr. Amit Jaiswal, Associate Dean (Research) presented the proposal that the Research Methodology (RM-600) course will be floated at the school level from the next semester starting January, 2024. The curriculum should be tailored to meet the research-related requirements specific to each school, and the evaluation of the course will also be conducted at the school level. The school is advised to take necessary action in this regard, prepare the revised curriculum, and seek the required approvals. The BoA recommended the proposal for consideration of the Senate and its approval.

**Item No. 42.5: To consider the proposal for Early Induction in M.Tech./Ph.D. programmes:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Prof. Rahul Vaish, presented a proposal for Early Induction in M.Tech./Ph.D. programmes at IIT Mandi. The BoA recommended the proposal as placed at **Annexure-B; Page No. 41 to 42** for consideration of the Senate and its approval.

**Item No. 42.6: To consider the revision of the new CSE curriculum and change in course for minor in Intelligent Systems:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Dr. Padmanabhan Rajan, Nominee SCEE, presented the revision of new CSE curriculum and change in course for minor in Intelligent Systems. The BoA recommended the proposal as placed at **Annexure-C; Page No. 43 to 47**. Approval of the BoA is reported to the Senate for its approval.

**Item No. 42.7: To consider the proposal of crediting of independent study course for graduate students:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Dr. Varun Dutt, Chair IKSMHA, presented the proposal of crediting of independent study course for graduate students. The BoA recommended the proposal for courses taken upto December, 2023 as placed at **Annexure-D; Page No. 48 to 52** for consideration of the Senate and its approval.

**Item No. 42.8: To consider the new courses for BS Chemical Sciences in 2<sup>nd</sup> Year Curriculum:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Dr. Bhaskar Mondal, Nominee SCS, presented the new courses for BS Chemical Sciences in 2<sup>nd</sup> Year Curriculum. The BoA recommended the proposal as placed at **Annexure-E; Page No. 53 to 92** for consideration of the Senate and its approval.

**Item No. 42.9: To consider the proposal for inclusion of HSS paper in JAM for admission to MA program:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Dr. Rajeshwari Dutt, Nominee SHSS, presented the proposal for inclusion of HSS paper in JAM for admission to MA program. The BoA recommended the proposal as placed at **Annexure-F; Page No. 93 to 95** for consideration of the Senate and its approval.

**Item No. 42.10: To consider the new courses from IKSMHA:**

In the 52<sup>nd</sup> meeting of the Board of Academics held on November 2, 2023, Dr. Ramajayam, presented the proposal of the new courses from IKSMHA. The BoA recommended the proposal as placed at **Annexure-G; Page No. 96 to 104**. Approval of the BoA is reported to the Senate for its approval:

Sl. No.	Course No.	Course Name	Credits
1	IK-506	Research Methods and Statistics for Contemplative Science	2-1-0-3
2	IK-507	Neuroscience and Mental Health	3-0-0-3

**Item No. 42.11: To consider the proposal of new Master of Arts in IKS programme:**

In the 52<sup>nd</sup> meeting of the Board of Academics meeting held on November 2, 2023, Dr. Varun Dutt presented the proposal for a new branch of the Master of Arts in IKS programme. The BoA suggested to constitute a committee for the proposal and Dr. Varun Dutt will present the revised proposal for the consideration of the Senate.

**Item No. 42.12: To consider the proposal for M.S. (Research) in Music and Musopathy and Ph.D. program:**

In the 52<sup>nd</sup> meeting of Board of Academic meeting held on November 2, 2023, Dr. Pratim Kundu, presented a proposal for Master and Ph.D. in Music and Musopathy and the BoA suggested to constitute a committee for recommendations on the proposal. Accordingly, the revised proposal is placed at **Annexure-H; Page No. 105 to 132** for consideration of the Senate and its approval.

**Item No. 42.13: To consider the revision of M.Tech. (Biotechnology) Curriculum:**

In the 53<sup>rd</sup> Board of Academics meeting held on December 22, 2023, Dr. Kasturi Prasad presented the proposal for revision of M.Tech. (Biotechnology) Curriculum. The BoA recommended the proposal as

placed at **Annexure-I; Page No. 133 to 136** for consideration of the Senate and its approval.

**Item No. 42.14: To consider the revision of MBA DS&AI and IMBA curriculum:**

In the 53<sup>rd</sup> Board of Academics meeting held on December 22, 2023, Dr. Akhaya Nayak, Nominee SOM presented the proposal for revision of the MBA DS & AI and I-MBA curriculum. The BoA recommended the proposal as placed at **Annexure-J; Page No. 137 to 159** for consideration of the Senate and its approval.

**Item No. 42.15: To consider reservation applicability in Ph.D. admission from CFTIs B.Tech Candidates.**

As per the initial Ordinance & Regulations for Ph.D. Programme candidates who have B.Tech Degree from one of the IITs, with a minimum CGPA of 8.0 on a scale of 10.0 were eligible for PhD admissions without national level examination.

Thereafter the Exemptions from mandatory requirements of valid GATE or National Level examination and allowed to B.Tech./B.E./B.S. (or equivalent) degree from CFTI (Centrally Funded Technical Institute)/ any of the top 100 institutes according to NIRF ranking (overall category) at the time of application/ any Himachal Pradesh Govt. institution or universities with CGPA/CPI of at least 7.5 (on a scale of 10) or equivalent as approved in 39<sup>th</sup> meeting of the senate held on April 25, 2023.

It is proposed to consider the reservation as per GoI norms and to relax the criteria for the categories of OBC/SC/ST/PwD as below:

1. OBC (NCL): 7 CGPA
2. SC/ST/Pwd: 6.5 CGPA

However, other qualifying criteria will remain the same. The Senate may deliberate to decide the applicability of reservation in the interest of the institute as per GoI norms. Dean (Acad) will present the proposal.

**Item No. 42.16: To consider the proposal to create an Entrepreneurship-Practicum Programme for UG students in the Institute:**

Dr. Satvasheel Powar, Academic Coordinator of the Entrepreneurship-ecosystem program will present a proposal to add entrepreneurship practicum to the Academic Curriculum of B.Tech. students as placed at **Annexure – K; Page No. 160 to 166** to the Senate for its consideration and approval.

**Item No. 42.17: To consider the proposal to start a new Minor in Japanese language:**

Dr. Venkata Uday Kala, Associate Professor will present a proposal to start a new Minor in the Japanese language to the Senate for its consideration and approval.

**Item No. 42.18: Any other agenda item with the permission of the Chairman, Senate.**

**Item No. 42.19: To report decisions/action taken by the Chairman, Senate:**

- (i) **To report approval for Academic calendar for Jan-June, 2024(Even Semester) and July-December, 2024 (Odd Semester):** On the recommendations of AD(Courses)/Dean (Academics), Chairman Senate approved Academic calendar for Jan-June, 2024(Even Semester) and July-December, 2024 (Odd Semester). (*Approved on December 22, 2023 and Notified vide Notification No. IIT Mandi/Academics/Academic Calendar/ 2024/5126-30 dated 26-12-2023.*)
- (ii) **To report the approved proposal for B.Tech. Data Science and Engineering program administration by SCEE:** On the recommendation of School Chairs (SCEE & SMSS), B.Tech DSE will be administrated solely by SCEE. (*Approved on 09-05-2023 and Notified vide Notification No. IITMandi/Acad/Notf./2023/621-624 dated 16-05-2023*)
- (iii) To report regarding implementation of reservation on admission on seats under different MoUs: (*Approved on 16-05-2023*)
- (iv) To report regarding Institute Seminar Colloquium Cell: (*Approved on 24-05-2023 and Notified on IIT Mandi/Acad/Notf./2023/1164-68 dated 15-06-2023*)
- (v) To report about the Ph.D. Scholar Cap for Faculty: (*Approved on 30-06-2023 and Notified on IIT Mandi/Acad/Notf./2023/2122-26 dated 14-07-2023*)
- (vi) To report about the provisional offers to summer interns at IIT Mandi for further Degree Programme Admissions: (*Approved on 17-07-2023 and Notified on IIT Mandi/Acad/Notf./2023/2264-70 dated 18-07-2023*)
- (vii) To consider the proposal of establish a new Centre for Quantum Technology: (*Approved on 29-07-2023*)
- (viii) To report about the conversion of credits earned at NTNU, Norway for Student Exchange programme: On the recommendations of Committee and Dean (Academics) conversion of credits earned at NTNU, Norway (*Approved on 22-08-2023 and Notified on IIT Mandi/Academics/Notf./2023-24/3487-91 dated 24-08-2023*)
- (ix) To report about the conversion of credits earned at Kyushu University for Student Exchange programme: On the recommendations of Committee and Dean (Academics) conversion of credits earned at Kyushu University (*Approved on 22-08-2023 and Notified on IIT Mandi/Academics/Notf./2023-24/3482-86 dated 24-08-2023*)
- (x) **To report the summer internship program 2023:** Summer Internship interns have successfully completed the Summer Internship Program at IIT Mandi. On the recommendations of individual faculty members the amount of stipend for internship is released to interns. (*Approved on 04-09-2023*)
- (xi) **To report the merit scholarship to female students of B.Tech. for (2019, 2020 and 2021) batches:** As per policy of the Institute, female students entitled for a merit scholarship of Rs. 1000/- per month and full tuition fee waiver subject to good academic performance with minimum SGPA criteria of 7.0 for the previous two semesters.



*(Approved on 22-08-2023 and 17-09-2023 and Notified vide Notification No. IITMandi/Acad/2023/4073-75 dated 25-09-2023)*

- (xii) To report the guidelines of HRA for students through external funding agencies: Guidelines for HRA for students are framed *(Approved on 17-09-2023 and Notified vide Notification No. IITMandi/Acad/2023/4182-88 dated 26-09-2023)*
- (xiii) **To report the revision of emoluments and guidelines on service conditions for Research Personnel engaged in R & D programme of the Central Government Departments/Agencies: Ph.D. scholars revision of emoluments** *(Approved on 04-10-2023 and Notified vide Notification No. IITMandi/Acad/Notf./2023/4289-94 dated 05-10-2023)*
- (xiv) On the recommendation of School Chairs (SCEE & SMSS), B.Tech DSE will be administrated solely by SCEE. *(Approved on 09-05-2023 and Notified vide Notification No. IITMandi/Acad/Notf./2023/621-624 dated 16-05-2023)*
- (xv) **To report the proposal of B.Tech. semester wise distribution according to revised curriculum:** In 50<sup>th</sup> BoA Meeting held on 14<sup>th</sup> July, 2023, the BoA approved the proposal of B.Tech. semester wise distribution to revised curriculum. *(Approved on 14-07--2023 and Notified vide Notification No. IITMandi/Acad/BoA/2023/4973-76 dated 18-12-2023)*
- (xvi) **To report the proposal of revision in curriculum of Master of Arts in Development Studies (to be applicable from 2023-25 batch):** In 50<sup>th</sup> BoA Meeting held on 14<sup>th</sup> July, 2023, the BoA approved the proposal of revision in curriculum of Master of Arts in Development Studies (to be applicable from 2023-25 batch). *(Approved on 14-07-2023 and IITMandi/Acad/BoA/2023/4973-76 dated 18-12-2023)*
- (xvii) **To consider the proposal for modification in the name and courses of Minor in German Language to be Minor in German Studies:** In 52<sup>nd</sup> BoA Meeting held on 2<sup>nd</sup> November, 2023, the BoA approved the proposal for modification in the name and courses of Minor in German Language to Minor in German Studies. *(Approved on 02-11-2023 and Notified vide Notification No. IITMandi/Acad/BoA/2023/5000-05 dated 21-12-2023)*
- (xviii) **To consider the proposal for discarding the HSS course basketing:** In 52<sup>nd</sup> BoA Meeting held on 2<sup>nd</sup> November, 2023, the BoA approved the proposal for discarding the HSS course basketing. *(Approved on 02-11-2023 and Notified vide Notification No. IITMandi/Acad/BoA/2023/5006-10 dated 21-12-2023)*
- (xix) **To consider the proposal of modification in the courses towards Communication Competence in the Management Minor:** In 52<sup>nd</sup> BoA Meeting held on 2<sup>nd</sup> November, 2023, the BoA approved the proposal the proposal of modification in the courses towards Communication Competence in Minor Management. *(Approved on 02-11-2023 and Notified vide Notification No. IITMandi/Acad/BoA/2023/5011-15 dated 21-12-2023)*
- (xx) **To report different MoUs for Joint Degree programmes:**
  - (i) SVNIT and IIT Mandi (24-03-3023)
  - (ii) IIT Ropar and IIT Mandi (on 31-05-2023)
  - (iii) NIT Goa and IIT Mandi (22-06-2023)
  - (iv) IIT Jammu and IIT Mandi (29-06-2023)
  - (v) PEC, Chandigarh and IIT Mandi (29-06-2023)
- (xxi) **Withdrawal from the programme during (09<sup>th</sup> May, 2023 to 08<sup>th</sup> January, 2024):**

The following student resigned and requested for withdrawal which was recommended by his/her Faculty Advisor/School Chair. Consequently, Chairman, Senate approved their withdrawal from the programme.

Sl. No	Roll No.	Student Name	School/ Branch	Program	Date of Joining	Date of Resignation Accepted
1	T22256	Puneet Kapoor	SCEE	M.Tech.	10-08-2022	09-05-2023
2	T22269	Ambeyraj Mishra	SCEE	M.Tech.	10-08-2022	10-05-2023
3	B22159	Dhrubojyoti Bala	SCEE	B.Tech.	November, 2022	10-05-2023
4	D22039	Iftikhar Bashir	SMSS	Ph.D.	10-08-2022	10-05-2023
5	T22260	Subham Kumar	SCEE	M.Tech.	10-08-2022	24-05-2023
6	D22128	Mandeep Kaur	SMME	Ph.D.	30-01-2023	27-05-2023
7	D22144	Neeraj Singh Bisht	SCEE	Ph.D.	30-01-2023	06-06-2023
8	V22097	Amit Kumar Maity	SCS	M.Sc.	10-08-2022	08-06-2023
9	T22154	Shubham Jaiswal	SCEE	M.Tech.	10-08-2022	20-06-2023
10	D22187	Tanu Yadav	SHSS	PhD	03-03-2023	20-06-2023
11	S22026	Aditya Singh Yadav	SCEE	M.Tech (Research)	16-08-2022	30-06-2023
12	S22010	Saurav Kumar Nidhi	SCENE	M.Tech (Research)	10-08-2022	06-07-2023
13	S22032	Shivam Suri	SMME	M.Tech (Research)	17-08-2022	06-07-2023
14	T22160	Rudra Pratap Singh	SCEE	M.Tech	10-08-2022	14-07-2023
15	T22304	Sachin Yadav	SMME	M.Tech	10-08-2022	27-07-2023
16	T22303	Karan Shrivastava	SMME	M.Tech	10-08-2022	01-08-2023
17	D22171	Ekesh Chandra	SCENE	Ph.D	06-02-2023	01-08-2023
18	T23054	Vanshika Sisodia	SCENE	M.Tech.	07-08-2023	22-08-2023
19	B23254	Ayaan Siddiqui	SCEE	B.Tech.	06-08-2023	22-08-2023
20	MB22004	Harsha Harod	SOM	MBA	19-09-2022	30-08-2023
21	S22050	Biswarup Biswas	CAIR	M.Tech (Research)	27-02-2023	04-09-2023
22	A23011	Yuvraj Shanker	SHSS	MA	08-08-2023	04-09-2023
23	T23194	Virothi Venkata Swaroop	SCEE	M.Tech.	16-08-2023	08-09-2023
24	A23005	Navadha Maheshwari	SHSS	MA	07-08-2023	17-09-2023
25	A23018	Eshika Rahil	SHSS	MA	10-08-2023	17-09-2023
26	D23129	Subodh Kumar Verma	SMME	PhD	17-08-2023	17-09-2023
27	T23155	Ashish Maruti	SCEE	M.Tech.	07-08-2023	21-09-2023
28	T23158	Nitin Chandel	SCEE	M.Tech.	18-08-2023	21-09-2023
29	S23058	Debabrata Saha	SCEE	M.Tech.	07-08-2023	21-09-2023
30	D23041	Abhijeet	SCEE	Ph.D.	28-08-2023	29-09-2023
31	S22049	Akhilesh Kumar Singh	CAIR	M.Tech.(Research)	24-02-2023	29-09-2023
32	D23111	Riya	SCS	Ph.D. Joint Degree	21-08-2023	04-10-2023
33	A20010	Jasmeet Singh Bindra	SHSS	MA	16-09-2020	07-10-2023
34	D22006	Niraj Kumar	SCEE	PhD	10-08-2022	07-10-2023
35	D23110	Arihant Jain	SCS	Ph.D.	09-08-2023	07-10-2023
36	V22085	Kiran Barman	SCS	M.Sc.	10-08-2022	07-10-2023
37	A23019	Rahul Kumar	SHSS	MA	18-08-2023	07-10-2023
38	A23004	Manoj	SHSS	MA	08-08-2023	07-10-2023
39	D22152	John Tete	SCS	Ph.D.	29-01-2023	07-10-2023
40	T23196	Arpit Anand	SCEE	M.Tech.	16-08-2023	18-10-2023
41	T22161	Vivek Vinod Sharma	SCEE	M.Tech.	10-08-2022	01-11-2023

42	D23122	Chandra Prakash	SCENE	PhD	18-08-2023	08-11-2023
43	D23048	Prajwal Jaswal	SCEE	PhD	07-08-2023	14-11-2023
44	D22097	Shafiqul Islam	SCENE	PhD	22-08-2022	14-11-2023
45	D23167	Jyoti Ranjan Kabi	SCS	PhD	28-08-2023	24-11-2023
46	S22044	Mr. Rajmin Ashish Navinbhai	SCEE	PhD	09-02-2023	06-12-2023
47	DD23001	Mr. Saurabh Mishra	SCEE	M.Tech (R)+PhD Dual Degree	07-08-2023	22-12-2023
48	T23065	Mr. Tarun	SCENE	M.Tech (Structural Engineering)	07-08-2023	28-12-2023
49	D23061	Mr. Akhil	SCENE	Ph.D.	07-08-2023	30-12-2023

**(xxii) Cancellation/Termination from the programme during (04<sup>th</sup> September, 2023 to 8<sup>th</sup> January, 2024):**

The following students was recommended by his/her Faculty Advisor/School Chair. For cancellation/termination from the programme. Consequently, Chairman, Senate approved their cancellation/termination from the programme.

Sl. No	Roll No.	Student Name	School/Branch	Program	Date of Joining	Date of Resignation Accepted	Reason of cancellation
1	D17005	Tarun Semwal	SCENE	PhD	03-08-2017	04-09-2023	Not submitted the fee, leave and Unsatisfactory performance
2	PTD2204	Pankaj Sharma	SOM	PhD	25-08-2022	26-09-2023	Not register the semester nor paid the fee
3	A20005	Daimond Narzary	SHSS	MA	16-09-2020	26-09-2023	Credit requirement not completed and maximum duration of program completed
4	V20042	Fayaz Ahmad	SCS	M.Sc.	16-09-2020	26-09-2023	
5	V20050	Ashim Majumdar	SMSS	M.Sc.	16-09-2020	29-09-2023	
6	V20060	Feroz Ahmad Khan	SMSS	M.Sc.	16-09-2020	29-09-2023	
7	V20072	Kartikay Sharma	SMSS	M.Sc.	16-09-2020	29-09-2023	of program completed

**(xxiii) Provisional Certificate issued to M.S. / Ph.D. scholars (approved during 9<sup>th</sup> May, 2023 – 5<sup>th</sup> January, 2024):**

On completion of all requirements of M.S./Ph.D., Provisional Degree Certificates have been issued to following students:

Sl.No	Roll No.	Student Name	Programme	School	Date of Joining	Provisional Certificate issued on
1	D19073	Chander Mohan	Ph.D.	SMME	13-08-2018	09-05-2023
2	D17043	Aditya Yadav	Ph.D.	SCS	01-02-2018	10-05-2023
3	D16072	Pushpendra Mani Mishra	Ph.D.	SBB	01-02-2017	10-05-2023
4	D17020	Muneeswaran P	Ph.D.	SCEE	01-02-2018	27-05-2023
5	D18022	Saptarshi Karmakar	Ph.D.	SMME	01-08-2018	08-06-2023
6	D17002	Mohammad Kamran	Ph.D.	SCENE	03-08-2017	08-06-2023

7	D15038	M Naresh	Ph.D.	SCENE	17-08-2015	20-06-2023
8	D17012	Aranya Kar	Ph.D.	SCS	03-08-2017	20-06-2023
9	S19014	Faria Jigar Visanji Desai	M.S.	SCEE	01-08-2019	20-06-2023
10	S19029	Prakash Neupane	M.S.	SCEE	17-02-2020	20-06-2023
11	D16038	Rituporn Gogoi	Ph.D.	SCS	15-11-2016	29-06-2023
12	D16052	Shikha Marwaha	Ph.D.	SCEE	01-02-2017	06-07-2023
13	D17011	Diksha Thakur	Ph.D.	SCS	03-08-2017	06-07-2023
14	D17032	Ravinder Kaushik	Ph.D.	SCS	01-02-2018	06-07-2023
15	S21036	Ankita Deo	M.S.	SCEE	01-02-2018	06-07-2023
16	D18035	Hushan Chand	Ph.D.	SCS	01-02-2019	14-07-2023
17	D14006	Anindita Ghosh	PhD	SHSS	01-08-2014	17-07-2023
18	D15058	Nagaraju Nakka	Ph.D.	SPS	08-02-2016	17-07-2023
19	D16002	Mohammad Faizan Ahmed	Ph.D.	SHSS	25-07-2016	17-07-2023
20	D16042	Kumar Sambhav Pandey	Ph.D.	SCEE	01-02-2017	17-07-2023
21	D18029	Shweta Singh	Ph.D.	SMME	01-08-2018	27-07-2023
22	D17047	Prasanth Saini	Ph.D.	SMME	01-02-2018	01-08-2023
23	D19048	Dheeraj	Ph.D.	SPS	03-02-2020	01-08-2023
24	S20012	Meetesh K Mehta	M.S.	SCEE	15-02-2021	01-08-2023
25	D16063	Ranjit Singh	Ph.D.	SCS	01-02-2017	11-08-2023
26	D18004	Manoj Kumar	Ph.D.	SMSS	01-08-2018	11-08-2023
27	S19007	Ayush Gupta	M.S	SMME	01-08-2019	04-09-2023
28	D18057	Deepa Thakur	Ph.D.	SMME	01-02-2019	04-09-2023
29	D18066	Arya Priyadarsini	Ph.D.	SHSS	01-02-2019	13-09-2023
30	D17021	Muralikrishna H	Ph.D.	SCEE	01-02-2018	17-09-2023
31	D18006	Subhash Chandra	Ph.D.	SMSS	01-08-2018	26-09-2023
32	D17059	Keshav Bhardwaj	Ph.D.	SBB	15-02-2018	26-09-2023
33	D17033	Astha Singh	Ph.D.	SCS	01-02-2018	26-09-2023
34	D17015	Ritwik Ghosh	Ph.D.	SCEE	03-08-2017	26-09-2023
35	D19035	Neha Aswal	Ph.D.	SCENE	01-08-2018	29-09-2023
36	D15060	Manoj Kumar	Ph.D.	SMME	08-02-2016	29-09-2023
37	D17031	Dalchand Ahirwar	Ph.D.	SCEE	01-02-2018	29-09-2023
38	D16047	Santu Nandi	Ph.D.	SCS	01-02-2017	04-10-2023
39	D19050	Anil Kumar	Ph.D.	SMSS	03-02-2020	04-10-2023
40	D19047	Kuncham Eshwar	Ph.D.	SCENE	03-02-2020	07-10-2023
41	D17028	Sumit Choudhary	Ph.D.	SCEE	01-02-2018	07-10-2023
42	D16044	Ranjeet Ranjan Jha	Ph.D.	SCEE	01-02-2017	07-10-2023
43	D17025	Sukesh Kumar Das	Ph.D.	SCEE	01-02-2018	07-10-2023
44	D18014	Jitendra Adhikari	Ph.D.	SMME	01-08-2018	07-10-2023
45	D18058	Niraj K C	Ph.D.	SCENE	01-02-2019	07-10-2023
46	D16022	Amarjit Haty	Ph.D.	SMSS	02-08-2016	07-10-2023
47	D17035	Bidisha Biswas	Ph.D.	SCS	01-02-2018	07-10-2023
48	DI1605	Yogesh	I-Ph.D.	SPS	16-08-2016	09-10-2023
49	D19023	Neeraj	Ph.D.	SMSS	01-08-2019	09-10-2023
50	D18031	Milon Kundar	Ph.D.	SPS	03-08-2018	08-11-2023
51	D17042	Shubhangi Dwivedi	Ph.D.	SMSS	01-02-2018	14-11-2023
52	D20032	Aastha Gupta	Ph.D.	SCS	16-09-2020	06-12-2023
53	D18044	Prateek Kumar	Ph.D.	SBB	01-02-2019	11-12-2023
54	D18047	Taniya Bhardwaj	Ph.D.	SBB	01-02-2019	11-12-2023
55	D18048	Kapuganti Shivani Krishna	Ph.D.	SBB	01-02-2019	11-12-2023
56	D17044	Pawan Kumar Mondal	PhD	SMSS	01-02-2018	22-12-2023
57	D17054	Hemant Kumar	PhD	SMME	01-02-2018	22-12-2023

**(xxiv) Conversion of fellowship in funding agencies in Ph.D., M.Tech (Research) programmes (Approved during 01<sup>st</sup> August, 2023 – 8<sup>th</sup> January, 2024):**

On the recommendations of the Guide, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the conversion of fellowship in funding agencies of the given below students:

Sl. No	Roll No.	Student Name	School	Fellowship	Date of Joining	Date of Conversion
1	D22166	Sakshi Chauhan	IKSMHA	Project to HTRA	30-01-2023	01-08-2023
2	D22025	Koushik P	SPS	Project to HTRA	10-08-2022	04-08-2023
3	D22061	Lavati Hemanth Krishna	SCEE	Project to HTRA	16-08-2022	10-08-2022
4	D22112	Aarifah Jan	SHSS	Project to HTRA	26-08-2022	10-08-2023
5	D20054	Vinit Srivastava	SCEE	Self-sponsored to HTRA	15-02-2021	30-08-2023
6	S23063	Shivani	IKSMHA	HTRA to Project	08-08-2023	08-09-2023
7	S23062	Akash Singh	IKSMHA	HTRA to Project	08-08-2023	08-09-2023
8	S23035	Amit Verma	SMME	Self-sponsored to HTRA	07-08-2023	17-09-2023
9	S23047	Ruchika Bhardwaj	SCEE	Self-sponsored to HTRA	07-08-2023	29-09-2023
10	S23043	Sagnik Ghosh	SCEE	HTRA to Project	08-08-2023	07-10-2023
11	T23156	Vaibhav Sharma	SCEE	HTRA to Vehant Fellowship	07-08-2023	01-10-2023
13	D23082	Harshita	SBB	Project to CSIR-JRF	07-08-2023	01-12-2023

**(xxv) Conversion of Programme to another programme (Approved during 22<sup>nd</sup> August, 2023 – 8<sup>th</sup> January, 2024):**

On the recommendations of the Faculty Advisor, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the conversion of I-Ph.D. to Master of Science (Research) of the given below students:

Sl. No	Roll No.	Student Name	Date of Joining	Date of Conversion	Programme
1	B20064	Rishav	August 2020	22-08-2023	B.Tech to dual M.Tech
2	S22039	Yashwant Kumar	15-09-2022	30-08-2023	Upgraded to Ph.D
3	DI2202	Chayan Kumar Mandal	10-08-2022	04-09-2023	I-Ph.D. to Master of Science (Research)
4	DI2205	Siddhartha Mithiya	10-08-2022	04-09-2023	

**(xxvi) Transfer of Ph.D. Scholars from SHSS to SOM (Approved on 20-06-2023):**

On the recommendations of the Faculties, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the transfer of Ph.D. scholars from SHSS to SOM of the given below students:

Sl.No	Roll No.	Student Name	Guide
1	D17058	Navdeep Kaur	Dr. Puran Singh
2	D18012	Suryani Sinha Ray	
3	D22010	Dharmendra	
4	D22011	Neha Jaswal	

5	PTD2203	Lakhwinder Singh	Dr. Saumya Dixit
6	D19072	Sabita Dutta	
7	PTD2007	Anjali Pathania	

**(xxvii) Double Major programme of B.Tech 2020 and 2021 batches:**

On the recommendations of the FA, School Chair, AD (Courses) and Dean (Academics), Chairman Senate has approved the Double Major programme of the given below students:

Sl. No	Roll No.	Student Name	Present Branch	Double Major in
1	B20001	Aditya Prakash	BE	CSE
2	B21025	Uthamkumar M	BE	CSE
3	B21041	Biswadeep Purkayastha	CE	CSE
4	B21059	Nihal Singh	CE	CSE
5	B21268	Vikas	EP	CSE
6	B21296	Ishmeet Kaur	ME	DSE

**(xxviii) Conversion in branches/programme of M.Tech. students (Approved 18-09-2023):**

On the recommendations of the Chair, PG Admissions Committee, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the conversion in branches/programme of M.Tech. students in SCEE:

Sl. No	Roll No.	Student Name	Current Branch	Converted to
1	T23151	Aditya Kumar	M.Tech. in Communication and Signal Processing	M.Tech, VLSI
2	T23152	Shashank Kartik	M.Tech. in Communication and Signal Processing	M.Tech, VLSI
3	T23153	Aditya	M.Tech. in Communication and Signal Processing	M.Tech, VLSI
4	T23207	Himanshu Patel	M.Tech. in Communication and Signal Processing	M.Tech, VLSI
5	T23208	Virendra Kumar	M.Tech. in Communication and Signal Processing	M.Tech, VLSI
6	T23159	Shailesh Kumar	M.Tech. in Electric Transportation	M.Tech. PED
7	T23162	Ram Vikash	M.Tech. in Electric Transportation	M.Tech (Research) in Data Science and AI
8	T23161	Vishal Kumar	M.Tech. in Electric Transportation	M.Tech. PED
9	T23183	Akshat Sharma	M.Tech. in Electric Transportation	M.Tech. PED
10	T23185	Indrajit Sahu	M.Tech. in Electric Transportation	M.Tech. PED

**(xxix) Transfer of Ph.D. Scholar to IIT Madras (Approved on 08-09-2023):**

On the recommendations of the Guide, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the request for transfer to IIT Madras from Ph.D. programme of the given below student:

Sl. No	Roll No.	Student Name	School	Guide	Date of Joining	Date of Transfer
1	D22089	Jakki Narasimha Rao	SCENE	Dr. Tanushree Parsai	29-08-2022	08-09-2023

**(xxx) To report the Branch Change for B.Tech. 2022 batch (Approved on 24-08-2023)**

<i>Sl. No.</i>	<i>Student Name</i>	<i>Roll No.</i>	<i>Present Branch</i>	<i>Changed Branch</i>
1	Anand Kishore	B22002	BE	EE
2	Arnav Thakur	B22003	BE	DSE
3	Aryan Kumar	B22005	BE	DSE
4	Edukulla Virinchi	B22011	BE	CSE
5	Sadhanna Ramesh	B22021	BE	CSE
6	Aditya Kumar Mishra	B22030	CE	CSE
7	Devansh Sehgal	B22036	CE	EE
8	Dipanshu Thakur	B22037	CE	CSE
9	Ekamjot Singh	B22038	CE	EE
10	Eshaan	B22039	CE	CSE
11	Pooja Kumari	B22060	CE	EE
12	Priyanshi Agrawal	B22064	CE	EE
13	Rishabh Shukla	B22065	CE	DSE
14	Shyam Suman	B22072	CE	EE
15	Siddhi Upadhyaya	B22073	CE	EE
16	Ayush Sinha	B22153	DSE	CSE
17	Gargi Ketan Chauhan	B22161	DSE	CSE
18	Shiven Kaushal Patel	B22176	DSE	CSE
19	Siddharth Amlavad	B22177	DSE	CSE
20	Ankit Yadav	B22195	EE	DSE
21	Bindela Jaswanth Kumar Reddy	B22202	EE	CSE
22	Garima Ketan Chauhan	B22206	EE	CSE
23	Harmandeep Singh	B22208	EE	CSE
24	Krish Mittal	B22214	EE	CSE
25	Piyush Kumar	B22229	EE	CSE
26	Ritam Dutta	B22231	EE	CSE
27	Satyam Kumar	B22236	EE	CSE
28	Saurabh Chaurasia	B22237	EE	DSE
29	Toshan Gupta	B22244	EE	DSE
30	Utsav	B22246	EE	DSE
31	Aaditya Singh	B22253	EP	EE
32	Gopesh Sharma	B22264	EP	DSE
33	Jatin Prasad	B22266	EP	EE
34	Rahul Sree Manitha	B22268	EP	EE
35	Mohammed Arish Qureshi	B22269	EP	EE
36	Siddhant Tyagi	B22278	EP	EE
37	Aadi Chandra Modak	B22283	ME	DSE
38	Aryan Raj	B22290	ME	CSE
39	Ashmit Ojha	B22291	ME	DSE
40	Bilal Muhammad Khan	B22293	ME	CSE
41	Ch. Sunil Patra	B22294	ME	CSE

42	Mayank Goel	b22306	ME	DSE
43	Smit Shah	B22321	ME	EE
44	Shivam Agarwal	B22325	ME	EE
45	Soumya Sharma	B22328	ME	DSE
46	Tarun Srivastava	B22333	ME	DSE
47	Vanshika Sharma	B22336	ME	EE

**(xxxii) Admitted students for AY 2023-24:****(a) Admitted students in M.Tech. (Research):**

Sl.No.	Roll No.	Name	School
1.	S23001	SIDDHI AGARWAL	SMSS
2.	S23003	SHIVESH SINGH	SMSS
3.	S23005	MUSKAN KATIYAR	SMSS
4.	S23006	GAURAV	SMSS
5.	S23007	ISHAN SHARMA	SMSS
6.	S23008	RAMNATH KIRAN NAYAK	SBB
7.	S23009	GARIMA YADAV	SBB
8.	S23010	SHIVA KUMAR	SBB
9.	S23012	KOUSTAV DEY	SBB
10.	S23013	MANALI BHATTACHARYYA	SBB
11.	S23014	VANSHIKA SHARMA	SBB
12.	S23015	SUBHAM KUMAR SHAW	CAIR
13.	S23016	PRIYANSHU SHARMA	CAIR
14.	S23017	MAYANK THAKUR	CAIR
15.	S23018	BHUSHAN ASHOK THOOL	CAIR
16.	S23019	RISHABH PRATAP SINGH	CAIR
17.	S23020	KISHOR KUMAR DAS	CAIR
18.	S23021	RAMANDEEP SINGH MALHOTRA	SCENE
19.	S23022	SALIL SHARMA	SCENE
20.	S23023	SAKSHAM SHARMA	SCENE
21.	S23024	SONAM ROHAUN	SCENE
22.	S23025	KAUSHAL JHA	SMME
23.	S23026	NITESH	SMME
24.	S23028	PRANAV GAUR	SMME
25.	S23029	RAJAT SHARMA	SMME
26.	S23030	CHIRAG THAPA	SMME
27.	S23032	ASHISH	SMME
28.	S23034	AMIT SINGH	SMME
29.	S23035	AMIT VERMA	SMME
30.	S23036	VARTIKA SONKER	CAIR
31.	S23037	MAYANK KUMAR SINGH	SMME
32.	S23038	ABHINANDASN KUMAR	SMME
33.	S23039	SANJAY TALUKDAR	SMME
34.	S23042	INAM UL HAQ GULZAR	SCEE
35.	S23043	SAGNIK GHOSH	SCEE
36.	S23044	SHUBHAM SHARMA	SCEE
37.	S23045	KHUSHBOO RANI	SCEE
38.	S23046	AMAN SACHINBHAI MAKWANA	SCEE
39.	S23047	RUCHIKA BHARDWAJ	SCEE
40.	S23048	SIDDHARATH NARAYAN SHAKYA	SCEE
41.	S23049	HARI VENKATA SAI KISHORE PABBISSETTY	SCEE
42.	S23050	KOMAL KUMARI	SCEE
43.	S23051	SRISHTI MISRA	SCEE



44.	S23053	AAYUSH SHRIVAS	SCEE
45.	S23054	AMIT SINGH	SCEE
46.	S23055	RITIKA	SCEE
47.	S23056	SUMIT KUMAR SUMAN	SCEE
48.	S23058	DEBABRATA SAHA	SCEE
49.	S23060	ARTI DEVI	IKSMHA
50.	S23061	PANKAJ FERKALU	SBB
51.	S23062	AKASH SINGH	IKSMHA
52.	S23063	SHIVANI	IKSMHA
53.	S23064	ARCHIT	SCEE
54.	S23065	ISHA CHOUDHARY	SCEE
55.	S23066	AKANGSHA DEB	SCEE
56.	S23067	SAHIL CHAUHAN	SCEE
57.	S23068	AANIDHYA	SCEE
58.	S23069	KRITI KHARE	SCEE
59.	S23070	PEEYUSH THAKUR	SCEE
60.	S23071	VAIBHAV THAKUR	SCENE
61.	S23072	PIYUSH VERMA	SCENE
62.	S23073	AARTI DHAKA	SCENE
63.	S23074	ANANAY THAKUR	SCENE
64.	S23075	SHIVANI	SCENE
65.	S23076	KESHAV KR SINGH	SCEE
66.	S23077	TARUN PANWAR	SCEE
67.	S23079	ANURAG SHARMA	SCEE
68.	S23080	MRINAL MALHOTRA	SCEE
69.	S23081	SHREYASH SONI	SCEE
70.	S23082	IMRAN ALI	SCEE
71.	S23083	KAJAL	SCEE
72.	S23084	ARYA PULKIT	SCEE
73.	S23085	PRANAV SINGH	CAIR
74.	S23086	RAHUL	CAIR
75.	S23087	MD UMAR FAROOQ	CAIR
76.	S23088	NIHARIKA CHAUDHARY	CAIR
77.	S23089	RISHABH GANGWAR	SCEE
78.	S23090	TUSHAR VASUDEV	SMME
79.	PTS2301	KUMAR PALIT PALIT SHARMA	SCEE
80.	PTS2302	MANDHEER BALI	SCENE

## (b) Admitted students in Ph.D. Programme:

Sl.No	Roll No.	Name	School
1.	D23001	ADYA GAUR	SHSS
2.	D23002	AMRENDRA KUMAR KUSHWAHA	SHSS
3.	D23003	AVNISH PAL	SHSS
4.	D23004	BHANUPRIYA PAREEK	SHSS
5.	D23005	GAYATHRI VARIER	SHSS
6.	D23006	MEGHA THAKUR	SHSS
7.	D23007	NEEL KAMAL	SHSS
8.	D23008	SHIVANI KUMARIA	SHSS
9.	D23009	SONAM PRIYA	SHSS
10.	D23010	NAVNEET SINGH	SCS
11.	D23011	DEEPIKA SHARMA	SCS
12.	D23012	SHEELA YADAV	SCS
13.	D23013	SHAGUN	SCS
14.	D23014	AKRITI	SCS
15.	D23015	SATYABROTA SARKAR	SCS
16.	D23017	AJAY ATWAL	SPS

17.	D23018	JAIDEEP KALANI	SPS
18.	D23019	MANISHA CHOUDHARY	SPS
19.	D23020	UMASHANKAR PARIDHI	SPS
20.	D23021	MANISHA KUMARI	SPS
21.	D23022	ANURAAAG RATHORE	SPS
22.	D23024	PANKAJ	SPS
23.	D23025	SACHIN RANA	SPS
24.	D23026	MR. SOURAV DUTTA	SMSS
25.	D23027	MANOJ KUMAR	SMSS
26.	D23028	SHAILLY RAJPUT	SMSS
27.	D23029	ADIL SHAFI WANI	SMSS
28.	D23030	RISHABH SAINI	SMSS
29.	D23031	BIJOY BISWAS	SCEE
30.	D23032	RESHU BANSAL	SCEE
31.	D23033	RAVI SHANKAR PRASAD	SCEE
32.	D23035	RAVI SHANKAR BAHUGUNA	SCEE
33.	D23036	VINAY PALIWAL	SCEE
34.	D23037	MANOJ MISHRA	SCEE
35.	D23038	SAYAN MUKHERJEE	SCEE
36.	D23039	DILSHAD AHMAD	SCEE
37.	D23040	AMAN	SCEE
38.	D23041	ABHIJEET	SCEE
39.	D23042	AMIT KUMAR SONI	SCEE
40.	D23043	RAKESH KUMAR SINGH	SCEE
41.	D23045	SURUCHI BHARTI	SCEE
42.	D23048	PRAJWAL JASWAL	SCEE
43.	D23050	ABHISHEK KUMAR GUPTA	SMME
44.	D23051	PRADUMAN KUMAR RAY	SMME
45.	D23052	KARTIK N	SMME
46.	D23053	SUDHIR KUMAR CHAUDHARY	SMME
47.	D23054	ROHIT KUMAR	SMME
48.	D23055	KRISHNA KUMAR	SMME
49.	D23056	TANU AGARWAL	SOM
50.	D23057	NAGA VENKATA VINAYAKA SATYA PRAMODH YENDRA	CAIR
51.	D23058	RITULESH MOHAN	CAIR
52.	D23059	RITALI VATSI	CAIR
53.	D23060	H KEERTHI TEJA	SCENE
54.	D23061	AKHIL	SCENE
55.	D23062	DIVESH SHARMA	SCENE
56.	D23063	YASH SHUKLA	SCENE
57.	D23065	SHAILESH KUMAR JHA	SCENE
58.	D23066	GARIMA SHARMA	SCENE
59.	D23067	DHOLAKIYA JAYDEEP PRAVINBHAI	SCENE
60.	D23068	ALPA RAJPUT	SCENE
61.	D23069	VISHAL	SCENE
62.	D23071	ANISH CHHILLAR	SBB
63.	D23072	ANANYA KAPOOR	SBB
64.	D23073	SOORAJ SIINI	SBB
65.	D23074	HIMANSHI DIWAN	SBB
66.	D23076	PRASUN KUMAR BHUNIA	SBB
67.	D23078	PRIYANKA	SBB
68.	D23079	SHWETA SANJAY PAWAR	SBB
69.	D23081	SWAPNILA PRAMANICK	SBB
70.	D23082	HARSHITA	SBB
71.	D23083	SHWETA	SBB
72.	D23084	RIJA KALITA	SBB
73.	D23085	PRIYANKARI	IKSMHA

74.	D23086	SOURABH SUMAN	IKSMHA
75.	D23087	SHAKTIJA MISHRA	IKSMHA
76.	D23088	ABHISHEK THAKUR	CAIR
77.	D23089	TARU BHATNAGAR	SOM
78.	D23090	RAHUL KANT YADAV	SCENE
79.	D23091	PUSHKAR SHARMA	SCENE
80.	D23092	SOUMYAJIT DAS	SOM
81.	D23093	AYUSH THAKUR	SOM
82.	D23094	SHARAD SUBHASH YADAV	SCS
83.	D23095	MALLIKARJUN GUDADINNI	SOM
84.	D23096	SHUBHAM LONDHE	SCS
85.	D23097	VINITA SHUKLA	CAIR
86.	D23098	NISHCHALA THAKUR	CAIR
87.	D23099	KUNAL ATRA	CAIR
88.	D23100	PRASANTA BISWAS	CAIR
89.	D23101	RAJEEV VERMA	CAIR
90.	D23103	MALIKA NAGPAL	IKSMHA
91.	D23104	KRITI KUMARI	SCENE
92.	D23105	MORINGKHUL MOLUNG KANSHOUWA	SCENE
93.	D23109	SHARIF AHMAD NAIKOO	SCS
94.	D23114	ANKIT SINGH	IKSMHA
95.	D23115	IPSITA PATTANAYAK	SMME
96.	D23116	YASH TANEJA	SMME
97.	D23117	RAHUL KUMAR RAI	SMME
98.	D23118	MR. SUJEET RAWAT	SCS
99.	D23119	AMAN KUMAR PAL	SMME
100.	d23120	RANDEEP SINGH	SMME
101.	D23121	VINAY THAKUR	SCENE
102.	D23122	CHANDRA PRAKASH	SCENE
103.	D23123	REHAN FAZAL	SCENE
104.	D23124	ANURAG	SCENE
105.	D23126	SHUBHAM SHARMA	SCENE
106.	D23127	VISHESH SINGH	SMME
107.	D23128	RAHUL	SMME
108.	D23129	SUBODH KUMAR VERMA	SMME
109.	D23130	HIMANSU SEKHAR SENAPATI	SCEE
110.	D23132	CHITRA BISHT	SCEE
111.	D23133	VIVEK THAKUR	SCEE
112.	D23134	MD MUSHFIQUR RAHMAN CHOWDHURY	SCEE
113.	D23136	SAURABH	SCEE
114.	D23137	RAKESH PRASAD	SCEE
115.	D23138	SUNEEL KUMAR SINGH BONAL	SCEE
116.	D23139	NARESH SHARMA	SCEE
117.	D23140	YUGAL PACHORI	SCEE
118.	D23141	VINOD SHRIVASTAVA	SCEE
119.	D23142	ABHISEKH BEHERA	SCEE
120.	D23143	AJEET KUMAR YADAV	SCEE
121.	D23144	KUNDHA HARIKRISHNA	SCEE
122.	D23145	CHOPALI CHANCHAL SAHU	SCEE
123.	D23146	JEET BANDHU LAHIRI	SCEE
124.	D23147	AKASH KUMAR	CAIR
125.	D23148	SADBHAV SINGH	CAIR
126.	D23149	KARAN RAJ PANT	CAIR
127.	D23150	ANJANI GUPTA	CAIR
128.	D23151	RICHA THAKUR	SCEE
129.	D23152	SHALINI DESHMUKH	SCEE
130.	D23153	BRAJESH KUMAR YADAVENDU	SCEE
131.	d23156	MD WAQUAR	SMME

132.	d23157	AVINASH THAKUR	SMME
133.	d23158	AMIT KUMAR SINGH	SMME
134.	D23159	SUMIT MAAN	SCEE
135.	D23160	ADITY	SCEE
136.	D23162	RAHEES	SMSS
137.	D23163	MOHD NOOR	SMSS
138.	D23164	GOVIND GODARA	SMSS
139.	D23165	BISWANATH BARMAN	SMSS
140.	D23166	KUSHAL HALDER	SMSS
141.	D23167	JYOTI RANJAN KABI	SCS
142.	D23168	TANU SHARMA	SCS
143.	D23169	PIYUSH THAPER	SCS
144.	D23170	SUSOVON GHOSH	SCS
145.	D23171	BHARTI KASHYAP	SCS
146.	D23172	NITISH KUMAR	SCS
147.	D23173	ABUL HASNAT	SCS
148.	D23174	ANCHAL	SCS
149.	D23176	VIPUL RAI	SCS
150.	d23178	BABLESH GUPTA	SMME
151.	d23179	AASTHA SINGH	SMME
152.	d23180	AMIT KUMAR SHARMA	SMME
153.	D23182	KM DEEPANJALI GAUTAM	SMME
154.	D23183	MOHIT	CQST
155.	D23184	SIMRAT PAL SINGH	CQST
156.	D23185	APURAV	CQST
157.	D23186	SAGAR GAUR	CQST
158.	D23187	CHIRANJIT ROY	CQST
159.	D23188	ARPAN GUPTA	SPS
160.	D23189	RINKESH PANIGRAHI	SPS
161.	D23190	ROBIN KAROTHIYA	SPS
162.	PTD2301	RAJESH SUBRAMANI	SMME
163.	PTD2302	SYED JUNAID AHMED	SCEE
164.	PTD2303	PAWAN MOOLRAJANI	CAIR
165.	PTD2304	DEEPIKA SOOD	CAIR
166.	PTD2305	PANKAJ MANKOTIA	CAIR
167.	PTD2306	SHWETA PARGANIHA	CAIR
168.	PTD2307	MANISH PARGANIHA	CAIR
169.	PTD2308	JYOTI PRAKASH MAURYA	CAIR
170.	PTD2309	SUDHANSHU MAURYA	CAIR

## (c) Admitted students in Ph.D. under Joint Degree Programme (JDP)

Sl.No	Roll No.	Name	School
1	D23110	ARIHANT JAIN	SCS
2	D23111	RIYA	SCS
3	D23106	NEETU	SCENE
4	D23107	SOHAIL AKHTAR	SMME
5	D23108	AATISH SHARMA	SMME
6	D23113	NEERAJ YADAV	SMME

## (d) Admitted students in Ph.D. under Dual Degree Programme:

Sl.No	Roll No.	Name	School
1.	DD23001	SAURABH MISHRA	SCEE
2.	DD23003	BISWAJIT DAS	SCEE
3.	DD23004	VINAY MOHAN KANDPAL	SBB
4.	DD23005	AAKASH MANJU	SCENE

5.	DD23006	MITHUN KUMAR SINGH	SCENE
6.	DD23007	AMAN SHUKLA	SMME
7.	DD23008	ANJALI SHARMA	SMME
8.	DD23009	LAKHAN RAWAT	SMME
9.	DD23010	MANISH KUNDARA	SMME
10.	DD23011	ABHIJAY KISHRBHAI MULIYA	SMME
11.	DD23012	KAMLESH SUKHADEO WANKHADE	SMME
12.	DD23013	TARUN KUMAR	IKSMHA
13.	DD23014	VAISHALEE	CAIR
14.	DD23015	ADITI GUPTA	CAIR
15.	DD23016	LAKSHYAJIT BEHERA	CAIR
16.	DD23017	ANAND PRABHAKAR	SCENE

**(e) Admitted students in I-Ph.D. Programme:**

Sl.No	Roll No.	Name	School
1.	DI-2301	POOJAN ANGIRAS	SPS
2.	DI-2303	PRIYA	SPS
3.	DI-2304	UDDIPTA DEV CHOUDHARY	SPS
4.	DI-2305	SHIBSHANKAR KARMAKAR	SPS

**(f) Admitted students in MA in development Studies Programme:**

Sl.No	Roll No.	Name	School
1.	A23001	ABHISHEK AWADHUT DAITHANKAR	SHSS
2.	A23002	ADITYA SHANU	SHSS
3.	A23003	ANUGRAHA K KURIAN	SHSS
4.	A23004	MANOJ	SHSS
5.	A23005	NAVADHA MAHESHWARI	SHSS
6.	A23008	NEELIMA VP	SHSS
7.	A23009	SHREYA THAKUR	SHSS
8.	A23010	SRIKANTA MONDAL	SHSS
9.	A23011	YUVRAJ SHANKER	SHSS
10.	A23012	VASUNDHARA BOGI	SHSS
11.	A23013	TANYA GUPTA	SHSS
12.	A23014	AKASH LAXMAN CHAUDHARI	SHSS
13.	A23015	VIVEK SINGH	SHSS
14.	A23016	PRIYANKA MAHALI	SHSS
15.	A23018	ESHIKA RAHIL	SHSS
16.	A23019	RAHUL KUMAR	SHSS

**(g) Admitted students in M.Sc. Programme:**

Sl.No	Roll No.	Name	Branch
1.	V23001	CHANDAN JAISWAL	Applied Mathematics
2.	V23002	SAGAR SINGH SINDHU	Applied Mathematics
3.	V23003	PRADIP DOLAI	Applied Mathematics
4.	V23004	GURPREET GAUTAM	Applied Mathematics
5.	V23005	RAJIB DAS	Applied Mathematics
6.	V23006	DIVYANSH MALIK	Applied Mathematics
7.	V23007	TANNU	Applied Mathematics
8.	V23008	HARSHITA	Applied Mathematics
9.	V23009	PRAVEEN KUMAR	Applied Mathematics
10.	V23010	JITENDRA KUMAR	Applied Mathematics
11.	V23011	AKASH VERMA	Applied Mathematics
12.	V23012	SRUTI RANJAN BEHERA	Applied Mathematics

13.	V23013	DIKSHA RANI	Applied Mathematics
14.	V23014	DISHA VIJ	Applied Mathematics
15.	V23015	SURENDRA KUMAR	Applied Mathematics
16.	V23016	SURESH KUMAR TRIPATHI	Applied Mathematics
17.	V23017	MANISHA KUMARI	Applied Mathematics
18.	V23018	KAKLOTAR KRUPALI SHAILESHKUMAR	Applied Mathematics
19.	V23019	SHIVAM SHRIVASTAV	Applied Mathematics
20.	V23020	MINAL GOYAL	Applied Mathematics
21.	V23021	HITESH	Applied Mathematics
22.	V23022	PRIYANKA NATWADIYA	Applied Mathematics
23.	V23023	MEHUL KALSOTRA	Applied Mathematics
24.	V23024	BHAVANA JAIMAN	Applied Mathematics
25.	V23026	RAHUL KUMAR	Applied Mathematics
26.	V23027	SANYAM BHARDWAJ	Applied Mathematics
27.	V23028	UZAIR MATEEN	Applied Mathematics
28.	V23029	GOURAV KUMAR MEENA	Applied Mathematics
29.	V23051	PRATHMESH SUKARAM INGLE	Chemistry
30.	V23052	JASBIR	Chemistry
31.	V23053	JYOTI JAIN	Chemistry
32.	V23054	KAMRAN KHAN	Chemistry
33.	V23055	YOGANSHU SAXENA	Chemistry
34.	V23056	SHIVAM KHERAL	Chemistry
35.	V23057	VANSHIKA GUPTA	Chemistry
36.	V23058	RHYTHM SHARMA	Chemistry
37.	V23059	TANVI	Chemistry
38.	V23060	ADITI KANDARI	Chemistry
39.	V23062	JALAJ DIGGAL	Chemistry
40.	V23063	BHAVNISH KUMAR	Chemistry
41.	V23065	YASH ANEJA	Chemistry
42.	V23066	TUSHAR KUMAR SHARMA	Chemistry
43.	V23067	SIMRAN MADAAN	Chemistry
44.	V23068	GARIMA	Chemistry
45.	V23069	RIYA JITENDRAPRASAD DANAK	Chemistry
46.	V23070	AARTI	Chemistry
47.	V23071	YASH RAJWAR	Chemistry
48.	V23072	DEEPAK JAT	Chemistry
49.	V23073	DHANMANI RAMCHIARY	Chemistry
50.	V23074	KAUSHAL VIJAY THORAT	Chemistry
51.	V23075	AKHILESH SINGH TILARA	Chemistry
52.	V23076	ANKIT KUMAR	Chemistry
53.	V23077	SWMDWN DAIMARY	Chemistry
54.	V23078	SHIRIL KUMAR	Chemistry
55.	V23079	APARNA TYAGI	Chemistry
56.	V23081	PATIL SHIMPALE ANIRUDDHA DATTATRAYA	Physics
57.	V23082	T CHONBENTHUNG ODYUO	Physics
58.	V23083	DIVYANSHI SAINI	Physics
59.	V23084	SHRUTI TANWAR	Physics
60.	V23085	FATHIMA SHAREEF	Physics
61.	V23086	DIVYA BHARDWAJ	Physics
62.	V23087	SYED MUSADIQ IRFAN	Physics
63.	V23088	EKTA	Physics
64.	V23089	ABHISHEK KUMAR	Physics
65.	V23091	DEEPENDRA ASWAL	Physics
66.	V23092	HRITIK KUMAR GULIYAN	Physics
67.	V23093	SHAURYA SHARMA	Physics
68.	V23094	KUMAR ASHISH	Physics

69.	V23095	PANKAJ KUMAR SINGH	Physics
70.	V23096	SHYAM CHAUDHARY	Physics
71.	V23097	OBASHO M	Physics
72.	V23098	BHAVYA	Physics
73.	V23099	SYED SHOAB	Physics
74.	V23100	MEENA SWAMI	Physics
75.	V23101	BHANU PRATAP SINGH	Physics
76.	V23103	YOGESH RANA	Physics
77.	V23104	JITENDER KUMAR	Physics
78.	V23105	ARASALAN AHAMAD	Physics
79.	V23106	ANEET KAUR	Physics
80.	V23107	ABHAS RATHI	Physics

**(h) Admitted students in M.Tech. Programme:**

Sl.No	Roll No.	Name	Branch
1.	T23001	VINAY PAL SINGH BIST	M.Tech.-Biotechnology
2.	T23002	SITA HEMBROM	M.Tech.-Biotechnology
3.	T23003	HIMANSHU	M.Tech.-Biotechnology
4.	T23004	ANWESHA ROY	M.Tech.-Biotechnology
5.	T23005	AISHWARYA ADHYA	M.Tech.-Biotechnology
6.	T23006	MANISHA JOSHI	M.Tech.-Biotechnology
7.	T23007	ANUPRIYA MALVIYA	M.Tech.-Biotechnology
8.	T23008	PRIYANKA	M.Tech.-Biotechnology
9.	T23009	INCHARA K S	M.Tech.-Biotechnology
10.	T23010	ANJALI YADAV	M.Tech.-Biotechnology
11.	T23011	DEEPAK KUMAR MAURYA	M.Tech.-Biotechnology
12.	T23012	NAJNIN KHATUN	M.Tech.-Biotechnology
13.	T23013	SAUMYA SRIVASTAVA	M.Tech.-Biotechnology
14.	T23014	ALISHA SANTOSH SHINDE	M.Tech.-Biotechnology
15.	T23015	HEMANT KUSHWAH	M.Tech.-Biotechnology
16.	T23017	GURSIMRAN SINGH	M.Tech.-Biotechnology
17.	T23019	DEVANSH PUNDIR	M.Tech.-Biotechnology
18.	T23020	SOUHARDYA BANDYOPADHYAY	M.Tech.-Biotechnology
19.	T23021	SUMIT SUPRABHAT BEHERA	M.Tech.-Biotechnology
20.	T23022	AJAY SINGH	M.Tech.-Biotechnology
21.	T23023	NILESH GUPTA	M.Tech.-Biotechnology
22.	T23025	MD ATHAR JAMAL	M.Tech.-Biotechnology
23.	T23026	PRASHANT AGRAHARI	M.Tech.-Biotechnology
24.	T23027	PRIYANGA S	M.Tech.-Biotechnology
25.	T23028	DIKSHA KUMARI	M.Tech.-Biotechnology
26.	T23051	HRITIK SINGH	M.Tech (Regular)-Structural Engineering
27.	T23052	SHIVANSH SOOD	M.Tech (Regular)-Structural Engineering
28.	T23053	ABHISHEK CHAUHAN	M.Tech (Regular)-Structural Engineering
29.	T23054	VANSHIKA SISODIA	M.Tech (Regular)-Structural Engineering
30.	T23055	HRISHABH MEHTA	M.Tech (Regular)-Structural Engineering
31.	T23056	PARDEEP KUMAR	M.Tech (Regular)-Structural Engineering
32.	T23057	VINAY SINGH	M.Tech (Regular)-Structural Engineering
33.	T23058	MOHD TAUQIR	M.Tech (Regular)-Structural Engineering
34.	T23059	RAHUL KUMAR	M.Tech (Regular)-Structural Engineering
35.	T23060	DEEKSHANT SHARMA	M.Tech (Regular)-Structural Engineering
36.	T23061	ABHISHEK BHARDWAJ	M.Tech (Regular)-Structural Engineering
37.	T23062	GAURAV PRAKASH NEGI	M.Tech (Regular)-Structural Engineering
38.	T23063	DEEPAK KUMAR	M.Tech (Regular)-Structural Engineering
39.	T23064	ANKIT KUMAR BIJLA	M.Tech (Regular)-Structural Engineering
40.	T23065	TARUN	M.Tech (Regular)-Structural Engineering
41.	T23066	RAGHAV	M.Tech (Regular)-Structural Engineering

42.	T23067	ANANYO DUTTA	M.Tech (Regular)-Structural Engineering
43.	T23068	GARUDAMMAGARI CHARAN REDDY	M.Tech (Regular)-Structural Engineering
44.	T23069	ARUSHI	M.Tech (Regular)-Structural Engineering
45.	T23070	PUSHPA SHANKAR YADAV	M.Tech (Regular)-Structural Engineering
46.	T23160	VIPIN KUMAR	M.Tech. in Power Electronics and Drives
47.	T23165	RITESH KUMAR SINGH	M.Tech. in Power Electronics and Drives
48.	T23166	ROHIT CHAUHAN	M.Tech. in Power Electronics and Drives
49.	T23167	TANYA SHUKLA	M.Tech. in Power Electronics and Drives
50.	T23168	ASHISH YOGENDRA WANODE	M.Tech. in Power Electronics and Drives
51.	T23169	ADAPA DURGA RAJESH	M.Tech. in Power Electronics and Drives
52.	T23170	AJAY KUMAR MISHRA	M.Tech. in Power Electronics and Drives
53.	T23171	RAHUL GANGWAR	M.Tech. in Power Electronics and Drives
54.	T23186	VIKAS YADAV	M.Tech. in Power Electronics and Drives
55.	T23203	PARITOSH SINGH PARIHAR	M.Tech. in Power Electronics and Drives
56.	T23204	TENTU MAHESH	M.Tech. in Power Electronics and Drives
57.	T23206	PRAVEEN KUMAR	M.Tech. in Power Electronics and Drives
58.	T23159	SHAILESH KUMAR	M.Tech. in Power Electronics and Drives
59.	T23161	VISHAL KUMAR	M.Tech. in Power Electronics and Drives
60.	T23183	AKSHAT SHARMA	M.Tech. in Power Electronics and Drives
61.	T23185	INDRAJIT SAHU	M.Tech. in Power Electronics and Drives
62.	T23163	ROHIT KASGAR	M.Tech. in VLSI
63.	T23173	SUMIT KUMAR DASH	M.Tech. in VLSI
64.	T23175	PALASH SHROTRIYA	M.Tech. in VLSI
65.	T23176	AJAY MEHROTRA	M.Tech. in VLSI
66.	T23177	SAHIL	M.Tech. in VLSI
67.	T23178	SURAJ KUMAR DAS	M.Tech. in VLSI
68.	T23179	RAKESH KUMAR	M.Tech. in VLSI
69.	T23180	ANKIT VISHWAKARAMA	M.Tech. in VLSI
70.	T23181	NIKHIL TYAGI	M.Tech. in VLSI
71.	T23182	GOPAL PRASAD KUSHWAHA	M.Tech. in VLSI
72.	T23209	AKASH SINGH	M.Tech. in VLSI
73.	T23210	VISHAL SHARMA	M.Tech. in VLSI
74.	T23211	AADARSH JAIN	M.Tech. in VLSI
75.	T23212	GAURAV SHARMA	M.Tech. in VLSI
76.	T23213	RITIKA PORE	M.Tech. in VLSI
77.	T23214	SHARAD VERMA	M.Tech. in VLSI
78.	T23216	PRAGYA	M.Tech. in VLSI
79.	T23217	SARJIT SINGH	M.Tech. in VLSI
80.	T23218	SRISHTI DHANGAR	M.Tech. in VLSI
81.	T23219	CHANDAN SINGH	M.Tech. in VLSI
82.	T23151	ADITYA KUMAR	M.Tech. in VLSI
83.	T23152	SHASHANK KARTIK	M.Tech. in VLSI
84.	T23153	ADITYA	M.Tech. in VLSI
85.	T23207	HIMANSHU PATEL	M.Tech. in VLSI
86.	T23208	VIRENDRA KUMAR	M.Tech. in VLSI
87.	T23155	ASHISH MARUTI BARGE	M.Tech. in Computer Science and Engineering
88.	T23156	VAIBHAV SHARMA	M.Tech. in Computer Science and Engineering
89.	T23157	FLORINA RAMCHIARY	M.Tech. in Computer Science and Engineering
90.	T23158	NITIN CHANDEL	M.Tech. in Computer Science and Engineering
91.	T23184	RIYA ARYA	M.Tech. in Computer Science and Engineering
92.	T23188	ARYAN KHARINTA	M.Tech. in Computer Science and Engineering
93.	T23189	ANIKET KUMAR	M.Tech. in Computer Science and Engineering
94.	T23191	ABHISHEK SINGH RAWAT	M.Tech. in Computer Science and Engineering
95.	T23192	ARPIT DUA	M.Tech. in Computer Science and Engineering
96.	T23193	ABHISHEK DUBEY	M.Tech. in Computer Science and Engineering
97.	T23194	VIROTHI VENKATA SWAROOP	M.Tech. in Computer Science and Engineering
98.	T23196	ARPIT ANAND	M.Tech. in Computer Science and Engineering



99.	T23197	AKASH PAL	M.Tech. in Computer Science and Engineering
100.	T23198	JATIN VERMA	M.Tech. in Computer Science and Engineering
101.	T23200	ASMITA ANKUSH KAMBLE	M.Tech. in Computer Science and Engineering
102.	T23201	ABHISHEK KUMAR GOND	M.Tech. in Computer Science and Engineering
103.	T23202	PRABHU PRASAD MOHANTY	M.Tech. in Computer Science and Engineering

(i) **Admitted students in MBA in Data Science & Artificial Intelligence Programme:**

Sl.No	Roll No.	Name	School
1.	MB23001	RUPJYOTI BASUMATARY	SoM
2.	MB23002	HARSH RAGHUWANSHI	SoM
3.	MB23003	SOHAN BALACHANDRAN	SoM
4.	MB23004	SUNIL CHOUDHARY	SoM
5.	MB23005	RASHMITA BORA	SoM
6.	MB23006	SAMARTH SINHA	SoM
7.	MB23007	SHANTANU DUBEY	SoM
8.	MB23008	DEEKSHA GUPTA	SoM
9.	MB23009	MANOJ A M	SoM
10.	MB23010	SHIVANSH MISHRA	SoM
11.	MB23011	MEDINI MAURYA	SoM
12.	MB23012	ANURAG MISHRA	SoM
13.	MB23013	ADITH SAGAR	SoM
14.	MB23015	VISHNUPRIYA K R	SoM
15.	MB23016	DIPANWITA SIKDER	SoM
16.	MB23017	SHALINI ROY	SoM
17.	MB23018	YASHASHVI TRIVEDI	SoM
18.	MB23019	ASEEM SAGAR	SoM
19.	MB23020	APURV VERMA	SoM
20.	MB23021	YAGYANSH KAPOOR	SoM
21.	MB23022	DATTATRAYA KATHARE	SoM
22.	MB23023	PRATYUSH KISHAN	SoM
23.	MB23024	RASHI JOHARI	SoM
24.	MB23025	SRISHTI MISRA	SoM
25.	MB23026	VISHAL KAMAL	SoM
26.	MB23027	JITESH PARIHAR	SoM
27.	MB23028	UTSAV SHETH	SoM
28.	MB23029	PRASHANT KUSHWAHA	SoM
29.	MB23030	PANKAJ	SoM
30.	MB23031	HARSH RAJ	SoM
31.	MB23032	VIDIT	SoM
32.	MB23033	HIMANSHU AGARWAL	SoM
33.	MB23034	SAMREEN J SINGH	SoM
34.	MB23035	DIKSHANT PANDEY	SoM
35.	MB23036	AAKASH KUMAR	SoM
36.	MB23037	AMIT KUMAR	SoM
37.	MB23038	ARPITA GUPTA	SoM
38.	MB23039	ANURAG SINGH	SoM
39.	MB23040	PRANAV SHARMA	SoM
40.	MB23041	PRIYA RANI	SoM
41.	MB23042	VASISHT VIJAY V	SoM
42.	MB23043	HARSH KUMAR	SoM
43.	MB23044	HARSH TIWARI	SoM
44.	MB23045	BHARBEE BORA	SoM
45.	MB23046	TEELLA BHANU	SoM
46.	MB23047	ASHIT SINGH	SoM
47.	MB23048	SHIVANSH DOGRA	SoM
48.	MB23049	YUVRAJ BHARADWAJ	SoM

(xxxii) To report the Seat Matrix for PG programme (M.Sc.) and I-Ph.D. (Physics) for AY 2024-25 (through JAM): (Approved on 22-08-2023)

Program	Intake	UR	EWS	OBC (NCL)	SC	ST	PD*	Foreign Nationals
		40.50%	10%	27%	15%	7.50%	5%	5%
M.Sc. (Chemistry)	31	12+1PD	3	7+1PD	5	2	2	2
M.Sc. (Physics)	30	12	2+1PD	8	5	1+1PD	2	2
M.Sc. (Applied Mathematics)	30	11+1PD	3	8	3+1PD	3	2	2
I-Ph.D. (Physics)	12	4+1PD	1	3	2	1	1	1
<b>Total</b>	<b>103</b>	<b>42</b>	<b>10</b>	<b>27</b>	<b>16</b>	<b>8</b>	<b>7</b>	<b>7</b>

\*PD reservations @ 5% will be horizontal (i.e., PD candidates will consume seats from their birth category quota).

(xxxiii) To report the Seat Matrix for Ph.D./M.Tech (Research) programme for AY 2023-24: (Approved on 11-12-2023)

Ph.D. Intake for Academic Year 2023-24 (excluding project)

School	Program	Intake	UR	EWS	OBC (NCL)	SC	ST	PD*	Foreign Nationals
			40.50%	10%	27%	15%	7.50%	5%	10%
SMME	Ph.D.	94	55	14	37	21	10	7	14
	M.Tech (R) + Ph.D Dual degree	23							
	Joint Degree	20							
<b>Total (SMME)</b>		<b>137</b>							
SPS	Ph.D.	37	15	4	10	5	3	2	4
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	0							
<b>Total (SPS)</b>		<b>37</b>							
SMSS	Ph.D.	40	16	4	11	6	3	2	4
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	0							
<b>Total (SMSS)</b>		<b>40</b>							
SCENE	Ph.D.	44	33	8	22	13	6	4	8
	M.Tech (R) + Ph.D Dual degree	32							
	Joint Degree	6							
<b>Total (SCENE)</b>		<b>82</b>							
SCS	Ph.D.	41	22	5	14	8	4	3	5
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	12							
<b>Total (SCS)</b>		<b>53</b>							
SHSS	Ph.D.	20	8	2	5	3	2	1	2
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	0							
<b>Total (SHSS)</b>		<b>20</b>							
SoM	Ph.D.	25	10	2	7	4	2	1	3
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	0							

<b>Total (SoM)</b>		<b>25</b>							
SBB	Ph.D.	29	18	4	12	6	3	2	4
	M.Tech (R) + Ph.D Dual degree	9							
	Joint Degree	5							
<b>Total (SBB)</b>		<b>43</b>							
IKSMHA	Ph.D.	20	14	4	9	5	3	2	4
	M.Tech (R) + Ph.D Dual degree	15							
	Joint Degree	0							
<b>Total (IKSMHA)</b>		<b>35</b>							
CAIR	Ph.D.	28	17	4	11	6	3	2	4
	M.Tech (R) + Ph.D Dual degree	13							
	Joint Degree	0							
<b>Total (CAIR)</b>		<b>41</b>							
CQST	Ph.D.	14	6	1	4	2	1	1	1
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	0							
<b>Total (CQST)</b>		<b>14</b>							
SCEE#	Ph.D.	91	39	10	26	14	7	5	10
	M.Tech (R) + Ph.D Dual degree	0							
	Joint Degree	5							
<b>Total (SCEE)</b>		<b>96</b>							
<b>Total (Overall)</b>		<b>623</b>	<b>253</b>	<b>62</b>	<b>168</b>	<b>93</b>	<b>47</b>	<b>32</b>	<b>63</b>

*\*PD reservations @ 5% will be horizontal (i.e., PD candidates will consume seats from their birth category quota).*

#### **M.Tech (Research) Intake for Academic Year 2023-24 (excluding project)**

School	Program	Intake	UR	EWS	OBC (NCL)	SC	ST	PD*	Foreign Nationals
			40.50%	10%	27%	15%	7.50%	5%	10%
SMME	M.Tech (R)	47	19	5	12	7	4	2	5
SMSS	M.Tech (R)	10	4	1	3	1	1	1	1
SCENE	M.Tech (R)	44	18	4	12	7	3	2	4
IKSMHA	M.Tech (R)	20	8	2	5	3	2	1	2
CAIR	M.Tech (R)	31	13	3	9	4	2	1	3
SBB	M.Tech (R)	10	4	1	2	2	1	1	1
SCEE#	M.Tech (R)	84	34	8	23	13	6	4	8
<b>Total</b>		<b>246</b>	<b>100</b>	<b>24</b>	<b>66</b>	<b>37</b>	<b>19</b>	<b>12</b>	<b>24</b>

*\*PD reservations @ 5% will be horizontal (i.e., PD candidates will consume seats from their birth category quota).*

#### **(xxxiv) To report the Seat Matrix for PG programme for AY 2023-24: (Approved on 16-05-2023)**

Program	Intake	UR	EWS	OBC (NCL)	SC	ST	PD*	Foreign Nationals (Supernumerary)
		40.50%	10%	27%	15%	7.50%	5%	5%
M.Tech (MEE)	10	4	1	3	1	1	1	1
M.Tech (FTE)	10	4	1	3	1	1	1	1
M.Tech (STE)	20	8	2	6	3	1	1	1
M.Tech (CSE)	20	8	2	5	3	2	1	1
M.Tech (PED)	20	8	2	6	3	1	1	1
M.Tech (VLSI)	25	10	2	7	4	2	1	1

M.Tech (CSP)	18	7	2	5	3	1	1	1
M.Tech (ET)	21	9	2	5	3	2	1	1
M.Tech (Bio-Tech)	28	11	3	8	4	2	1	1
M.Tech (R) Bio-Tech#	10	4	1	2	2	1	1	1
M.Tech (R) Robotics#	20	9	2	5	3	1	1	1
M.A.	19	8	2	5	3	1	1	1
I-Ph.D.	10	4	1	2	2	1	1	1
MBA in Data Science and Artificial Intelligence	80	32	8	22	12	6	4	4
I-MBA	60	24	6	16	9	5	3	3
<b>Total</b>	<b>371</b>	<b>150</b>	<b>37</b>	<b>100</b>	<b>56</b>	<b>28</b>	<b>20</b>	<b>20</b>

*\*PD reservations @ 5% will be horizontal (i.e., PD candidates will consume seats from their birth category quota).*

*# Intake for ODD Semester of AY 2023-24*

**(xxxv) Report on granting of Scholarship to UG and PG students for AY 2022-23 (Approved on 22-12-2023):**

**MCM Scholarship for UG and PG students:**

<i>Sl. No.</i>	<i>Roll No.</i>	<i>Name</i>	<i>Branch</i>
1.	B19006	CHIRAG	BE
2.	B19011	LAISHRAM PONGTHANGAMBA MEITEI	IDD BE
3.	B19050	PAWAN KUMAR SAINI	CE
4.	B19051	RAJESH FAGORIYA	CE
5.	B19052	RUPESH KUMAR	CE
6.	B19062	YASH AGGARWAL	CSE
7.	B19072	ANURAG CHAUHAN	CSE
8.	B19117	SUDINI NARAYAN REDDY	CSE
9.	B19191	RAVI KUMAR	CSE
10.	B19244	DEEPANSHU KUMAR GUPTA	CSE
11.	B19032	DEEPAK SHARMA	EE
12.	B19166	JAYKISHAN PRAJAPATI	EE
13.	B19231	ABHISHEK MISHRA	EE
14.	B19236	ANKIT	EE
15.	B19254	PRADEEP SINGH	EE
16.	B20031	ARYAN TYAGI	CE
17.	B20073	VIVEK PRAJAPAT	CE
18.	B20096	DIPESH SHARMA	CSE
19.	B20113	LAVISH SACHDEVA	CSE
20.	B20123	RAJAT BANSAL	CSE
21.	B20128	RUSTAM NARAYAN	CSE
22.	B20131	SANJEET CHOUDHARY	CSE
23.	B20135	SHIVAM MIDDHA	CSE
24.	B20225	RAMAY MAHESHWARI	CSE
25.	B20311	RAJAT DAWRA	CSE
26.	B20314	ROHAN BHARTI	CSE
27.	B20171	VISION AGGARWAL	DSE
28.	B20239	VISHAL SHARMA	DSE

29.	B20028	ANAND VISHWAKARMA	EE
30.	B20059	RAHUL YADAV	EE
31.	B20180	AMIT	EE
32.	B20186	ARYAN APTE	EE
33.	B20191	DEEPAK KUMAR	EE
34.	B20238	VIKAS DANGI	EE
35.	B20265	SAHIL KUMAR	EP
36.	B21025	UTHAMKUMAR M	BE
37.	B21040	BHUMESH GAUR	CSE
38.	B21081	ADITYA RAJ	CSE
39.	B21117	RISHAB BAIRI	CSE
40.	B21121	RONAK PRAKASH PAMNANI	CSE
41.	B21125	SAHIL GUPTA	CSE
42.	B21132	RAVI PUTUSHOTTAM SHIRSAT	CSE
43.	B21151	ANUJ SOLANKI	CSE
44.	B21204	MAYANK MEHTA	CSE
45.	B21236	VIKASKUMAR RAMSURESH SINGH	CSE
46.	B21149	ALOK KUMAR	DSE
47.	B21150	AMIT KUMAR	DSE
48.	B21317	RAVI HM	DSE
49.	B21055	MOHIT MAHAJAN	EE
50.	B21176	ADARSH SANTORIA	EE
51.	B21213	PURWANSH SAHU	EE
52.	B21217	RAM SINGHAL	EE
53.	B21221	SAMARTH WALSE	EE
54.	B21237	VINOD YADAV	EE
55.	B21241	YOGESH	EE
56.	B21253	BHARGAVI BABANRAO KHADAP	EP
57.	B21257	NAVEEN	EP
58.	B21263	SATWIK JAISWAL	EP
59.	B21270	ABHISHEK	ME
60.	B21285	BHARAT KUMAR PRAJAPAT	ME
61.	B21289	DIVYANSH TRIPATHI	ME
62.	B21325	SUSHIL KUMAR	ME
63.	B22149	ABHIJEET KUMAR JHA	DSE
64.	B22172	SAMEER SINGH RAWAT	DSE
65.	B22268	MANITHA RAHUL SREE	EP
66.	B22013	HARSH VARDHAN SINGH BHADAURIYA	BE
67.	B22185	ADITHYA KUMAR PANDEY	EE
68.	B22214	KRISH MITTAL	EE
69.	B22246	UTSAV	EE
70.	V21019	BRIJESH PATEL	CHEMISTRY
71.	V21033	SHIVANI CHOUDAHARY	CHEMISTRY
72.	V21036	ASHISH KUMAR	CHEMISTRY

73.	V21047	PIYUSH SHARMA	CHEMISTRY
74.	V21063	KARTIK	AM
75.	V21081	MITHLESH SAINI	AM
76.	V21085	ANCHAL JANGIR	AM
77.	V21089	RAHEES	AM
78.	V21094	MOHIT	AM
79.	V22109	HIMANSHU TRIPATHI	PHYSICS
80.	V22111	NAVEEN GUPTA	PHYSICS
81.	V22120	AVIKA VERMA	PHYSICS
82.	V22127	DINESH KUMAR	PHYSICS
83.	V22131	TUSHAR KHANDELWAL	PHYSICS
84.	V22132	SHRADHA	PHYSICS
85.	V22137	GAGAN GOUDA	PHYSICS
86.	V22138	VAIBHAV SHUKLA	PHYSICS
87.	V22057	SIMRAN BISHT	CHEMISTRY
88.	V22069	AKSHARA OM	CHEMISTRY
89.	V22073	NAKUL H KHODIYAR	CHEMISTRY
90.	V22082	R BHUVANESHWARI	CHEMISTRY
91.	V22083	SAHIL SAINI	CHEMISTRY
92.	V22090	RIYA RAJ	CHEMISTRY
93.	V22093	ARNAB DAS	CHEMISTRY
94.	V22094	MANSI	CHEMISTRY
95.	V22095	DEEPIKA KUMARI DWIVEDI	CHEMISTRY
96.	A21005	LALITA WALDIA	MA-DS
97.	A22009	TARUN DEV MISHRA	MA-DS
98.	A22010	HARSHIT KUMAR KUSHWAHA	MA-DS
99.	A22018	AJIT PANDEY	MA-DS

**Institute Scholarship for SC/ST students of UG and PG**

<i>Sl. No.</i>	<i>Roll No.</i>	<i>Student Name</i>	<i>Branch</i>	<i>Category</i>
1.	B20117	NILESH REWASIYA	CSE	SC
2.	B21219	RAWAL RAM	EE	SC
3.	B22296	DEVPRAKASH BAGHEL	ME	SC
4.	V21043	SHIV NARAYAN	CHEMISTRY	SC
5.	V21070	PRATEEK KUMAR	AM	SC
6.	V21090	HIMANSHU	AM	SC
7.	V21110	ROBIN KAROTHIYA	PHYSICS	SC
8.	V21112	SHEVO LOHE	PHYSICS	ST
9.	V21113	AJIT MEENA	PHYSICS	ST
10.	V21132	SHAILESH KUMAR VERMA	PHYSICS	SC
11.	V21135	HARSH NISHANT RAJORIYA	PHYSICS	SC
12.	V22012	RASHMI SINGH	AM	SC
13.	V22038	VIKAS MEENA	AM	ST

14.	V22046	SAGAR KUMAR	AM	SC
15.	V22084	DHANI RAM	CHEMISTRY	SC
16.	V22087	SENTIYANGLA LONGKUMER	CHEMISTRY	ST
17.	V22088	RUPLEKHA BORDOLOI	CHEMISTRY	ST
18.	V22091	PRIYANKA MEENA	CHEMISTRY	ST
19.	V22117	NITESH KUMAR	PHYSICS	SC
20.	A22013	VINAYAK RAGHUNATH KAMBLE	MA	SC

**(xxxvi) To report approval of the courses by the Board of Academics (BoA):****List of courses approved by BoA during its 50<sup>th</sup> meeting held on 14<sup>th</sup> July, 2023:**

Sl.No.	Course No.	Name	Credits
1	AR-501	Robot Kinematics, Dynamics, and Control	3-1-0-4
2	AR-502	Advanced Design Practicum	3-0-3-4
3	AR-503	Mechatronics	3-0-0-3
4	AR-504	Robot Programming, Modeling, and Simulation	2-0-2-3
5	AR-505	Principles of Robot Autonomy	3-0-0-3
6	AR-506	Cognitive Robotics	3-0-0-3
7	AR-507	Probabilistic Robotics	3-0-0-3
8	AR-508	Marine Robotics	3-0-0-3
9	AR-509	Deep Learning for Robotics	3-0-2-4
10	AR-510	Underactuated Robotics	3-0-0-3
11	AR-511	Autonomous Mobile Robots	3-0-0-3
12	AR-512	Rapid Prototyping and Tooling	3-0-2-4
13	AR-513	Unmanned Aerial Systems	3-0-0-3
14	AR-514	Vision and Learning Based Control	3-0-0-3
15	AR-515	Sensors and State Estimation	3-0-0-3
16	BE-306	Genetic Engineering: Principles and Applications	3-1-0-4
17	BE-307P	Reverse Engineering for Bioengineers	0-0-2-1
18	BE-308	Introduction to Biomanufacturing	3-0-2-4
19	BE-401	Bioengineering Mini Project, Term Paper and Seminar	0-0-8-4
20	BE-507	Tissue Engineering	3-0-0-3
21	BY-509	Practical OMICS	0.5-0.5-2-3
22	CE-515	Environmental Impact Assessment	3-0-0-3
23	CE-516	Uncertainty Analysis in Civil Engineering	3-0-0-3
24	CE-517	Hydroinformatics	3-1-0-4
25	CE-518	Structural Reliability and Risk Assessment	3-0-0-3
26	CE519	Chemistry of Natural Waters	3-0-0-3
27	CE-613	Mechanics of Unsaturated Soils	3-0-0-3
28	CS-516P	Exploratory Project	0-0-6-3
29	CY-524	Basic and Applied Electrochemistry	3-0-0-3
30	EE-541	Sensors: Techniques, Algorithms, Applications for Signal Processing, and Machine Learning	3-0-2-4
31	EE-542	Modelling, Simulation and Control of Hybrid Electric Vehicle	3-0-0-3
32	EE-543	Vision and Learning Based Control	3-0-0-3
33	EP-502	Informatics for Materials Design	2-0-2-3

34	ET-504P	Systems Design for Electric Vehicles	0-0-3-2
35	HS-302	Introduction to Drama in English	3-0-0-3
36	HS-303	Partition of India: History and Legacy	3-0-0-3
37	HS-546	Readings in World Literature	3-0-0-3
38	HS-547	Philosophy of Texts and Narratives	3-0-0-3
39	HS-548	Science and Society	3-0-0-3
40	HS-549	Indian Literatures in English Translation	3-0-0-3
41	IC-102P	Foundations of Design Practicum	1-0-6-4
42	IC-112	Calculus	1.5-0.5-0-2
43	IC-113	Complex and Vector Calculus	1.5-0.5-0-2
44	IC-114	Linear Algebra	2-0-0-0
45	IC-115	ODE and Integral Transform	2-0-0-0
46	IK-501	Yoga sutras	2-0-1-3
47	IK-504	Bhagavad Gita - Comprehensive	3-0-0-3
48	IK-502	Introduction to Bio-signals	3-0-2-4
49	IK-503	Cognitive Psychology and the Indian Thought System	3-0-0-3
50	MA-528	Measure Theory and Integration	3-1-0-4
51	MA-529	Statistical Inference	3-1-0-4
52	MA-530	Graph Theory	3-1-0-4
53	MA-610	Mathematical Modeling	3-0-0-3
54	MA-611	Statistical tools and Computing	3-1-0-4
55	MB-510	Probability and Statistics for Data Science and AI	2-0-0-2
56	MB-511	Python Programming	2-0-0-2
57	MB-512	Mathematical Foundations for DS and AI	2-0-0-2
58	MB-513	Principles of Management	2-0-0-2
59	MB-514	Communication Skills for Managers	2-0-0-2
60	MB-515	Financial Statements Analysis	2-0-0-2
61	MB-516	Managerial Economics	2-0-0-2
62	MB-517	Marketing Management	2-0-0-2
63	MB-518	Decision analysis	2-0-0-2
64	MB-519	Creative Thinking, Problem Solving and Decision Making	2-0-0-2
65	ME-511	Manufacturing of Composites	3-0-0-3
66	ME-523	Product Design	3-0-0-3
67	ME-524	Additive Manufacturing	3-0-0-3
68	PH-608	Computer assisted quantum mechanics	2-0-3-3
69	PH-609	Theory of quantum collision and spectroscopy	3-0-0-3
<b>Preparatory Courses</b>			
1	CY-001	Preparatory Chemistry – 1	3-1-0-4
2	CY-002	Preparatory Chemistry – 2	3-1-0-4
3	HS-001	Preparatory English – 1	3-0-0-3
4	HS-002	Preparatory English – 2	3-0-0-3
5	MA-001	Preparatory Mathematics – 1	3-1-0-4
6	MA-002	Preparatory Mathematics – 2	3-1-0-4
7	PH-001	Preparatory Physics – 1	3-1-0-4
8	PH-002	Preparatory Physics – 2	3-1-0-4

**List of courses approved by BoA during its 52<sup>nd</sup> meeting held on 2<sup>nd</sup> November, 2023:**



Sl.No.	Course No.	Course Name	Credits
1.	HS-108	Basic English for Engineers	3-0-0-3
2.	HS-109	Advanced English for Engineers	3-0-0-3
3.	HS-306	Introduction to German Literature	3-0-0-3
4.	HS-501	Global Health and Demography	3-0-2-4
5.	HS-503	German Literature from World War II to Reunification	3-0-0-3
6.	HS-504	Personal Finance and Portfolio Management	3-0-0-3
7.	MB520	Fundamentals of Data and Analytics	2
8.	MB521	Disruptive Technologies for Data Science	2
9.	MB522	Machine Learning for Business	2
10.	MB523	Introduction to AI and Automation	2
11.	MB524	Organizational Behavior	2
12.	MB525	Qualitative Research	2
13.	MB526	Strategic Management	2
14.	MB527	Financial Management	2
15.	MB528	Human Resource Management	2
16.	MB530	Neural Networks fundamentals for Business	2
17.	MB531	Ethical and Legal Aspects of Business	2
18.	MB532	Digital Business Strategy, Models and Transformations	2
19.	MB533	Entrepreneurship	2
20.	MB570	Product Management	2
21.	MB592	Management Science in Practice	2
22.	MB579	Marketing Analytics	2
23.	MB562	Operations Management	2
24.	MB580	AI In Finance	2
25.	PH-625	Data Analysis in Particle Physics	2-0-4-4
26.	PH-626	Elementary Theoretical Particle Physics	3-0-0-3
27.	PH-627	Topological Quantum Matter	3-0-0-3
28.	CE-202	Introduction to Civil Engineering	1
29.	CE-203	Civil Engineering Materials	3
30.	CE-203P	Building Materials Lab	1
31.	CE-306P	Environmental Engineering Lab	1
32.	CE-310	Strength of Materials and Structures	3
33.	CE-310P	Strength of Materials and Structures Lab	1
34.	CE-404	Analysis of Structures	3
35.	CE-405	Water and Wastewater Engineering	3
36.	CE-451	Irrigation Engineering & Hydraulic Structures	3
37.	CE-521	Ecology and Environment Microbiology	4
38.	CE-522	Matrix Methods for Structural Analysis	3
39.	CE-558	Air Pollution and its mitigation	3
40.	CE-604	Theory of Plasticity	3
41.	CE-303	Water Resources Engineering	3
42.	CE-311	Geotechnical Engineering I	3
43.	CE-311P	Geotechnical Engineering Laboratory	1
44.	CE-352P	Transportation Engineering Laboratory	3
45.	EE-304	Communication Systems	3-0-2-4
46.	EE-205	Electromagnetics and Wave Propagation	2.5-0.5-0-3
47.	EE-326	Computer Organization and Processor Architecture Design	3-0-2-4

**List of courses approved by BoA during its 53<sup>rd</sup> meeting held on 22<sup>nd</sup> December, 2023:**

Sl.No.	Course No.	Course Name	Credits
1.	ME-212	Product Manufacturing Technology	2-0-3-3
2.	ME-213	Engineering Thermodynamics	3-1-0-4
3.	ME-215	Manufacturing Engineering -1	3-0-0-3
4.	ME-315	Manufacturing Engineering -2	3-0-0-3
5.	IC-202P	Design Practicum	0-0-6-3
6.	ME-210P	Thermo-Fluids Lab	0-0-2-1
7.	ME-100	Reverse Engineering	0-0-2-1
8.	IK-509	Research Methodology	1-0-0-1
9.	BY-600	Research Methodology	1-0-0-1
10.	BY-529	Mechanobiology of the Cell (MBoC)	3-0-0-3
11.	EE-223P	Reverse Engineering	0-0-2-1

The Senate may kindly note the above matters.

# **PART – ‘B’**

**Item No. 42.20: Issues to be discussed by the Senate without Student Members being present.**

-None-

## Center for Climate Change and Disaster Resilience Research (C3DAR)

### **Introduction**

Climate change is a major challenge the world is facing today, with impacts already being felt globally. IPCC (2022) highlights that the rapidly accelerating climate change has altered the characteristics of the hydrological cycle resulting in higher intensity and frequency of climate and weather extremes. Climate hazards propagate through the atmosphere, hydrosphere, and lithosphere leading to related disaster events. These include large-scale events such as droughts, floods, hot and cold extremes, and leading to local-scale disasters such as landslides, cloud bursts, forest fires and flash floods. While large-scale events demand global interventions and stakeholders, the risk mitigation strategies, both structural and non-structural, can be taken up for localised adaptation to extreme events. However, for designing better interventions, it is critical to understand not only the localised causative factors behind the climate change, such as the behaviour of air pollutants, aerosol concentration and, carbon transport in the atmosphere, but also the impact of climate change on the ecosystem, people and infrastructure better.

In the Indian subcontinent, especially in the Indian Himalayan Region (IHR), a rapid increase in extreme events coupled with rapid infrastructural development have significantly impacted the water resources, agriculture, and infrastructure of the region. These impacts can potentially affect vulnerable communities, living in poverty or in remote or isolated areas, disproportionately. Additionally, the tectonic movements leading to earthquake hazard may add momentary yet disaster risk compounding to the long-term but steadily increasing climate risk. The approaches and schemes for adaptation and/or mitigation for each of the events are different. The design of these measures demands knowledge of the global to local conditions investigations, data collection and systematic field, laboratory and/or numerical analysis. Finally, these strategies should be implemented in coordination with various stakeholders with acceptance from the pertinent communities.

Situated in the Shivalik range of the mid-Himalayan region in India, the IIT Mandi research community took the advantage of being located in the serene yet disaster-prone mountainous range. The critical combination of wideband expertise available with IIT Mandi, ready-to-adopt society, easily reachable sites and data-intense conditions surely motivate the need for such a centre. The centre is intended to focus on encouraging brainstorming, innovation, testing, and reaching society with implementable and affordable schemes.

The 'Center for Climate Change and Disaster Resilience Research' at IIT Mandi would be a valuable resource for addressing the challenges of climate change in the IHR and beyond. By bringing together experts from various fields, conducting research, developing and implementing adaptation and mitigation strategies, and engaging with stakeholders, the centre would work towards understanding and addressing the impacts of climate change and associated disasters and in order to improve the resilience of communities in the region.

### **Objectives**

1. National level facility creation for field-laboratory-numerical studies in the domain of climate change and disaster re.
2. Encourage innovation, critical thinking, teaching and learning aspects
3. Developing innovative and sustainable solutions for resilient infrastructure with a specific focus on mountainous hazards.
4. Developing informed mitigation measures/schemes through exploiting the technological advancements and AI/ML based tools.
5. Increasing the outreach by short-term courses, aligned diploma and masters programs, training and capacity building programs.
6. Creation of national level competence to address the domain issues for state-region-local requirements

### **Focus**

The realm of the center falls into the core expertise of IIT Mandi faculty working in sub-areas as listed below:

<b>Domain</b>	<b>Sub-areas</b>
Climate Change studies	Climate Change Impact Assessment, Data Assimilation Adaptation planning, Weather Forecasting, Extreme Event Forecasting
Atmosphere	Air pollution, Aerosols, Black and brown carbon
Hydrosphere	Glaciers, Avalanches, water, rainfall patterns, flood, drought, soil moisture
Lithosphere	Landslide, Earthquake and liquefaction
Infrastructure	Hazard and risk management, infrastructural disaster management, Service life prediction, Smart infrastructure/cities

### **Existing and Proposed labs and research groups**

- Extreme Hydroclimatology Lab,
- i4s lab
- Geohazard Lab
- Theoretical and Computational Geomechanics Research Lab
- Atmospheric Chemistry and Climate Change Lab
- Computational Engineering Seismology
- Sustainable Infrastructure Lab
- Structural Dynamics and Uncertainties (STUDENT) Research Group
- MH-RESIST - Multi-Hazard RESilient Infrastructure SysTEms Research Lab
- Computational Engineering Seismology
- Sustainable Infrastructure Lab

### **Deliverables**

High quality research  
 International collaborations  
 Capacity building and workshops  
 Certificate and higher level courses and programs  
 One stop solution for life-line departments IPH, PWD, NHAI, DDMA, SDMA, NDMA

technical consultancy on detailed project reports, technical consultation, extreme event reports and mitigation schemes.

**Sustainable Development Goals (SDGs) aspects targeted (CoP: 27)**

SDG 6: Clean water and Sanitation

SDG 9: Innovation, Industry and Infrastructure

SDG 11: Sustainable cities and communities

SDG 13: Climate action

SDG 17: Partnership for the goals

**Collaborations (Indian and International)**

- ❖ National Institute of Disaster Management (NIDM)
- ❖ IITs [Bombay, Roorkee, Ropar, Indore, Madras, Guwahati, Kanpur, Gandhinagar, Delhi]
- ❖ IISc Bangalore
- ❖ Central Building Research Institute,
- ❖ IISER Kolkata,
- ❖ Jawaharlal Nehru University,
- ❖ Tezpur University,
- ❖ National Center for Polar and Ocean Research
- ❖ International
- ❖ UCL London
- ❖ Milan: Prof. Roberto Paolucci (Polytechnic University of Milan)
- ❖ National Institute of Hydrology Roorkee
- ❖ University of California Merced
- ❖ KAUST-Saudi Arabia
- ❖ Team i4s, India, Rennes, France, Dingsheng Li, Shantanu Univ, China
- ❖ Jafar Ali parole, Kuwait
- ❖ Vincenzo Nava, Spain"
- ❖ Durham University, UK
- ❖ Physical Research Laboratory
- ❖ National Physical Laboratory,
- ❖ Linkoping University (Sweden),
- ❖ Karolinska Institut (Sweden)
- ❖ Jinan University (China),
- ❖ Sun Yat-sen University (China)
- ❖ CNRS (France)
- ❖ National University of Singapore
- ❖ Monash University,
- ❖ University of Adelaide
- ❖ TU Munich
- ❖ Kyoto University
- ❖ NTNU Norway
- ❖ UNISA, Italy
- ❖ TAMU, Arlington
- ❖ UIC, Chicago

- ❖ University of Brussels, Belgium

**Industries/Organizations:**

- ❖ National Disaster Management Authority (NDMA)
- ❖ State and District Disaster Management Authority (SDMA-HP, Mandi, Kinnaur, Kangra, Chamba)
- ❖ Intiot Services Pvt Ltd.
- ❖ Macaferri Env Sol
- ❖ Techfab
- ❖ Line departments (IPH, PWD, NHAI,



## Proposal for Early admission in M.Tech (R) /M.Tech (R ) + PhD/PhD programs

Preamble: It has been noticed that higher technical education in Indian institutes is always less attractive among professional undergraduate students. It is due to more lucrative private companies offers, unawareness and many peers and social influences. In order to strengthen Indian education and research, it is important to motivate and admit young bright candidates into higher education. Indian government and many institutes in India have initiated many schemes to fulfill the objectives.

Early admission to M.Tech/M.Tech (R )/PhD can be one of the attractive provisions where students would like to join to save time.

Institute may consider below mentioned provisions to attract young bright candidates to admit in IIT Mandi PG/PhD programs.

### Early admission in M.Tech (R)

**It can be 4+1/1.5 years degree program for students opting provisional admission in M.Tech (R).**

Students can be offered to work in IIT Mandi in their VIIth and VIIIth semesters of UG program and can be offered provisional admission in M.Tech (R ). During this duration, students need to fulfill academic requirements of their parents institutions and can start working on research projects and course requirements of M.Tech (R ). Students may require additional courses to fulfill UG/PG requirements. After completion of their VIIIth semester and successful completion of B.Tech degree, student will continue for one more year at IIT Mandi to complete academic requirement of M.Tech program. Student can opt exit from the program before (any time) formally registered in the program.

In case students join IIT Mandi in 8<sup>th</sup> semester, student has to complete minimum 1.5 yrs after completion of UG degree.

### Eligibility of the students

B.Tech (students of VIIth /VIIIth Semester)/MSc students in top 100 NIRF institutions (overall category)/CFTIs/MoU partner institutions with 7.00 CGPA/10.00 scale or equivalent.

**Fellowship:** Fellowship can be awarded for additional 1/1.5 yrs as per existing Norms for the M.Tech ( R).

These students can be awarded Degree certificates with mentioning their mode of admission as ***“Under the scheme of early induction in M.Tech degree program”***

### **Early admission in PhD /M.Tech (R )+ PhD dual degree programs**

Students can be provisionally admitted in PhD/M.Tech (R ) +PhD and allow to work in IIT Mandi in their last semester/year of UG/PG programs . During this duration, students need to fulfill academic requirements of their parents institutions and can start working on research projects and course requirements of PhD/ (M.Tech+PhD). Students may require additional courses to fulfill UG/PhD requirements. After successful completion of B.Tech/MSc/M.Tech/MA/MBA or equivalent degree from their parent institutions, student will be registered in respective program and will continue full time at IIT Mandi to complete academic requirement of registered program. Student can opt exit from the program before (any time) formally registered in the program.

### **Eligibility of the students**

B.Tech (students of VIIth /VIIIth Semester)/MSc/M.Tech students in top 100 NIRF institutions (overall category)/ CFTIs/MoU partner institutions with 7.00 CGPA/10.00 scale or equivalent.

**Fellowship:** Fellowship can be awarded after completion of their UG/PG degree and as per existing Norms for the PhD/Dual degrees.

### **Selection Procedure:**

There can be three modes selection

1. Common advertisements followed by shortlisting and written test/interviews
2. Selection through campus placement
3. These offers can be made for intern students through interview/PI recommendations.

Fee structure/lodging-boarding charges etc (during final year of their UG/PG program) can be framed separately.

Sl. No.	Semester	Type	Course Code	Course Name	L	T	P	C	L - T - P - C	Remarks	Semesterwise Credits	Credits Completed
First Semester												
1	I	IC	ICxxx	Calculus	1.5	0.5	0	2	1.5-0.5-0-2			
2	I	IC	ICxxx	Complex and Vector Calculus	1.5	0.5	0	2	1.5-0.5-0-2			
3	I	IC	IC140	Engineering Graphics for Design	2	0	3	4	2-0-3-4			
4	I	IC	IC152	Introduction to Python and Data Science	3	0	2	4	3-0-2-4			
5	I	IC	ICXXX	IC Core basket - 1	2.5/3	0.5/0	0	3	2.5-0.5-0-3	<a href="https://cloud.iitmandi.ac.in/f/7a485930ecc4b0fbaa0/">https://cloud.iitmandi.ac.in/f/7a485930ecc4b0fbaa0/</a>		
6	I	HSS	HSXXX	HSS Course	3	0	0	3	3-0-0-3	Preferably English Course for weak students; Other courses may also run		
7	I	IKS	IKS181	Ikshma Course	3	0	0	3	3-0-0-3			
8			ICXXX	Foundations of Design Practicum	1	0	6	4	1-0-6-4	Only one course (FDP/IKS) needs to be taken by students. They may take the other course in the 2nd semester		
The total credits may be 18 if HSS course is not taken by the student. Accordingly the subsequent number would be changed. The compulsory 12 credits from HSS need to be completed by Sem VI. IKS and FDP may run in both semesters. Half of the batch does one course while the other half of the students do the other course. In the second semester, this will be swapped. Accordingly students may do 18-22 credits											21	21
Second Semester												
1	II	IC	ICxxx	Linear Algebra	1.5	0.5	0	2	1.5-0.5-0-2			
2	II	IC	ICxxx	ODE & Integral Transforms	2.5	0.5	0	3	2.5-0.5-0-2			
3	II	IC	IC161	Applied Electronics	3	0	0	3	3-0-0-3			
4	II	IC	IC 161P	Applied Electronics Lab	0	0	3	2	0-0-3-2			
5	II	IC	IC252	Probability and Statistics	3	0	2	4	3-0-2-4			
6	II	IC	ICXXX	Programming and Data Structures	2.5/3	0.5/0	0	3	2.5-0.5-0-3			
7	II	IC	ICXXX	Foundations of Design Practicum	1	0	6	4	1-0-6-4			
8	II	IC	IC221P	Physics Practicum	3	0	0	3	0-0-3-2			
9	II	IC	IKS	Ikshma courses						IKSHMA course and FDP may swap their batches from 1st year. Total credits may be 20-21 based on the courses	24	45
Third Semester												
1	III	IC	IC272	Machine Learning	3	0	0	3	3-0-0-3			
2	III	DC	CS213	Reverse Engineering	0	0	2	1	0-0-2-1			
3	III	DC	CS208	Mathematical Foundations of Computer Science	3	1	0	4	3-1-0-4			
4	III	DC	CS212	Design of Algorithms	3	0	2	4	3-0-2-4			
5	III	DC	CS214	Computer Organization	3	0	2	4	3-0-2-4			
6	III	HSS	HSXXX	HSS Course	x	x	x	3	x-x-x-3			
Discipline Core and elective courses may be included as per requirement; please fill the details of the courses here. Machine learning may be offered in 3rd semester, and design practicum may be offered in 4th semester											19	64

Fourth Semester												
1	IV	IC	IC201P	Design Practicum	0	0	6	3	0-0-6-3			
2	IV	DC	CS304	Formal Languages and Automata Theory	3	0	0	3	3-0-0-3			
3	IV	DC	CS309	Information Systems and Databases	3	0	2	4	3-0-2-4			
4	IV	DC	CSXXX	Software Engineering	3	0	2	4	3-0-2-4			
5	IV	DE	DE-1	Discipline Elective-1	3	0	0	3	3-0-0-3	17	81	
Fifth Semester												
1	V	DC	CS312	Operating Systems	3	0	2	4	3-0-2-4			
2	V	DC	CS313	Computer Networks	3	0	2	4	3-0-2-4			
3	V	DC	CSXXX	Artificial Intelligence	3	0	0	3	3-0-0-3			
4	V	DE	DE-2	Discipline Elective-2	x	x	x	4	x-x-x-4			
5	V	FE	FE-1	Free Elective-1	x	x	x	4	x-x-x-3	19	100	
Sixth Semester												
1	VI	DC	CS302	Paradigms of Programming	3	0	2	4	3-0-2-4			
2	VI	DE	DE-3	Discipline Elective-3	x	x	x	4	x-x-x-4			
3	VI	DE	DE-4	Discipline Elective-4	x	x	x	4	x-x-x-4			
4	VI	FE	FE-2	Free Elective-2	x	x	x	3	x-x-x-4			
5	VI	FE	FE-3	Free Elective-3	x	x	x	3	x-x-x-4			
		ISTP	ISTP	ISTP/Free elective	x	x	x	4	x-x-x-4	All core courses need to be completed by 6th semester. If the discipline core courses are completed by 5th semesters, the students may go for semester internship, without much issues of completing the core courses	22	122
Seventh Semester												
1	VI/VII	IC	IC010	Internship	x	x	x	2	x-x-x-2	Internship needs to be completed before start of 8th semester. The grades for the internship may be added to 8th semester grades.		
1	VII	DE	DE-5	Discipline Elective-5	x	x	x	4	x-x-x-4			
2	VII	DE	DE-6	Discipline Elective-6	x	x	x	4	x-x-x-4			
3	VII	FE	FE-4	Free Elective-4	x	x	x	4	x-x-x-4			
4	VII	FE	FE-5	Free Elective-5	x	x	x	4	x-x-x-4			
5	VII	MTP-1	MTP-1	MTP-1	x	x	x	3	x-x-x-3	21	143	
Eighth Semester												
1	VIII	DE	DE-7	Discipline Elective-7	x	x	x	4	x-x-x-4			
2	VIII	DE	DE-8	Discipline Elective-8	x	x	x	4	x-x-x-4			
3	VIII	FE	FE-6	Free Elective-6	x	x	x	4	x-x-x-4			
5	VIII	MTP 2	MTP-2	MTP-2	x	x	x	5	x-x-x-5	17	160	
										If 3 credits HSS is done in Sem I then only one 3 credits needs to be done in either Se V or Sem VI. Hence the total HSS credits would be 12 and Overall Credits would be 160.		

Program:

List of Discipline Electives/Electives

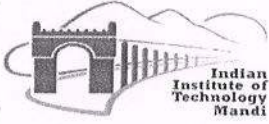
Sl. No	Course Code	Course Name	L	T	P	Cr	L-T-P-C	Remarks
1	CS303	Software Engineering	2	0	2	3	2-0-2-3	
2	CS451	Computer Graphics and Game Design	2	0	2	3	2-0-2-3	
3	CS456	Distributed Databases	3	0	0	3	3-0-0-3	
4	CS507	Computer Architecture	3	0	2	4	3-0-2-4	
5	CS508	Introduction to Heterogeneous Computing	2	0	0	2	2-0-0-2	
6	CS514	Data Structures and Algorithms-II	3	0	2	4	3-0-2-4	
7	CS522	Distributed Algorithms	3	0	0	3	3-0-0-3	
8	CS523	Verification of Reactive Systems	3	0	0	3	3-0-0-3	
9	CS541P	IoT Systems and the Cloud	3	0	2	4	3-0-2-4	
10	CS542	Design patterns for scalable systems						
11	CS544	Formal Concept Analysis: Theory and Practice	2	0	2	3	2-0-2-3	
12	CS545	Software Design Pattern	3	0	0	3	3-0-0-3	
13	CS546	Design of Concurrent Software	3	0	0	3	3-0-0-3	
14	CS549	Performance analysis of computer networks	3	0	0	3	3-0-0-3	
15	CS550	Computer Graphics and Geometric Design	2	0	2	3	2-0-2-3	
16	CS561	Map Reduce and Big Data	3	0	0	3	3-0-0-3	
17	CS563	Scalable Data Science	3	1	0	4	3-1-0-4	
18	CS606	Computational Modeling of Social Systems	3	0	0	3	3-0-0-3	
19	CS609	Speech Processing	3	0	2	4	3-0-2-4	
20	CS611	Program Analysis	3	1	0	4	3-1-0-4	
21	CS660	Data Mining for Decision Making	3	0	0	3	3-0-0-3	
22	CS662	Mobile Virtual Reality and Artificial Intelligence	3	0	0	3	3-0-0-3	
23	CS669	Pattern Recognition	3	1	0	4	3-1-0-4	
24	CS670	Kernel Methods for Pattern Recognition	4	0	0	4	4-0-0-4	
25	CS671	Deep Learning and Applications	3	0	1	4	3-0-1-4	
26	DS201	Data handling and visualization	2	0	2	3	2-0-2-3	
27	DS301	Mathematical Foundation of Data Science	3	1	0	4	3-1-0-4	
28	DS303	Statistical Foundations of Data Science	3	0	0	3	3-0-0-3	
29	DS401	Optimization for Data Science	3	0	0	3	3-0-0-3	
30	DS403	Introduction to Statistical Learning	3	0	2	3	3-0-2-3	

This Discipline Electives list will be maintained by Academics Office. Elective courses are not allowed to delete. The addition of courses is permitted. This list may be modified during the time of next curriculum revision. UG students may preferably be allowed to take upto 5 level courses as Discipline Courses. 6 level courses may be offered as free electives.

Semester	DC	DE	DC + DE
III	13	0	13
IV	11	3	14
V	11	4	15
VI	4	8	12
VII	0	8	8
VIII	0	8	8
Total	39	31	70

Symbol	Course Type	Credits
DC	Discipline core	39
DE	Discipline elective	31
FE	Free elective	18
HSS	Humanities and Social Science Course	12
IC	Institute Core	45
IKS	Indian knowledge system	3
ISTP	Interactive Socio-Technical Practicum	4
MTP 1	Major Technical project 1	3
MTP 2	Major Technical project 2	5
		160

Including the baskets



Acad Office &lt;acadoa1@iitmandi.ac.in&gt;

## Fwd: Minor in intelligent systems

1 message

**Padmanabhan Rajan** <padman@iitmandi.ac.in>  
To: Sonia Gupta <acadoa1@iitmandi.ac.in>

Fri, Dec 15, 2023 at 2:48 PM

----- Forwarded message -----

From: **Jinesh Machchhar** <jinesh@iitmandi.ac.in>  
Date: Thu, Sep 21, 2023 at 12:55 PM  
Subject: Fwd: Minor in intelligent systems  
To: Padmanabhan Rajan <padman@iitmandi.ac.in>

Hi Paddy,

The following change need to be made to the list of courses for minor in Intelligent Systems:

1. Remove "CS669" from the list.
2. Add "DS403 Introduction to Statistical Learning" to the list.

This needs to be approved in the **BOA meeting**. It has been discussed amongst our colleagues. (see the trailing email).

Regs  
Jinesh

----- Forwarded message -----

From: **Dileep A. D** <addileep@iitmandi.ac.in>  
Date: Mon, Jul 31, 2023 at 3:54 PM  
Subject: Re: Minor in intelligent systems  
To: Jinesh Machchhar <jinesh@iitmandi.ac.in>  
Cc: SCEE\_fac <scee@iitmandi.ac.in>, chairscee <chairscee@iitmandi.ac.in>, Padmanabhan Rajan <padman@iitmandi.ac.in>

Please go ahead.

On Mon, 31 Jul 2023, 3:44 pm Jinesh Machchhar, <jinesh@iitmandi.ac.in> wrote:  
Hello Folks,

CS669 is listed as one of the courses for minor in Intelligent Systems. However CS669 is only open to PG students. In view of this CS669 is to be replaced with "DS403 Introduction to statistical learning".

Let me know if you have any comments in this regards by tomorrow.

Regs  
Jinesh

--  
Padmanabhan Rajan  
School of Computing and Electrical Engineering  
Indian Institute of Technology Mandi  
Himachal Pradesh, India.  
Office: A17-03-12, North Campus  
<http://faculty.iitmandi.ac.in/~padman/>

# Proposal for making Independent Study Course for Credits for Graduate Students

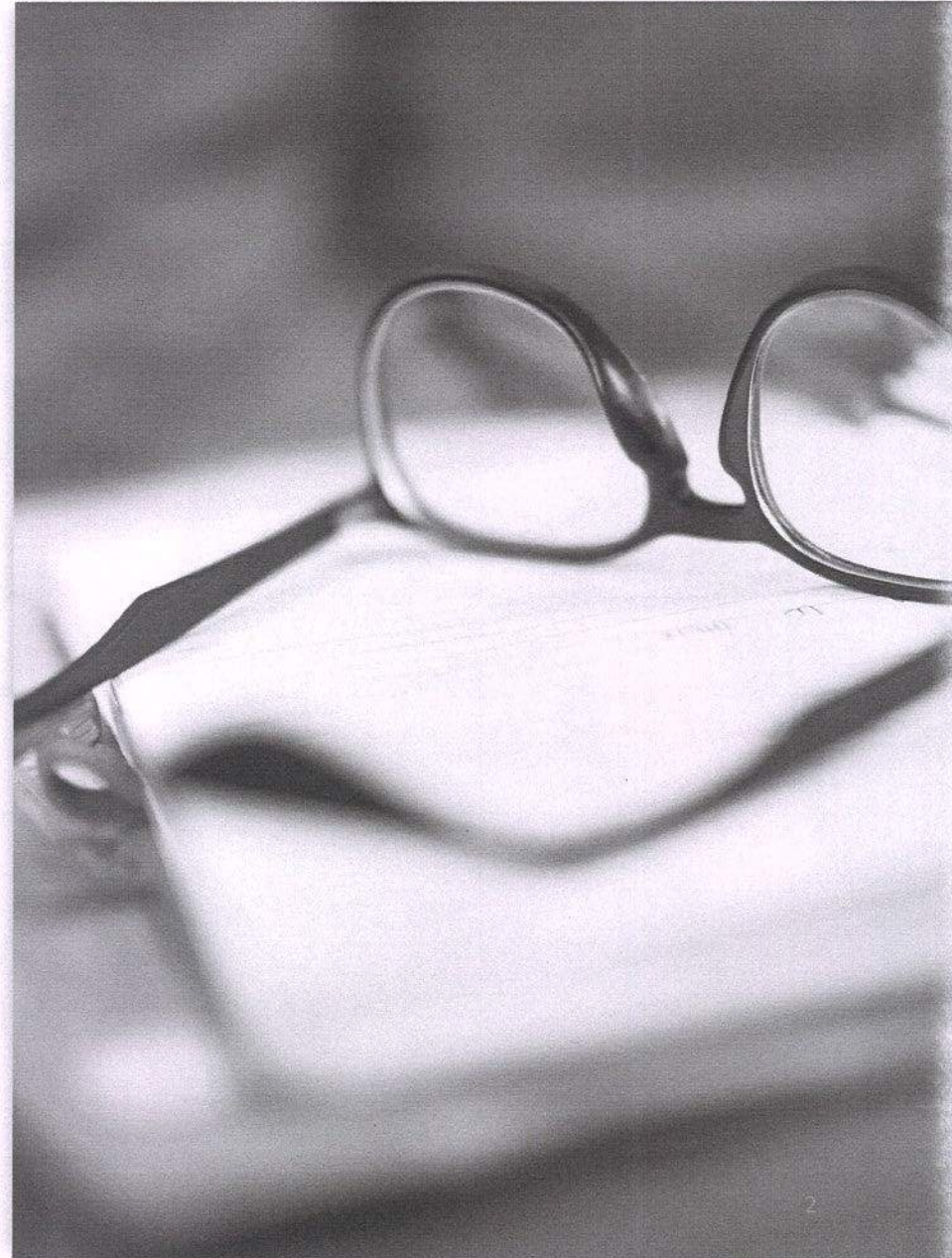
---

Committee: Prof. Anil Kishan (Chair), Prof. Arnav Bhavsar (Member), and Prof. Varun Dutt (Member)



# Independent Study Course at IIT Mandi

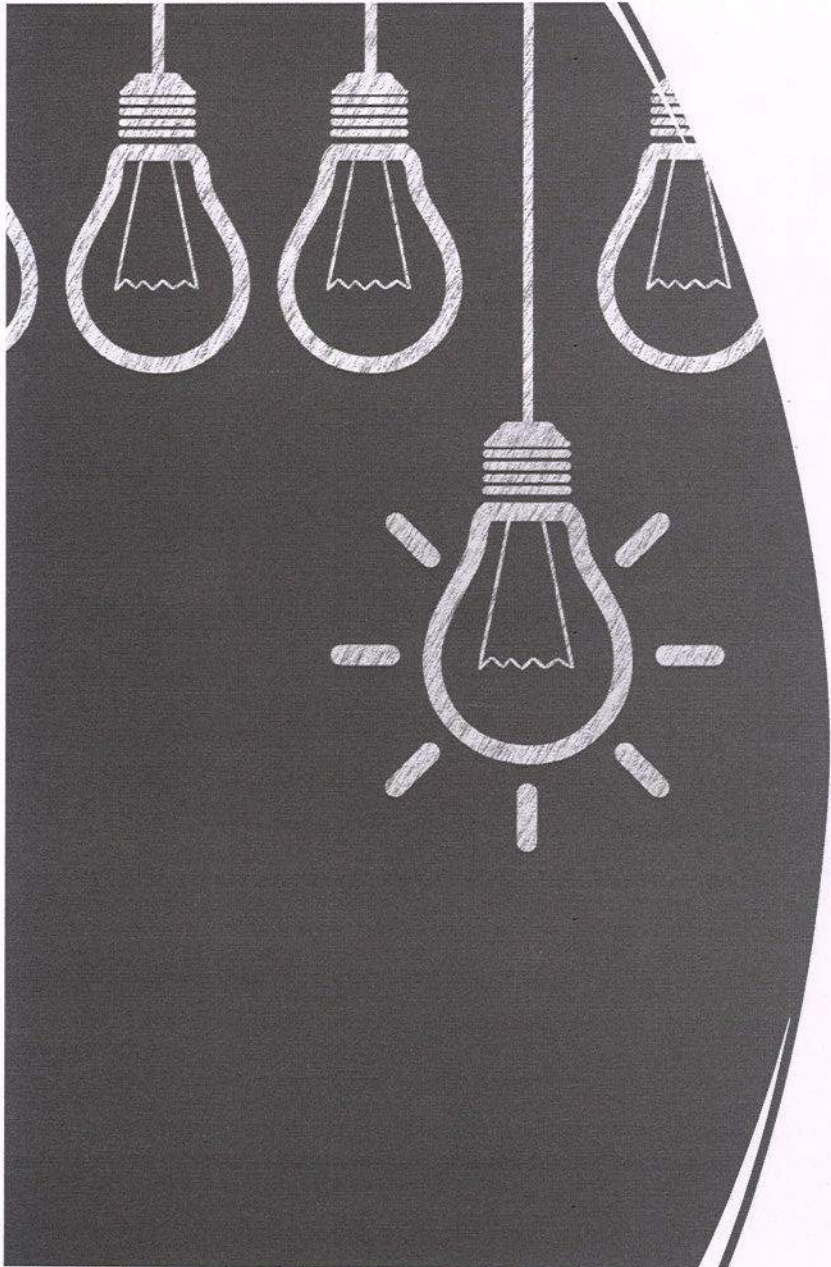
- Credit-based independent study course.
- Facilitates self-learning, supervised by faculty.
- Detailed proposal and approval process.
- Open to B.Tech./Dual Degree, M.A./M.Sc./M.Tech. students.
- M.S. or Ph.D. students can take it, but credits aren't counted towards minimum coursework.



# Proposed Change: Extending Credits to Graduate Students

- Proposal to allow Master by Research and Ph.D. students to take the independent study course for credits.
- This will be in addition to their existing curriculum and count towards minimum course work requirements.
- Proposal to introduce a graded evaluation, moving away from the current PASS/FAIL system for these graduate students.





# Rationale

---

- The rise of new Centres such as IKSMHA, CAIR, and HCI without ample core faculty and courses.
- Graduate students find value in undertaking specialized topics under the guidance of faculty members.
- Enabling credits and grades provide an incentive and formal recognition of student's sincere efforts.

# Benefits

- Enhances the academic depth for graduate students.
- Facilitates interdisciplinary learning.
- Provides a solution to the challenge of fewer courses in new centers.



## Semester-Wise Curriculum

1 <sup>st</sup> and 2 <sup>nd</sup> Year (Total Credit: 84)			
Semester-I		Semester-II	
<ul style="list-style-type: none"> <li>• Math-I: Calculus (IC) 2</li> <li>• Math-II: Complex Variable and Vector Calculus (IC) 2</li> <li>• Engineering Graphics (IC) 4</li> <li>• Introduction to Python and Data Science (IC) 4</li> <li>• IC-I Basket (IC131 Chemistry Compulsion) 3</li> <li>• HSS Course (HSS, Basket) 3</li> <li>• IKSMHA (IKS) 3</li> </ul>	21	<ul style="list-style-type: none"> <li>• Math-III: Linear Algebra (IC) 2</li> <li>• Math-IV: ODE &amp; Integral Transform (IC) 2</li> <li>• Applied Electronics (IC) 3</li> <li>• Applied Electronics Lab (IC) 2</li> <li>• Probability and Statistics (IC) 4</li> <li>• IC-II Basket (IC121 Physics Compulsion) 3</li> <li>• Foundations of Design Practicum (IC) 4</li> <li>• Physics Practicum (IC) 2</li> </ul>	22
Semester-III		Semester-IV	
<ul style="list-style-type: none"> <li>• Understanding Biotech. and its Application (IC-I) 3</li> <li>• Physical Chemistry-I (CY) 3</li> <li>• Basic Organic Chemistry (CY) 3</li> <li>• Principles of Inorganic Chemistry (CY) 3</li> <li>• Discipline Elective I (DE) 3</li> <li>• Physical Chemistry Lab (CY, Lab-I) 2</li> <li>• HSS Course (HSS Basket) 3</li> </ul>	20	<ul style="list-style-type: none"> <li>• Discipline Elective II (DE) 2</li> <li>• Physical Chemistry-II (Quantum &amp; Spec.) (CY) 3</li> <li>• Analytical Chemistry (CY) 3</li> <li>• Discipline Elective III (DE) 3</li> <li>• Organic Chemistry Lab (CY, Lab-II) 2</li> <li>• Inorganic Chemistry Lab (CY, Lab-III) 2</li> <li>• HSS Course (HSS Basket) 3</li> <li>• Free Elective I (FE) 3</li> </ul>	21

## Proposed Courses (2, 3, and 4 Levels)

Course Code	Course Title	L-T-P-C
CY-3XX	Principles and Theories of Physical Chemistry	3-0-0-3
CY-4XX	Introduction to Quantum Chemistry & Molecular Spectroscopy	3-0-0-3
CY-2XX	Physical Chemistry Laboratory	0-0-4-2
CY-3XX	Principles of Organic Chemistry	3-0-0-3
CY-2XX	Organic Chemistry Laboratory	0-0-4-2
CY-3XX	Fundamentals of Inorganic Chemistry	3-0-0-3
CY-2XX	Inorganic Chemistry Laboratory	0-0-4-2
CY-3XX	Basic Analytical Chemistry	3-0-0-3
CY-4XX	Applied Materials Chemistry	3-0-0-3
CY-4XX	Numerical Methods and Data Analysis in Chemistry	3-0-0-3

## Response to Reviewer's Comments

Following the suggestions of the Reviewer, the listed changes were made in the listed course proposal.

**Prof. Ramakrishna Ramaswamy, IIT Delhi**

1. I completely agree with the Reviewer that including the basic programming part in the current proposal will make the course content of much higher volume compared to what is appropriate for one semester. Therefore, the Unit in the previous proposal has been completely removed. Consequently, a B. Tech 'Computing and Data Science' course (IC152) has been mentioned as the prerequisite that comes under the curriculum of the target students assuming this course will cover the basic programming part. I thank the Reviewer for pointing out this fact.

2. As suggested by the Reviewer, the application part of the numerical methods related to specific chemical problems has been included explicitly under all the methods discussed, in addition to what was proposed only for Unit 4 before. Considering the fact that the explanation of these applications in the classroom will benefit the students, they have been included in the lectures. As recommended, homework and assignments will be planned accordingly so that the students get a better idea of how to implement the methods in real applications.

3. I agree with the Reviewer that numerical packages are used extensively for Units 1(e) and 1(f). However, presuming the importance of providing the students with an idea about how these numerical packages run and the basic principles, the suggested methods have been included in the course proposal.

Some of the involved methods could be removed in case the lecture hours were not sufficient. However, as Unit 3 has been omitted from the proposal, it is presumed that proper scheduling of the lectures is done including the topics in 1(e) and (f).

4. It was a very important suggestion to add the discussions on the Monte Carlo method as it has significant applications in Chemistry including calculations of numerical integration. A new section (Unit 4 in the current proposal) has been added covering both Langevin dynamics simulations and Monte Carlo methods.

I extend my sincerest thanks to the Reviewer for his valuable time in evaluating the course proposal and for his constructive criticisms and valuable suggestions on it.

\_\_\_\_\_

**Chairperson, CPC**

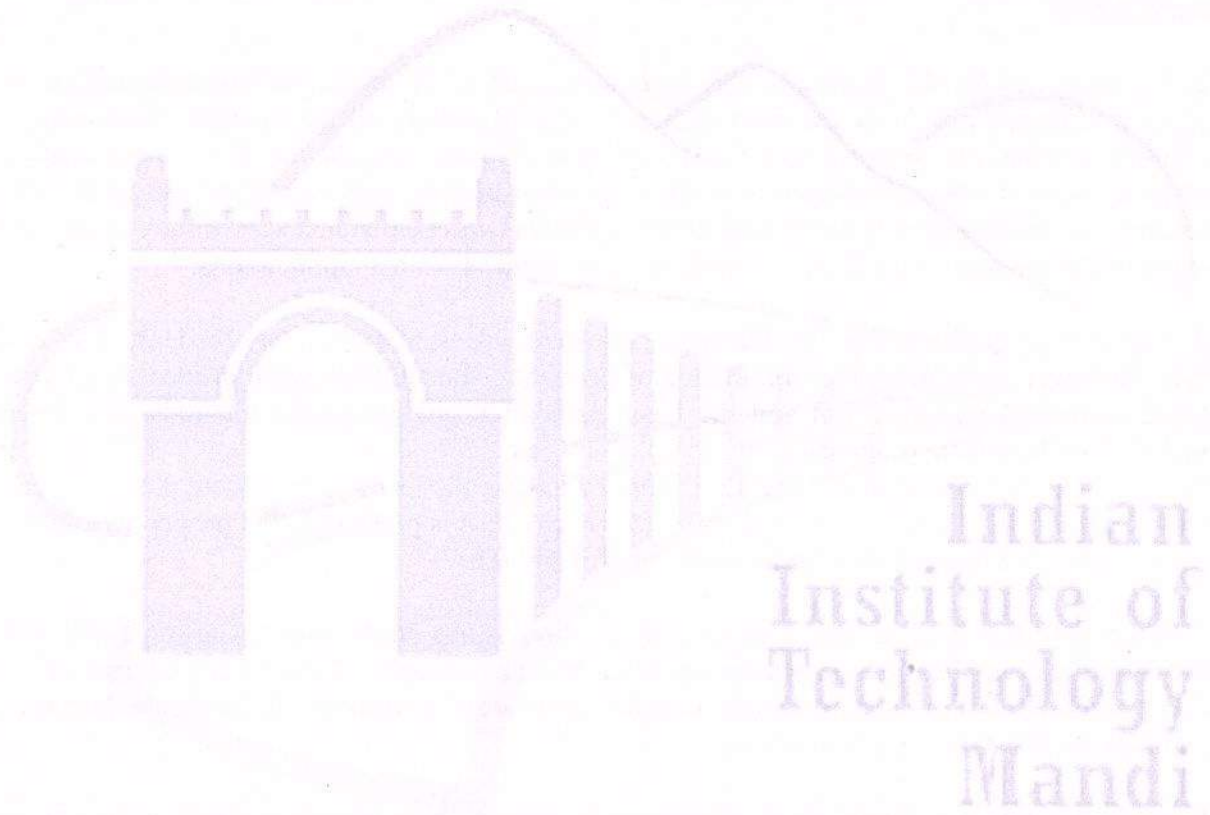
**Date:** \_\_\_\_\_

*Approved / Not Approved*

\_\_\_\_\_

**Chairperson, BoA**

**Date:** \_\_\_\_\_





(d) Carleo et al., Machine learning and the physical sciences, *Reviews of Modern Physics* **91**, 045002 (2019).

**5. Similarity with the existing courses:  
(Similarity content is declared as per the number of lecture hours on similar topics)**

S. No.	Course Name	Course Code	Similarity Content	Approx. % of Content
1.	Numerical Analysis (3-1-0-4)	MA523	8 lectures	19%
2.	Numerical Analysis (3-0-0-3)	MA551	8 lectures	19%
3.	Numerical Analysis (2-0-2-3)	MA607	8 lectures	19%
4.	Numerical Methods for Engineering Computation (3-0-0-3)	ME 504	8 lectures	19%

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course: -**

**Proposed by: Dr. Moupriya Das**

**School: Chemical Sciences**

**Signature:**

**Date:**

**Recommended/Not Recommended, with Comments:**

**Unit 5: Introduction to time-series analysis and machine learning and their connection to chemistry (12 lectures)**

- (a) *Time-series analysis*: Trend, stationarity, seasonality and correlations; Moving average (MA), Autoregressive (AR), Autoregressive moving average (ARMA), Autoregressive integrated moving average (ARIMA) models; Forecasting with ARIMA model; Spectral density function and Spectral analysis
- (b) *Machine learning*: Supervised learning and linear regression, Logistic regression, Decision tree and Random forest, Unsupervised learning, Time-series modelling, Deep learning
- (c) *Significance in Chemistry*: Illustration of the applicability of time-series analysis and machine learning in important problems related to chemistry; such as calculating bond orders and determining normal modes, forecasting reaction pathways, proposing the designing techniques of new molecules and materials etc.

**3. Textbooks:**

- (a) H. W. Press, S. A. Teukolsky, W. T. Vettering, and B. P. Flannery, Numerical Recipes - The Art of Scientific Computing (Cambridge Univ. Press, 1992).
- (b) F. Jensen, Introduction to Computational Chemistry, Second Edition (Wiley, New York, NY, 2006).
- (c) T. Hastie, R. Tibshirani and J. Friedman, The Elements of Statistical Learning (Springer, New York, NY, 2009).
- (d) R. H. Shumway and D. S. Stoffer, Time series analysis and its applications (Springer, New York, 2011)

**4. References:**

- (a) H. W. Press, S. A. Teukolsky, W. T. Vettering, and B. P. Flannery, Numerical Recipes in Fortran (Cambridge Univ. Press, 1992)
- (b) W.H. Press, B.P. Flannery, S.A. Teukolsky, and W.T. Vetterling, Numerical Recipes in C (Cambridge Univ. Press, 1990)
- (c) J. M. Zelle. Python Programming: An Introduction to Computer Science (Beedle & Associates, Inc.: Portland, OR, USA, 2004)

- elimination, Gauss-Seidel method, QR decomposition method
- (b) *Solution of nonlinear algebraic equations*: Bisection method, Newton-Raphson method, Secant method
- (c) *Interpolation and extrapolation*: Polynomial interpolation and extrapolation, Rational function interpolation and extrapolation, Cubic spline interpolation
- (d) *Numerical differentiation*: Finite-difference method, Higher-order methods
- (e) *Numerical integration*: Newton-Cotes quadrature – Rectangle rule, Trapezoidal rule, Simpson's 1/3<sup>rd</sup> and 3/8<sup>th</sup> rule, Romberg's method; Gaussian quadrature
- (f) *Solution of differential equations*: Euler method, Predictor-corrector method - Improved and Modified Euler method, Runge-Kutta method; Finite-difference method
- (g) *Fourier analysis*: Fourier transform of discretely sampled data, Fast Fourier transform

**Unit 2: Significance and application of the numerical methods in Chemistry: (8 lectures)**

Application of the solution of the sets of linear equations in Quantum Mechanics, Application of the solution of the nonlinear algebraic equations to get the optimum of the energy landscapes and minimum of the error function, Application of interpolation and extrapolation techniques in Chemistry; to predict data related to chemical experiments at a given condition, Application of the numerical differentiation techniques to solve diffusion equation, Brief introduction to the Molecular Dynamics; Störmer-Verlet, Verlet, Velocity – Verlet methods, Importance of Fourier analysis in spectroscopy.

**Unit 3: Data Analysis (4 lectures)**

Determining the distribution of a set of data, Moments of a distribution – its mean, variance, skewness etc., Correlation of data – linear correlation, auto-correlation, least square fit method, Importance of data analysis in Chemistry

**Unit 4: Introduction to the Langevin Dynamics Simulations and Monte Carlo Techniques: (6 lectures)**

Idea of the random numbers, Langevin Dynamics Simulations, Monte Carlo algorithm, Metropolis algorithm, Gillespie algorithm; their significance in Chemistry



## IIT Mandi

### Proposal for a New Course

**Course number** : CY xxx  
**Course Name** : Numerical methods and Data Analysis in Chemistry  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS  
**Prerequisite** : Computing and Data Science IC152  
**Mutual Exclusion** : None

---

**1. Preamble:** Various mathematical methods are essential to deal with several fundamental branches of chemistry; such as kinetic theory, thermodynamics, chemical kinetics, transport phenomena, quantum mechanics and spectroscopy, and so on. In many cases, the problems related to these subjects are not exactly solvable and then there appears the need to apply numerical techniques for advancement. The objective of the present course is to offer the students learning the theories of numerical analysis and computer simulation techniques to solve the problems by employing the method of solution of the linear set of equations and nonlinear equations, numerical differentiation and integration, interpolation and extrapolation techniques, solution of ordinary and partial differential equations, Fast Fourier Transform, etc. The programming techniques will primarily be demonstrated in Python and Fortran programming languages with also some introduction to C and C++. The course would also focus on the important aspect of statistical analysis of data. The course will provide exposure to the students regarding the importance of learning stochastic simulations and Monte Carlo techniques in chemistry. The students would be introduced to the basic techniques of time-series analysis and machine learning to get an idea about their importance in crucial chemical applications; for example, detecting bond orders and normal modes, predicting reaction pathways, and designing new molecules and materials, to mention a few.

#### **2. Course Modules with quantitative lecture hours:**

##### **Unit 1: Theories of Numerical Methods: (12 lectures)**

(a) *Methods of solution of sets of linear equations:* Gauss elimination, Gauss-Jordan

It has been included. Thank you.

- *Module 5: X-ray photoelectron spectroscopy, EXAFS, Raman spectroscopy*

As per the suggestion from the first reviewer, this module has been removed from the syllabus.

- *Module 6: carbon materials,  
Thin films, Chemical vapour deposition (CVD), Atomic Layer deposition (ALD).*

It has been included. Thank you.

- *Textbooks: The Chemistry of Dental Materials (Classic Reprint) Hardcover – 21 October 2018  
by Charles Stanley Gibson (Author)*

It has been included. Thank you.

- *References:*

5. *Semiconducting and Metallic Polymers: The Fourth Generation of Polymeric Materials*, Alan J. Heeger, **J. Phys. Chem. B**, Vol. 105, No. 36, 2001

6. *Handbook of Conducting Polymers*, ed. T. A. Skotheim, Dekker, New York, 1986, vol. 1–2.

7. *Nanotechnology in catalysis vol.3*, Eds. Bing Zhou, Scott Han, Robert Raja, and Gabor A. Somorjai, Springer 2007

8. *Introduction to Nanotechnology* by Charles P. Poole Jr and Frank J. Owens, Wiley India student Edition 2008

9. *Nanoscale Materials in chemistry* by K.J. Klabunde and Ryan M. Richard

10. *Nanostructured Materials* by Guozhong Cao, Imperial College Press 2004

Suggested references have been included in the revised course content file. Thank you.

## Response to Reviewer's Comments

### Prof. Jacob (IIT Delhi):

Email with Prof. Jacob's comments enclosed.

1. *In my opinion, there is too much of content packed into this course. I think the characterization module can be removed and be part of another course solely on characterization (probably you are planning on it anyway). The currently allocated teaching hours can be easily distributed among the other modules.*

Thank you very much for the suggestion. We have now removed the characterization module and redistributed the teaching hours.

2. *For the polymer part (module 2), thermoplastics, thermosets and elastomers should also included. The proposed topics under this head still look heavy. Check if processing aspects are part of any other course, if so, these can be excluded.*

Thank you very much for the suggestion. We have now included thermoplastics, thermosets and elastomers in module 2. We have also removed polymer processing part from the module 2.

3. *The reference book by G. Odian is not easy for BS students to follow. Introduction to polymers by Yound and Lovell or Polymer chemistry by Charles Carraher is a lot easier to follow at this stage.*

Thank you very much for the suggestion. We have now removed G. Odian and added the suggested books.

### Prof. Rao (IIT Madras):

Email with Prof. Rao's comments enclosed.

- *Module 2: conducting polymers (PANI and others),  
Refer J. Phys. Chem. B, Vol. 105, No. 36, 2001 (FEATURE ARTICLE)*

It has been included. Thank you.

- *Module 3: Discovery and synthesis of quantum dots (quantum dots are used in photonics industry and research) Recently the Nobel prize 2023 in chemistry has been awarded "for the discovery and synthesis of quantum dots" to Moungi Bawendi (MIT, USA), Louis Brus Columbia, USA and Alexei Ekimov (Nanocrystals Technology Inc, USA). .... <https://www.nobelprize.org/prizes/chemistry/>*

It has been included. Thank you.

- *Module 4: Chemistry of dental materials*

9. *Introduction to Nanotechnology* by Charles P. Poole Jr and Frank J. Owens, Wiley India student Edition 2008

10. *Nanoscale Materials in chemistry* by K.J. Klabunde and Ryan M. Richard

11. *Nanostructured Materials* by Guozhong Cao, Imperial College Press 2004

**5. Similarity with the existing courses:**

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course: –**

**Proposed by: Dr. Garima Agrawal**

**School: Chemical Sciences**

**Signature:**

**Date:**

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_ **Chairperson, CPC**

**Date:** \_\_\_\_\_

**Approved / Not Approved**

\_\_\_\_\_ **Chairperson, BoA**

**Date:** \_\_\_\_\_

nanomaterials, Top down and bottom-up approach, Discovery and synthesis of quantum dots, Particle surface functionalization: electrostatic, steric and electrosteric stabilization, Toxicity

#### **Module 4: Biomaterials (9 Hours)**

Introduction to biomaterials and its history, Classification, Properties of Biomaterials, biocompatibility and biodegradability, biopolymers, hydrogels, sealants and adhesives, Chemistry of dental materials

#### **Module 5: Functional materials, properties, and their applications (9 Hours)**

Smart materials, Carbon materials, Energy materials, Optoelectronic materials, Catalysis, Environment, Agriculture, Biomedicine, Emerging materials, Thin films, Chemical vapour deposition (CVD), Atomic Layer deposition (ALD).

### **3. Textbooks:**

1. Harry R. Allcock, Introduction to Materials Chemistry, Wiley, 2<sup>nd</sup> Edition, 2019.
2. V. R. Gowarikar, N. V. Viswanathan, J. Sreedhar, Polymer Science, New Age International. Wiley, 3<sup>rd</sup> Edition, 2019.
3. Bikramjit Basu; Biomaterials Science and Tissue Engineering: Principles and Methods; Cambridge University Press; [ISBN: 9781108415156]; 2017.
4. M.D. Ventra, S. Evoy, J.R. Heflin Jr. (Eds.), Introduction to Nanoscale Science and Technology, Kluwer Academic Publishers, Boston.
5. The Chemistry of Dental Materials (Classic Reprint) Hardcover – 21 October 2018 by Charles Stanley Gibson (Author)

### **4. References:**

1. R. J. Young and P. A. Lovell, Introduction to Polymers, CRC Press, Taylor & Francis group.
2. C. E. Carraher, Polymer Chemistry, CRC Press, Taylor & Francis group.
3. L. M. Liz-Marsan and P. V. Kamat, Nanoscale Materials, Kluwer Academic Publishers, Boston, USA.
4. Advanced Biomaterials: Fundamentals, Processing and Applications; John Wiley & Sons, Inc., USA (ISBN: 978-0-470-19340-2), September, 2009.
5. Related journal articles
6. *Semiconducting and Metallic Polymers: The Fourth Generation of Polymeric Materials*, Alan J. Heeger, *J. Phys. Chem. B*, Vol. 105, No. 36, 2001
7. *Handbook of Conducting Polymers*, ed. T. A. Skotheim, Dekker, New York, 1986, vol. 1–2.
8. *Nanotechnology in catalysis vol.3*, Eds. Bing Zhou, Scott Han, Robert Raja, and Gabor A. Somorjai, Springer 2007





## IIT Mandi Proposal for a New Course

**Course number** : CY xxx  
**Course Name** : Applied Materials Chemistry  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

### **1. Preamble:**

Applying the fundamentals of chemistry for developing functional materials has revolutionized the human life at various fronts. The exciting opportunity to tune material properties by manipulating various parameters opens up plethora of novel applications. Materials chemistry has emerged as a dynamic platform for billion-dollar industry in a very short span of time. This course will provide the students an appreciation of the versatility which is inherent in material chemistry and which is available to the material chemist in conjunction with other core and elective courses in the BS-MS program.

### **2. Course Modules with quantitative lecture hours:**

#### **Module 1: Introduction to Materials chemistry (6 Hours)**

Concepts of materials chemistry, Different types of materials, Sources and characteristics of traditional materials, Uses of materials, Approaches to producing new materials with new properties, Atomic level growth of solid material (crystalline and amorphous), Types of bonding in solids, Crystal structures

#### **Module 2: Polymers and Polymer based Materials (9 Hours)**

Introduction to polymers, History and recent developments, Classification and nomenclature of polymers, Thermoplastics, Thermosets, Elastomers, Molecular weight, Polymer synthesis, Techniques of polymerization Conducting polymers

#### **Module 3: Nanomaterials (9 Hours)**

Fundamentals of nanotechnology, Classification of nanomaterials, Synthesis of

## Response to Reviewer's Comments

**Prof. Raj Kumar Dutta, IIT Roorkee**

**Comment:** I have edited a few points in the proposed syllabus. Overall, the syllabus looks fine, hopefully atomic spectroscopic methods will be covered as advanced course?

**Response:** All the corrections are included in the revised proposal.

NA

**Approvals:**

**Other Faculty interested in teaching this course:**

**Proposed by: Dr. Sharvan Kumar**

**School: Chemical Sciences**

**Signature:**

**Date: 29-09-23**

*Recommended/Not Recommended, with Comments:*

\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_

*Approved / Not Approved*

\_\_\_\_\_  
**Chairperson, BoA**

**Date:** \_\_\_\_\_

Indian  
Institute of  
Technology  
Mandi

Calculation of the pH of Solutions.

### **Unit 3: Chemical Equilibria (8 Hours)**

Reversible Reactions and Chemical Equilibria, Thermodynamics and Equilibrium Chemistry, Equilibrium Constants for Chemical Reactions, Precipitation Reactions, Acid–Base Reactions, Complexation Reactions, Oxidation–Reduction (Redox) Reactions, Le Châtelier’s Principle, Buffer Solutions.

### **Unit 4: Analytical Electrochemistry (8)**

Potentiometry-General principles, Calomel Electrodes, Ag-AgCl electrodes, Membrane electrodes-ion selective electrodes, glass electrodes, biosensors. Coulometry: Basic principles, constant current and constant potential coulometry. Voltammetry: different waveforms – linear scan, square scan and triangular scan, cyclic voltammetry.

### **Unit 5: Separation Techniques (6 Hours)**

Principles and applications of TLC, General Theory of Column Chromatography, Gas chromatography (GC), High Performance Liquid Chromatography (HPLC), FPLC, Ion chromatography (IC), Supercritical Fluid Chromatography, Capillary Electrophoresis.

### **3. Textbooks:**

- D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch, Fundamentals of Analytical Chemistry, 9th Edition, Thomson, 2013.
- D. Harvey, Analytical chemistry 2.1, McGraw-Hill, 2016. (better to include: Analytical Chemistry by G.D. Christian, P.K. Dasgupta and K.A. Schug, 7<sup>th</sup> edition, Wiley,)
- H. H. Willard, L. L. Merritt Jr., J. A. Dean, f. A. Settle Jr., Instrumental Methods of Analysis, CBS Publishers, New Delhi, 1986.
- J. C. Miller, J. N. Miller, Statistics for Analytical Chemistry, 2nd Edition, Wiley, 1998.
- D. C. Harris, W. H. Freeman Quantitative Chemical Analysis, 7th Edition, 2006.

### **4. Similarity with the existing courses:**

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA	-	-	

### **6. Justification of new course proposal if cumulative similarity content is >30%:**



**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CYXXX  
**Course Name** : **Fundamental Analytical Chemistry**  
**Credit Distribution** : 3-0-0-3  
**Intended for** : **BS Chemical Sciences**  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

This course aims to sensitize students towards appropriate scientific reporting of the data, and use of statistics for testing hypothesis. It also emphasizes the reproducibility of experiments and the sources of “errors” during repetitions of experiments. In the later part, it deals with the principles of separation techniques employed on synthetic chemicals and biomolecules.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Basic Tools of Analytical Chemistry (10 Hours)**

Measurements in Analytical Chemistry, Units of Measurement, Uncertainty in Measurements, Concentration, Molarity and Formality, Normality, Molality, Weight, Volume, and Weight-to-Volume Percent, Parts Per Million and Parts Per Billion, Converting Between Concentration Units, Stoichiometric Calculations, Types of errors in Chemical Analyses, Accuracy, Precision, Sensitivity, Specificity and Selectivity, Sampling, Standardization and Calibration, Least square fit, Limit of detection and quantification, Statistical Data Treatment and Evaluation, Basic Equipment, Signal and noise in instrumental measurement, Equipment for Measuring Mass and Volume, Equipment for Drying Samples, Spreadsheets and Computational Software,

**Unit 2: Classical Methods of Analysis (10 Hours)**

Preparing Solutions, Preparing Stock Solutions, Preparing Solutions by Dilution, Gravimetric Methods of Analysis, Titrations in Analytical Chemistry, Principles of Neutralization Titrations, Complex Acid/Base Systems, Applications of Neutralization Titrations, Complexation and Precipitation Reactions and Titrations, Titration Curves,

## Response to Reviewer's Comments

**Prof. G. K. Lahiri, IIT Bombay**

**Comment:** Thanks. It looks fine.

**Response:** No changes were required in the both the syllabus of theory and laboratory course of Inorganic Chemistry

**Chairperson, BoA**



Indian  
Institute of  
Technology  
Mandi

1. A Collection of Interesting General Chemistry Experiments: A.J. Elias (2007) Revised edition Universities Press (India) Pvt. Ltd.

#### 4. References:

1. Vogel's Textbook of Quantitative Chemical Analysis, 5th Edn, Orient Longman, 1989.
2. Vogel's Textbook of Macro and Semimicro Qualitative Inorganic Analysis, 5th Edn, Orient Longman, 1982.
3. Synthesis and Technique in Inorganic Chemistry, Robert J. Angelici, University Science Books, U.S.; 2nd edition, 1991.
4. Lab Manual and Instrument Manuals

#### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

#### 6. Justification of new course proposal if cumulative similarity content is >30%:

NA

Approvals:

Other Faculty interested in teaching this course: –

Proposed by: Dr. Garima Agrawal

School: Chemical Sciences

Signature:

Date:

*Recommended/Not Recommended, with Comments:*

\_\_\_\_\_ Date: \_\_\_\_\_  
Chairperson, CPC

*Approved / Not Approved*

\_\_\_\_\_ Date: \_\_\_\_\_





## IIT Mandi Proposal for a New Course

**Course number** : CY XXX  
**Course Name** : Inorganic Chemistry Laboratory  
**Credit Distribution** : 0-0-4-2  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

### 1. Preamble:

This course is intended to provide the BS students with practical training on various aspects of inorganic chemistry.

### 2. Course Modules with quantitative lecture hours:

1. General introduction to inorganic laboratory
2. Basic concepts of quantitative analysis
3. Errors in chemical analysis data
4. Qualitative analysis: Inorganic semi micro qualitative analysis with four radicals
5. Quantitative analysis:
  - a) Volumetric Analysis:
    - Acid-base titrations relevant to the neutralizing power of antacids
    - Complexometric and spectroscopic estimation of metal ions
  - b) Gravimetric Analysis:
    - Estimation of barium/sulphate as barium sulphate
    - Estimation of iron as ferric oxide etc.
6. Synthesis:
  - a) Preparation of potash alum from scrap aluminum
  - b) Preparation of hexamine Ni(II) chloride
  - c) Preparation of tetramine Cu(II) sulphate

### 3. Textbooks:

**Other Faculty interested in teaching this course: –**

**Proposed by: Dr. Garima Agrawal**

**School: Chemical Sciences**

**Signature:**

**Date:**

***Recommended/Not Recommended, with Comments:***

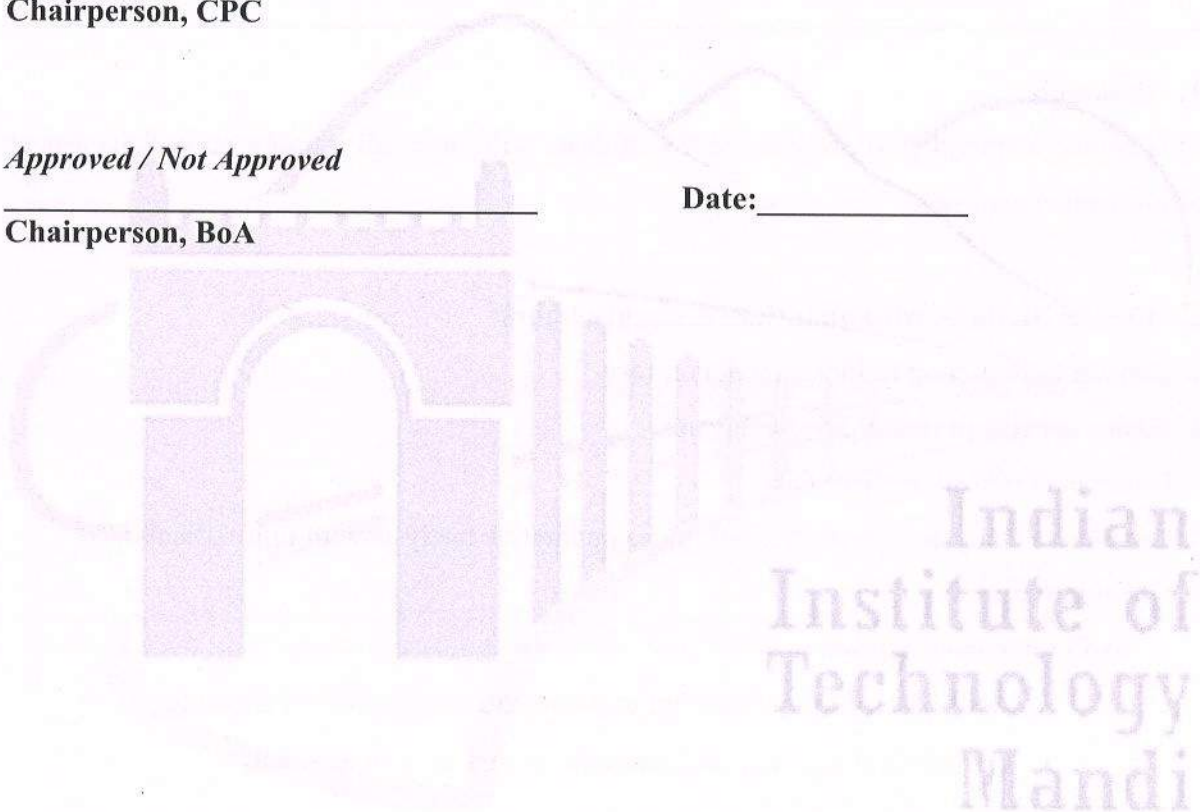
\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_

***Approved / Not Approved***

\_\_\_\_\_  
**Chairperson, BoA**

**Date:** \_\_\_\_\_



Indian  
Institute of  
Technology  
Mandi

Structure and properties of s and p block elements, and their compounds like hydrides, oxides, and halides, biological functions of inorganic elements in organisms

### **Module 5: Transition elements (8 Lectures)**

Coordination complexes, Isomerism, Theories of metal-ligand bonding and their limitations, Valence bond theory, Spectrochemical series of ligands, Crystal field theory, Splitting of d orbitals in octahedral, tetrahedral and square planar complexes, Low-spin and high-spin complexes, Brief introduction to color and magnetism.

### **Module 6: Introduction to nuclear chemistry (4 Lectures)**

Nuclear reactions, fission and fusion, radio analytical techniques

### **3. Textbooks:**

1. Ajai Kumar, Basic Inorganic Chemistry, Aaryush Education, 2<sup>nd</sup> Edition, 2019.
2. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity, 4th edition, Pearson Education Inc., 2000.

### **4. References:**

1. F. A. Cotton, G. Wilkinson, C. A. Murillo and M. Bochmann, Advanced Inorganic Chemistry, Wiley, 6th edition, 2007.
2. B. Douglas, D. McDaniel and J. Alexander, Concepts and Models of Inorganic Chemistry, 3rd edition, Wiley, 2006.
3. J. D. Lee, Concise Inorganic Chemistry, 5th edition, Wiley, 2010.
4. P. Atkins et al, Shriver & Atkins' Inorganic Chemistry, 5th edition, W. H. Freeman and Company, New York, 2010.

### **5. Similarity with the existing courses:**

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

### **6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**



**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CY XXX  
**Course Name** : Fundamentals of Inorganic Chemistry  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

The main focus of this course is to provide the students with the fundamental understanding of the properties of inorganic compounds. Additionally, this course will strengthen the conceptual knowledge of students related to inorganic chemistry such as chemical periodicity, structure and bonding, acidity and basicity etc. This course will help the students appreciate the importance of the elements of the periodic table in practical world.

**2. Course Modules with quantitative lecture hours:**

**Module 1: Periodic properties (8 Lectures)**

Atomic Structure, electronic configuration, Chemical periodicity and periodic anomalies, Size of atoms and ions, Effective nuclear charge, Screening effect, Ionization energy, Electronegativity, Electron affinity, Lanthanide contraction, Fajan's rules.

**Module 2: Concepts of acids and bases (8 Lectures)**

Theories of acids and bases, Bronsted and Lewis acids and bases, Gas phase versus solution acidity, leveling effects of solvents, Concepts of pH, pKa, pKb, Hardness and softness, surface acidity.

**Module 3: Principles of electrochemistry (6 Lectures)**

Oxidation and reduction, Redox potential and stability, Electrode potentials, Nernst equation, Frost, Latimer and Pourbaix diagrams.

**Module 4: s & p block elements (8 Lectures)**

Include the experiments that you are teaching them in the theory course as part of the lab experiment. This would give them good feel and will be able to appreciate the course also.

**Response:** As suggested, we have now modified the syllabus accordingly.

## Response to Reviewer's Comments

**Prof. P. Anbarasan, IIT Madras**

We are extremely thankful to the reviewer for his valuable comments and suggestions. Following are the responses to the reviewer's comments.

### Theory syllabus

1. I feel it start from B.Sc level and ends in M.Sc level. Have a look at some of the IIT BS program syllabus or central university syllabus to have some good idea.

**Response:** As suggested, we have modified the syllabus accordingly.

2. Unit 1: Bonding and aromaticity is fine. I am not sure whether it is important to discuss Baker-Nathen effect after hyperconjugation. In the aromaticity, you may specify the Huckel's rule.

**Response:** As suggested, we have removed the Baker-Nathen effect and also included Huckel's rule under aromaticity.

3. Unit 2 looks fine. You may want to add primary and secondary in KIE.

**Response:** As suggested, we have now incorporated primary and secondary in KIE.

4. Unit 3 is OK.

5. Unit 4: some of the parts are M.Sc level. For the first course to BS students, please restrict the conformational analysis to butane and may be cyclohexane, decalin is of master level. Similarly, include center of chirality and remove planar chirality and helicity. Also, remove the rest after that.

**Response:** As suggested, we have now restricted the conformational analysis to butane cyclohexane. The conformation analysis of decalin is removed. We have also included the center of chirality and removed planar chirality, helicity, and rest after that.

6. Unit 5 is very broad. You may include aromatic substituted reactions (electrophilic, nucleophilic and etc), chemistry/reactions of carbonyl compounds and chemistry/reactions of alkene. Please make it more specific to help the students.

**Response:** As suggested, we have now included aromatic substituted reactions (electrophilic, nucleophilic, etc.), chemistry/reactions of carbonyl compounds, and chemistry/reactions of alkene under the Unit-5.

### Laboratory syllabus

Most of them is not appropriate to BS student who may be doing the lab for first time. Please include qualitative analysis of functional groups, may be even from mixture of compounds without separation.

### 3. Textbooks:

- Vogel's book of Practical Organic Chemistry (2006), 5th Edition, Longman Scientific & Technical.
- Organic Chemistry A Lab Manual, Pavia, Lampman, Kriz & Engel (2009), Cengage Learning.

### 4. References:

- Advanced Practical Organic Chemistry, Leonard, Lygo & Procter (1998), Stanley Thomas

### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA	-	-	

### 6. Justification of new course proposal if cumulative similarity content is >30%:

NA

Approvals:

Other Faculty interested in teaching this course:

Proposed by: Amit B. Pawar

School: Chemical Sciences

Signature:

Date: 01.11.2023

*Recommended/Not Recommended, with Comments:*

\_\_\_\_\_  
Chairperson, CPC

Date: \_\_\_\_\_

*Approved / Not Approved*

\_\_\_\_\_  
Chairperson, BoA

Date: \_\_\_\_\_



## IIT Mandi

### Proposal for a New Course

**Course number** : CY2XX  
**Course Name** : Organic Chemistry Laboratory  
**Credit Distribution** : 0-0-4-2  
**Intended for** : BS  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

#### 1. Preamble:

This course will provide an opportunity to the students to learn the fundamental aspects in organic synthesis with the help of hand-on experiments. It includes the principles and applications of separation, isolation, and analytical techniques in organic chemistry.

#### 2. Course Modules with quantitative lecture hours:

##### Unit 1: Basic Lab Techniques

- (a) To determine type and detection of extra elements (N, S, Cl, Br, I) in organic compounds
- (b) Thin layer chromatography (TLC) and calculation of R<sub>f</sub> values
- (c) Separation of 2 organic compounds by paper chromatography
- (d) Purification of organic compounds by crystallization.

##### Unit 2: Organic Qualitative Analysis

Separation of two components from the binary mixture of organic compounds (Solid-Solid, Solid-Liquid).

##### Unit 3: Organic Preparations (any 6)

- (a) Preparation of paracetamol
- (b) Preparation of aspirin
- (c) Preparation of phthalimide from phthalic anhydride
- (d) Preparation of 2:4-DNP derivative of aldehyde or ketone
- (e) Preparation 4-chloro benzyl alcohol from 4-chloro benzaldehyde
- (f) Base catalyzed Aldol condensation
- (g) Preparation 4-iodonitrobenzene from 4-nitroaniline by Sandmeyer Reaction
- (h) Preparation of Glucosazone derivative of Glucose
- (i) Preparation of quinone from hydroquinone
- (j) Preparation of Oxime derivative of Ketones.



NA

Approvals:

Other Faculty interested in teaching this course:

Proposed by: Amit B. Pawar and Abhishek Dewanji

School: Chemical Sciences

Signature:

Date: 31.12.2022

*Recommended/Not Recommended, with Comments:*

\_\_\_\_\_  
Chairperson, CPC

Date: \_\_\_\_\_

*Approved / Not Approved*

\_\_\_\_\_  
Chairperson, BoA

Date: \_\_\_\_\_

Indian  
Institute of  
Technology  
Mandi

### Unit 3: Acid-Base Theory (4 lectures)

Acidity, basicity, and pKa, Brønsted & Lowry concept, Lewis concept, The definition of pKa, Basicity, Factors that influence the acidity and basicity, HSAB Principle, Keto-enol tautomerism

### Unit 4: Principles of Stereochemistry (10 lectures)

Baeyer's strain theory, Pitzer strain (torsional strain) and conformational analysis (up to cyclohexane), geometrical isomerism (E/Z), optical isomerism, projections, CIP rules (R/S nomenclature of acyclic and cyclic molecules); nomenclature – threo and erythro, syn and anti, endo and exo, and meso and d/l; Introduction to chirality and its origin;

### Unit 5: Organic Reactions (10 lectures)

Carbon-carbon bond forming reactions, Olefination reactions, Reduction & oxidation reactions, aromatic substitution reactions (electrophilic, nucleophilic, etc.), chemistry of carbonyl compounds, alkenes and alkynes.

### 3. Textbooks:

- Clayden, J., Greeves, N., Warren, S., Wothers, S. Organic Chemistry, Oxford University Press, 2001.
- Eliel, E. L., Wilen, S. H., Doyle, M. P. Basic Organic Stereochemistry, John Wiley and Sons, 2001.
- Smith, M. B. and March, J. Advanced Organic Chemistry, Wiley Interscience, 2007.
- D. Nasipuri, Stereochemistry of Organic Compounds-Principle and Applications, 4 Revised ed., New Academic Science, 2012.
- P. Sykes, A Guidebook to Mechanism in Organic Chemistry, 7ed., Addison-Wesley, 2003.

### 4. References:

- Modern Synthetic Reactions by H. O. House, W.A. Benjamin, Inc., 1972
- Understanding Organic Reaction Mechanism by A. Jacobs, Cambridge 1998.

### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA	CY501	5%	

### 6. Justification of new course proposal if cumulative similarity content is >30%:



**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CY1XX  
**Course Name** : Principles of Organic Chemistry  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

This course introduces basic concepts in organic chemistry with the aim to provide understanding with respect to structure, stereochemistry, reactivity, and mechanism. It would cover acid-base theory, aromaticity, oxidation and reduction protocols, reactive intermediates, reaction energetics and principles of stereochemistry.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Bonding & Aromaticity (10 lectures)**

Atomic orbitals and their overlaps, bonding of different types –  $\sigma$ -bond,  $\pi$ -bond, Bond dissociation energy, Bond order and multiplicity, Hybridization, VSEPR theory, Bent's rule, Dipole moment, Molecular orbital (MO) theory, Electronic effects: inductive & field effects, Mesomeric effects, Hyperconjugation, Resonance. Aromaticity, antiaromaticity, and homoaromaticity; Hückel's rule, aromatic ring currents; examples of nonbenzenoid aromatic and antiaromatic compounds.

**Unit 2: Reaction Kinetics and Reactive Intermediates (8 lectures)**

Energetics of a chemical reaction, Transition state, Hammond's postulate, Hammett equation, Arrhenius equation, Effect of a catalyst, Kinetic Isotope Effect (primary and secondary), Isotope scrambling, Structure, stability and reactivity of carbocations, carbanions, free radicals, carbenes, and nitrenes

**5. Similarity with the existing courses:**

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course: –**

**Proposed by: B. Mondal and C. K. Nandi**

**School: Chemical Sciences**

**Signature:**

**Date: 25.11.2022**

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_

**Approved / Not Approved**

\_\_\_\_\_  
**Chairperson, BoA**

**Date:** \_\_\_\_\_

considering aqueous solutions of glycerol, ethanol, etc.

6. Determination of surface tension of a given solution by drop weight method using a stalagmometer, considering aqueous solutions of NaCl, acetic acid, ethanol, etc., as systems.

### Module-III: Chemical Kinetics

7. Study of kinetics of saponification of ester by using the conductometric method.
8. Study of the kinetics of the reaction  $I^- + S_2O_8^{2-}$  by colorimetric method.
9. Acid hydrolysis of methyl acetate at different temperatures at a given concentration of  $[H^+]$  ions.

### Module-IV: Spectroscopy

10. Verification of Beer-Lambert law using colorimetry.
11. Absorption spectrum of a conjugated dye, polymethine, interpretation of the spectra using the "free-electron" model.
12. Determination of quantum yield.

### Module-V: Electrochemistry

13. Determination of emf of an electrochemical cell and measurement of thermodynamic parameters from the temperature dependence of emf.
14. Determination of  $E_0$  of  $Fe^{3+}/Fe^{2+}$  couple in the hydrogen scale by potentiometric titration of ferrous ammonium sulfate solution using  $KMnO_4$ , or  $K_2Cr_2O_7$  as standard.

### 3. Textbooks:

- *Experimental Physical Chemistry*, D. P. Shoemaker, C. W. Garland, and J. W. Nibler, 8<sup>th</sup> Edition, McGraw Hill (2009).
- *Experimental Physical Chemistry*, G. Peter Matthews, Oxford University Press (1986).

### 4. References:

- *Experimental physical chemistry*, Frederick A. Bettelheim, Saunders; 1<sup>st</sup> edition (1971)
- A. Ghosal, B. Mahapartra, A. K. Nad, *An Advanced Course in Practical Chemistry*, New Central Book Agency Pvt Ltd, Calcutta (2000).



**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CYXXX  
**Course Name** : Physical Chemistry Laboratory  
**Credit Distribution** : 0-0-4-2  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

In this laboratory course, students will be introduced to basic data analysis and Physical Chemistry experiments involving spectroscopy, pH-metry, conductometry, chemical kinetics, etc. This laboratory course is designed to complement the theories and principles learned by the students in the general chemistry and basic physical chemistry courses.

**2. Course Modules with quantitative lecture hours:**

**Module-I: Data Analysis and Programming**

1. Determination of distribution, mean, variance, standard deviation, confidence interval from sample data obtained for the space variables of diffusive particles at a finite-time.
2. Determination of correlations, auto-correlations and spectral density of sample data obtained for the space and momentum variables of diffusive particle at a given time.
3. Linear and non-linear curve fitting (regression analysis) of given spectroscopic data (Abs. coefficient. vs. T/Fl. Decay) and determination of physical properties from fitting.
4. Writing a Fortran/C++ program for matrix multiplication, diagonalization, and calculation of roots of a Secular determinant.

**Module-II: Physical Properties**

5. Determining a given solution's viscosity coefficient with Ostwald's viscometer

*Approved / Not Approved*

**Date:** \_\_\_\_\_

\_\_\_\_\_  
**Chairperson, BoA**



**3. Textbooks:**

*Physical Chemistry, Peter Atkins, Julio de Paula, James Keeler, Oxford University Press (2018).*

**4. References:**

*Quantum Chemistry & Spectroscopy, Thomas Engel, Pearson, 3rd edition (2015).*

*Physical Chemistry: A molecular approach, Donald A. McQuarrie & John D. Simons, Indian Reprint, Viva books (2019).*

**5. Similarity with the existing courses:**

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course: –**

**Proposed by: A. Chakraborty**

**School: Chemical Sciences**

**Signature:**

**Date: 25.11.2022**

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_





**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CYXXX  
**Course Name** : Introduction to Quantum Chemistry & Molecular Spectroscopy  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

This is an introductory course and must for all areas of chemistry. This course aims to provide molecular level understanding of fundamental chemistry. It includes topic from spectroscopy, reaction dynamics, thermodynamics, molecular structure, and dynamics.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: 20 Lectures**

Introduction to Schrödinger equation, Bohr's atom, De Broglie's Wave, wave-particle duality, Light-atom/molecule interaction, Introduction to optical spectroscopy, time-independent Schrodinger equation, Particle in a box, Quantum Mechanics of Hydrogen Atom.

**Unit 2: 14 Lectures**

Heisenberg's Uncertainty Relation, Operators, Commutators, Eigenvalues and Eigenvectors, absorption and emission spectra, Boltzmann Energy distribution, Principle of equipartition of energy Einstein's Semiclassical model, Born Oppenheimer Approximation, Beer-Lambert Law.

**Unit 3: 8 Lectures**

Diatomic Vibrational Spectra: Harmonic Model, Morse Oscillator Model, Molecular Vibrations in Polyatomic Molecules, Diatomic rotational spectra, rotation of polyatomic molecules, electronic absorption, and emission spectra.

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course: –**

**Proposed by: B. Mondal and C. K. Nandi**

**School: Chemical Sciences**

**Signature:**

**Date: 22.12.2022**

***Recommended/Not Recommended, with Comments:***

**Date: \_\_\_\_\_**

**Chairperson, CPC**

***Approved / Not Approved***

**Date: \_\_\_\_\_**

**Chairperson, BoA**

Indian  
Institute of  
Technology  
Mandi

### Unit 3: Chemical Kinetics and Photochemistry (12 Lectures)

Rate laws and rate constants, order and molecularity of reactions, determination of order, kinetics of zero-, first- and second-order reactions, parallel, reversible and consecutive reactions, rate-determining and steady-state approximation, temperature dependence of rate constant, potential energy surface, Frank-Condon principle, decay of excited states, fluorescence and phosphorescence, Jablonsky diagram, laws of photochemistry, quantum yield.

### Unit 4: Conductance and Electrochemistry (6 Lectures)

Mechanism of electrolysis and Faraday's law, strong and weak electrolytes, conductance, electrolytic conductance, ionic conductance, conductometric titration, estimation of solubility product. Types of electrochemical cells, cell reactions, EMF and change thermodynamics properties, Nernst equation, standard cells, half-cells/electrodes.

#### Textbooks:

- *Physical Chemistry, Peter Atkins, Julio de Paula, James Keeler, Oxford University Press (2018).*
- *Physical Chemistry: A molecular approach, Donald A. McQuarrie & John D. Simons, Indian Reprint, Viva books (2019).*

#### 3. References:

- *Physical Chemistry, Ira N. Levine, McGraw Hill Book Co. (2008).*
- *Physical Chemistry, G. W. Castellan, Narosa Publications. (2004).*

#### 4. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA	CY513, CY514	15%	



**IIT Mandi**  
**Proposal for a New Course**

**Course number** : CYXXX  
**Course Name** : Principles and Theories of Physical Chemistry  
**Credit Distribution** : 3-0-0-3  
**Intended for** : BS Chemical Sciences  
**Prerequisite** : None  
**Mutual Exclusion** : None

---

**1. Preamble:**

This course deals with fundamental concepts of physical chemistry involving properties of gases, viscosity and surface tension, chemical kinetics, thermodynamics, and conductance. This is foundation course for all students interested in Chemistry and the concepts taught here would be required for most of the advanced and specialized courses in Chemistry.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Gaseous State and Fluids (12 Lectures)**

Gas laws, distribution of molecular speeds, kinetic energy distribution, molar heat capacity of gases, virial expressions, collision of gas molecules and mean free path. Viscosity of fluids, viscosity coefficient, temperature dependence of viscosity, surface tension of liquids, capillary rise, measurement of surface tension, temperature dependence of surface tension.

**Unit 2: Concepts of Thermodynamics (12 Lectures)**

Equilibrium and concept of temperature, the zeroth-law of thermodynamics, first law of thermodynamics, state and path functions, extensive and intensive properties, equation of state, work, heat, internal energy, heat capacity and concept of enthalpy, second law of thermodynamics, reversible and irreversible process, heat engines, Carnot cycle, concept of entropy, free energy, criteria for equilibrium and stability, third law of thermodynamics, concept of the absolute zero temperature and Nernst heat theorem.

**PROPOSAL**

Proposal for inclusion of HSS paper in JAM for admission to MA programs in IITs and IISERs

**CONTENTS**

- I. PREAMBLE**
- II. JUSTIFICATION**
- III. JAM SYLLABUS**
- IV. ELIGIBILITY**

**I. PREAMBLE**

It is proposed that a new Humanities and Social Sciences (HSS) paper be added to the list of subjects that are currently included in the JAM for testing. This new paper will allow candidates to take the exam with a view towards applying for admissions to the MA programmes currently being offered at IIT Guwahati, IIT Mandi, as well as other postgraduate programmes available at other institutions. The aforementioned programmes are examples of the wide variety of programmes on offer at IITs and IISERs that can use JAM scores for admissions.

The Joint Admission Test for Masters (JAM) for admission into postgraduate programmes at IITs and the Indian Institute of Science, Bangalore is a computer based online examination. Admissions to most postgraduate programmes across various institutions is made on the basis of the JAM scores/ ranks.

Eight institutes conduct JAM: IISc, IITB, IITK, IITD, IITM, IITKGP, IITR, and IITG. The others are admitting institutes. There are 21 IITs that participate in admissions only through JAM that includes admissions also with respect to the Science programmes. The inclusion of the HSS paper and syllabi in the JAM test structure will widen the ambit of admissions into several PG courses of study available at IITs, IISERs etc.

**II. JUSTIFICATION**

1. The inclusion of an HSS paper for admission to MA programmes as mentioned above will allow students from across India and abroad to take the exam in a more convenient manner.
2. The HSS paper, if included in JAM, will allow greater number of aspirants to sit for the exam from different regions who otherwise may not be able to take it as the exam is currently held only at IIT Guwahati, IIT Mandi or at other specific institutions who conduct their own entrance exams.

3. The inclusion of this new paper in JAM will allow institutes to have a more seamless mode of selection of students for any additional programmes of study that may be introduced in the future.
4. The paper (a sample of which is provided with this proposal) will test students on standardized components as outlined. This will be beneficial to assess their suitability for the programmes offered.
5. Since several IITs already use the JAM for admissions into their postgraduate programmes, the inclusion of this new paper puts our programmes on par with the latest testing processes in the country currently used for admissions.
6. The online examination such as JAM obviates the need for a paper-based, single city testing process for MA admissions. This all-India online examination will enable students to take the exam in the event of travel, weather or other related disruptions that can prevent students to sit for a paper-based exam scheduled in a few cities.

### **III. JAM SYLLABUS (Indicative)**

#### **HUMANITIES AND SOCIAL SCIENCES**

##### **1. Logic and Reasoning:**

Deductive Reasoning, Statement Analysis, Figure Matrix, Syllogism, Statement and Assertion, Premises and Conclusion, Extension and Intension, Pattern Series and Sequences, Order and Ranking, Alphanumeric series, Analogical Reasoning, Inductive Reasoning, Abductive Reasoning, Data Sufficiency, Cause and Effect, Picture Series and Sequences.

##### **2. Quantitative Ability:**

Number systems, Polynomials, Linear and Quadratic Equations, Areas, Surfaces, Volumes, basic arithmetic, interpretation of tables, graphs, charts, etc.

##### **3. Verbal Ability:**

Antonyms, Synonyms, Reading Comprehension, Error detection, One word substitutions, Concise and precise writing, Conversion from passive to active voice, Omission of vague words, Jumbled words, Jumbled sentences and paragraph, paragraphs, Idioms and Phrases.

##### **4. Disciplinary Competence:**

- a. **Indian Society and Culture:** Structure of Indian Society (Marriage, Family and Kinship), Political Institutions, Stratification and Inequality (Caste, Class, Religion, Tribe, Region), Social Change in India, Affirmative Action and Policies of Positive Discrimination, Commissions and Policy Interventions, Social Movements in India,

Gender and Development, Violence and Social Unrest, Population and Development in India.

- b. **Economy, Polity and Development:** Indian Economy, Planning and liberalization; Relevant policies in sectors such as agriculture, industry, health, education, etc.; Monetary and Fiscal policies; Poverty, inequality, unemployment, inflation; Demand and supply; Consumers' and producers' behaviour; Market structure; Welfare economics; Trade; Public Economics;
- c. **Global Politics and Economy:** Sustainable Development Goals, International Relations and Politics, Treaties and Declarations, World Affairs and Global Economy, Global North and South Divide, Cold War, Trade and International Organizations, UN, WTO, NAM, NATO, SAARC, ASEAN, BRICS.
- d. **Ecology and Development:** Environment, Ecology and Development, Environmental Pollution and Health Hazards, Climate Change, Environmental Movements in India, Natural Resources Management, Displacement and Development.
- e. **India's History and Politics:** India's Struggle for Independence, Nationalism, Emergence of the Indian Nation State, Contemporary history, Indian political thinkers and theories..

#### **IV. ELIGIBILITY**

Eligibility requirement is any bachelor's degree (3 yr or 4 yr), 55% marks (or equivalent CGPA) obtained in bachelor's degree.

\*\*\*

## IIT Mandi

### Proposal for a New Course

**Course number** : IK\_506  
**Course Name** : Research methods and statistics for contemplative science  
**Credit Distribution** : (2-1-0-3) (*Lectures-Tutorial-Practical-Total credits*)  
**Intended for** : 3<sup>rd</sup> & 4<sup>th</sup> Year B. Tech, Masters and PhD  
**Prerequisite** : None  
**Mutual Exclusion**: None

---

#### 1. Preamble:

Research methods and statistics are the foundation for scientific research. Two existing courses of the institute (HS550 & HS 522) covers research methods and statistics from social science perspective. Considering the inherent challenges associated with contemplative science research (e.g., Yoga/Meditation), this course is designed to equip the students to develop skills in research methods and statistics from a contemplative science perspective. This course would enable the students/research scholars working on Indian knowledge systems and mental health applications (IKSMHA) to understand the concepts better from a contemplative science and mental health perspective.

#### 2. Course Modules with quantitative lecture hours (42 hours):

##### Module 1 (21 hours + 7 tutorial hours)

##### Research methods theory:

Basic assumptions underlying scientific research

Ethics in scientific research

Literature review and hypothesis formulation

Data collection methods

Measurement techniques & Sampling methods

Research designs

Apart from controlled trial designs (including randomized controlled trial designs-RCT), emphasis will also be given on case-control study design and prospective cohort design from contemplative science perspective. For example, studying the effect of advanced meditation (with monks is more feasible from case-control design



than RCT). Similarly naturalistic cohort long term follow-up studies are optimal from sampling perspective to study the effect of yogic/meditative lifestyle.

Procedure for conducting research experiment

Control techniques in experimental research

Mixed methods research

Emphasis on first person (for subjective experience) and third person perspective-based assessments will be discussed. Special emphasis on experience sampling method and its relevance for contemplative science will be discussed

Scientific writing

### **Tutorial sessions**

Randomization procedure

Scientific illustrations-Inkscape and blender

Reference management-Zotero

Qualitative data coding-Qualcoder

**Note:** All the tutorial sessions will be taught with Yog/Meditation based dataset for better understanding of the concepts

### **Module 2 (7 hours + 7 tutorial hours)**

#### **Statistics theory**

Data representation-tables & figures

Descriptive statistics

Key ingredients for inferential statistics

Hypothesis testing, statistical significance and decision errors

T tests

ANOVA

Correlation

Regression

Chi square test

Linear mixed model analysis (LMM)

Distribution free statistics

#### **Tutorial sessions (Using Jamovi & R-open-source free software)**

Data wrangling

T tests

ANOVA

Correlation & Regression

Chi square test

LMM

Sample size calculation-G power

**Note:** All the tutorial sessions will be taught with Yog/Meditation based dataset for better understanding of the concepts

### 3. Text books:

Christensen LB, Johnson B, Turner LA. Research Methods, Design, and Analysis. Pearson Education; 2019.

Aron A, Aron EN. Statistics for psychology (6<sup>th</sup> Ed). Pearson Education; 2013.

### 4. References:

Zar JH. Biostatistical analysis. Pearson Education India; 1999.

Creswell JW, Poth CN. Qualitative inquiry and research design: Choosing among five approaches. Sage publications; 2016

### Similarity with the existing courses:

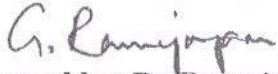
(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.		HS550	Hypothesis testing, T test, ANOVA, correlation & regression	25%
2		HS 522	Literature review & Hypothesis formulation	5 %

### 6. Justification of new course proposal if cumulative similarity content is >30%:

**Approvals:**

**Faculty interested in teaching this course: –**



**Proposed by: Dr Ramajayam G**

**School: IKSMHA**

**Signature:**

**Date:**

The following faculty (at least 3 faculty) discussed on.....and approved the proposal on.....

Sl. No	Faculty Name	Signature

School Chair:

School:

Date:

This proposal is reported in .....th Board of Academics on .....

Dean Academics

Date:

Note: School is responsible for the Course Code. Academic Office provides the IC Course Code.

**Responses for the reviewer's comments:**

**Reviewer 1:**

Dr Arun Sasidharan MBBS, PhD (Neurophysiology)  
Scientist-C  
Centre for Consciousness Studies  
Dept of Neurophysiology  
National Institute of Mental Health & Neurosciences (NIMHANS)  
Bengaluru

**Comment 1:**

*As there are overlapping courses from social science perspective, it would be good to have a subtopic (in Module 1 & 2) that describes the differences between social science and contemplative science perspectives in terms of application/challenges in research method and statistics approaches.*

**Response 1:**

*Suggestions are incorporated on page no-1 & 2, under research designs and mixed methods section in module 1*

**Comment 2:**

*Explicitly mention that the Lab sessions would use examples/datasets from contemplative science research*

**Response 2:**

*Suggestions are incorporated on page no- 2, under tutorial sessions in module 1 & 2*

**Reviewer 2:**

Dr Bhupendra Singh MBBS, MD (Psychiatry)  
Additional Professor  
Dept of Psychiatry (Geriatric Mental Health)  
King George Medical College  
Lucknow

**Comments:**

*The course content looks good.*

# IIT Mandi

## Proposal for a New Course

**Course number** : IK\_507  
**Course Name** : Neuroscience and mental health  
**Credit Distribution** : (3-0-0-3) (*Lectures-Tutorial-Practical-Total credits*)  
**Intended for** : 3<sup>rd</sup> & 4<sup>th</sup> Year B.Tech, Masters and PhD  
**Prerequisite** : None  
**Mutual Exclusion**: None

---

### **1. Preamble:**

As per the National Mental Health Survey 2016, 120 million people in India are suffering from common mental health disorders like depression and anxiety and 12 million Indians are suffering from severe mental health disorders like psychosis. Many of these mental health disorders are preventable if the youth are sensitized appropriately, as many of these mental health disorders begin in young adulthood. This course would enable the students to have a scientific understanding of common mental health problems and adopt a healthy lifestyle to prevent mental health disorders. It would also facilitate the students to develop new research questions related to preventive/therapeutic technologies for promotion of positive mental health.

### **2. Course Modules with quantitative lecture hours (42 hours):**

#### **Theory (38 hours)**

##### **Module 1(10 hours)**

##### **Basics of neuroscience**

Structure and function of the nervous system-1

Structure and function of the nervous system-2

##### **Module 2 (14 hours)**

##### **Neuropsychology underlying illness & wellness**

Illness & Wellness-perspectives from neuroscience

Neuroscience of positive psychology

Human development through life cycle and the neuroscience of ageing  
Theories of personality & psychopathology: eastern & western perspectives

**Module 3 (14 hours)**

**Mental health disorders**

Classification of mental health disorders  
Substance related mental health disorders  
Common mental health disorders  
Severe mental health disorders

**Practical (4 hours)**

**Module 4 (4 hours)**

Stigma of mental illness-discussion  
The beautiful mind-movie analysis  
Active listening as a crisis intervention-activity in pairs  
Complementary & integrative mental health practices-discussion

**3. Text books:**

Kandel ER, Koester JD, Mack SH, Siegelbaum SA. Principles of Neural Science, Sixth Edition. McGraw Hill LLC; 2021.

Sadock BJ, Sadock VA. Kaplan & Sadock's Concise Textbook of Clinical Psychiatry. Wolters Kluwer/Lippincott Williams & Wilkins; 2008.

**4. References:**

Sadock BJ, Sadock VA, Ruiz P. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. Wolters Kluwer; 2017.

**5. Similarity with the existing courses:**

**(Similarity content is declared as per the number of lecture hours on similar topics)**

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

**Approvals:**

**Faculty interested in teaching this course: –**

*G. Ramajayam*  
**Proposed by: Dr Ramajayam G**

**School: IKSMHA**

**Signature:**

**Date:**

The following faculty (at least 3 faculty) discussed on.....and approved the proposal on.....

Sl. No	Faculty Name	Signature

School Chair:

School:

Date:

This proposal is reported in .....th Board of Academics on .....

Dean Academics

Date:

Note: School is responsible for the Course Code. Academic Office provides the IC Course Code.

**Responses for the reviewer's comments:**

**Reviewer 1:**

Dr Arun Sasidharan MBBS, PhD (Neurophysiology)  
Scientist-C  
Centre for Consciousness Studies  
Dept of Neurophysiology  
National Institute of Mental Health & Neurosciences (NIMHANS)  
Bengaluru

***Comments:***

*1. As the Module-2 has subtopics on Neuroscience besides Psychology, it may be renamed from "Psychology underlying illness & wellness" to "Neuropsychology underlying illness & wellness".*

***Response:***

*1. As suggested by the reviewer, "Psychology underlying illness & wellness" is renamed as "Neuropsychology underlying illness & wellness" in module 2 on page no. 1*

**Reviewer 2:**

Dr Bhupendra Singh MBBS, MD (Psychiatry)  
Additional Professor  
Dept of Psychiatry (Geriatric Mental Health)  
King George Medical College  
Lucknow

***Comments:***

*The course content looks good.*



Graduate Programs  
**MS by Research in  
Music and  
Musopathology and PhD**

---



Indian Knowledge System and Mental Health Applications  
(IKSMHA) Centre, Indian Institute of Technology Mandi, Himachal  
Pradesh, India - 175005

01st October, 2023

---

## Table of Contents

Motivation	3
Description	3
Curriculum	3
Eligibility	4
Requirements for part-time students	4
Employability and Future Prospects	5
Course Syllabi	6

# MS by Research in Music and Musopathy and PhD

**Program Level:** Post Graduate and PhD

**Year of Commencement:** 2024 (January)

**Duration:** As per guidelines for MS (R) and Ph.D. programs at IIT Mandi

## Motivation

In the realm of integrative medicine and healthcare, the role of music and Musopathy - which studies the *fundamental mechanics* behind the benefits of music in a culture and region neutral manner - is gaining exceptional prominence. Leveraging the synergies between music, therapy, and technology can facilitate remarkable advances in health and well-being. Recognizing this potential, IIT Mandi proposes the commencement of an M.Tech program in Music and Musopathy and a Ph.D. program. This initiative underlines the commitment to promote interdisciplinary learning and contribute to the highly regarded field of (Indian) music and the burgeoning field of Musopathy.

## Description

The M.Tech in Music and Musopathy and Ph.D. programs at IIT Mandi aim to produce highly skilled professionals and researchers who can meaningfully contribute to the development and understanding of Musopathy, while also deepening and widening their knowledge and skills in Music and its applications in modern society. These programs provide a robust grounding in the foundational, intermediate, and advanced aspects of Music and Musopathy, coupled with additional insights from the Indian Knowledge System and Mental Health Applications Centre (IKSMHA Centre).

## Curriculum

### **M.Tech in Music and Musopathy:**

Total Credits of Coursework: 15 Credits

IK 507: Music and Musopathy Foundation (3 credits)

IK 508: Music and Musopathy Intermediate (3 credits)

IK 609: Music and Musopathy Advanced (3 credits)

Additional Courses from IKSMHA Centre, NPTEL, Swayam, Acharyanet, etc. One of these courses can be an independent study course for performing artists. (6 credits)

Research: Beyond 15 credits

### **Ph.D.:**

Total Credits of Coursework: *12 Credits*

IK 507: Music and Musopathy Foundation (3 credits)

IK 508: Music and Musopathy Intermediate (3 credits)

IK 609: Music and Musopathy Advanced (3 credits)

Additional Courses from IKSMHA Centre, NPTEL, Swayam, Acharyanet, etc. One of these courses can be an independent study course for performing artists. (3 credits)

Research: Beyond 12 credits

Three other courses IK 510 (music and cognition), IK 511 (introduction to audio engineering), and IK 512 (rhythmic structures and applications in music and musopathy), may also be taken by graduate students in the program.

## **Eligibility**

Eligibility will be as per the norms outlined in the MS and Ph.D. admissions Ordinances. In this program, some traditional degrees from recognized universities like Acharya and others will be considered at par with bachelor's and master's degrees in engineering, sciences, arts, and social sciences. These may include appropriate degrees from accredited music institutions like Kalakshetra, Chennai; Gandharva Maha Vidyalaya Delhi; Chennai Govt Music College, etc., after 3-years of Music Education. The committee may impose additional requirements for eligibility as needed from time to time. For example, the committee can consider weight to Acharyanet and other certifications after 2/3 years of study and All India Radio ratings for performing artists. Students will be enrolled in full-time, part-time, and ERP categories per norms detailed by the Senate IIT Mandi.

## **Requirements for part-time students**

The requirements for part-time students are aligned with the Ordinances of MS (by Research) and Ph.D. programs at IIT Mandi. Part-time students at IIT Mandi include Institute staff members, research scholars under QIP or External Registration, and individuals employed in R&D environments in scientific institutions or industries, including IIT Mandi. Eligibility also extends to faculty members from recognized engineering colleges or universities and scholars working in organizations with a recognition or MoU from IIT Mandi. Scholars from other IITs or recognized institutes may gain lateral entry with credit transfer, and part-time scholars in R&D environments in scientific institutions or industries and faculty members of recognized engineering colleges/universities are also considered eligible.

The academic qualifications for part-time candidates align with those for regular candidates, coupled with a prerequisite of a minimum of two years of work experience. Additional requirements for part-time scholars include a 16-week campus residential semester for course completion, although the Academic Progress Committee/Doctoral Committee may recommend completing IIT Mandi courses online, with at least 50% of the course assessment conducted

offline. A flexible residential requirement is available with partial online course completion. Scholars can complete the 16-week residential requirement in multiple visits, each lasting at least two weeks.

Exemptions from the residential requirement apply to part-time scholars residing within 50-60 KM of IIT Mandi, who can be treated as day scholars. Nevertheless, part-time scholars must remain at the same organization and workplace until research completion, and approval is required for program continuation at IIT Mandi if transferred or joining a new organization. For Part Time/Externally registered M.Tech. (by Research) Scholars, thesis submission is expected within four years from the registration date, with possible extensions of up to one year by the Academic Progress Committee.

## Employability and Future Prospects

Graduates will find substantial opportunities in various sectors, such as healthcare, the music industry, the film industry, research institutions, academia, and wellness organizations. The seamless integration of technology, music, and therapy equips graduates with the comprehensive skills needed for innovative problem-solving and leadership roles in various disciplines.

### Potential Career Paths:

- Performing artists
- Academicians in Schools or Colleges
- Independent Art Educators
- Musopathists (Therapists applying Musopathy)
- Mental Health and Physical Wellness Consultants
- Research Analysts in Music and Health
- Music Technology and Recording Engineering Specialist

---

## Course Syllabi

**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 507

**Course Name:** Music and Musopathy Foundation

**Credit Distribution:** 2-0-2-3

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** None

**Mutual Exclusion:** None

**1. Preamble:**

The core curriculum consists of a 3-credit course specializing in vocal or instrumental music. This course provides a solid grounding in theory, practice, principles, and aesthetics, and inculcates a scientific mindset for conducting interdisciplinary research. Students will explore diverse facets of music and their connections and impact on cognitive abilities, physical, psychological and neuropsychological well-being, disease prevention, and therapeutics. The course includes lectures, discussions, video and audio clips, live concerts and/or recordings, class experiments, term-papers, presentations, and field research.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Music - The Macro Picture (5 Hours)**

*Universality of music:* Glimpse into melody, rhythm, harmony, prominent music systems in the world.

*Indian Music in World Arena:* How and why Indian music is respected in the world for melody, rhythm and its incredible richness and versatility and how Indian music has impacted jazz, pop and several other cultures in the world.

*Music & Social well-being:* How music contributes to Inter-cultural harmony, goodwill, respect, fund-raisers for health, education etc.

*Music & Personal Evolution:* How music promotes mental health and physical wellbeing including equanimity, cognitive development, spiritual and philosophical evolution and cardiovascular and pulmonary health among other things.

**Unit 2: Music in Other Fields and Regions of India: Introduction (3 Hours)**

*Exploration of different Indian music systems and their influences:* Indian System in North India and Persian Influences; Rabindra Sangeet of Eastern India; Ancient Tamil Music; Folk Systems in various States.

**Unit 3: Introduction to Melody and Voice Exercises (2 Hours)**

*Theoretical Introduction to Melody and Voice Exercises:* Melody, 7,12,16 note system, raga, ascending and descending scales, concept of technical exercises.

**Unit 4: Preliminary Sequential Exercises (Varishai) (4 Hours)**

*Theoretical Introduction to Preliminary Sequential Importance of Sequential Exercises such as Sarali and Jantai varishais; Introduction to notation writing, Introduction to basic rhythmic concepts, Concept of Speed (kaala) and tempo (kalapramana).*

**Unit 5: Sapta Tala Alankarams (4 Hour)**

Introduction to Cyclic Rhythms of various types (Talas) - Parts of a tala, concept of jaati (types of finger counts) and gati (internal pulse within each unit of a tala), system of 7 (sapta) talas

*Exercises:* Training in the 7 basic Alankaras

**Unit 6: Ragas of Indian Music 72 Principal Scales (Melakartas) and 7 Million Derived Scales (Janya Ragas) (4 Hours)**

*Exploration of 16 Notes, 72 Melakarta scheme/structure:* Permutation and Combination of the 16 Notes, 72 Melakarta scheme/structure; 12 Chakras; Musical Mnemonics: KaTaPaYaadi Formula (sootra) for Raga names and numbers.

*Concept & Classification of Derived Ragas:* Based on number of notes (3, 4, 5, 6, 7); based on types of sequences - (Straight or zig-zag) and based on nativity of notes (Upanga & Bhashanga).

**Unit 7: Geetams and Simple Devotional Songs in a few Ragas (3 Hours)**

*Introduction to Practice Compositions:* Geetams and Swarajatis

*Essentials of a Raga:* Scale and sequence of notes (arohana and avarohana); swara rendition, ornamentation (gamakas); hierarchy of notes etc

**Unit 8: Music in Other Fields (3 Hours)**

*Exploration of Music's integration with various fields:* Music & Dance; Music & Physics - concept of octaves, cycle of fourths and fifths, Music & Mathematics - patterns and korvais; Musical Literature - works of composers in diverse languages; Music and Philosophy; Music and Musopathy - pulmonary, cardio, mental health, etc; Music in Indian Knowledge Systems - Vedas, ancient Tamil culture, Puraanas and Itihaasaas.

**Laboratory/practical/tutorial Modules:**

Unit 3 Practical: (8 Hours) Plain notes, oscillated notes, octave exercises, swaram, akaaram.

Unit 4 Practical: (8 Hours) Exercises in swara (3 speeds), akaaram, in Sarali, Jantai, and other Varishais.

Unit 5 Practical: (2 Hours) 7 Alankarams - 3 speeds in swara and akaaram; introduction to prominent talas - adi, roopakam, chapu and concept of 35-talas.

Unit 6 Practical: (2 Hours) 72 Melaragamalika Geetam.

Unit 7 Practical: (8 Hours) Learn 5 Geetams and 3 Devotional Songs.

**3. Textbooks:**



Chitravina N Ravikiran (2023). *Perfecting Carnatic Music Level 1*. India. Accessed on 1st Oct 2023 at:

<https://acharyanet-india.myshopify.com/collections/carnatic-books/products/perfecting-carnatic-music-level-i-e-book>

Krishnaswami, S. (2017). *Musical instruments of India*. Publications Division Ministry of Information & Broadcasting.

#### 4. References:

Acharyanet: (2023). Carnatic Lessons India. Retrieved from

<https://www.acharyanet.com/carnatic-lessons-india/#plans>

Chatterjee, G. (2023). भरतनाट्यशास्त्र: *Bharata's Natyashastra (Meanings and Expositions in English and Hindi With Abhinavagupta's Commentary)* (ISBN: 8186117210). Indian Mind.

Ravikiran, C. N. (2006). *Appreciating Carnatic Music*. Ganesh & Company. ISBN: 9788185988214

Shringy, R.K., & Sharma, P.L. (Trans.). (2018). *Sangitaratnakara (Sangeet Ratnakara) of Sarngadeva* (Vol. One, ISBN: 9788121505086; Vol. Two, ISBN: 9788121504669). Munshiram Manoharlal Publishers Pvt. Ltd.

Subramaniam, L., & Subramaniam, V. (1999). *Euphony (Indian Classical Music)* (Foreword by Sir Yehudi Menuhin). EastWest Books (Madras) Pvt. Ltd. ISBN: 8186852352

#### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

#### 6. Justification of new course proposal if cumulative similarity content is >30%:

NA

#### Approvals:

**Other Faculty interested in teaching this course:** Shri Chitravina Ravikiran

**Proposed by:** Dr. Pratim Kundu  
Mental Health Applications Centre

**School:** Indian Knowledge System and

**Signature:**

**Date:** 17th September 2023

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_

**Approved / Not Approved**

**Date:** \_\_\_\_\_

\_\_\_\_\_  
**Chairperson, BoA**

Item	Course Code	Category	Priority

**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 508

**Course Name:** Music and Musopathy Intermediate

**Credit Distribution:** 2-0-2-3

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** IK 507 Music and Musopathy Foundation Course or equivalent understanding.

**Mutual Exclusion:** None

**1. Preamble:**

This intermediate course on Music and Musopathy integrates theoretical knowledge and practical components of pure music as an art form as well as its applications in a cutting edge manner for health and wellbeing through Musopathy. With a focus on Indian classical music, students will delve into the history, significance, and therapeutic aspects of music, while also obtaining practical training in performing various ragas and types of songs. The course allows students to explore the connection between music and well-being, providing a holistic understanding of Musopathy.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Music in Indian Knowledge Systems (4 Hours)**

Music as a Science; Music as one of the 64 Arts; Music as vehicle for Spiritual and Philosophical evolution; Importance of Music in ancient Indian Society from Epics and Literature

**Unit 2: Music as Therapy in Ancient Civilisations & Recent studies based on Ragas, Shlokas and Western Classical and other Systems (4 Hours)**

Ragas as Evocative Tools (Rasa Theory); Time Theory of Ragas; Healing power of Ragas; Broad overview of a few current Studies with respect to Human Beings, Animals and Plants

**Unit 3: Musopathy (4 Hours)**

Why Musopathy (Limitations and Inconsistencies of Music Therapy in various parts of the world); Differences between Music Therapy and Musopathy; Features of Musopathy; Types of Musopathy - Passive and Active; Tonation Breathing Technique (TBT); Benefits and Scope of Musopathy and TBT

**Unit 4: Introduction to Architects of Music (2 Hours)**

*Brief bio sketches of Composers:* Jayadeva, Purandaradasa, Tulsidas, Oottukkadu Venkata Kavi, Tyagaraja, Meerabai, Muttuswamy Dikshitar, and Shyama Shastri

*Brief bio sketch of Musicologists:* Bharata, Sharngadeva, Venkatamakhi, Matanga, etc.

**Unit 5: Introduction to 15-20 New Ragas (4 Hours)**

### Unit 6: Practice Songs: 8 Geetams and 1 Swarajati (7 Hours)

### Unit 7: Performance Repertoire: Varnams, Krtis, and Devotional Songs (1 Hour)

Introduction to Performance Musical Forms

### Unit 8: Introduction to Prominent Musicians with musical samples (2 Hours)

#### Laboratory/practical/tutorial Modules:

Unit 6: Practice Songs: 8 Geetams and 1 Swarajati (12 Hours)

Unit 7: Performance Repertoire: 8 Varnams/ Krtis / Devotional Songs (16 Hours)

#### 3. Textbooks:

Chitravina N Ravikiran (2023). *Perfecting Carnatic Music Level 1*. India. Accessed on 1st Oct 2023 at:

<https://acharyanet-india.myshopify.com/collections/carnatic-books/products/perfecting-carnatic-music-level-i-e-book>

Ravikiran, C. N. (2023). *Perfecting Carnatic Music Level II: Varnams, Krtis (eBook)*. Acharyanet.

<https://acharyanet-india.myshopify.com/products/perfecting-carnatic-music-level-ii-varnams-krtis-ebook>

#### 4. References:

Acharyanet. (2023). Carnatic Lessons India. Retrieved from

<https://www.acharyanet.com/carnatic-lessons-india/#plans>

Chatterjee, G. (2023). *भरतनाट्यशास्त्र: Bharata's Natyashastra (Meanings and Expositions in English and Hindi With Abhinavagupta's Commentary)* (ISBN: 8186117210). Indian Mind.

Krishnaswami, S. (2017). *Musical instruments of India*. Publications Division Ministry of Information & Broadcasting.

Ravikiran, C. N. (2006). *Appreciating Carnatic Music*. Ganesh & Company. ISBN: 9788185988214

Shringy, R.K., & Sharma, P.L. (Trans.). (2018). *Sangitaratnakara (Sangeet Ratnakara) of Sarngadeva* (Vol. One, ISBN: 9788121505086; Vol. Two, ISBN: 9788121504669). Munshiram Manoharlal Publishers Pvt. Ltd.

Subramaniam, L., & Subramaniam, V. (1999). *Euphony (Indian Classical Music)* (Foreword by Sir Yehudi Menuhin). EastWest Books (Madras) Pvt. Ltd. ISBN: 8186852352

#### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

#### 6. Justification of new course proposal if cumulative similarity content is >30%:

NA

**Approvals:**

**Other Faculty interested in teaching this course:** Shri Chitravina Ravikiran

**Proposed by:** Prof. Varun Dutt  
Mental Health Applications Centre

**School:** Indian Knowledge System and

**Signature:**

**Date:** 17th September 2023

***Recommended/Not Recommended, with Comments:***

\_\_\_\_\_  
**Chairperson, CPC**

**Date:** \_\_\_\_\_

***Approved / Not Approved***

\_\_\_\_\_  
**Chairperson, BoA**

**Date:** \_\_\_\_\_

**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 609

**Course Name:** Music and Musopathy Advanced

**Credit Distribution:** 1-0-3-3

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** IK 508 Music and Musopathy Intermediate Course or equivalent understanding.

**Mutual Exclusion:** None

**1. Preamble:**

This course offers advanced insights into the field of Music and Musopathy. It empowers those wishing to specialize as performers. Also, it enables an in-depth understanding and practical experience of various ragas, introducing composers, their significant works, and includes discussions of designs for original Musopathy clinical trials. Thus, this course integrates theoretical knowledge with extensive practical sessions, helping students explore the impact of music professionals as well as in clinical and therapeutic settings.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Introduction to More Composers and Musicologies (3 Hours)**

Composers such as Annamacharya, Surdas, Arunagirinathar, Kshetragnya, Bhadrachala Ramadas, Swati Tirunal, Patnam Subramanya Iyer, Muthiah Bhagavatar, Papanasam Sivan etc and a few significant Musicologists

**Unit 2: Introduction to Prominent Musicians (5 Hours)**

A glimpse of the greats who shaped modern music with audio/video samples

**Unit 3: Challenges of Music Therapy and Possible Musopathy Studies (4 Hours)**

A brief overview and analysis of the Limitations and unreliability of Conventional Music Therapy Studies and Results in various parts of the world; Practical Applications and Possible Topics for Clinical Studies and Research

**Laboratory/practical/tutorial Modules:**

**Unit 4:** Introduction to 30 more Ragas with Voice and Instrumental Exercises (12 Hours)

**Unit 5:** Practice Songs: 10 Geetams and 1 Swarajati (14 Hours)

**Unit 6:** Performance Repertoire: 10-12 Varnams, Kritis, Tillanas & Misc Songs (16 Hours)

### 3. Textbooks:

Chitravina N Ravikiran (2023). *Perfecting Carnatic Music Level 1*. India. Accessed on 1st Oct 2023 at:

<https://acharyanet-india.myshopify.com/collections/carnatic-books/products/perfecting-carnatic-music-level-i-e-book>

Ravikiran, C. N. (2023). *Perfecting Carnatic Music Level II: Varnams, Krtis (eBook)*. Acharyanet. <https://acharyanet-india.myshopify.com/products/perfecting-carnatic-music-level-ii-varnams-krtis-ebook>

### 4. References:

Acharyanet. (2023). Carnatic Lessons India. Retrieved from <https://www.acharyanet.com/carnatic-lessons-india/#plans>

Chatterjee, G. (2023). *भरतनाट्यशास्त्र: Bharata's Natyashastra (Meanings and Expositions in English and Hindi With Abhinavagupta's Commentary)* (ISBN: 8186117210). Indian Mind.

Krishnaswami, S. (2017). *Musical instruments of India*. Publications Division Ministry of Information & Broadcasting.

Ravikiran, C. N. (2006). *Appreciating Carnatic Music*. Ganesh & Company. ISBN: 9788185988214

Shringy, R.K., & Sharma, P.L. (Trans.). (2018). *Sangitaratnakara (Sangeet Ratnakara) of Sarngadeva* (Vol. One, ISBN: 9788121505086; Vol. Two, ISBN: 9788121504669). Munshiram Manoharlal Publishers Pvt. Ltd.

Subramaniam, L., & Subramaniam, V. (1999). *Euphony (Indian Classical Music)* (Foreword by Sir Yehudi Menuhin). EastWest Books (Madras) Pvt. Ltd. ISBN: 8186852352

### 5. Similarity with the existing courses:

(Similarity content is declared as per the number of lecture hours on similar topics)

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

### 6. Justification of new course proposal if cumulative similarity content is >30%:

NA

### Approvals:

Other Faculty interested in teaching this course: Prof. Laxmidhar Behera

Proposed by: Prof. Varun Dutt  
Mental Health Applications Centre

School: Indian Knowledge System and

Signature:

Date: 17th September 2023

Recommended/Not Recommended, with Comments:

\_\_\_\_\_

**Chairperson, CPC**

**Date:** \_\_\_\_\_

***Approved / Not Approved***

\_\_\_\_\_

**Chairperson, BoA**

**Date:** \_\_\_\_\_




**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 510

**Course Name:** Music and Cognition

**Credit Distribution:** 3-0-0-3

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** None.

**Mutual Exclusion:** None.

**1. Preamble:**

This course explores the intricate relationship between music and cognitive processes. It will delve into topics such as musical perception, musical memory, the emotional impact of music, and music's relationship with intellectual development and learning. Through this exploration, students will learn how music and cognition intertwine, shedding light on musical understanding and cognitive science. No different fonts or sizes are allowed.

**2. Course Modules with quantitative lecture hours:**

**Unit/Topic 1: Introduction to Music and Cognition (5 Hours)**

Basics of cognitive science and musical structure, exploring the ways music and cognitive processes interact, and the role of music in cognitive enhancement and therapy.

**Unit/Topic 2: Musical Perception (10 Hours)**

Delve into the cognitive processing of musical elements such as pitch, rhythm, timbre, and melody. Explore the auditory system, musical feature extraction, and the cognitive organization of musical sounds.

**Unit/Topic 3: Musical Memory (8 Hours)**

Understand the intricacies of short-term and long-term musical memory and musical expectation. Examine the encoding, storage, and retrieval of musical information.

**Unit/Topic 4: Emotion and Music (9 Hours)**

Examination of how music evokes emotional responses, the role of musical expression, and the neuroscientific basis of musical emotions. Understand the role of cultural and individual differences in musical emotion.

**Unit/Topic 5: Music, Intelligence, and Learning (10 Hours)**

Analysis of the Mozart Effect, exploration of the impact of musical training on cognitive development, and the relationship between music and spatial-temporal reasoning.

**Laboratory/practical/tutorial Modules:** None.

**3. Textbooks:**

Levitin, D. J., "This Is Your Brain on Music: The Science of a Human Obsession," Penguin, USA, 2007.

Sloboda, J. A., "The Musical Mind: The Cognitive Psychology of Music," Oxford University Press, UK, 1985.

**4. References:**

Patel, A. D., "Music, Language, and the Brain," Oxford University Press, USA, 2008.

Hodges, D. A., "Handbook of Music Psychology," San Antonio: IMR Press, USA, 1996.

**5. Similarity with the existing courses:**

**(Similarity content is declared as per the number of lecture hours on similar topics)**

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course:** Prof. Laxmidhar Behera

**Proposed by:** Prof. Varun Dutt  
Mental Health Applications Centre

**School:** Indian Knowledge System and

**Signature:**

**Date:** 17th September 2023

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_  
Chairperson, CPC

**Date:** \_\_\_\_\_

**Approved / Not Approved**

\_\_\_\_\_  
Chairperson, BoA

**Date:** \_\_\_\_\_

**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 511

**Course Name:** Introduction to Audio Engineering

**Credit Distribution:** 3-0-0-3

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** None.

**Mutual Exclusion:** None.

**1. Preamble:**

This course offers a comprehensive insight into audio engineering, presenting foundational concepts, technical knowledge, and practical applications. The content covers the physics of sound, audio equipment, recording techniques, and audio processing, ensuring students gain a holistic understanding. Real-world case studies complement theoretical understanding to facilitate effective learning and application in the professional sphere.

**2. Course Modules with quantitative lecture hours:**

**Unit/Topic 1: Introduction to Audio Systems (5 Hours)**

Overview of various audio systems and components. Signal flow and interfacing standards.

**Unit/Topic 2: Fundamentals of Sound (10 Hours)**

Acoustic principles, sound wave properties, psychoacoustics, and human perception of sound.

**Unit/Topic 3: Microphones and Speakers (8 Hours)**

Types, designs, and applications of microphones and speakers. Practical considerations in microphone placement and speaker setup.

**Unit/Topic 4: Recording Technology (8 Hours)**

Multi-track recording, audio interfaces, digital audio workstations, and recording techniques for different instruments and vocal performances.

**Unit/Topic 5: Audio Signal Processing (8 Hours)**

Equalization, compression, reverb, delay, and other audio effects. Use of audio processing tools in mixing and mastering.

**Unit/Topic 6: Audio for Video and Film (3 Hours)**

Techniques and challenges in audio post-production for video and film, including synchronization, sound design, and Foley.

**Laboratory/practical/tutorial Modules:** None.

**3. Textbooks:**

Stanley R. Alten, "Audio in Media", 10th Edition, Cengage Learning, USA, 2014  
David Miles Huber, "Modern Recording Techniques", 9th Edition, Focal Press, USA, 2017

**4. References:**

Bartlett, B., & Bartlett, J. (2018). Practical Recording Techniques: The Step-by-Step Approach to Professional Audio Recording. 7th Edition, Focal Press, USA.

Eargle, J., & Foreman, R. (2020). Eargle's The Microphone Book: From Mono to Stereo to Surround - A Guide to Microphone Design and Application. 3rd Edition, Focal Press, USA.

Izhaki, R. (2018). Mixing Audio: Concepts, Practices, and Tools. 3rd Edition, Focal Press, USA.

**5. Similarity with the existing courses:**

**(Similarity content is declared as per the number of lecture hours on similar topics)**

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	NA			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

NA

**Approvals:**

**Other Faculty interested in teaching this course:** Prof. Laxmidhar Behera

**Proposed by:** Prof. Varun Dutt  
Mental Health Applications Centre

**School:** Indian Knowledge System and

**Signature:**

**Date:** 17th September 2023

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_  
Chairperson, CPC

**Date:** \_\_\_\_\_

**Approved / Not Approved**

\_\_\_\_\_  
Chairperson, BoA

**Date:** \_\_\_\_\_

**IIT Mandi**  
**Proposal for a New Course**

**Course number:** IK 512

**Course Name:** Rhythmic Structures and Applications in Music and Musopathy

**Intended for:** BTech/MTech/MS/MSc/MA/Ph.D.

**Prerequisite:** None.

**Mutual Exclusion:** None.

**1. Preamble:**

This course focuses on an introductory study of rhythm as a fundamental element in music, its impact on world music, and possible therapeutic applications in Musopathy. It explores rhythmic structures from various musical traditions, with a special focus on Indian rhythms, their cognitive impacts, and possible applications for speech rehabilitation and potential as a preventative tool for dementia-related disorders. The course aims to equip students with a fundamental understanding of rhythm's role in music creation and appreciation, making it an essential component for students in Music and other interdisciplinary programs.

**2. Course Modules with quantitative lecture hours:**

**Unit 1: Introduction to Rhythm (2 Hours)**

Rhythm as a Fundamental Operating Principle in the Universe and a regulating health mechanism for all living organisms right from heartbeat.

**Unit 2: Fundamentals of Rhythm (2 Hours)**

Understanding rhythm basics common to world music systems; time signatures; tempo; speed and beat.

**Unit 3: Introduction to India's approach to rhythm (6 hours)**

Global popularity of Indian rhythms; Concept of Laya & Tala; Parts of Talas (angas); Finger counting (Jaati and Laghu); Pulse and Gait within beats (Gati/Nadai); Kaala and Kaalapramana; Types of Patterns (Yatis) etc.

**Unit 4: Percussion Instruments of India (3 hours)**

Types (Skin based, body based etc); Ancient instruments; prominent contemporary instruments; Drum language in India

**Unit 5: Rhythmic performances (3 hours)**

Percussion accompaniment to melody in Carnatic and Hindustani traditions; percussion interludes and improvisation; percussive cadenzas and climaxes;

#### **Unit 6: Rhythmic Expressions Across Cultures (4 Hours)**

Examination of rhythmic complexities in various world music traditions, including Indian classical, African, Latin American, and Western music.

#### **Unit 7: Cognitive Aspects of Rhythm (4 Hours)**

Exploring the relationship between rhythm and cognitive functions, including memory, attention, and motor coordination.

#### **Unit 8: Rhythm in Musotherapy (6 Hours)**

Studying the therapeutic applications of rhythm, its impact on psychological states, Use of Vocal Percussion in speech rehabilitation of stroke victims or patients with other conditions.

#### **Unit 9: Technological Tools for Rhythmic Analysis and Creation (4 Hours)**

Introduction to software and digital tools for rhythm analysis, creation, and its applications in music therapy.

#### **Unit 10: Workshop and Case Studies (8 Hours)**

Practical workshops on creating rhythmic compositions; case studies on using rhythm in therapeutic settings.

### **3. Textbooks:**

Sadanand Naimpali (2011). *Theory and Practice of Tabla - The Secular Rationalist Reformer*. Popular Prakashan Private Limited.

Sankaran, T. S. (2010). *The Art of Konnakol (Solkattu): Spoken Rhythms of South Indian Music*. Lalith Publishers.

### **4. References:**

Clayton, M., Sager, R., & Will, U. (2005). *In Time with the Music: The Concept of Entrainment and Its Significance for Ethnomusicology*. ESEM CounterPoint.

Hartenberger, R. (Ed.). (2016). *The Cambridge Companion to Percussion*. Cambridge University Press.

London, J. (2012). *Hearing in Time: Psychological Aspects of Musical Meter, 2nd Edition*. Oxford University Press, UK.

Sankaran, T. S. (1994). *The Rhythmic Principles and Practice of South Indian Drumming*. Lalith Publishers.

Thaut, M. H. (2005). *Rhythm, Music, and the Brain: Scientific Foundations and Clinical Applications*. Routledge, USA.

**5. Similarity with the existing courses:**

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	None			

**6. Justification of new course proposal if cumulative similarity content is >30%:**

N/A

**Approvals:**

**Other Faculty interested in teaching this course: –**

**Proposed by:** Dr. Varun Dutt, Dr. Pratim Kundu  
and Mental Health Applications Centre

**School:** Indian Knowledge System

**Signature:**

**Date:**

**Recommended/Not Recommended, with Comments:**

\_\_\_\_\_ **Date:** \_\_\_\_\_

**Chairperson, CPC**

**Approved / Not Approved**

\_\_\_\_\_ **Date:** \_\_\_\_\_

**Chairperson, BoA**

**Comments/recommendation on the MS in Music and Musopathy and PhD programs at  
IKSMHA Centre, IIT Mandi**

Date: 28th November 2023

To ensure the highest academic rigor and relevance standards, an expert committee was constituted by the Dean (Academics) post the 51st Board of Academics meeting for reviewing the proposed programs in MS in Music and Musopathy and PhD (the approval is provided in Annexure A). The members of the approved committee were as follows:

**Shri Chitravina Ravikiran:** Renowned Carnatic music expert (Chair)

**Prof. Trichy Sankaran:** Professor, York University, Canada. An award-winning teacher and master percussionist specializing in the mrdangam (Member)

**Shri Neyveli Santhana Gopalan:** A noted, respected Indian vocalist, recipient of many awards from music associations in India and overseas (Member)

**Smt Sowmya Acharya:** Founder and CEO of Acharyanet (Member)

**Prof. Ganpati Ramanath:** Professor, Rensselaer Polytechnic Institute, USA (Member)

The course curriculum circulated among the committee members is the following, which has now been revised to incorporate the comments:

<https://docs.google.com/document/d/1MKNIxaQxVkyYnJmzGBssncUHYciqBu5PDzagy4vCmAg/edit?usp=sharing>

The comments received and responses to the comments from the committee members are the following:

**Shri Chitravina Ravikiran:**

I'm honoured to be in this committee with such achievers that you've selected.

I strongly believe that this course will inspire a lot of students from within and outside India as well as many non Indians. Your eligibility criteria have been well set and we only need to ensure that this is very well publicised in India as well as countries like USA, Canada, UK, Singapore etc which have a significant Indian population as well as interest in music and allied subjects, in the remaining weeks leading up to the launch. To make it appealing and to ensure scientific rigor, it may be better to call it MS rather than MTech.

I also think that if possible, we can introduce 1 or 2 courses centred on Rhythm and I'll do my best to get one created ASAP with inputs from icons like Prof Trichy Sankaran Ji and Shri Neyveli Santhanagopalan ji.

With best regards,  
Ravikiran



**Response:** We appreciate your kind comments. Thank you for your valuable insights. A new course on Rhythmic Structures and Applications in Music and Musopathy has now been added to the program in the abovementioned document. The MTech has now been changed to MS in the program.

**Prof. Trichy Sankaran:**

Greetings! The proposed M. Tech by research in Music and Musopathy and PhD is an excellent initiative for the amalgamation of synergies between music, therapy and technology. This integrated study should potentially enhance the health and well being. This interdisciplinary study should help to develop Indian Knowledge System on Music and Musopathy for the spiritual and cognitive aspects, deemed essential for the human well being.

Meditative aspects of music and its effects on the realization of 'Atman' have been repeatedly emphasized by our seers for centuries and the therapeutic effects can not be underestimated in this regard. Scholars and performing musicians who are taking part in this program can contribute immensely for the advancement of this study. The curriculum description, eligibility criteria and other details are very well laid out.

As a performing musician and scholar of international repute, I will be glad to take part and contribute towards achieving the goals of this program.

My best wishes to the success of this new initiative.

Yours sincerely,

Trichy Sankaran

Sangeet Natak Akademi Awardee

Sangita Kalanidhi Dr. Trichy Sankaran

Professor Emeritus/Senior Scholar

Music Department, Faculty of Fine Arts

York University, Toronto, Canada

email: trichysankaran@gmail.com

Ph: 647-764-6073

**Response:** We appreciate your kind comments. Thank you for your valuable insights.

**Shri Neyveli R. Santhana Gopalan:**

Greetings. The propounded courses and research in Music and Musopathy, is an extraordinary and a potentially resourceful enterprise that can ignite young minds into the depths of musical, psychological, spiritual and sociocultural consciousness and exploration.

I heartily congratulate and commend this yeoman's service that IIT Mandi has taken to provide a nurturing and supportive environment for students to pursue Indian knowledge systems and Indian music along with its multidimensional perspectives. I would certainly recommend this program as it has the potential to become a global success and also exponentially strengthen mental health and wellbeing of everyone that is a part of this, and I will surely provide my complete contribution to help achieve the objectives of the program.

Yours sincerely  
Neyveli R.Santhanagopalan

**Response:** We appreciate your kind comments. Thank you for your valuable insights.

**Smt Sowmya Acharya:**

The Music and Musopathy program at IIT Mandi stands out as a pioneering and innovative initiative, aspiring to integrate Music Therapy and technology for the betterment of public health and overall well-being. While the therapeutic benefits of music on mental health have long been acknowledged, the current advancements in computer science, artificial intelligence, and machine learning present a unique opportunity to amplify these advantages by combining time-tested ancient music therapy practices with cutting-edge technology.

IIT Mandi's degree programs are designed to amalgamate arts, science, and wellness, with a strong emphasis on academic rigour and research. This interdisciplinary approach not only enhances career prospects for professionals in the arts but also contributes significantly to the broader field. The flexibility of offering courses in both in-house and online modes further adds to the program's accessibility, benefitting professionals within India and abroad.

Acharyanet.com has been a trailblazer in Indian classical music education, collaborating with celebrated musicians and teachers to provide courses, curriculums, exams, and certifications to students globally for over a decade. We are eager to extend our support to this novel and unique program introduced by IIT Mandi.

We eagerly anticipate the opportunity to collaborate with IIT Mandi and the esteemed musicians on this distinguished panel. Your initiative aligns seamlessly with our commitment to the advancement and accessibility of music education on a global scale.

—  
Regards  
Sowmya Acharya

**Response:** We appreciate your kind comments. Thank you for your valuable insights.

**Prof. Ganpati Ramanath:**

I am writing to express my most enthusiastic recommendation and strongest possible support to the proposed programs of MS by research, and PhD, in Music and Musopathy at IIT Mandi. This pioneering initiative fits beautifully with the larger vision of India's new education policy that aims to seamlessly combine art, science and technology in the spirit of Indian Knowledge Systems for individual/societal well-being, and nation building.

The proposed curricular frameworks are well thought out and provide an excellent structure for blending high quality, rigor, flexibility and customizability. The collaborations envisioned between IIT faculty and eminent artists and scholars in these programs will enrich the fields of science, technology and art by providing multifarious transdisciplinary opportunities to blend rigor and creativity. These programs will also contribute to creating an Indic ethos that provides a cultural grounding to students in institutions focused on science and technology education and research. I anticipate these programs to inspire artists, scientists and technologists to explore entirely new cross-disciplinary topics and embark on new exciting career paths. The success of these programs will foster proliferation, adaptation (e.g., by other IITs) and collaborations that will elevate IIT Mandi's stature as a pioneer and a leader.

I must say that I am honored and delighted to be a part of the committee comprised of awe-inspiring legends in Indian music, namely, Sangeeta Kalanidhis Prof. Trichy Sankaran, Shri Neyveli Santhanagopalan, and Shri Chitraveena Ravikiran. This trio of Indian classical music superstars has made immeasurable contributions to the growth and projection of India's soft power over the last few decades, e.g., as performing artists with a collective experience of 150+ years, as internationally reputed interdisciplinary scholars and researchers, and as thought leaders and innovative educators with global impact transcending geographical and cultural boundaries. The association of this trio with the proposed initiative augers well for the quality, reach and impact of the new programs. I hope that IIT Mandi fully harnesses the expertise and reach of these artists for content creation, instruction, seminars, workshops, recruitment, and publicity. I commend IIT Mandi's vision for involving Shrimati Sowmya Acharya from Acharyanet —a globally accessible e-platform for Indian classical music education. I can envision Acharyanet playing a key role in facilitating asynchronous content creation, delivery, and teamwork, which would be crucial for providing flexibility and customization to students and working professionals hailing from diverse academic backgrounds and geographical locations around the world.

In summary, I reiterate my enthusiastic recommendation and strongest possible support to the proposed programs of MS by research, and PhD, in Music and Musopathy at IIT Mandi. Please let me know if I can be of any assistance in making this endeavor a spectacular success.

Best regards,  
Prof. Dr. Ganpati Ramanath,  
Graduate Program Director  
John Tod Horton Professor of Materials Science and Engineering

**Response:** We appreciate your kind comments. Thank you for your valuable insights.

## Annexure A

### Approval of the Dean Academics on the proposed committee for the review “MS in Music and Musopathy program and Ph.D. program” at IKSMHA Centre, IIT Mandi

**Subject:** Fwd: Requesting approval for the committee for reviewing the MTech in Music and Musopathy program and PhD program at IKSMHA Centre, IIT Mandi  
**Date:** Mon, 13 Nov 2023 10:21:30 +0530  
**From:** Aniruddha Chakraborty <achakraborty@iitmandi.ac.in>  
**To:** Varun Dutt <varun@iitmandi.ac.in>  
**CC:** ADCOURSE <adcourses@iitmandi.ac.in>, adresearch iitmandi <adresearch@iitmandi.ac.in>, DR Academics <dracad@iitmandi.ac.in>

approved

Sent from my iPhone

Begin forwarded message:

**From:** Varun Dutt <varun@iitmandi.ac.in>  
**Date:** 13 November 2023 at 9:35:49 AM IST  
**To:** deanacad@iitmandi.ac.in  
**Subject:** Re: Requesting approval for the committee for reviewing the MTech in Music and Musopathy program and PhD program at IKSMHA Centre, IIT Mandi

A gentle reminder, Aniruddha.

On 11/11/23 8:55 am, Varun Dutt wrote:

Dear Aniruddha,

Subsequent to the 51<sup>st</sup> BoA meeting, the following expert committee is proposed for the review of the proposed MTech in Music and Musopathy program and PhD program at IKSMHA Centre, IIT Mandi:

- **Shri Chitravina Ravikiran:** Renowned Carnatic music expert. (Chair)
- **Prof. Trichy Sankaran:** Professor, York University, Canada. He is an award-winning teacher and master percussionist specializing in the mrdangam. (Member)
- **Shri Neyveli Santhana Gopalan:** A noted, respected Indian vocalist, who is the recipient of many awards from music associations in India and overseas. (Member)
- **Smt Saumya Acharya:** Founder and CEO of Acharyanet. (Member)
- **Prof. Ganpati Ramanath:** Professor, Rensselaer Polytechnic Institute, USA. (Member)

The committee may check the proposed curriculum of the MTech in Music and Musopathy program and PhD program on this [link](#) and provide its recommendation for offering the proposed programs from January 2024 (subject to approval of Senate, IIT Mandi).

## **A proposal to revise the MTech (Biotechnology) curriculum *School of Biosciences and Bioengineering, IIT Mandi***

The field of biotechnology is dynamic and rapidly evolving, with constant advancements in research and technology. To ensure that our M.Tech Biotech program remains at the forefront of these developments and continues to produce graduates equipped with the latest knowledge and skills, a curriculum revision is essential.

The revised curriculum provides students with a well-rounded education, and produce graduates who are not only technically proficient but also equipped to tackle the challenges of the evolving biotech industry.

The biotech research and development (both in academia and industry) places a strong emphasis on practical skills. With this revised curriculum, the students who opted for a specialization will do their dissertation work in the related domain of the specialization. This will help in enhancing the specific skills while reducing overall expenses.

*The following changes are introduced in the curriculum*

- Core subjects increased from 5 to 7.
- In the first semester one free elective is replaced with the mandatory research methodology course.
- IPR course (0 credit) is now merged with the research methodology course.
- Medical nanobiotechnology specialization is renamed as Medical biotechnology.
- There will be no labs for specialization electives. Instead, the students who opted for a specialization, will do their dissertation work in that domain.

## Existing Curriculum (72 credits)

Semester 1
<b>Foundation:</b> Advanced Cell Biology <b>Core 1:</b> Cell Physiology in health and disease <b>Core 2:</b> Quantitative and Computational Biology <b>Core 3:</b> Cellular Bioprocess Technology  <b>Free elective 1:</b> from other disciplines <b>Free elective 2:</b> from other disciplines  <b>Core Lab 1</b> - Cell Biology and Physiology <b>Core Lab 2</b> - Computational Biology and Cellular Bioprocess Technology <b>Credits: 20</b>

Semester 2
<b>Core 4:</b> Analytical Biotechniques <b>Core 5:</b> Molecular Biotechnology <b>Mandatory:</b> Research Methodology <b>Mandatory:</b> IPR and Biosafety  <i>Specialization electives from BioX</i> <ul style="list-style-type: none"><li>• Systems Biology themes</li><li>• Medical and Nano-biotechnology themes</li><li>• Other electives: Offered by the SBB</li></ul> <b>Core Lab 3</b> - Analytical and Molecular Biotechnology <b>Core Lab 4</b> - Specialization Lab <b>Credits: 18</b>

Semester 3
Seminar (BY525) Post Graduate Project-1 (BY698P) <b>Credits: 17</b>

Semester 4
Post Graduate Project-1 (BY699P) <b>Credits: 17</b>

# Proposed Revised Curriculum (72 credits)

## Semester 1

**Core-1:** Advanced Cell and Molecular Biology (3)

**Core-2:** Computational Biology (4\*)

**Core-3:** Analytical Biotechniques (3)

**Core 4:** Nanobiotechnology (3)

**Free elective-1** (3)

**Mandatory:** Research Methodology (1\*)

Core Lab 1 – Advanced Cell and Molecular Biology (1)

Core Lab 2 - Analytical Biotechniques (1)

**Credits: 19**

## Semester 2

**Core 5:** Quantitative Biology and Data analytics (3)

**Core 6:** Immunotechnology (all life forms) (3)

**Core 7:** Cellular Bioprocess Technology (3)

***Specialization electives (any 3) (9)***

- Systems Biology
- Medical Biotechnology
- Other electives: Offered by the SBB

Core Lab 3- Immunotechnology (1)

Core Lab 4 - Cellular Bioprocess Technology (1)

**Credits: 20**

## Semester 3

Seminar (1)

Post Graduate Project-1 (16)

**Credits: 17**

## Semester 4

Post Graduate Project-2 (16)

**Credits: 16**

## Specialization electives

<b>Specialization-1: Systems Biology</b>		
Special elective	Course	Credits
S1	Introduction to omics and Systems Analysis (BY516)	3-0-0-3
S2	Metabolic Systems Biology (BY504)	3-0-0-3
S3	Metagenomics, and Next Generation Sequencing Technologies (BY613)	3-0-0-3
S4	Proteomics (BY517)	3-0-0-3
S5	Biological Modelling and Simulation (BE506)	3-0-0-3
S6	Bioalgorithms	
S7	Practical Metabolomics	
S8		

<b>Specialization-2: Medical Biotechnology</b>		
Special elective	Course	Credits
M1	Cellular Fuel and Cellular Communication (BY503)	3-0-0-3
M2	Disease Biology (BY518)	3-0-0-3
M3	Protein Sciences in therapeutics (BY519)	3-0-0-3
M4	Gene silencing and genome editing: principles and applications (BY527)	3-0-0-3
M5	Sensory Biology	3-0-0-3
M6	Mechanobiology of the cell	3-0-0-3
M7	Biomaterials and Tissue engineering	3-0-0-3
M8		



## ANNEXURE - J

### Program Proposal Form

**Name of the New Proposed Program:** Integrated Master of Business Administration Program (IMBA Program)

**I. General Information:**

Name (s) of prosper schools/centres: School of Management

**II. Program Description:**

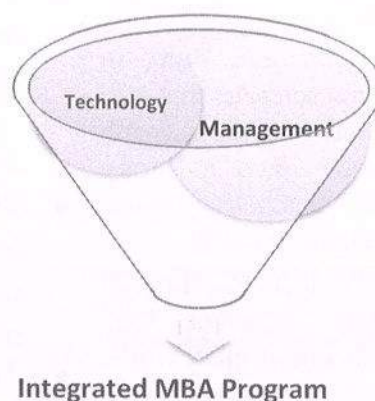
**A. Provide a justification/rationale for the program. How does the program relate to the mission of the IIT Mandi?**

**Rationale:**

The last decade saw a tremendous increase in uptake of technology by masses in India, particularly due to affordable access to internet and smart devices. In a game changing event, the pandemic amplified the adoption of digital solutions by businesses of every size. It has implications for the scalability of businesses that were earlier deemed to be unviable due to reasons that are now eliminated by high-tech interventions. The competitiveness of businesses has elevated multifold and minimum bar for business success has been raised very high. The larger businesses face competition from new ventures that leverage the modern advancements and continue to challenge former that have dominated the economic circles for long. On the demand side, consumers not only in urban areas, but also rural areas are resorting to technology enabled platforms. The consumers' comfort level with digital transactions has created many new business opportunities.

Therefore, the future belongs to those who will adopt the futuristic solutions in every sphere of doing business ranging from product design, customer awareness, customer acquisition, product delivery, and customer service. The above developments necessitate that the new age management curriculums educate the students on the application of latest high-tech in the traditional and contemporary functional areas of business.

In this context, the School of Management proposes a new *Integrated MBA Program* that will prepare the youth to be ready for the technology-based revolution that is underway. The proposed five-year *Integrated MBA Program* will blend the traditional business knowledge with the modern technology that business executives of tomorrow will require.



This program will create professionals capable of leading the development of innovative products and processes. The program will prepare the youth for the changing business dynamics of future and meet the human resource requirements of businesses, in turn shaping the economic and business outcomes for the country.

#### Intake Strategy: Mode of Admission

We intend to admit students through JEE Mains. Those who qualify to appear in JEE Advance (approximately 2.5 Lakhs) will be eligible to apply for the program. Given the technological orientation of the program, students with a science background would be ideal. In contrast, most of the management institutes admit students into their integrated programs through a written exam (generally open to candidates from all streams), the number of students writing these exams is limited.

#### B. SWOT analysis of the program

IIT Mandi has a well-established reputation for providing innovative, practicum-based education at the undergraduate and graduate levels. The students of the proposed Integrated MBA Program would have an opportunity to get quality education from one of the premier technical institutes in the country. The students will get the opportunity to brush shoulders with B.Tech. and master's degree students of IIT Mandi by means of engaging academically (in the initial 2 years) as well as by engaging in various extra-curricular and co-curricular activities. This would help them in building a competitive spirit along with the holistic development. In addition to the above, other points of SWOT are given below:

Strengths:	Weaknesses:
<ul style="list-style-type: none"> <li>❖ The proposed innovative curriculum has several differentiating propositions:</li> <li>❖ It offers a blend of management education with the application of data science &amp; AI tools.</li> <li>❖ The uniquely designed curriculum and innovative pedagogy enables cross functional thinking and problem-solving in students.</li> <li>❖ It offers a balanced education in technology and social sciences that will produce business leaders equipped with technical skills who have a strong understanding of business ethics, human behaviour, and life skills.</li> <li>❖ It offers experiential learning through hands on training, semester long industrial internship, and project work.</li> </ul>	<ul style="list-style-type: none"> <li>● Awareness of integrated MBA programs across the target segment is low.</li> <li>● Availability of dedicated faculty in relevant techno-management areas to deliver the relevant course content using experiential pedagogy.</li> <li>● The program will require periodical review of the latest developments in relevant fields to keep the curriculum updated, program execution relevant, and outcomes effective.</li> <li>● The school will need to create international visibility and interest in the proposed program to attract overseas.</li> <li>● The school will also need to establish collaborations with some of the</li> </ul>

<p>❖ The fee structure of the proposed program is likely to be lower than the Integrated Programs offered by IIMs/other premier institutions, making our program more economic proposition for the prospective applicant. This estimation is based on the fee structure of our ongoing MBA program.</p>	<p>international institutes to enable student exchange.</p> <ul style="list-style-type: none"> <li>•</li> </ul>
<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• IIT Mandi can have the first mover advantage among IITs in offering a Five-Year integrated MBA program.</li> <li>• A pre-existing and robust annual pipeline of 2.5 lakh prospective students through JEE Mains -who have qualified for JEE advance (B.E. /B. Tech).</li> <li>• The program has the potential to receive international interest from industry and academia which will benefit academic research, teaching and collaboration for IIT Mandi.</li> <li>• IIT Mandi has a deep industry connection to keep the course content relevant, enable internship and create placements opportunities for the students.</li> </ul>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• We need to establish and communicate a clear differentiated position compared to integrated management programs of IIMs. Therefore, the communication strategy must be well planned.</li> <li>• The first mover advantage may be short lived. The proposed program will face competition if other technical institutes also decide to enter this segment.</li> </ul>

### C. Justification with respect to New National Education Policy (NEP) mandates

The proposed program well aligns with NEP's mandate of holistic and multi-disciplinary education. Some of the salient features of the proposed program that are in line with the NEP are as follows:

- The program is carefully designed with a blend of technology and management, and other courses that would integrate the holistic development of the management graduates.
- In the first three years of the proposed program, a strong base in Science, Technology, Engineering, and Mathematics (STEM) along with courses on management, communications, soft skills, personality development, humanities and social sciences would provide a good blend with the management education.
- The multidisciplinary curriculum would nurture the social, physical, emotional, moral, and intellectual growth of the students in a well-rounded manner.

- The program also offers credits to courses related to the co-curricular activities, Arts, Music, Sports, Yoga, personality development, outbound activities, etc.
- The program offers multiple exit options to the students – BBA Analytics and BBA Analytics (Honors) after successful completion of third and fourth years, respectively.

**D. Provide a mission statement for the program. Include educational and learning objectives.**

**Mission Statement:**

Integrated MBA Program strives to foster creativity and leadership through a unique management education program that blends traditional business education with the application of technology across diverse business domains. The program will create future business leaders with a deep technology appreciation and effective cross-functional management acumen.

**Educational and learning objectives:**

1. To impart state of the art management education through coursework that blends the technology application into the traditional management courses. The focus of the program is to produce business leaders with capability to translate the broad surface level understanding of business problems to fine grained comprehension and interpretation by critically evaluating, analyzing to produce robust and adaptable solutions in changing business environment.
2. To make the learning more experiential, engaging, and hands-on with the help of lectures, classroom discussions, computing and business simulations labs, case studies, individual and group projects complemented by group discussions, role-plays, industrial internship to enable multifaceted professional and personal development of the students.
3. To develop management professionals with deep understanding of technology and management acumen that are capable of leading technology-oriented organizations in VUCA business world with the help of the experiential learning that inculcates leadership qualities and hones the managerial skills of future leaders to develop desired intent to create more sustainable businesses and socially responsible organizations.
4. To develop management professionals with resilience to face VUCA world and maintain well-being of self and others around them by applying knowledge gained through courses offered from time tested Indian Knowledge System.

**E. Credit Structure of the program**

The program has a total of 200 credits across five years. The program will provide exit options to the student as follows:

- After successful completion of 3<sup>rd</sup> year, upon exit, a student will be awarded a Bachelor of Business Administration (BBA) Analytics degree.
- After successful completion of 4<sup>th</sup> year, upon exit, a student will be awarded a Bachelor of Business Administration (BBA) Analytics (Honors) degree.
- The students completing the 5-year program will be awarded Integrated MBA degree [BBA Analytics + MBA (DS&AI)].

The credit breakdown across the years is as follows:

a) The program has 130 credits in the first three years which are divided into discipline core and elective courses. The details are as follows:

Division	Subdivision	Credits
IC Compulsory, IC Baskets, and Core courses from other Relevant Disciplines	Engineering, Science, Mathematics & Statistics, Data Science, and Computer Science	54
Discipline Core	Management, Economics, Indian Knowledge System, Language and Communication, Social Sciences, and Data Science and AI	71
Discipline Electives	Skills such as Life Skills, Technical Skills, Professional Skills, and Art Forms	5

b) The credits structure for the fourth years of the program is as follows:

Division	Credits
Internship*	12
Discipline Core	20

\*Internship will happen after successful completion of the first three years of the program. In the semester VII, the students of the integrated MBA program would be going for a sixth month long extended industrial internship anytime during June to January. This is a unique proposition of the proposed program. The students will get 12 credits for the internship. This period can also be utilized for semester exchange or exploring entrepreneurship (start-up in an incubation center).

The program will have a provision to allow students interested in setting up their own start-ups to go for a one-year sabbatical to do so immediately after semester VII. After one year, the student needs to rejoin semester VIII of the program.

This unique proposition was validated by both industry and academic experts that were consulted. According to their comments, the industry prefers a long internship instead of

the traditional 2-month internship. We also experienced the same during the current internship drive for our students of our existing MBA (DS & AI) program.

Salient features/benefits of the semester long internship are as follows:

- The courses offered to the two-year MBA students in their Semester I are covered by the Integrated MBA students in their first three years and hence the six months internship avoids the repetition of similar courses and utilizes this semester for essential industrial exposure.
- The internship will give the students an exposure to real business world and help relate better to the management courses in 4th and 5th year of the integrated MBA program.
- In the recent years an increasing requirement of six months long internship for the B.Tech. students at IIT Mandi is observed from the companies visiting the campus and found to provide higher chance of Pre-Placement Offers (PPO). It is highly likely that the longer industrial internships for the management students would also open the options of PPO.

c) The credits structure for the fifth year of the program is as follows:

Division	Credits
Core	10
Discipline Electives	12
Free Electives	6
Management Project	10

In near future, SOM is also planning to offer a two-year MBA program in multiple specialization. The students of the integrated MBA program will then have the option of choosing one of the specializations. The criteria for allocation of one of the specializations would be formulated in future.

d) Criteria for program completion:

The minimum requirement to continue the program and passing criteria will be the same as B. Tech program as mentioned in B. Tech ordinance R.11. A student is in good academic standing if he/she stays abreast of the credit requirement at any particular stage of his/her academic program and if his/her CGPA is at least the minimum required for graduation (5.0). The rules for Academic Warning, Academic Probation and Completion of the program will be the same as B. Tech. as mentioned in B. Tech. ordinance. The maximum duration of the integrated program is 10 semesters and maximum duration will be 14 semesters excluding semester withdrawn on medical ground.

## F. List of proposed Courses

The following are the details of courses for the first three years of the program

### List of Core Courses

Course Title	Credit
Calculus	2
Introduction to Python and Data Science (Previously DS I)	4
Understanding Biotechnology and its Application	3
Introduction to Consciousness and Wellbeing (IKSMHA)	3
Microeconomics	3
Foundations of Business Management	4
Management Workshop I	1
Linear Algebra	3
Probability and Statistics (Previously DS II)	4
Foundations of Design Practicum	4
Macroeconomics	3
Written and Verbal Communication	4
Ethics and Values	3
Management Workshop II	1
Data handling and Visualization	3
Design Practicum	3
Machine Learning (Previously DS III)	3
Mathematical Foundation of Computer Science/data science	4
Environmental Science	3
Data Structures and Algorithms	3
Management Workshop III	1
Management Workshop IV	1
Optimization for Data Science	4
Statistical Foundation of Data Science	4
Matrix Computations for Data Science	4
Introduction to Accounting	3
Psychological Foundations of Business Management	3
Business Government and Society	3
Management Workshop V	1
Business Communication	3
Introduction to Marketing	3
Introduction to Operations Management	3
Foreign Language 1	3
Business Research Methods	3
Data Base for Managers	4
Financial statement analysis	3

Problem solving and Decision Making for Managers	3
Mathematics for Business Management	3
Introduction to Financial Management	3
Indian Art Form	2
Public Speaking and debating	3
Sustainable Business Practices	3
Management Lessons from Indian Knowledge System	3
Indian Economy	3

**List of Elective Courses/Workshops**

Skill Baskets	Suggestive Title of Courses	Credits
Technical Skills	Basic Excel	1
	Advanced Excel	1
	Programming languages	1
	Software training	1
	Impactful Presentation	1
		1
Soft Skills	Personality Development	1
	Written Communication	1
	Verbal Communication	1
		1
Professional Skills	Business Etiquettes	1
	Story Telling with Data	1
	Preparing for Interview	1
	Time Management	1
		1
Art forms	Dramatics	1
	Music	1
	Dance	1
	Painting	1
		1
Life Skills	Yoga	1
	Outbound Activities	1
	Physical Training	1

*Note: The above is not an exhaustive list*

The following are the details of the courses for the last two years of the program:

The students of the integrated program will undertake a semester long industry internship in the seventh semester. For the remaining semesters, the students will take the same courses as offered to MBA (DS & AI) students in their last three semesters. See the Section I for the complete list of courses.

**G. Provide a list of any current courses that would be cross-listed with the program:**



The program has many courses in its first three years that have commonality with the existing courses of other undergraduate and postgraduate programs at IIT Mandi. Following is a list of courses that are common with other UG programs of the institute.

Course Title	Credit
Calculus	2
Introduction to Python and Data Science (Previously DS I)	4
Understanding Biotechnology and its Application	3
Introduction to Consciousness and Wellbeing (IKSMHA)	3
Linear Algebra	3
Probability and Statistics (Previously DS II)	4
Foundations of Design Practicum	4
Data handling and Visualization	3
Design Practicum	3
Machine Learning (Previously DS III)	3
Mathematical Foundation of Computer Science/data science	4
Environmental Science	3
Data Structures and Algorithms	3
Optimization for Data Science	4
Statistical Foundation of Data Science	4
Matrix Computations for Data Science	4

Additionally, the proposed program aims to make learning more experiential and engaging with the help of following pedagogies that are not essentially used in the existing undergraduate courses at IIT Mandi:

- Business case studies
- Management role-plays
- Course instructors from industry to bridge the gap between the academic training and industrial practices.

**H. What, if any, new courses will be required for the program? A separate course proposal is required for each new required course.**

The detailed course contents are under development. Review comments from the academic and industry experts have been taken into consideration for this purpose.

I. Provide a sample academic plan for students completing the academic program being proposed.

Semester I		
Course Code	Course Title	Credit
IC112	Calculus	2
IC152	Introduction to Python and Data Science (Previously DS I)	4
IC136	Understanding Biotechnology and its Application	3
IC181/ICXXX	Introduction to Consciousness and Wellbeing (IKSMHA)	3
DC*	Microeconomics	3
DC	Foundations of Business Management	4
DE	Management Workshop I	1
	<b>Total Credits</b>	<b>20</b>
Semester II		
IC114	Linear Algebra	3
IC252	Probability and Statistics (Previously DS II)	4
ICXXX/IC181	Foundations of Design Practicum	4
DC	Macroeconomics	3
DC	Written and Verbal Communication	4
DC	Ethics and Values	3
DE	Management Workshop II	1
	<b>Total Credit</b>	<b>22</b>
Semester III		
DS201	Data handling and Visualization	3
IC201P	Design Practicum	3
IC272	Machine Learning (Previously DS III)	3
CS208/DS301	Mathematical Foundation of Computer Science/data science	4
IC230	Environmental Science	3
CS202	Data Structures and Algorithms	3
DE	Management Workshop III	1
DE	Management Workshop IV	1
	<b>Total Credit</b>	<b>21</b>
Semester IV		
DS401	Optimization for Data Science	4
DS303	Statistical Foundation of Data Science	4
DS402	Matrix Computations for Data Science	4
DC	Introduction to Accounting	3
DC	Psychological Foundations of Business Management	3
DC	Business Government and Society	3
DE	Management Workshop V	1
	<b>Total Credit</b>	<b>22</b>

Semester V		
DC	Business Communication	3
DC	Introduction to Marketing	3
DC	Introduction to Operations Management	3
DC	Foreign Language 1	3
DC	Business Research Methods	3
DC	Data Base for Managers	4
DC	Financial statement analysis	3
	<b>Total Credit</b>	<b>22</b>
Semester VI		
DC	Problem solving and Decision Making for Managers	3
DC	Mathematics for Business Management	3
DC	Introduction to Financial Management	3
DC	Indian Art Form	2
DC	Public Speaking and debating	3
DC	Sustainable Business Practices	3
DC	Management Lessons from Indian Knowledge System	3
DC	Indian Economy	3
DC	<b>Total Credits</b>	<b>23</b>
Semester VII		
	Compulsory Industry Internship	12
		12
Semester VIII		
DC	Fundamentals of Data Analytics	2
DC	Disruptive Technology in Data Science	2
DC	Strategic Management	2
DC	Machine Learning for Business	2
DC	Introduction to AI and Automation	2
DC	Organizational Behaviour	2
DC	Decision Analysis	2
DC	Project Management	2
DC	Marketing Management II	2
DC	Ethical and Legal Aspects of Business	2
		20
Semester IX		
DC	Neural Network Fundamentals for Business	2
DC	Digital Business Strategy, Models and Transformations	2
DC	Entrepreneurship	2
DC	Business and Data Leadership	2
DC	Management Insights from Indian Knowledge System	2
DC	Discipline Elective 1	2
DC	Discipline Elective 2	2
DC	Free Elective 1	2
DC	Management Project I	4
		20

Semester X		
DC	Discipline Elective 1	2
DC	Discipline Elective 2	2
DC	Discipline Elective 3	2
DC	Discipline Elective 4	2
DC	Free Elective 1	2
DC	Free Elective 2	2
DC	Management Project II	6
DC		18

\*DC refers to Departmental Core

\*\* DE refers to Departmental Elective

### Credit distribution

Total Credit in First 3 Years (BBA Analytics)	130
Total Credit in First 4 Years (BBA Analytics (Honors))	162
Total Credit in Five Years (Integrated MBA)	200

Indian  
Institute of  
Technology  
Mandi

**J. If established at other institutions, please submit sample programs from those institutions.**

**1. In what ways is this proposal consistent with those programs?**

At present five IIMs are offering an integrated management program. In addition, some of the renowned central and state government institutions and leading private institutions are also offering similar program. Notably, majority of these institutes have started the program in last 3-4 years (please refer table below for details). A recent focus of educational institutes on five-year integrated MBA program indicates its demand.

**List of institutions offering an Integrated Management Program\***

Institute Name	Starting Year	Intake
Indian Institute of Management Indore	2011	150
Indian Institute of Management Rohtak	2019	180
Indian Institute of Management Ranchi	2021	120
Indian Institute of Management Bodh Gaya	2021	60
Indian Institute of Management Jammu	2021	60
Indian Institute of Foreign Trade Kakinada	2022	50
NALSAR University of Law Hyderabad	2021	66
Kurukshetra University	2010	60
Mumbai University	2016	60
Kumaon University	2018	50
Maharshi Dayanand University	2008	120
OP Jindal University		
Manipal Academy of Higher Education		120
Nirma University		180

\*Data collected from different web resources.

**2. In what ways is this proposal different from those programs? Please explain those differences**

The five-year integrated MBA program offered by majority of the premier institutes focus mainly on the traditional management education such as finance, marketing, strategy, human resource management, and operations management. Most of these programs are not adequately inclined towards the growing role of technology in the changing business landscape. While few of these programs offer courses to educate students in analytics domain, but they seem to lack building advance analytical foundation to enable robust student learning.

On the other hand, the proposed program, in addition to these traditional courses, also includes courses that enable learning and experience on latest technology. Moreover, these courses and their pedagogy are intently designed to help students learn the application of these advance analytical tools in the realm of business domains. Particularly, the long-

duration internships and live industry projects embedded in the program would help students develop strong orientation towards the real problems facing industry and the use-cases of analytical tools. The students will take advantage of IIT ecosystem, and compete with students of other undergraduate branches in curricular and co-curricular activities.

In addition to the differentiated course curriculum, the program offers the students a unique enriching campus life in the lap of nature within the serene Himalayan ecosystem away from the hustle and bustle from cities. It offers the students opportunity for holistic development by engaging in various extra-curricular and co-curricular activities, along with the student of other streams at IIT Mandi. Further, students would have an opportunity to leverage start-up/incubator ecosystem of IIT Mandi and initiate tech-based ventures that can shape the business landscape and create social/economic impact.

**Provide a list of the faculty available to teach courses for this program.**

The School of Management is recently having 8 regular faculty members along with several other adjunct faculty members, visiting faculty members, and distinguished Professors. In addition, the faculty members from other schools will be teaching the IC Compulsory and IC Basket courses during 1<sup>st</sup> years of the program. The school may utilize the service of some visiting faculty members from Industry and Academia as when necessary. The school is also hiring more regular faculty members in required areas.

**In case of interdisciplinary program, mention governances and execution mechanism of the program:**

During the first two years of the program, faculty members from other schools will be teaching the courses and students will study along with other B. Tech students. The next three years will be taught by faculty members from school of management and the industry experts.

**Student interest:**

**What measures of student interest in the program are there? How/why are the proposers convinced that students would want to take this program of study? (Attach Career and Placement Cell recommendation or any other)**

In the last five years, at least five IIMs, and several private and government universities have offered an integrated management program. It indicates growing student interest in such integrated programs. The proposed programs would be attractive for students for the following reasons:

- The unique curriculum cuts across different type of training and skills in the area of technology, management, and other courses offers a holistic learning experience for the management graduates in the pristine Himalayan environment.
- Several students spend one to two years in preparation for the competitive exams after their bachelor's degree. The integrated program by its design enables the student to peruse the bachelor's and master's degree and saves the time and cost spend in preparation for competitive exams.

- The proposed program will provide a long industrial internship opportunity for 3<sup>rd</sup> year students. The internship will provide the students an exposure to real business world and help relate better to the management courses in 4<sup>th</sup> and 5<sup>th</sup> year of the integrated program.
- Six months internship has been highly desired and accepted by the companies for the B.Tech. students and provides a much higher chance of getting Pre-Placement Offers (PPO). Many companies now a days look for management interns for a longer duration (up to six months or more) instead of the traditional 2-month internship. It is highly likely that the longer industrial internships for the management students would also open the options of PPO.
- The fee structure of the proposed program is likely to be lower than the Integrated Programs offered by other premier institutions, making our program more economic proposition for the prospective applicant. This estimation is based on the fee structure of our ongoing MBA program.
- The proposed program will also create national and international student exchange opportunities.
- The proposed program, in addition to mentoring from faculty advisor, will facilitate guidance/mentoring through engagement with industry professionals for better career guidance.
- The proposed students would also have an opportunity to leverage start-up/incubator ecosystem of IIT Mandi and initiate tech-based ventures that can shape the business landscape and create social/economic impact.

#### **Resources:**

#### **Additional requirements of laboratory space with justification (name of the labs)**

For smooth functioning of the program and for experiential learning, following labs will be set up over the next two years:

1. Business Analytics Laboratory (1500 Sq. feet)
2. Behavioral Laboratory (1500 Sq. feet)
3. Finance Research Laboratory (1500 Sq. feet)
4. Entrepreneurship Research Laboratory (1500 Sq. feet)

#### **Additional requirements of laboratory fund (recurring and non-recurring) with justification (name of the labs)**

- |  |          |
|--|----------|
| 1. Business Analytics Laboratory           | (1.5 Cr) |
| 2. Behavioral Laboratory                   | (1.2 Cr) |
| 3. Finance Research and Trading Laboratory | (1.5 Cr) |
| 4. Entrepreneurship Research Laboratory    | (1.0 Cr) |

#### **Additional requirements of faculty and non-teaching staff (Numbers and justification)**

1. We would require about 20-24 faculty members in relevant research and teaching areas in the next 5 years.
2. We would require a staff member dedicated for managing internships, placements, industry liaisoning, and students exchange visits.

3. We will require two laboratory assistants to maintain the laboratories proposed earlier in this proposal.
4. We will require assistance of one office assistant to manage day to day operations related to the proposed program.

Note: The proposed infrastructure would also be helpful for executive education programs including FDP, MDP, Continuing Education, etc., which is a proven source of significant revenue to the institute.

### III. Origin and development of the proposal:

- Please mention name of faculty members involved in developing this proposal.

- Phase 1

1. Dr. Ashish Bollimbala
2. Dr. Saumya Dixit
3. Dr. Puran Singh
4. Prof. Manoj Thakur

- Phase 2: Curriculum Committee

1. Dr. Akhaya Kumar Nayak
2. Prof. Anjan Swain
3. Dr. Ashish Bollimbala
4. Dr. Puran Singh

- Details of external industry experts and their recommendations (please include their evaluation)

1. Mr. Saurabh Mittal, Qyon
2. Mr. Vinay Kumar, Datawise
3. Mr. Mahesh Venkataraman, Accenture

- Details of external academia experts and their recommendations (please include their evaluation):

1. Prof. G Shridhar
2. Prof. B K Mohanty
3. Prof. M. Venkateswarlu

- Proposers faculty name and their signatures:

Name of Faculty members	Signatures
Dr. Ashish Bollimbala	
Dr. Puran Singh	
Prof. Anjan Swain	
Dr. Akhaya Kumar Nayak	





**Recommendations of Chairperson of School/ Centre**

**Signature with Date:**

**Dean (Students) recommendations on availability of hostels and other requirements**

**Signature with Date:**

**Associate Dean (Courses) recommendation on class rooms availability and other academic infrastructure requirements**

**Signature with Date:**



Dean Finance recommendation on financial aspects (if any)

Signature with Date:

Dean Academics recommendations:

Recommended/Not Recommended

Signature with Date:

*Please enclose additional information if any.*

Indian  
Institute of  
Technology  
Mandi

## Annexure A

### Curriculum of 2 years MBA DS & AI at program IIT Mandi

The proposed **MBA (DS & AI)** program is a blend of management of contemporary concepts, softer skills towards developing individuals, and relevant applications of data science tools. **MBA (DS & AI)** is a 2-year long full-time Master's program, distributed in 4 semesters. The credit requirement is 80. The program aims to provide an in-depth exposure on data science tools and techniques like analytics, artificial intelligence machine learning, deep learning, natural language processing, and neural networks with a strong emphasis on problem solving approach.

The course structure has three major components as detailed below:

#### Discipline Cores (52 credits):

Discipline Cores are designed to give the students appropriate exposure to different thoughts and theories of 'management' and 'Data science'. These include course in managerial competence such as communication skills, Legal aspects of business, HR management, creative thinking problem solving and decision making, organizational behaviour; as well as data science course such as Neural networks fundamentals for business, Mathematical foundations, disruptive technologies for data science, Introduction to AI and automation etc.

#### Electives (12+6 credits):

A pool of discipline and free elective courses help students to go deeper into selected areas of application of data science and artificial intelligence in business. While discipline cores are more theme oriented and interdisciplinary in nature, the discipline electives have greater disciplinary grounding. The pool of discipline electives courses is dynamic in nature and more courses may be added in the future depending upon suitability. Students also have to take 4 credits offered in the institute from outside the pool of discipline electives for the **MBA (DS & AI)** Program.

#### Project and internship (10 credits):

Students would get exposure to real world problems, research methodology and industry experience through the Qualitative research workshop, social immersion project, Industry internship and two semester long Management project.

**Curriculum:**

The distribution of credits across types of courses is proposed to be the following:

1	Discipline Core	52
2	Discipline Electives	12
3	Free Electives	6
4	Project and Internship	10
Total		80

**Proposed Curriculum of Two Years Master of Business Administration  
(Data Science and Artificial Intelligence)**

<b>Semester I MBA DS&amp;AI</b>		
	Communication Skills for Managers	2
	Financial Statement Analysis	2
	Mathematical Foundation of Data Science and AI	2
	Creative Thinking, Problem Solving and Decision Making	2
	Python Programming	2
	Operations Management	2
	Managerial Economics	2
	Marketing Management I	2
	Probability and Statistics for Data Science & AI	2
	Human Resource Management	2
	Financial Management	2
		<b>22</b>
<b>Semester II DS and AI</b>		
	Fundamentals of Data Analytics	2
	Disruptive Technology in Data Science	2
	Strategic Management	2
	Machine Learning for Business	2
	Introduction to AI and Automation	2
	Organizational Behaviour	2
	Decision Analysis	2
	Project Management	2
	Marketing Management II	2
	Ethical and Legal Aspects of Business	2
		<b>20</b>
<b>Semester III DS and AI</b>		
	Neural Network Fundamentals for Business	2
	Digital Business Strategy, Models and Transformations	2
	Entrepreneurship	2

	Business and Data Leadership	2
	Management Insights from Indian Knowledge System	2
	Discipline Elective 1	2
	Discipline Elective 2	2
	Free Elective 1	2
	Management Project I	4
		20
<b>Semester IV</b>		
	Discipline Elective 1	2
	Discipline Elective 2	2
	Discipline Elective 3	2
	Discipline Elective 4	2
	Free Elective 1	2
	Free Elective 2	2
	Management Project II	6
		18
<b>Total credits in two years 80</b>		



## ANNEXURE-K

### **The Innovation and Entrepreneurship Practicum (IEP) Program**

#### **1. Preamble**

The Indian Institute of Technology Mandi (IIT Mandi) is committed to encouraging innovation and entrepreneurship among its students. IIT Mandi has seamlessly integrated innovation and design into its curriculum, fostering creativity and problem-solving skills. IIT Mandi has incorporated a distinctive Practicum model of learning, which integrates innovation and design into its curriculum. This approach fosters a creative and problem-solving mindset among students, resulting in an academic environment that promotes these skills.

Through this program, IIT Mandi is initiating an effort to introduce an Entrepreneurial curriculum, acknowledging the crucial influence of entrepreneurship in shaping the future. This program is designed to develop individuals with the necessary skills to navigate the intricate challenges of the modern business environment. This innovative curriculum represents more than just an addition; it signifies the institution's dedication to fostering an entrepreneurial mindset among its undergraduate students.

The IEP curriculum is spread across three semesters, during which students will fully engage in the complex process of creating and developing their own ventures. The journey commences during the first six months, which constitute a dedicated semester where aspiring innovators transform their ideas into tangible prototypes. The objective of this practical approach is to foster a profound comprehension of the innovation lifecycle and the pragmatic elements of materializing ideas. During the following year, these prototypes undergo a transformation and become marketable Minimum Viable Products (MVPs) and, eventually, fully established startups. The extended duration provides students with ample time and resources to improve their ideas, tackle obstacles, and enhance their entrepreneurial skills.

IIT Mandi aims to collaborate with leading organizations that promote digital innovation in order to tackle urgent social problems, demonstrating its strong dedication to collaborative innovation. Possible partners consist of the IIT Mandi iHub and TCS DISQ, organizations known for their successful implementation of technology and innovation to bring about significant changes.

#### **2. Course Objectives**

- 2.1. Encourage a culture of innovation by providing students with a platform to ideate, prototype, and develop marketable solutions to real-world problems.
- 2.2. Develop entrepreneurial skills in students by encouraging them to recognize opportunities, risk management, and transform ideas into viable businesses.
- 2.3. Give students the skills and confidence they need to make the transition from

academia to entrepreneurship, easing their journey from ideation to startup development.

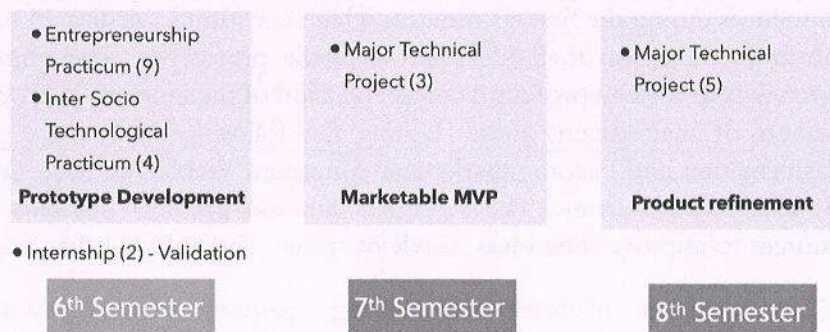
- 2.4. Encourage the development of solutions to pressing societal challenges in areas such as health, education, the environment, transportation, finance, and others.

### 3. Eligibility

- 3.1. The course is designed for B.Tech students who have finished the fifth semester.
- 3.2. Students must apply for this program; the committee will review the applications and admit students based on certain selection criteria.
- 3.3. Based on the sponsorships from the partners, The Institute may provide a Rs 15,000 per month scholarship to a maximum of 30 students selected by the committee.
- 3.4. If the student(s) wishes to continue without the scholarship, they will be permitted to do so.
- 3.5. The student may participate as an individual or as part of a team of no more than two other students (as approved by the committee).

### 4. Duration, Structure, and Credit

- 4.1. **Duration:** The duration of the program is 18 months i.e., for the 6th semester, 7th Semester, and 8th semester/or as approved by the Senate.
- 4.2. **Structure and credits:** The proposed collaborative program between IIT Mandi and DISQ is intended to provide a structured pathway for students to develop their entrepreneurial skills and create marketable solutions over multiple semesters. Here's a rundown of the program's structure:



#### Semester 6:

**Entrepreneurship Practicum (9 credits):** Students choose this course and spend the semester developing prototypes. This phase focuses on ideation, design, and the creation of an initial prototype. During this semester, the students will be given a few lectures on the basics of entrepreneurship, and mentor(s) will be allotted to them for one-on-one mentoring. IIT Mandi Catalyst, Technology Business Incubator, will play a major role in the entrepreneurship practicum part.

**ISTP (4 credits):** The developed prototype is validated in the market, allowing students to gather feedback and assess its viability and usability in real-world scenarios.

Internship (2 credits): If the student wishes to work on the same project during the vacations as a part of the internship, the student can opt for internship credits.

#### **Semesters 7 and 8:**

Major Technology Project (MTP) (8 credits): Students continue to work on their product as a final-year project while taking their regular courses. This phase involves the prototype's further refinement, iteration, and potential scalability.

The program covers 21-23 credits from the BTech curriculum.

If necessary, students are expected to form a legal entity. According to the IPTT Cell's recommendations, students will also be encouraged to protect their intellectual property with a patent/copyright. IIT Mandi will support the application as part of its ongoing policy at the time. The IPR policy of IIT Mandi will apply to all IPR applications.

#### **5. Evaluation**

- 5.1. An evaluation committee will be formed to assess the work of students.
- 5.2. At the end of each semester, the student/team must present their respective progress to the committee or as determined by the committee's evaluation scheme.

#### **6. Implementation**

- 6.1. IIT Mandi may benefit from the expertise of IIT Mandi Catalyst in incubation and startup mentoring for course implementation. As a result, IIT Mandi Catalyst may play a significant role in program implementation.
- 6.2. The institute may, however, provide infrastructural support for program implementation, such as classrooms, conference rooms, lab access, faculty access, and other facilities.
- 6.3. Student selection and monitoring: Student selection is based on the committee's predetermined criteria and conditions.

#### **7. Follow-on**

- 7.1. Eligible students may pursue a minor in entrepreneurship, a specialization in entrepreneurship, or other entrepreneurship-related courses at IIT Mandi to further their knowledge and skills in entrepreneurship.
- 7.2. The eligible teams can explore the benefits of IIT Mandi Catalyst's support programs, including the Entrepreneurs-in-Residence Program and various startup grants available during or after the program's completion.
- 7.3. If necessary, IIT Mandi will assist the student in filing the patent and support as per the intellectual property and technology transfer norms.

The program will be implemented by the School of Mechanical and Materials Engineering and IIT Mandi Catalyst with help from various schools, centers, and the IIT Mandi hub.



# Entrepreneurship Practicum (EP)

(Abridged Version)

## 1. Preamble

The Entrepreneurship Practicum intends to introduce an academic course to provide students with hands-on training and first-hand experience building a startup company. It follows IIT Mandi's unique practice of exposing its students to project-based learning. The past programs, including Design Practicum and Integrated Socio-Technical Practicum, have successfully enabled immersive learning for students. Likewise, students in Entrepreneurship Practicum will undertake a guided experiment with entrepreneurship by building a venture.

IITs have always been the hub of entrepreneurs and job creators, and this program contributes to strengthening the same. Furthermore, the New Education Policy ([NEP 2020](#)) and National Innovation and Start-up Policy ([NISIP 2019](#), section: Components of Guiding Framework, point-5) have also a futuristic vision for a radical transformation of job seekers into job creators. Therefore, it is imperative to support and foster the entrepreneurial spirit among the students by exposing them to entrepreneurial training and practice.

## 2. Course Objective

To provide students with hands-on training and first-hand experience building a startup company.

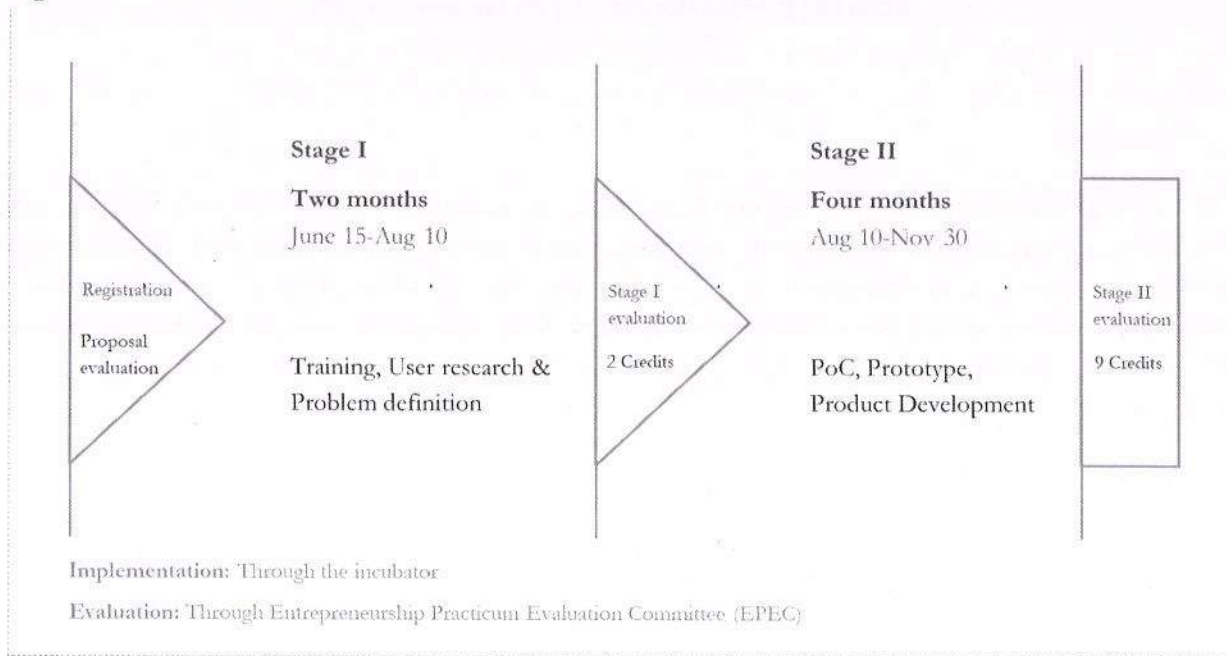
## 3. Eligibility

- 3.1. The course is for B.Tech students only.
- 3.2. The students should have completed four semesters in the B.Tech degree at IIT Mandi.

## 4. Registration

- 4.1. The interested student(s) will indicate interest in the course by pre-registering at the end of the 4th semester.
- 4.2. The student(s) can register individually or in a group of a maximum of four.
- 4.3. The students(s) will submit a startup proposal in a prescribed format.
- 4.4. An Entrepreneurship Practicum Evaluation Committee (EPEC) will evaluate the proposal by following an appropriate process.
- 4.5. The EPEC can relax the cap on team size on justified grounds.

Figure 1: Overview of course



## 5. Structure, Duration and Credits

5.1. **Duration:** The duration of this practicum will be approximately six months, including a regular semester and the preceding vacation period [Jun-Nov and Dec-May].

### 5.2. Structure:

5.2.1. The students will learn the basics of starting a venture during the first two months [Jun-Jul or Dec-Jan] through online/offline lectures/workshops/training sessions amounting to at least 14 hours. In addition, the students are expected to do user research to develop their problem statement during this time.

5.2.2. The students will implement the startup idea in the following four months [Aug-Nov or Feb-May]. The implementation will comprise user research and proof of concept, prototype, or product development. The students may register a legal entity to take their EP project forward. The student(s) may also raise external funding in addition to the program budget. However, if the duration of commitment for such external funding exceeds the course duration, students will need approval from the institute.

### 5.3. Credits:

5.3.1. The course has a total of 11 Pass/Fail credits

- i. The students who exit at the end of the first two months will get two credits. It will be equivalent to the 2-month industrial training that students undergo.
- ii. Students who complete the course will earn 11 credits in total.

## 6. Evaluation

An Entrepreneurship Practicum Evaluation Committee (EPEC) will evaluate the student(s) on two occasions:

- 6.1. At the end of two months, the EPEC will assess the students' understanding of the problem, problem validation, and execution plan.
  - 6.1.1. The EPEC may ask a student(s) to exit due to reasons that may include unsatisfactory performance, lack of business potential, or any other reasons deemed valid by EPEC.
  - 6.1.2. The student(s) can also opt out of the course at this stage at their discretion.
  - 6.1.3. The students that get a Pass grade will earn two credits.
- 6.2. At the end of six months, the EPEC will evaluate the students' through a final presentation.
  - 6.2.1. The students that get a Pass grade will earn additional nine credits.

## 7. Implementation

- 7.1. The course implementation requires entrepreneurship expertise to evaluate proposals, provide training, enable mentoring and monitor the progress. Therefore, IIT Mandi may leverage its incubator(s)' expertise for course implementation. Accordingly, the institute may outsource the execution of EP to the incubator(s) on campus.
- 7.2. However, the institute may extend infrastructural support for the program implementation, including providing classrooms, conference rooms, lab access, faculty access, and other facilities.
- 7.3. Role of incubator
  - 7.3.1. **Constitution of EPEC:** Incubator will constitute an EPEC as per the following composition:
    - i. EP coordinator [Faculty In charge of Incubator]
    - ii. At least one technology or business expert(s) from IIT Mandi or Incubator or outside
    - iii. Any other member(s) invited by the EP Coordinator, if any.
  - 7.3.2. **Student selection and monitoring:** The incubator will convene EPEC meetings and take other actions necessary for student selection, training, monitoring and evaluation.
  - 7.3.3. **Content design and delivery:** The incubator will design and deliver at least 14 hours of classroom lectures and/or training workshops online or offline.
  - 7.3.4. **Fund disbursement:** The incubator will manage and disburse the funding provided by the institute or other funding agencies for this course.

## 8. Financial Implications

- The institute will provide a financial grant each semester to support student teams selected by EPEC for stage 2.
- The institute may determine the number of teams for the financial grant from time to time.
- The teams can also arrange financial support through other sources.
- The teams will utilise the funding provided by the institute for the user research and proof of concept, prototype, or product development.
  - The incubator will approve the student's budget utilisation plan.
  - The incubator will decide on the timing and size of the disbursement of funds to the student(s).
- The incubator will keep the necessary records for producing a utilisation certificate.