भारतीय प्रौद्योगिकी संस्थान मण्डी
कमांद–175075, हिमाचल प्रदेश

INDIAN INSTITUTE OF TECHNOLOGY MANDI
KAMAND – 175075, HIMACHAL PRADESH

कार्य सूची
AGENDA
उनतालीसवीं सीनेट बैठक सूची

AGENDA FOR THE 39th SENATE MEETING

बैठक सं0	:	उनतालीसवीं
MEETING NO.	:	THIRTY NINTH
स्थान	:	सभा कक्ष, सी. वी. रमन अतिथि गृह, आई. आई. टी. मण्डी
VENUE	:	CONFERENCE ROOM, C. V. RAMAN GUEST HOUSE, IIT MANDI
दिनांक	:	25 अप्रैल, 2023
DATE	:	25th April, 2023
समय	:	10:30 पूर्वाह्न
TIME	:	10:30 A.M.

INDIAN INSTITUTE OF TECHNOLOGY MANDI
KAMAND, HIMACHAL PRADESH

39th SENATE MEETING
TUESDAY, 25th APRIL, 2023

AGENDA

PART – 'A'

Item No. 39.1: To confirm the minutes of the 38th Senate meeting held on 8th February, 2023.

The minutes of the 38th Senate meeting held on 8th February, 2023 at IIT Mandi were circulated to members of the Senate on 11th April, 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 38th Senate meeting of the Institute.

Item No. 39.2: To receive a report on the actions taken on the decisions taken in the 38th Senate meeting held on 8th February, 2023.

Given below are the details of actions taken for the decisions taken in 38thSenate meeting held on 8th February, 2023.

Item No.	Particulars	Status of Action Taken
38.3	To consider the proposal of new branch in B.Tech. programme i.e., B.Tech in Materials Science and Engineering	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/224-226 dated 13-04-2023 and the same shall be reported to the BoG.
38.4	To consider the proposal of new branch in B.Tech. programme i.e., B.Tech. in General Engineering	After incorporating the suggestions of the Senate, the revised proposal would be presented during the subsequent Senate meeting.
38.5	To consider the proposal of new BS-MS in Chemical Sciences	After incorporating the suggestions of the Senate, the revised proposal shall be reported during the subsequent Senate meeting.
38.6	To consider the proposal of M.Tech./M.A/M.Tech (Research) with Specialization	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/227-231 dated 13-04-2023
38.7	To consider the proposal of award of B.Tech. degree with Specialization	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/232-236 dated 13-04-2023
38.8	To consider the proposal for granting permission to extend degree duration (UG/PG)	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/237-241 dated 13-04-2023
38.9	To consider the proposal of modification in the programme M.Tech. in Mechanical Engineering with Specialization in Energy Systems	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/242-244 dated 13-04-2023
38.10	To consider the revision in course curriculum of M.Sc. in Applied Mathematics	Approved and Notified vide Notification No. IIT Mandi/Acad/Senate/2023/245-247 dated 13-04-2023

Item No. 39.3: **To consider the proposal of BS credit structure.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Prof. Pradeep Parameswaran, Chair SCS, presented a proposal of BS credit structure in Chemical Sciences. After discussions, the BoA recommended the proposal to the Senate for consideration and approval.

Division	Sub-Division	BS Credit	BS-MS Credit
Institute Core Courses (IC)	IC Compulsory	As per the institute's 1st year B.Tech. Curriculum with courses from IC/HSS/Management baskets as per the requirements of a specific BS program	
	IC Basket		
	Humanities and Management		
	IKSHMA		
Discipline Courses*	Discipline Core	Min. 50	Min. 50
	Discipline Electives (DE)	Min. 12	Min. 18
Free Electives and Research Projects	Free Electives (FE)	Min. 12	Min. 12
	Research Communications and Projects/DE	Min. 12	Min. 38
Total Credit		**160-163**	**192-201**

Item No. 39.4: **To consider the proposal of B.Tech. in General Engineering branch.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Satvasheel Powar, presented a revised proposal to start a new branch in B.Tech. in General Engineering. After discussions, the BoA recommended the proposal, as placed at **Annexure – A; Page No. 22 to 27** to the Senate for consideration and approval.

Item No. 39.5: **To consider the proposal of five years Integrated MBA programme.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Manoj Thakur, Chair SoM, presented the proposal of five years Integrated MBA programme. After discussions, the BoA recommended the proposal, as placed at **Annexure - B; Page No. 28 to 45** to the Senate for consideration and approval.

Item No. 39.6: **To consider the guidelines for eligibility of Ph.D. programme and its scholarship.**

Dr. Amit Jaiswal, Associate Dean (Research), will present the proposal of guidelines for eligibility of Ph.D. programme and its scholarship, for consideration of the Senate.

Item No. 39.7: **To consider the proposal of committee on guidelines of B.Tech. (Honours) in UG Programme.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Shyam K Masakapalli, Committee Chair, presented the proposal on modified guidelines of B.Tech. (Honours) in UG programmes. After discussions, the BoA recommended the proposal, as placed at **Annexure - C; Page No. 46 to 47** to the Senate for consideration and approval.

Item No. 39.8: **To consider the proposal of attendance criteria in classes.**

Dr. P Anil Kishan, Associate Dean (Courses), will present the proposal of attendance criteria in classses, for consideration of the Senate.

Item No. 39.9: **To consider the proposal of Thesis credit structure for M.Tech.(R) programme.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Sandip Saha, Committee Chair, presented the proposal of thesis credit structure for M.Tech. (R) programme. After discussions, the BoA recommended the proposal, as placed at **Annexure-D; Page No. 48 to 50** to the Senate for consideration and approval.

Item No. 39.10: **To consider the proposal to establish a new centre Human-Computer Interaction (HCI) at IIT Mandi.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Varun Dutt, presented a proposal to establish a new centre Human-Computer Interaction (HCI) at IIT Mandi. After discussions, the BoA recommended the proposal, as placed at **Annexure – E; Page No. 51 to 57** to the Senate for consideration and approval.

Item No. 39.11: **To consider the proposal of revision of Comprehensive Examination in Ph.D. programme.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Shyamasree Dasgupta, Chair SHSS, presented the proposal of revision of Comprehensive Examination in Ph.D programme. After discussions, the BoA recommended the proposal, as placed at **Annexure – F; Page No. 58 to 59** to the Senate for consideration and approval.

Item No. 39.12: **To consider the proposal of revision in Early Induction of M.Tech.(Rsh)/Ph.D. programme for Young Researchers.**

Dr. Amit Jaiswal, Associate Dean (Research), will present the proposal of revision in Early Induction of M.Tech. (Research)/Ph.D. programmes for Young Researchers, for consideration of the Senate.

Item No. 39.13: **To consider the proposal of minor revision in B.Tech. Ordinances and Regulations.**

Dr. P Anil Kishan, Associate Dean (Courses), will present the proposal of minor revision in B.Tech. Ordinances and Regulations, for consideration of the Senate.

Item No. 39.14: **To consider the proposal of B.Tech. in Maths and Computing branch.**

In the 49th meeting of the Board of Academics held on 28th March, 2023, Dr. Muslim Malik, Chair SMSS, presented a revised proposal to start a new branch i.e. B.Tech. in Maths and Computing. After discussions, the BoA recommended the proposal, as placed at **Annexure – G; Page No. 60 to 67** to the Senate for consideration and approval.

Item No. 39.15: **Any other agenda item with the permission of the Chairman, Senate.**

Item No. 39.16: **To report decisions/action taken by the Chairman, Senate:**

(i) **To report conversion of five years B.Tech.-M.Tech. Integrated Dual Degree in Bio-Engineering to B.Tech. four years**: Chair SBB, proposed in 49th BoA meeting held on 28th March, 2023 regarding conversion of five-year B.Tech.-M.Tech. Integrated Dual Degree in Bio-Engineering programme to B.Tech. in Bio-Engineering four-year programme. (***Approved on 15-04-2023 and Notified vide Notification No. IITMandi/Acad/Senate/2023/248-251 dated 17-04-2023***)

(ii) **To report the execution of Minor/specialization in B.Tech. programme:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the guidelines for execution of Minor/specialization in B.Tech. programme. (***Approved on 28-03-***

2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/254-58 dated 17-04-2023)

(iii) **To report guidelines regarding selection of Discipline Elective courses and its execution:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the guidelines for selection of Discipline Elective courses and its execution. (***Approved on 28-03-2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/259-63 dated 17-04-2023***)

(iv) **To report curriculum revision of B.Tech.-M.Tech. integrated Dual Degree in Bio-Engineering:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the revised curriculum of B.Tech.-M.Tech. Integrated Dual Degree in Bio-Engineering. (***Approved on 28-03-2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/264-68 dated 17-04-2023***)

(v) **To report modification in ISTP, MTP, Outside Electives, Free Electives etc. in UG and PG programmes:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the proposal of modification in ISTP, MTP, Outside Electives, Free Electives etc. in UG and PG programmes. (***Approved on 28-03-2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/269-73 dated 17-04-2023***)

(vi) **To report the modification in the B.Tech. 2019 (Electrical Engineering) branch students to consider the listed courses as DE:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the modified list of DE courses for B.Tech. 2019 (EE) branch students. (***Approved on 28-03-2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/274-77 dated 17-04-2023***)

(vii) **To report dissolution of CPC:** In the 49th meeting of the BoA held on 28th March, 2023, the BoA approved the proposal to dissolve the CPC. Current CPC chair will complete the CPC process of the pending courses, before the new course proposal process starts. (***Approved on 28-03-2023 and Notified vide Notification No. IIT Mandi/Acad/BoA/2023/340-44 dated 19-04-2023)***

(viii) **To report the MoU:** signed between Indian Institute of Technology Mandi and Sardar Vallabhbhai National Institute of Technology, Surat (SVNIT) for Joint Doctoral Degree Program (***Approved on 24-03-2023)***

(ix) **To report One Time Approval for ISTP (DP-301P) course for 4th Year B.Tech. students:** On the request of Academic Secretary, ISTP course offered in the final semester for 4th B.Tech. students. (***Approved on 22-02-2023)***

(x) **To report rolling advertisement for Ph.D. Admissions:** On the recommendations of the Dean (Academics), advertisement for

Ph.D. admission should be made rolling on quarterly basis throughout the year. (Date of Admission 1st August, 1st November, 1st February, 1st May) ***(Approved on 20-03-2023).***

(xi) To report regarding "On the Spot Admission Method": On the recommendations of the Dean (Academics), to attract the students from other Institutes through "On the Spot Admission" process for M.Tech. (Rsh)/Ph.D./Dual Degree programmes admission. ***(Approved on 28-03-2023)***

(xii) Withdrawal from the programme during *(22nd February, 2023 to 15th April, 2023)*:

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	T21151	Meghana Kushwaha	SBB	M.Tech.	09-08-2021	22-02-2023
2	A22005	Nancy Raghav	SHSS	MA	10-08-2022	22-02-2023
3	D21116	Saurabh Tiwari	SMME	Ph.D.	02-03-2022	23-02-2023
4	D22012	Mansi Ghunawat	SHSS	Ph.D.	10-08-2022	03-04-2023
5	D22113	Shweta Yadav	SHSS	Ph.D.	31-08-2022	03-04-2023
6	T21246	Priya Singh	SMME	M.Tech.	09-08-2021	03-04-2023
7	T22112	Anish Kumar Mondal	SCEE	M.Tech.	16-08-2022	03-04-2023
8	T22165	Sourajit Roy	SCEE	M.Tech.	16-08-2022	03-04-2023
9	T22105	Ajeet Kumar	SCEE	M.Tech.	10-08-2022	15-04-2023
10	D22124	Abhishek Kumar	SCENE	Ph.D.	30-01-2023	15-04-2023

(xiii) Withdrawal from the Upgradation option during *(14th February, 2023)*:

The following student resigned and requested for withdrawal from the upgradation option, which was recommended by her Faculty Advisor/School Chair. Consequently, Chairman, Senate approved her withdrawal from the Ph.D. programme with M.Tech. programme degree.

Sl. No	Roll No.	Student Name	School/ Branch	Program	Date of Joining	Date of Resignation Accepted
1	UD22002	Iram Parveen Shamim Ahmed Ansari	SBB	Ph.D.	16-09-2020	14-02-2023

(xiv) Permission for appearing in Comprehensive examination beyond two years in Ph.D. programme:

The following students requested for appearing in the comprehensive exam beyond two years in the programmes, which was recommended by their Guide/DC/School Chair. Consequently, Chairman, Senate approved their requests for appearing in the Comprehensive examination.

Sl. No.	Roll No.	Student Name	School/Branch
1	UD22008	Ekta Chaudhary	SCENE
2	ERPD1904	Ajay Kumar Sharma	SCEE

(xv) Provisional Certificate issued to M.S. / Ph.D. scholars (*approved during 1st February, 2023 – 3rd April, 2023*):

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

S. No	Roll No.	Student Name	Programme	School	Date of Joining	Provisional Certificate issued on
1	D18051	Nishant Verma	Ph.D.	SMME	01-02-2019	01-02-2023
2	S19016	Anoushka Banerjee	M.S.	SCEE	01-08-2019	01-02-2023
3	S19022	Shashank Uttarani	M.S.	SCEE	03-02-2020	07-03-2023

4	PTD1901	Amit Kumar	Ph.D.	SMME	01-08-2019	20-03-2023
5	D17006	Ahmed Raza	Ph.D.	SMME	03-08-2017	20-03-2023
6	D15048	Daood Saleem	Ph.D.	SCEE	01-02-2016	09-03-2023
7	D16073	Shounak Roy	Ph.D.	SBB	01-02-2017	07-03-2023
8	D16010	Kajal	Ph.D.	SCS	01-08-2016	28-03-2023
9	PTD1601	Pankaj	Ph.D.	SMSS	01-08-2016	28-03-2023
10	D16062	Ankita Sarkar	Ph.D.	SBB	01-02-2017	31-03-2023
11	D16036	Uttam Singh	Ph.D.	SHSS	29-08-2016	31-03-2023
12	D18015	Moolchand Sharma	Ph.D.	SMME	01-08-2018	31-03-2023
13	S19024	Anuj Kumar Rao	M.S.	SCEE	03-02-2020	03-04-2023
14	D17050	Yati Aggarwal	Ph.D.	SCENE	01-02-2018	03-04-2023

(xvi) Conversion from Regular Ph.D. Programme to Part Time Programme (*Approved during 14th February, 2023 – 2nd March, 2023*):

On the recommendations of the Guide, School Chair, AD (Research) and Dean (Academics), Chairman Senate has approved the conversion from regular Ph.D. to part-time Ph.D. programme of the given below student:

Sl. No	Roll No.	Student Name	School	Guide	Date of Joining	Date of Conversion
1	D17045	Kartik Sahoo	SMSS	Dr. Manoj Thakur	01-02-2018	14-02-2023
2	D16064	Trivender Kumar	SCS	Dr. Rik Rani Koner (Guide) Dr. Aditi Halder (Co-guide)	01-02-2017	02-03-2023

(xvii) To report the MCM/Institute Scholarship for B.Tech., M.Sc. and MA students for Academic Year 2021-22: *(Approved on 15-02-2023).*

B.Tech. 2018 batch students

Sl. No.	*Roll No.*	*Name*	*Branch*
1	B18006	ANIMESH CHOUDHARY	CE
2	B18036	VISHAL KUMAR	CE
3	B18039	YATIN KUMAWAT	CE
4	B18050	CHANDAN PRAKASH	CSE
5	B18058	INDERJEET	CSE
6	B18078	RAHUL ANAND	CSE
7	B18080	RAHUL SAINI	CSE
8	B18128	PRAKHAR UNIYAL	CSE
9	B18138	SAHIL GARG	CSE
10	B18002	AMAN KUMAR	EE
11	B18028	SWAPNIL ENGLA	EE
12	B18100	ADARSH RAJ	EE
13	B18106	ASHISH ANAND	EE
14	B18113	FINAVIA YASH	EE
15	B18117	KARAN SUNIL DOSHI	EE
16	B18139	SAKET LALLA	EE
17	B18159	ANKIT KARAN	EE
18	B18186	PRANJAL SONI	EE
19	B18195	SHUBRAH GUPTA	EE
20	B18156	ABHISHEK SINGH	ME
21	B18172	KARAN SINGH	ME
22	B18184	PRADYUMNA PRATAP SINGH	ME
23	B18198	VAIBHAV	ME
24	B18199	VANGARA KARTHIK KUMAR	ME
25	B18200	VISHESH	ME

B.Tech 2019 batch Students

Sl. No.	*Roll No.*	*Name*	*Branch*
1	B19005	BELLAMKONDA KRISHNASAI	BE
2	B19006	CHIRAG	BE
3	B19011	LAISHRAM PONGTHANGAMBA MEITEI	BE
4	B19012	LALIT NARAYAN MUDGAL	BE
5	B19018	SARTHAK GARG	BE
6	B19050	PAWAN KUMAR SAINI	CE
7	B19051	RAJESH FAGORIYA	CE
8	B19052	RUPESH KUMAR	CE

9	B19062	YASH AGGARWAL	CSE
10	B19066	AKKAPELLI HARSHITH	CSE
11	B19072	ANURAG CHAUHAN	CSE
12	B19083	GAURAV SAHITYA	CSE
13	B19104	RAHUL KUMAR	CSE
14	B19188	PRIYAM SETH	CSE
15	B19191	RAVI KUMAR	CSE
16	B19244	DEEPANSHU KUMAR GUPTA	CSE
17	B19128	AYUSH RAJ PATWA	DSE
18	B19129	DHEERAJ KUMAR	DSE
19	B19147	AKASH KARNATAK	DSE
20	B19023	ABHINAY AGRAWAL	EE
21	B19032	DEEPAK SHARMA	EE
22	B19163	HARSH	EE
23	B19175	NAVEEN KUMAR MAHESHWARI	EE
24	B19226	AAKASH SOLANKI	EE
25	B19231	ABHISHEK MISHRA	EE
26	B19236	ANKIT	EE
27	B19254	PRADEEP SINGH	EE
28	B19215	MD AKRAM KHAN	EP
29	B19220	SHAIK MOHAMMAD SHOEB	EP
30	B19251	KURUBA GOVARDHAN	ME

B.Tech 2020 batch Students

Sl. No.	*Roll No.*	*Name*	*Branch*
1	B20015	MD SUFI HUSSAIN	BE
2	B20031	ARYAN TYAGI	CE
3	B20040	DEEPAK GUPTA	CE
4	B20078	AKSHAT RAJ ANAND	CSE
5	B20090	BHARAT KUMAR	CSE
6	B20096	DIPESH SHARMA	CSE
7	B20113	LAVISH SACHDEVA	CSE
8	B20116	NIKHIL DHUMALE	CSE
9	B20123	RAJAT BANSAL	CSE
10	B20124	RAJEEV KUMAR	CSE
11	B20128	RUSTAM NARAYAN	CSE

12	B20131	SANJEET CHOUDHARY	CSE
13	B20135	SHIVAM MIDDHA	CSE
14	B20168	SHUBHAM SHUKLA	CSE
15	B20225	RAMAY MAHESHWARI	CSE
16	B20164	PRATEEK RAJ	DSE
17	B20171	VISION AGGARWAL	DSE
18	B20172	VIVEK JAISWAL	DSE
19	B20190	BHANU JINDAL	DSE
20	B20227	SAHIL SINGH RATHORE	DSE
21	B20239	VISHAL SHARMA	DSE
22	B20027	AKASH KUMAR	EE
23	B20028	ANAND VISHWAKARMA	EE
24	B20038	CHEPURI LALITHAMBICA	EE
25	B20058	PUNIT DAGA	EE
26	B20059	RAHUL YADAV	EE
27	B20180	AMIT	EE
28	B20186	ARYAN APTE	EE
29	B20191	DEEPAK KUMAR	EE
30	B20193	DHANANJAY KUMAR	EE
31	B20230	SHASHWAT SINGH	EE
32	B20238	VIKAS DANGI	EE
33	B20265	SAHIL KUMAR	EP
34	B20309	RACHIT GOEL	ME

B.Tech 2021 batch Students

Sl. No.	*Roll No.*	*Name*	*Branch*
1	B21023	SHASHANK DWIVEDI	BE
2	B21025	UTHAMKUMAR M	BE
3	B21036	AMAN KUMAR MOHANTY	CE
4	B21040	BHUMESH GAUR	CE
5	B21081	ADITYA RAJ	CSE
6	B21121	RONAK PRAKASH PAMNANI	CSE
7	B21125	SAHIL GUPTA	CSE
8	B21149	ALOK KUMAR	DSE
9	B21150	AMIT KUMAR	DSE
10	B21151	ANUJ SOLANKI	DSE
11	B21197	KUMAR KESHAV	EE

12	B21213	PURWANSH SAHU	EE
13	B21216	RAJIV	EE
14	B21217	RAM SINGHAL	EE
15	B21236	VIKASKUMAR RAMSURESH SINGH	EE
16	B21237	VINOD YADAV	EE
17	B21252	JIHAN ARORA	EP
18	B21271	AJAY CHOUDHARY	ME
19	B21285	BHARAT KUMAR PRAJAPAT	ME
20	B21297	JYOTISHMAN GOGOI	ME
21	B21298	KANARAM	ME
22	B21301	KUMAR LOVE	ME
23	B21317	RAVI H M	ME

For M.Sc. 2020 batch Students

Sl. No.	*Roll No.*	*Name*	*Branch*
1	V20071	VIKAS RAJPAL	AM
2	V20076	RESHMA	AM
3	V20049	PAYAL SHARMA	AM
4	V20044	ADARSH SUBHASH NARENDULWAR	AM
5	V20075	AJAY	AM
6	V20065	MAHESH KUMAR SHESHMA	AM
7	V20063	HEMANT KUMAR	AM
8	V20067	DEEPAK SAHU	AM
9	V20058	THACKER SONIYA LAXMIDAS	AM
10	V20007	AJAY KUMAR	Chemistry
11	V20011	SAMIKSHA	Chemistry
12	V20012	AMAN YADAV	Chemistry
13	V20015	AMIT KUMAR NAYAK	Chemistry
14	V20084	SUSHIL	Physics
15	V20086	ANJALI	Physics
16	V20087	SHUBHANSHU KAROLIYA	Physics
17	V20091	SANDHYA A K	Physics
18	V20094	AFRA NAVAS	Physics
19	V20106	SAHIL KUMAR	Physics
20	V20108	VINOD KUMAR	Physics

For M.Sc. 2021 batch Students

Sl. No.	Roll No.	Name	Branch
1	V21004	SANYAM CHHETRI	Chemistry
2	V21018	ARUN KUMAR	Chemistry
3	V21019	BRIJESH PATEL	Chemistry
4	V21036	ASHISH KUMAR	Chemistry
5	V21047	PIYUSH SHARMA	Chemistry
6	V21055	MOHIT KUMAR JAIN	AM
7	V21057	HANUMAN SHUKLA	AM
8	V21060	SHUBHAM GARG	AM
9	V21063	KARTIK	AM
10	V21064	VIKRAM	AM
11	V21081	MITHLESH SAINI	AM
12	V21084	PANKAJ HEMNANI	AM
13	V21085	ANCHAL JANGIR	AM
14	V21086	ADITYA CHOUDHARY	AM
15	V21089	RAHEES	AM
16	V21093	AYUSH DWIVEDI	AM
17	V21094	MOHIT	AM
18	V21106	BANSHI LAL	Physics
19	V21118	ARPAN GUPTA	Physics
20	V21122	AMAN	Physics
21	V21124	SAGAR GAUR	Physics
22	V21130	MUSKAN YADAV	Physics
23	V21131	TANU SONI	Physics

For M.A. 2021 batch Students

Sl. No.	Roll No.	Name	Branch
1	A21005	LALITA WALDIA	MA-DS
2	A21016	MITHUNA P M	MA-DS

(xviii) Provisionally admitted students for AY 2022-23:

The following students were admitted provisionally in the Academic Year 2022-23 (Even Semester). Their admission is PROVISIONAL subject to fulfillment and verification of all the Academic and Non-academic requirement. Student must comply with the Eligibility and shortlisting criteria as per the advertisement, failure to meet eligibility and/or other criteria and/or furnishing any false information/documents will lead to suo-moto cancellation of their admission.

(a) Provisionally admitted students in M.Tech. (by Research):

Sl.No.	Roll No.	Name	School
1	S22040	VIKAS KUMAR	SCENE
2	S22041	ANKITA JOSHI	SCEE
3	S22042	ANOUSHKRIT GOEL	SCEE
4	S22043	SURAJ KUMAR	SCEE
5	S22044	RAJMIN ASHISH NAVINBHAI	SCEE
6	S22045	DHARMENDER	SCEE
7	S22047	PUNIT RAJENDRAKUMAR BHALLA	IKSMHA
8	S22048	ROHIT KUMAR ROY	IKSMHA
9	S22049	AKHILESH KUMAR SINGH	CAIR
10	S22050	BISWARUP BISWAS	CAIR
11	S22051	MAHA VISHNU	SCEE
12	S22052	AMIT KUMAR JANGID	SCEE
13	S22053	DARSHANKUMAR JEEVANMAL PRAJAPATI	CAIR
14	S22054	PIYALI DUTTA	CAIR
15	S22055	JOHN ANTHONY REBEIRO	CAIR
16	PTS2201	CHETAN SHARMA	CAIR

(b) **Provisionally admitted students in Ph.D. Programme**:

Sl.No	Roll No.	Name	School
1	D22119	NISHANT TIWARI	SCENE
2	D22120	NAVULURI JAYASRI	SCENE
3	D22121	ADIL NAZIR	SCENE
4	D22122	HIMANSHU SONI	SCENE
5	D22123	NIKHIL MAHAR	SCENE
6	D22124	ABHISHEK KUMAR	SCENE
7	D22125	AKSHAT	SCENE
8	D22126	AMIT PANDEY	SMME
9	D22127	ADITYA RANJAN	SMME
10	D22128	MANDEEP KAUR	SMME
11	D22129	RAHUL SARASWAT	SMME
12	D22130	RISHUBH GUPTA	SMME
13	D22131	PRAVEEN KUMAR	SMME
14	D22132	ROOPAM PANDEY	SMME
15	D22133	PRASUN KUMAR	SMME
16	D22134	ASHIS KUMAR MOHARANA	SMME
17	D22135	BUNE BETHSEBA LD	SHSS
18	D22136	ABHIRAMI PRASANTH	SHSS
19	D22137	VIVEK KUMAR	SHSS
20	D22138	RANU SHERPA	SHSS
21	D22139	DHRUBAJYOTI DEY	SMSS
22	D22140	VANDITA DUTT	SCEE

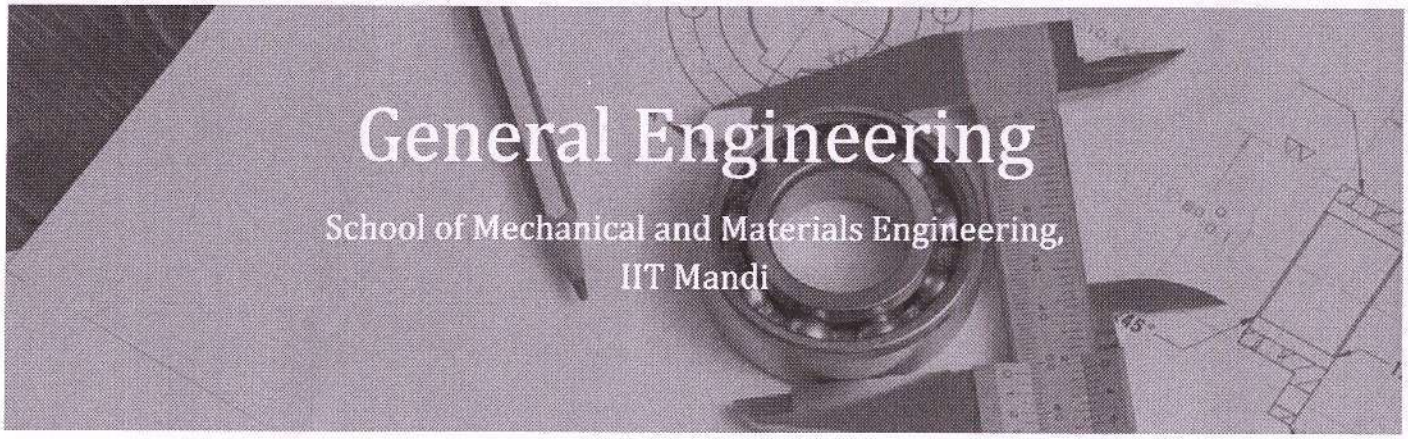
23	D22141	ANANDITA JAMWAL	SCEE
24	D22142	RAVI ANAND	SCEE
25	D22143	AMIT KUMAR	SCEE
26	D22144	NEERAJ SINGH BISHT	SCEE
27	D22145	A RUPESH KUMAR	SCEE
28	D22146	RAJAT KUMAR	SCEE
29	D22147	DIKSHA JAKHAR	SOM
30	D22148	YOGESH JOSHI	SCEE
31	D22149	ANITYA SHARMA	SCS
32	D22150	SAKSHI CHOUHAN	SCS
33	D22151	DEEPAK KUMAR	SCEE
34	D22152	JOHN TETE	SCS
35	D22154	DEEPIKA	SCS
36	D22155	AKANSHA VERMA	SPS
37	D22156	SAKSHI	SPS
38	D22157	SUJATA	SPS
39	D22158	PANKAJ KUMAR	SPS
40	D22160	KOUSHIK GAYEN	SPS
41	D22161	CHAITANYA BALASAHEB AUTI	SPS
42	D22162	DEEP SAGAR	SPS
43	D22163	PANDU SANTHOJU	IKSMHA
44	D22164	LOKESWARA KUMAR VIJANAPALLI	IKSMHA
45	D22165	DIVYANSH PANDEY	IKSMHA
46	D22166	SAKSHI CHAUHAN	IKSMHA
47	D22167	ANKUSH ARYA	IKSMHA
48	D22168	SAHIL SANKHYAN	IKSMHA
49	D22170	PIYUSH BHATT	SMME
50	D22171	EKESH CHANDRA	SCENE
51	D22172	SHAGUN SHARMA	SCENE
52	D22173	SHUBHAM KUMAR	SCENE
53	D22174	SYED BAKHTAWAR BILAL	SCENE
54	D22175	DEEKSHA KUMARI	SCENE
55	D22176	POOJA SHARMA	SCENE
56	D22177	ABHIMANYU KUMAR	SCENE
57	D22178	SUKH SAGAR SHUKLA	SCENE
58	D22179	AYUSHI JOLOTIA	SCEE
59	D22180	NANDANI SHARMA	SCEE
60	D22181	SHASHANK UTTRANI	SCEE
61	D22182	DINESH KUMAR	SCEE
62	D22183	NITISH KUMAR YADAV	SCEE
63	D22184	ABHISHEK KUMAR	SCEE
64	D22185	MANU PRAKASH MAURYA	SCEE
65	D22186	MAYANK ALARIA	SCEE
66	D22187	TANU YADAV	SHSS
67	D22188	SUPRIYA KUMARI	SHSS
68	D22189	SANTU SHIT	CAIR

69	D22190	DASGAONKAR YOGESH NAMDEO	CAIR
70	D22191	SANTOSH KUMAR	SCEE
71	D22192	NAMRATA NARAYAM	SCEE
72	D22194	DHARMENDRA SHARMA	CAIR
73	ERPD2201	PUSHAP DEEP SINGH	SCEE
74	PTD2205	JUHI KUSHWAHA	SCENE
75	PTD2206	ROHIT DASRAPURIA	IKSMHA
76	PTD2207	MANJU LATA	SBB
77	PTD2208	PARVEEN KUMAR	IKSMHA
78	PTD2209	UMA PALLAVI POTHU	IKSMHA
79	PTD2210	SHUBHRAJYOTI MOHAPATRA	SCEE

PART – 'B'

Item No. 39.17: Issues to be discussed by the Senate without Student Members being present.

-None-



Comments from last senate meeting

1. There should not be conventional UG specialization associated with this degree programme.
2. There should be inputs from the Industries and placement cell about the job prospectus
3. There should be a USP of the programme w.r.t existing similar program in other IITs.
4. The committee may explore specialization in the discipline of Liberal Art, photography, fashion design, filmmaking, product design, etc. In this regard collaboration with NIFT, CEPT etc. desirable where students can spend one year.
5. Committee may explore the execution of these specializations with sister institutions.

General Engineering

A general engineering programme is a interdisciplinary programme that gives students a foundation of theoretical and practical knowledge for a career in engineering. through active learning, an interdisciplinary approach, and collaboration with industry/academia for specialization.

Programme Structure

Course Type	Current credits	Proposed credits
IC course	39	39
Basket of IC course	6	6
HSS courses	12	12
IKS	3	3
Discipline Core	33	36
Discipline electives	33	
Free Electives	22	22
ISTP	4	4
MTP in specialization	8	8
Specialization courses + Internship		30
Total	**160**	**160**

General Engineering Programme Structure

- Students will complete the Institute core (compulsory for all branches) and General Engineering Discipline courses for the first two years, before selecting a specialization.
- During their third and final year of study, they will take courses related to their chosen specialization and free electives.
- The students will spend a year with a collaborating institute in their chosen field of specialization.

Institute Core Courses

Course Name
Calculus
Complex Variables and Vector Calculus
Linear Algebra
ODE & Integral Transforms
Internship
Engineering Graphics
Introduction to Python and Data Science
Probability and Statistics
Machine Learning
Design Practicum
Applied Electronics
Applied Electronics Lab
Physics Practicum
Environmental Science
Data Structures and Algorithms

General Engineering Discipline core courses

Course Name		Credits
Reverse Engineering (Mech)	0-0-2-1	1
Reverse Engineering	0-0-2-1	1
Electrical Systems Around Us	3-0-2-4	4
Materials Science for Engineers	3-0-0-3	3
Measurement and Instrumentation	2-0-2-3	3
Mathematical Foundations of Data Science	3-1-0-4	4
Artificial Intelligence	3-0-0-3	3
Engineering economics	3-0-0-3	3
Mechanics of Rigid Bodies	3-0-0-3	3
Thermodynamics	3-0-2-4	4
Essentials of Entrepreneurship	3-0-0-3	3
Communication Systems	3-0-2-4	4

B Tech in General Engineering (with Specialization in ABC) - Specialization options (Phase I)

Fashion:

- Fashion Management
- Fashion Technology
- Sustainable fashion/textile Design
- Fashion accessory Design
- Functional Fashion Design
- ERP for the Fashion industry

Design:

- Photography
- Graphic Design (UI/UX)

Nascent Engineering:

- Robotics and AI
- Advanced Manufacturing
- E-Mobility
- Energy Engineering

Innovation and Entrepreneurship

- Entrepreneurship
- Product Design
- Business management

For a specialization, student(s) must complete 36 credits in the specified field

B Tech in General Engineering (with Specialization in ABC) - Specialization options (Phase II)

Film:

- Film making
- Film and video communication
- Animation Film

Design

- Industrial Design

Administration:

- Political Science Engineering
- Economics

Nascent Engineering:

- Sustainability Engineering
- Quantum Engineering

Indian Knowledge System

- Liberal Arts
- Vedic studies

For a specialization, student(s) must complete 36 credits in the specified field

Collaborations for specializations

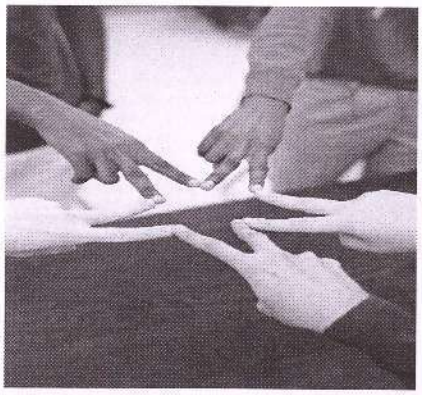
National Institute of Fashion Technology

- Fashion Management
- Fashion Technology
- Sustainable fashion/textile Design
- Photography
- Graphic Design (UI/UX)
- Fashion accessory Design
- Functional Fashion Design
- ERP for the Fashion industry

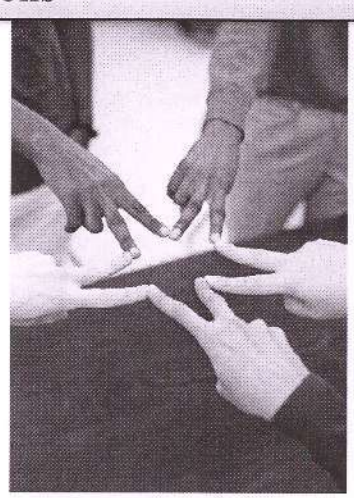
Dalarna University, Sweden

- Energy Engineering
- Economics
- Information Systems

DALARNA UNIVERSITY



Potential Collaborations for specializations



National Institute of Design (Ahmedabad, Gandhinagar, Bengaluru)

- Film and video communication
- Graphic Design
- Animation Film
- Photography
- Product Design
- Industrial design

Film and television Institute, Pune

- Sound recording and Television Engineering
- Electronic Cinematography
- Art Direction
- Screen Writing
- Screen acting

Specialization Courses for Energy Engineering

Course Name
Renewable Power Generation
Active Power Grids
Industrial Heating Technology
Energy Efficiency
Energy Systems
Scientific Methods
The Environmental Impact of Energy Systems
MTP

Specialization Courses for Advanced Manufacturing Engineering

Course Name
ME308 - Manufacturing Engineering
ME351 - Management of Manufacturing and Logistics Systems
ME515 - Carbon Materials and Technology
ME510 - Advanced Manufacturing Processes
ME2XX - PMT
ME524 - Additive Manufacturing
ME635 - Manufacturing for Energy Systems
ME509 - Nanomanufacturing
CAD for Additive Manufacturing
Process modelling in Additive Manufacturing
Design for Manufacturing and Assembly

Specialization courses for e- Mobility

Course Name
Power Electronics
Power Electronics Lab
Fundamentals of Electric Drives
Practicum on Electric Drives
Advanced Electric Drives
Practicum on Advanced Electrical Drives
Systems Design for Electric Vehicle
Embedded Systems and IoT for E-Transportation
Power Electronic Applications in Electric Transportation
Electrical Machine and Drives in Electric Transportation
Laboratory course on Power Electronics and Electrical Drives
Vehicle Design and Dynamics
Laboratory course on Vehicle Design and Control
Electrochemical Systems for Energy Engineering
Energy Storage Technologies
Laboratory course on Energy Storage Technologies
Modeling, Simulation and Control of HEV

Specialization courses for Product Design

Course Name
IC141 - PMT
ME308 - Manufacturing Engineering
ME523 – Product design
ME524 - Additive Manufacturing
Design thinking
User Experience & Interaction Design
Graphics Design, Animation & VFX
Introduction to Human Factors (Ergonomics & Anthropometry)
Marketing Research & Marketing
Intellectual property rights
Visualisation & Drawing Techniques
Introduction to Indian Craft Techniques

Specialization courses for Robotics and AI

Course Name
Robotics and control
Robot Kinematics, Dynamics and Control
Mobile Virtual Reality and Artificial Intelligence
Deep Learning and Applications
Advanced Topics in Deep Learning
Advanced Design Practicum
Data Mining for Decision Making
Introduction to Computer Vision
Digital Image Processing
Mechatronics
Robot Programming, Modeling and Simulation
Principles of Robot Autonomy
Deep Learning for Robotics

Courses for the other specializations are under discussion with collaborating Institutes

USP of the Programme

- Flexibility: Choice of a variety of specialization
- interdisciplinary
- Variety of career options
- Easier to keep up with evolving job market and new trends through specializations
- Compulsory year-long exchange program/internship
- It might fulfil the growing demand for interdisciplinary experts and/or specialists in nascent engineering fields

ANNEXURE-B

Programme Proposal Form

Name of the New Proposed Program: Integrated MBA Program

I. General Information:

Name (s) of prosper schools/centres: School of Management

II. Program Description:

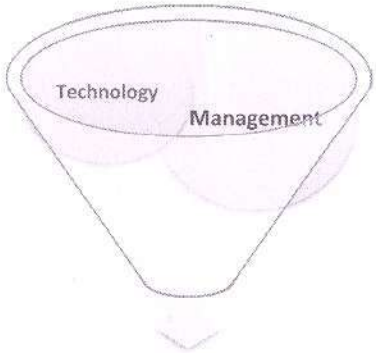
A. Provide a justification/rationale for the program. How does the program relate to the mission of the IIT Mandi?

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.



Integrated MBA Program

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, which was taken by more than nine lakh students in 2022. 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 Masters students of IIT Mandi by means of engaging academically (in some of the courses) 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:
❖ The proposed innovative curriculum is has several differentiating propositions: ❖ It offers a blend of management education with the application of data science & AI tools. ❖ The uniquely designed curriculum and innovative pedagogy enables cross functional thinking and problem-solving in students. ❖ 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. ❖ It offers experiential learning through hands on training, semester long industrial internship, and project work. ❖ 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	• Awareness of integrated MBA programs across the target segment is low. • Availability of dedicated faculty in relevant techno-management areas to deliver the relevant course content using experiential pedagogy. • The program will require periodical review of the latest developments in relevant fields to keep the curriculum updated, program execution relevant, and outcomes effective. • The school will need to create international visibility and interest in the proposed program to attract overseas. • The school will also need to establish collaborations with some of the international institutes to enable student exchange. •

proposition for the prospective applicant. This estimation is based on the fee structure of our ongoing MBA program.	
Opportunities: • IIT Mandi can have the first mover advantage among IITs in offering a Five-Year integrated MBA program. • A pre-existing and robust annual pipeline of nine lakh prospective students through JEE Mains Paper 1 (B.E. /B. Tech). • The program has the potential to receive international interest from industry and academia which will benefit academic research, teaching and collaboration for IIT Mandi. • IIT Mandi has a deep industry connection to keep the course content relevant, enable internship and create placements opportunities for the students.	**Threats:** • 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. • The first mover advantage may be short lived. The proposed program will face competition if other technical institutes also decide to enter this segment.

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 the courses related to the co-curricular activities, Arts, Music, Sports etc.
- The program offers multiple exit options to the students – BBA and BBA (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 programme

The program has a total of 190 credits across five years. The program will provide exit options to the student as follows:

- After successful completion of 3rd year, a student will be given a Bachelor of Business Administration (BBA) degree.
- After successful completion of 4th year, a student will be given a Bachelor of Business Administration (BBA) Honors degree.
- The students completing the 5 year program will be given Integrated MBA (DS & AI) degree.

The credit breakdown across the years is as follows:

a) The program has 128 credits in the first three years which are divided into discipline core and elective courses. The details are as follows:

Division	Sub division	Credits
Discipline Core	Management	115
	Economics	
	Indian Knowledge System	
	Data Science	
	Personality Development	
	Language	
	Social Sciences	
	Science and Engineering	
Discipline Electives	Elective Courses	14

b) The credits structure for the fourth years of the program is as follows:

Division	Credits
Industry Internship*	12
Discipline Core**	20

***See the courses offered in Semester 2 of MBA (DS & AI) program*

*Industry internship After successful completion of the first three years program (minimum CGPA 6.0 on 10 points scale). After this, the students of the integrated MBA program would be going for a sixth month long industrial internship any time during June to January. These students will use Semester VII to complete their extended industry internship which is a unique proposition of the proposed program. The students will get 12 credits for the internship.

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	18
Electives	12

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.

F. List of proposed Courses

The following are the details of courses for the first three years of the program

List of Core Courses

Core Courses	Credits
Differential Calculus	2
Introduction to Management	3
Python Programming	4
Introduction to Natural Science 1	2
Introduction to Indian Knowledge System	3
Introduction to Accounting	3
Basic Business Communication	3
Sports/Yoga/Physical Training	1
Integral Calculus	2
History of Indian Business	3
Linear Algebra	3
Micro-Economics	3
Basics of Psychology	3
Introduction to Data Structure for Business Application	3
Advanced Business Communication	3
Indian Art forms 1	1
Management Workshop 1	1
Business Statistics	3
Macro Economics	3

Philosophy and Management	3
Critical Thinking and Writing Skills	3
Mindfulness and Consciousness	3
Introduction to Natural Sciences 2	2
Introduction to Marketing	3
Sports/Yoga/Physical Training	1
Operations Research	3
Introduction to Databases	3
Foreign Language Level 1 (German/French etc)	3
Effective Public Speaking and Debating	3
Sustainable Business Practices	3
Spreadsheet Modelling	2
Management Accounting	3
Indian Art forms 2	1
Social immersion	0
Management Workshop 2	1
Web-Based Development	3
Business Research Methods	3
Management Lessons from Indian Knowledge System	3
Introduction to Engineering	2
Elective	6
Sports/Yoga/Physical Training	1
Game Theory	2
Capstone Project 1	1
Basic Econometrics	3
Decision Analysis	3
Elective	8
Ethics and Values	3
Management Workshop 3	1
Indian Art forms 3	1
Capstone Project 2	3

List of Elective Courses

Electives	Credits
Numerical Methods	3
Optimization	3
Multivariate Analysis	3
Time Series Analysis	3
Intellectual Property Rights	2
Indian Economy (Arthashastra)	2
Information System	2
International Trade	2
Money Banking and Finance	2

Cost Accounting	2
Business Regulatory Frameworks	2
Indian Financial System	2
Foreign Language level 2 (German/French etc)	3
Foreign Language level 3 (German/French etc)	3
Visual Analytics	2
R Programming	2
Entrepreneurial Practicum	6
Vedic Mathematics	2
Ancient Arts and Architecture	2
Cognitive Psychology and Indian Thought System	2
Sanskrit	2

Note: The above is not 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.

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. However, many of existing courses in their present form may not be suitable for Integrated MBA program and will need to be designed afresh keeping in mind program focus.

Secondly, 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:

- Hands-on computing and business simulations labs
- Business case studies
- Group discussions
- Management role-plays
- Course instructors from industry to bridge the gap between the academic training and industrial practices
- Projects

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.

a) Semester 1

Courses	Credits
Differential Calculus	2
Introduction to Management	3
Python Programming	4
Introduction to Natural Science 1	2
Introduction to Indian Knowledge System	3
Introduction to Accounting	3
Basic Business Communication	3
Sports/Yoga/Physical Training	1

b) Semester 2

Courses	Credits
Integral Calculus	2
History of Indian Business	3
Linear Algebra	3
Micro-Economics	3
Basics of Psychology	3
Introduction to Data Structure for Business Application	3
Advanced Business Communication	3
Indian Art forms 1	1
Management Workshop 1	1

c) Semester 3

Courses	Credits
Business Statistics	3
Macro Economics	3
Philosophy and Management	3
Critical Thinking and Writing Skills	3
Mindfulness and Consciousness	3
Introduction to Natural Sciences 2	2
Introduction to Marketing	3
Sports/Yoga/Physical Training	1

d) Semester 4

Courses	Credits
Operations Research	3
Introduction to Databases	3
Foreign Language Level 1 (German/French etc.)	3
Effective Public Speaking and Debating	3
Sustainable Business Practices	3
Spreadsheet Modelling	2
Management Accounting	3
Indian Art forms 2	1
Social immersion	0
Management Workshop 2	1

e) Semester 5

Courses	Credits
Web-Based Development	3
Business Research Methods	3
Management Lessons from Indian Knowledge System	3
Introduction to Engineering	2
Elective	6
Sports/Yoga/Physical Training	1
Game Theory	2
Capstone Project 1	1

f) Semester 6

Courses	Credits
Basic Econometrics	3
Decision Analysis	3
Elective	8
Ethics and Values	3
Management Workshop 3	1
Indian Art forms 3	1
Capstone Project 2	3

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.

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 established, and faculty recruitment is under process. Apart from existing faculty members, a number of faculty in the relevant areas would be recruited in SoM to teach the courses.

In case of interdisciplinary program, mention governances and execution mechanism of the programme:

Not applicable.

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 3rd year students. The internship will provide the students an exposure to real business world and help relate better to the management courses in 4th and 5th 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 for faculty involve in developing this proposal.**
  1. Dr. Ashish Bollimbala
  2. Dr. Saumya Dixit
  3. Dr. Puran Singh
  4. Prof. Manoj Thakur

- **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. A K Swain
  2. Prof. G Shridhar
  3. Prof. B K Mohanty
  4. Prof. M. Venkateswarlu

- **Proposers faculty name and their signatures:**

Name of Faculty members	**Signatures**
Dr. Ashish Bollimbala	
Dr. Saumya Dixit	
Dr. Puran Singh	
Prof. Manoj Thakur	

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.

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 Masters programme, distributed in 4 semesters. The credit requirement is 70. 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 (46 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 (8+4 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)** Programme.

Project and internship (12):

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	46
2	Discipline Electives	8
3	Free Electives	4
4	Project and Internship	12
Total		70

Sl. No.	Semester I	Break	Semester II	Break	Semester III	Break	Semester IV
1	Communication Skills for Managers	Qualitative Research (2 credits in Workshop mode) Social Immersion (0 credits)	Operations Management	Industry Internship (2 credits)	Legal Aspects of Business		Electives (6 – 10 credits)
2	Financial Statement Analysis		Fundamentals of Data and Analytics		Neural Networks fundamentals for Business		
3	Mathematical Foundations for DS/AI ML		Human Resource Management		Digital Business Strategy, Models and Transformations		
4	Creative Thinking, Problem Solving and Decision Making		Disruptive Technologies for Data Science		Entrepreneurship		
5	Marketing Management		Strategic Management		Electives (2 – 6 credits)		
6	Python Programming		Machine Learning for Business				
7	Decision Analysis		Introduction to AI and Automation				Management Project II (6 credits)
8	Probability and Statistics for Data Science/AI ML		Financial Management		Management Project I (4 credits)		
9	Managerial Economics		Organizational Behavior				
Credits	18	2	18	2	14-18		12 - 16
Summary	18 credits compulsory		18 credits compulsory		12 credits compulsory		6 credits compulsory
Total Credits earned	18	20	38	40	54-58		70

Following is the tentative list of the elective courses that may be revised time to time.

Discipline Elective Minimum 2 courses each in 3rd and 4th semester

Sl No	Course Title	Credits
1	AI in Marketing	2
2	Causal Analytics	2
3	AI for Finance	2
4	Fintech	2
5	Blockchain for Business	2
6	Deep Learning for Business Application	2
7	Natural Language Processing for Business	2
8	Intelligent Automation	2
9	Fuzzy logic for business decision making	2
10	Evolutionary computation for business solutions	2

Free Electives One course each in 3rd and 4th semester

Sl No	Course Title	Credits
1	Product Management	2
2	Design Thinking	2
3	Social Analytics	2
4	Cloud Computing for Business	2
5	Cyber Securities, Ethics and Privacy	2
6	Negotiation Analysis	2
7	Data Strategy	2
8	AI Strategy and Implementation	2
9	Leadership	2

ANNEXURE-C

Revision of B.Tech. Honors guidelines in UG programme

Current B.Tech. Ordinance:

R.29 Eligibility for Award of the B.Tech. (Honours) Degree

- R.29.1 In addition to the general eligibility criteria mentioned for the award of regular B.Tech. degree under R.28, **a student must earn additional 12 credits** (over and above the required 160 credits for regular B.Tech. degree) relevant to her/his discipline as recommended by the Faculty Adviser to be eligible for B.Tech. (Honours) degree.
- R.29.2 Student **must do DP401P & DP402P: Major Technical Project and DP-301P: Interactive Socio-Technical Practicum (ISTP)** and obtain **a grade of 'B' or above** in these courses.
- R.29.3 Student should **not have received 'F' grade** throughout the B.Tech. program.
- R.29.4 Student should secure an **overall CGPA of 8.5** or more out of 172-174 credits.

IIT Mandi (New Proposal for BTech (Hons)/BS (Hons) ; 2023 passing branch onwards)

	Extra Credits	Extra Credits (% of BTech)	Min. CGPA	MTP Compulsory	Backlog	Additional Rules/Comments	Degree to be awarded
Current Policy	12	7.50%	8.5	MTP in own discipline with min. B grade	No F grade ever	ISTP Compulsory with min. B grade	BTech (Hons) in <Branch>

Proposed New Policy - 2 Modes of earning a BTech (Hons.)/BS (Hons.) degree:							
Mode A	With 12 extra credits in DE	7.50%	>=CGPA of 8 in 172 or more credits (160 Btech/BS + 12 extra credits for Hons)	MTP in own discipline	No F grade ever, (Hons. Will be terminated if F Grade)	ISTP NOT Compulsory	BTech (Hons) in <Branch>
Mode B	With 0 extra credits	0%	>=8.5 CGPA in 160 or more credits	MTP in own discipline	No F grade ever, (Hons. Will be terminated if F Grade)	ISTP NOT Compulsory	
Justification	2 options based on merit		Matches with few other IITs	Minimum Grade in MTP is by default C. Completion of MTP should be enough (like BHU, Hyd, Ropar)		ISTP is not discipline specific	Extra credits are taking from Discipline electives meriting a Hons in Branch

Recommendations for Eligibility for Award of the B.Tech. (Honours), B.S (Hons) Degree

- Students admitted to B.Tech./B.S. program can opt for Honours degree during the fourth or fifth semester if they did not earn any 'F' grade till fourth or fifth semester.
- B.Tech./B.S./B.Tech. Double Major students must do DP401P & DP402P: Major Technical Project in their own (parent) discipline. Since B.Tech. - M.Tech. IDD/B.S. - M.S. IDD students are required to do PGP, hence the requirement of 8 credits of MTP are waived off.
- Student should not have received an 'F' grade throughout the program.

- Students opting for Honours can register for additional courses from the Discipline Elective basket over and above the courses prescribed in their regular curriculum from the 5th semester onwards in consultation with the Faculty Adviser. Such students are permitted to register for more than 22 credits in a semester.

- **On fulfilling the above relevant requirements, student can obtain the Honours degree by satisfying either of the modes below**

    - Mode A : Have a CGPA of 8.5 or more out of the total credits completed

    - Mode B : Opt for an extra 12 Discipline Elective credits and have a CGPA of 8 or more out of the total credits completed (i.e 172 or more credits (160 BTech/BS + 12 extra credits for Hons.)

- **Honours degree would be awarded as follows -**

1. For B.Tech./B.S. students : B.Tech. (Honours) / B.S. (Honours) in <Branch>
2. For IDD students : B.Tech. (Honours) and M.Tech. / B.S. (Honours) and M.S.
3. For B.Tech. Double Major students :B.Tech. (Honours) in <Parent Branch> with Second Major in <Second Branch>

In order to promote research culture into UG students, the following is proposed.

1. Any journal original research article published/accepted in Q1 SCI journal will be considered equivalent to 12 credits and it can be awarded grade point 8 or above by the supervisor or Faculty Advisor (in case of no supervisor). School Chair can decide 12 credits is from discipline electives or Free electives (based on area of research)
2. Each Journal research article published/accepted in any other SCI journal (i.e Q2, Q3, or Q4) will be considered as equivalent to 3 credits Pass/Fail course.
3. B.Tech. Hons can also be awarded inline of Mode B as
4. CGPA of 8 or more out of the total credits completed (i.e 172 or more credits (160 BTech/BS + one Q1 SCI Journal Article)

<u>Guidelines for Journal articles and execution processes</u>

1. Q1 can be considered in any research domain. Journal should be either Q1 at the time of submission/acceptance/publication.
2. There is no prior registration required.
3. Article should be submitted and accepted during student registration in IIT Mandi.
4. Article should be published with IIT Mandi affiliation.
5. Student should be first author of the journal article.
6. In case of Q1 Journal, Supervisor can grade student 8 point or above based on students' contribution and quality of the research.
7. Q1 Journal will reflect on transcript as course code RI999 and course name is Research and Innovation 0-0-24-12
8. Any other journal will reflect on transcript as course code RI900 and course name is Research and Innovation 0-0-6-3 with PASS grade.
9. Only one Q1 Journal research article will be considered towards degree programme completion and Honours required.

ANNEXURE-D

Recommendations for Thesis credit Structure

The committee looked into the credit structure related to the research components of various institutes of national and international repute and compared it with the practice being followed by IIT Mandi. Following points were noted:

(i) Currently there are no credits assigned to the research component (thesis) required to fulfill the graduation requirements of the research-based programs [e.g., M.Tech. (Research) and Ph.D.] at IIT Mandi.

(ii) Due to the reason mentioned in Point (i), the students registered for those research-based programs are not required to register every semester for their research component (i.e., thesis).

(iii) Once a student, registered in a research-based program, completes her/his courses credits requirements, there is nothing to show on the transcript/grade report. This creates confusion regarding the registration status of the student and sometimes the continuity in the program is not properly documented in the transcript/grade report.

(iv) As the students of the research-based programs do not register the research component (i.e., thesis), their continuous evaluation is not recorded anywhere on the transcript in the present practice. Although the students submit annual progress reports through the doctoral committee/annual progress committee, the performance does not reflect on the transcript.

(v) There were instances when M.Tech. (Research) students faced difficulties proving the overall credit completion in comparison to the course-based M.Tech. programs while applying for jobs, higher studies etc. Their transcript shows only 16 (minimum including RM600-Research Methodology) credits as compared to 70 (minimum) for the regular M.Tech. students.

(vi) It was also noted that most of the IITs ask the Ph.D. students to register for their doctoral thesis every semester. However, the credit structure differs significantly (with or without any assigned credits to the thesis component).

The committee deliberated on the matter and presented a proposal in the BOA meeting. Following are the recommendations accepted by the BoA:

(i) No change in credit system or transcript is recommended for the Ph.D. program.

(ii) The students of M.Tech. (Research)/M.Sc. (Research)/MA (Research) programs need to complete 60 thesis credits to fulfill the requirement of the degree in addition to the prescribed course credits as applicable for individual programs.

(iii) The course name will be "M.Tech. Thesis" with code XX699P, for the M.Tech. (Research)/M.Sc. (Research)/MA (Research) programs where 'XX' represents the relevant school/center/discipline code. The thesis course will appear in the transcript every semester till a thesis is formally submitted.

(iv) The thesis course needs to be registered by the student every semester until the thesis submission and the supervisor needs to evaluate it as Satisfactory (P)/ Unsatisfactory (F) during grade submission.

(v) The course will be shown as 'IP' (in Progress) in the grade report of each semester with awarded performance grade P or F. The total credit for the thesis will be added only in the final grade report. Thesis credit will not be counted towards the grade points (i.e., SGPA/CGPA).

(vi) The supervisor's evaluation of the thesis credit at the end of every semester is in addition to the evaluation by the concerned APC as applicable.

(vii) If a student of M.Tech. (Research)/M.Sc. (Research)/MA (Research) programs receive 2 (two) 'F' grades during the entire program duration, s/he will be terminated.

(viii) If a student's performance is unsatisfactory on medical grounds, maternity leave, semester withdrawal etc., the student may take approval, through the APC, of the competent authority to drop the thesis credit from that semester.

(ix) Sample of the grade report is attached in Annexure-A for reference.

Annexure-A: Sample Grade Report

Indian Institute of Technology Mandi
(GRADE REPORT)

ROLL NO. : **S16XXX** PROGRAMME : **Master of Technology (by Research)**

NAME : **TEST STUDENT** SCHOOL : SCHOOL OF BIOSCIENCES & BIOENGINEERING

ACADEMIC YEAR/ SEMESTER	SUBJECT CODE	TITLE OF SUBJECT	CREDIT	GRADE OBTAINED	SGPA	CGPA
2016-17 (EVEN)	BY-505	NANOBIOTECHNOLOGY	3	O	9.33	9.33
	BY-514	ANALYTICAL BIOTECHNIQUES	3	A		
	BY-518	DIASE BIOLOGY	3	A		
	RM-600*	RESEARCH METHODOLOGY	1	P		
	BE-699P*	M.TECH. THESIS	60 (IP)	P		
2016-17 (ODD)	CY-554	SCIENCE AND TECHNLOGY OF NANO MATERIALS	3	A	9.00	9.20
	BY515	MOLECULAR BIOTECHNOLOGY	3	A		
	BE-699P*	M.TECH. THESIS	60 (IP)	F		
2017-18 (EVEN)	BE-699P*	M.TECH. THESIS	60 (IP)	P	0.00	9.20
2017-18 (ODD)	BE-699P*	M.TECH. THESIS	60 (IP)	P	0.00	9.20
2018-19 (EVEN)	BE-699P*	M.TECH. THESIS	60 (IP)	P	0.00	9.20
2018-19 (ODD)	BE-699P*	M.TECH. THESIS	60	P	0.00	9.20
TOTAL CREDITS EARNED & FINAL CGPA			**76**			**9.20**

NOTE:

I. ** This course is not considered for final SGPA/CGPA calculations.*

II. *Please see overleaf for details of Grading System and SGPA/CGPA calculations.*

RESULT: *The student has successfully completed all requirements for the award of Doctor of Philosophy Degree.*

Date: **08th March, 2023**

Prepared By: Checked By: **Deputy Registrar (Academics)**

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ANNEXURE-E

Proposal for a Human-Computer Interaction (HCI) Centre at IIT Mandi

Introduction

Allen Newell, Herbert A. Simon, and Alan J. Perlis documented a letter to the journal *Science* in 1967 entitled "What is Computer Science?" In this letter, these researchers **articulated that computer science, a novel discipline, should include an investigation of the phenomena surrounding computers, not just the theory and design of the computation devices themselves.** The **interdisciplinary field of Human-Computer Interaction (HCI) investigates this phenomenon surrounding computers.** HCI is a field of study that focuses on designing, developing, and evaluating computer systems and other interactive technologies that people use. It is an interdisciplinary field that combines concepts and methods from computer science, cognitive science, AI, design, engineering, and other related fields. HCI aims to create computer systems and other interactive technologies that are easy to use, efficient, and effective for human users. This includes designing user interfaces that are intuitive and user-friendly, developing input devices and interaction techniques that are appropriate for the user's needs, and evaluating the system's usability. The scope of HCI is broad, ranging from desktop and mobile applications to augmented and virtual reality environments and from social media platforms to medical devices and applications. HCI researchers and practitioners focus on various topics, such as user experience design, user interface design, usability testing, accessibility, AI, and cognitive science.

Given the importance of HCI as a discipline and the emerging technologies that interact with human users, **it is proposed to have a Human-Computer Interaction (HCI) Centre at IIT Mandi**. The HCI Centre would be a research centre that would significantly impact academia and industry by advancing research in the field of HCI, creating new technologies, and improving the user experience for a wide range of applications.

Most recently, IIT Mandi iHub and HCI Foundation (iHub), a section-8 company, was created by the Government of India on the IIT Mandi campus with a mission to make IIT Mandi a "go-to" place in India for technology development, skill development, translation, and commercialization in the HCI area. **While the iHub focuses on technology development, skill development, incubation of start-ups in HCI and collaborating with industry partners, technology translation, and commercialization in the HCI area, the HCI Centre at IIT Mandi would provide an academic and research environment that would focus on research and prototype development in the HCI area, graduate programs in the HCI areas, and collaborative research with industry via faculty in the HCI area.** Thus, the HCI Centre would actively collaborate with the iHub and **provide the academic and research foundation for several of the outward/industry adoption and societal activities executed by the iHub**. A few motivations for establishing an HCI Centre at IIT Mandi include

- **Interdisciplinary Collaboration:** HCI research requires a broad range of expertise, including computer science, cognitive science, psychology, design, AI, and engineering. An HCI Centre at IIT Mandi would encourage collaboration among researchers with different backgrounds and skill sets, leading to a more comprehensive understanding of the field and the development of industry-relevant innovative solutions.
- **Addressing Societal Challenges:** HCI can address real-world problems, such as accessibility, health, education, defense and security, environment, and sustainability. An HCI Centre at IIT Mandi could focus on creating technology solutions to address industry problems that would positively impact society and potentially improve the lives of people around the world.
- **Industry Partnerships:** An HCI Centre at IIT Mandi could establish partnerships with industry leaders, providing opportunities for students and researchers to work on real-world problems and gain experience applying HCI research to industry settings. Such partnerships (including those with the iHub) can also provide funding for research and help bring new technologies to market.
- **Education and Training:** An HCI Centre at IIT Mandi could provide educational opportunities at the Certificate, Master, and Ph.D. levels for students and professionals in the field of HCI. This would include degree programs that could help to build the next generation of HCI researchers and practitioners.

Overall, an HCI Centre at IIT Mandi could play a significant role in advancing the field of HCI, developing new technologies, and improving the user experience for a wide range of applications.

Objectives

The HCI Centre at IIT Mandi will have the following objectives:

Outcome-based Research: One of the primary objectives of the HCI Centre is to conduct outcome-based research in human-computer interaction that address societal needs. The Centre can undertake research projects to develop innovative technologies, user interfaces, and interaction techniques. The research can focus on cognitive technologies, brain-computer interfaces, cognitive enhancement, different modalities of smell, taste, and touch, virtual and augmented reality, social computing, machine learning, and intelligent user interfaces.

Train Students and Professionals: Another objective of the HCI Centre is to train the next generation of HCI researchers and practitioners. The Centre can offer Certificate, Master, and Ph.D. programs, specializations, training programs, and workshops to students and professionals in the field of HCI. The Centre can also provide opportunities for students to gain practical experience through internships, research projects, and industry collaborations.

Foster Collaborations: The HCI Centre will foster collaboration among researchers, academics, industry professionals, and other stakeholders. The Centre can host seminars, conferences, and workshops to bring together experts in the field of HCI and provide a platform for exchanging ideas and sharing knowledge. This can promote interdisciplinary collaboration, essential for solving complex problems in HCI.

Improve User Experience: The HCI Centre will work towards improving the user experience of interactive technologies. The Centre can conduct usability studies, user experience evaluations, and accessibility testing to identify and address issues that may hinder the usability and effectiveness of interactive systems.

Address Societal Challenges: The HCI Centre will address societal challenges by developing HCI solutions that positively impact society. The Centre can focus on accessibility, health, education, defense and security, environment, sustainability, etc., and develop technologies that can significantly impact people's lives.

Resource Generation: The HCI Centre will try to generate monetary resources via teaching, skill development, research, and leasing the bleeding-edge lab equipment and other facilities to become self-sustaining over time eventually.

Overall, the HCI Centre at IIT Mandi will have several objectives, including conducting research, and training students and professionals, fostering collaborations, improving user experience, addressing societal challenges, and resource generation. These activities of the HCI Centre are planned to be undertaken independently or in conjunction with the iHub in HCI.

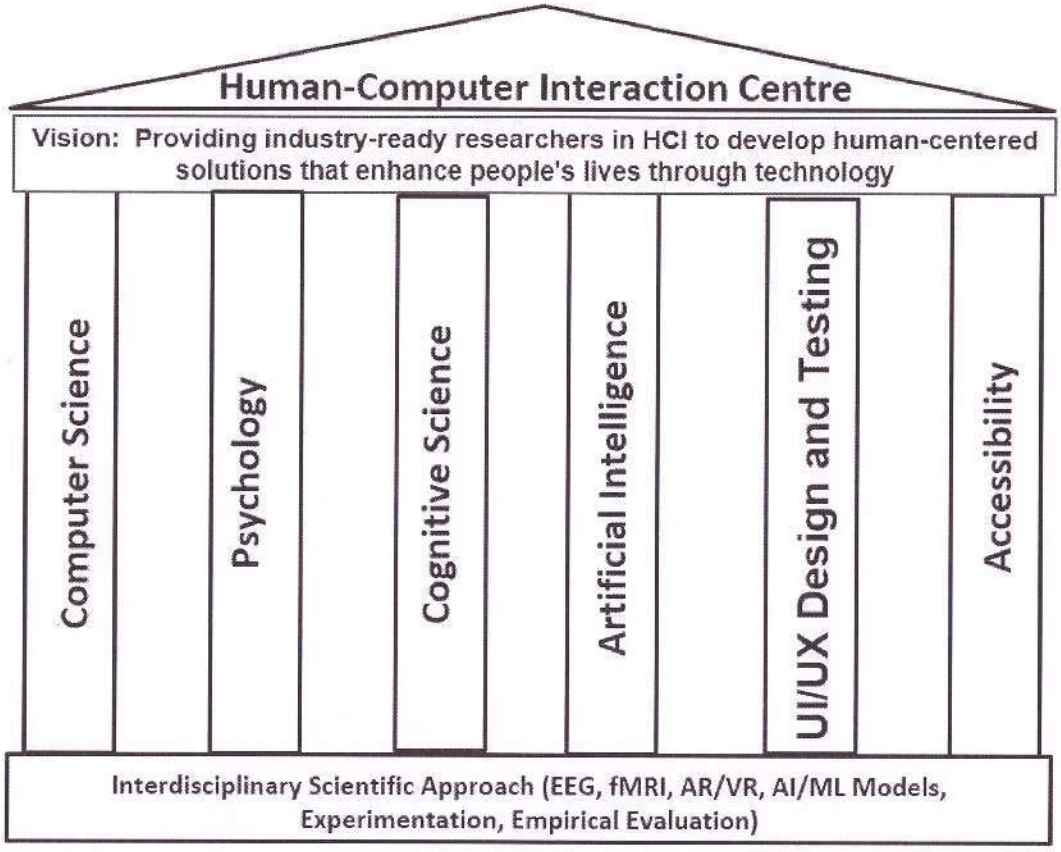

Figure 1. The HCI Centre at IIT Mandi is envisioned to provide industry-ready researchers in HCI to develop human-Centered solutions that enhance people's lives through technology. The pillars provide foundational areas where an interdisciplinary scientific approach is utilized for research.

As shown in Figure 1, the HCI Centre is envisioned to provide industry-ready researchers in HCI to develop human-centered solutions that enhance people's lives through technology. The research and teaching under the Centre would include the following HCI areas: computer science, human factors, psychology, cognitive science, neuroscience, artificial intelligence (AI), user experience design, user interface design, interaction techniques and input devices, accessibility, universal design, and virtual and augmented reality. The Centre's research would be grounded in interdisciplinary scientific methods and involve several methodologies from design, psychology, cognitive science, neuroscience, AI, and computer science.

Uniqueness

The proposed Centre will be unique because of the following:

1. It will be the first-of-its-kind Centre focused on the Himachali communities with its challenges due to geographical location.
2. It will be the first of its kind Centre at an IIT in India.
3. It will be the first of its kind Centre that brings interdisciplinary topics concerning HCI under a common umbrella.
4. It will be the first of its kind Centre that offers an interdisciplinary mix of faculty and programs in HCI.

Salient points

The HCI Centre at IIT Mandi has the following salient points:

1. **Interdisciplinary Focus:** IIT Mandi has a strong focus on interdisciplinary research and education, which can be leveraged to create a unique HCI Centre that brings together expertise from multiple fields. By integrating insights from computer science, psychology, design, engineering, and other disciplines, the centre can develop innovative approaches to human-computer interaction.
2. **Emphasis on Social Impact:** IIT Mandi is strongly committed to social impact, and the HCI Centre at the institute can reflect this emphasis by focusing on developing HCI solutions that positively impact society. By addressing societal challenges such as healthcare, education, accessibility, and sustainability, the centre can contribute to the well-being of people in the region and beyond.
3. **Regional Context:** IIT Mandi is located in the Himalayan region of India, which presents unique challenges and opportunities for HCI research and development. The HCI Centre at the institute can leverage the regional context to develop technologies tailored to the needs of people in the area while also addressing broader global challenges.

4. **Industry Collaboration:** IIT Mandi has established partnerships with industry leaders, which can be leveraged to create a unique HCI Centre closely connected to industry needs and trends. By collaborating with industry partners, the centre can ensure that its research and education are relevant to real-world problems and can have a practical impact.
5. **Entrepreneurship:** IIT Mandi strongly focuses on entrepreneurship, which can be leveraged to create a unique HCI Centre that fosters innovation and creativity. By providing opportunities for students and researchers to develop new technologies and start-up companies, the centre can contribute to the growth of the technology ecosystem in the region and beyond.

Overall, the HCI Centre at IIT Mandi can be unique by leveraging the institute's strengths in interdisciplinary research and education, social impact, regional context, industry collaboration, and entrepreneurship. By combining these factors, the centre can develop innovative approaches to human-computer interaction that positively impact society and the economy.

Research and Labs

The Centre would establish research labs like UI/UX and design lab, EEG/MEG lab, Neurostimulation lab, Eye-tracking lab, AR/VR and Motion lab, Psychology, data collection, AI/ML lab, and teaching labs. The Centre would also cater to several specializations and degree programs at the undergraduate and postgraduate levels, respectively. The undergraduate programs may include B. Tech. in Computer Science (with specializations in HCI). Furthermore, some of the postgraduate programs include M.Tech. programs in HCI/Cognitive Science/user-Centered design/AI and ML. Finally, the Centre would include a Ph.D. program in all HCI areas. The teaching programs would be supported via certain teaching labs.

Deliverables

The HCI Centre at IIT Mandi plans to deliver a variety of outputs and outcomes, depending on its goals and objectives. Here are some possible deliverables of such a Centre:

Research publications: The HCI Centre will conduct high-quality research in the field of human-computer interaction and publish their findings in top-tier conferences and journals. This can contribute to developing new knowledge and insights that can be applied to the design and development of interactive systems.

Design solutions: The HCI Centre will create design solutions that are tailored to specific user needs and contexts. This can include the development of prototypes, mockups, and user interfaces that can be tested and evaluated with real users to ensure their usability and effectiveness.

Education and training: The HCI Centre can offer courses, workshops, and training programs to students, professionals, and researchers in the field of human-computer interaction. This can help to build a skilled workforce that can design and develop interactive systems that are user-friendly, efficient, and effective.

Toolkits and frameworks: The HCI Centre can develop toolkits, frameworks, and libraries that designers and developers can use to create interactive systems more efficiently and effectively. This can include software libraries, design patterns, and other resources that can streamline the development process and improve the quality of the final product.

Consulting services: The HCI Centre can offer consulting services to industry partners and government agencies to help them design and develop interactive systems that are user-friendly and effective. This can include user research, design evaluation, and usability testing services that can provide valuable insights into user needs and preferences.

Start-up companies: The HCI Centre can encourage and support the creation of start-up companies focused on developing innovative solutions in the field of human-computer interaction. This can contribute to the growth of the technology ecosystem in the region and create new job opportunities for students and researchers.

Overall, the HCI Centre at IIT Mandi can deliver a range of outputs and outcomes that can contribute to developing high-quality research, innovative design solutions, a skilled workforce, and practical applications of human-computer interaction.

Academic and Industry Collaborations

Some of the Institutes in India and abroad that have expressed interest in collaborating with the HCI Centre include

1. IIT Mandi iHub and HCI Foundation
2. IIT Mandi Catalyst
3. IISc Bangalore
4. IIT Delhi
5. IIT Bombay
6. IIT Guwahati
7. INMAS, DRDO
8. AIIMS Bilaspur
9. PGIMER Chandigarh
10. Indian Airforce
11. Carnegie Mellon University, USA
12. The University of Texas, El Paso, USA
13. Unity 3D
14. Epic Games
15. Furhat Robotics
16. Rubiscape
17. Think Design
18. Naxon Labs

19. Neuphony
20. ITRA
21. Neuroleap
22. Icuro
23. Revenue Mantra

IIT Mandi Faculty Involved

Several faculty at IIT Mandi has expressed interest in participating in the HCI Centre. These include

Prof. Arnav Bhavsar
Prof. A D Dileep
Prof. Aditya Nigam
Prof. Satyajit Thakor
Prof. Shubhajit Roy Chowdhury
Prof. Gopi Shrikanth Reddy
Prof. Erwin Fuhrer
Prof. Dinesh Singh
Prof. Narendra Dhar
Prof. Radhe Shyam Sharma
Prof. Varun Dutt
Mr. Somjit Amrit, CEO, iHub
Postdocs, Faculty Fellows, and Research Staff at iHub

Other faculty, including newer faculty, will be invited from time-to-time to become a part of the proposed HCI Centre.

ANNEXURR-F

Revision in the guidelines of Comprehensive Examination for Ph.D. & I-Ph.D. research scholars at IIT Mandi

1. **The Committee observed that given the existing Comprehensive Examination guidelines, most of the schools followed the below mentioned procedure/practice:**

- Conduct Comprehensive Examination in two parts of written Examination (Part A and Part B), followed by a viva-voce.
- Part A of written Examination is designed to test the essential subject knowledge in the core discipline/core specialization, while Part B to test the depth of knowledge in the research area (especially few advanced topics) of the Ph.D.& I-Ph.D. research scholar.
- Part A often consisted of MCQ-type questions (however, not applicable for all Schools).
- Ph.D. & I-Ph.D. research scholars had to pass in both written as well as viva voce examination to pass/qualify the comprehensive examination.
- The performance in both written and oral examinations were expressed separately using categorical adjectives: Very Good, Good, Satisfactory and Not Satisfactory. These categorical attributes were derived from numeric values representing percentage of marks obtained in written and oral examinations.
- If a Ph.D. or I-Ph.D. research scholar passed/qualified the comprehensive examination with grade 'Satisfactory' or above, s/he is eligible to be converted from JRF to SRF after completion of 02 years (as per notification "Guidelines for JRF to SRF and issues related to monthly scholarship for M.Tech. (by Research)/M.Tech./I-Ph.D./Ph.D. Scholars" dated 16.11.2022).

2. **After deliberating on each of these existing points pertaining to the existing guidelines of comprehensive examination, the Committee observes and recommends the following:**

i. As pointed out in the existing guideline, Comprehensive examination is an integral part of the doctoral programme at IIT Mandi. It evaluates the academic preparedness of the Ph.D. & I-Ph.D. research scholars in terms breadth of their knowledge in their chosen discipline and ability to think independently of solutions for scientific, technical and social challenges in his/her area of research. The assessment provides feedback to the Ph.D. & I-Ph.D. research scholars that are useful for planning future courses of action in the research.

ii. The Comprehensive examination shall continue to be conducted once every semester for a group of Ph.D. & I-Ph.D. research scholars who opt to take the examination. The completion of 13 credit course work is mandatory in order to be eligible to qualify the comprehensive examination.

iii. The student have to be physically present in the campus to appear for every component of the comprehensive examination.

iv. A Ph.D. or I-Ph.D. research scholar is expected to successfully qualify the comprehensive examination within a year after his/her registration in the programme and in any case not later than two years after the registration in the programme [as per R.13 (d) of the Ordinances and Regulations for the Degree of Doctor of Philosophy at IIT Mandi].

v. The Chairperson of each School will constitute a Comprehensive Examination Committee (CEC) consisting of faculty members of the respective schools to conduct the comprehensive examination. Internal (from other schools at IIT Mandi) or external (outside IIT Mandi) experts may also be a part of CEC, depending on the requirement.

vi. The syllabi, dates, duration of the examination, etc., must be communicated to the research scholar at least 02 months before the examination date to enable the scholar to prepare for it adequately.

vii. The objective of the comprehensive examination is to test the broad subject knowledge in the disciplines and the in-depth knowledge in the area of research. Hence, overall, the syllabus of

the comprehensive examination should cover the breadth of the discipline, along with specific and advanced topics in the area of research. The relevant School and the CEC of the School may decide the scope of a 'discipline' and the syllabus. Likewise, the advanced topics related to the research area of a scholar and the syllabus on that may be decided by the CEC in consultation with respective supervisors.

viii. CEC of a School will set question papers for the comprehensive examinations (in consultation with the Ph.D. supervisors for the advanced research-related topics).

ix. The Comprehensive examination format may remain the same in terms of a written test and a viva voce examination; however, Part A and Part B of the written Examination may be merged. In addition, the CEC may decide the weightage for evaluating the discipline knowledge and in-depth knowledge in the research area.

x. MCQ is not considered a preferred mode of evaluation for advanced research-related topics in the written part of the examination.

xi. The doctoral Committee must be invited to the viva-voce examination.

xii. A Ph.D. or I-Ph.D. candidate must appear and pass the comprehensive examination in the School where s/he is registered.

xiii. A candidate must pass the written examination to appear for the viva-voce examination.

xiv. The performance in written and oral examinations may be expressed together using overall categorical attributes: 'Satisfactory' and 'Not- Satisfactory'. 'Satisfactory' would imply that the candidate has qualified/passed the comprehensive examination, while 'Not-Satisfactory' would imply that the candidate has not qualified/ has not passed the comprehensive examination. These categorical attributes may be derived from numeric values representing the percentage of marks obtained in written and oral examinations.

xv. If the scholar fails to clear the comprehensive examination even after a second attempt, their registration in the Ph.D. program at IIT Mandi will be terminated.

xvi. If a Ph.D. or I-Ph.D. research scholar qualified/passed the comprehensive examination, s/he is eligible to be converted from JRF to SRF after completion of 02 years (as per notification "Guidelines for JRF to SRF and issues related to a monthly scholarship for M.Tech. (by Research)/M.Tech./I-Ph.D./Ph.D. Scholars" dated 16.11.2022).

xvii. Any exception to the above procedures needs approval from the Chairman, Senate.

ANNEXURE-G

Proposal for B. Tech. in

Mathematics and Computing

School of Mathematical and Statistical Sciences (SMSS)

Indian Institute of Technology Mandi

Programme Proposal Form

Name of the New Proposed Program: B.Tech. in Mathematics and Computing (Four Years Undergraduate Program)

I. General Information:

Name (s) of prosper school: School of Mathematical and Statistical Sciences (SMSS)

II. Program Description:

A. Provide a justification/rationale for the program. How does the program relate to the mission of the IIT Mandi?

The Bachelor of Technology (B.Tech.) program in Mathematics and Computing is a comprehensive course that integrates the principles of mathematics and computing. This program is designed to equip students with a strong foundation in mathematics, computing, and computational thinking, enabling them to develop and apply analytical and problem-solving skills in a variety of fields in science and engineering. The aim of this program is two-fold, one to provide strong mathematical background for strong logical thinking, and other to prepare students for strong computing skills. The mathematics part will also give them strong foundation which enable them to be leader in the field. The program is design in such way that after important foundational courses, students can choose courses as per their interest in a particular domain.

The program aims to produce graduates who are well-versed in a broad range of mathematical and computational concepts, techniques, and tools. With the help of these skills, students can handle complex real-world problems. It will also enhance the ability of the students looking for solving new challenges in the society. With a focus on both theoretical and practical aspects of mathematics and computing, this program prepares students for a wide range of careers in industries, academia and research & development.

B. SWOT analysis of the program

The purpose of SWOT analysis is to see how B.Tech. in Mathematics and Computing can be implemented in the IIT Mandi's education system.

ADVANTAGES (Strengths-Opportunities)	DISADVANTAGES (Weakness – Threats)
This program is designed to equip students with a strong foundation in mathematics, computing, and computational thinking, enabling them to develop and apply analytical and problem-solving skills in a variety of fields in science and engineering.	Needs to recruit more faculty members in the core areas of Computational Mathematics and Scientific Computing.
The program aims to produce graduates who are well-versed in a broad range of mathematical and computational concepts, techniques, and tools, through which they can handle complex real-world problems. So, the	Dedicated teaching labs for providing hands on training to UG students in computational aspects of different engineering branches.

program is design in such way that after important foundational courses, students can choose courses as per their interest in a particular domain.	
With a focus on both theoretical and practical aspects of mathematics and computing, this program prepares students for a wide range of careers in industries, academia and research & development.	
Very good job market in the core areas of Scientific Computing and Numerical Computing and soft computing.	

C. Justification with respect to New National Education Policy (NEP) mandates

One of the major key points of the new national education policy (NEP) is transformational reforms in school and higher education systems in the country and also to foster interdisciplinary education, and learning by doing. In the proposed B.Tech. program, greater emphasis is given to connection between the fundamentals and analytical abilities, critical thinking, and real-life problem solving. The program is designed in such a way that students should get a strong foundation in mathematics, scientific computing, and computational thinking, which will enable them to develop and apply analytical and problem-solving skills in a variety of fields in science and engineering.

The proposed program aims to produce graduates who are well-versed in a broad range of mathematical and computational concepts, techniques, and tools. With the help of these skills, students can handle complex real-world problems. It will also enhance the ability of the students looking for solving new challenges in the society. With a focus on both theoretical and practical aspects of mathematics and computing, this program prepares students for a wide range of careers in industries, academia and research & development.

D. Provide a mission statement for the program. Include educational and learning objectives

The Bachelor of Technology in Mathematics and Computing program's mission is to prepare graduates who are well-versed in a broad range of mathematical and computational concepts, techniques, and tools, which can enable the students to solve complex real-world problems. With a focus on both theoretical and practical aspects of mathematics and computing, this program will prepare students for a wide range of careers in industries, academia and research & development.

The educational and learning objectives of the B.Tech. in Mathematics and Computing program are:

- Our graduates will be equipped with a strong foundation in mathematics, computing, and computational thinking, which will enable them to develop and apply analytical and problem-solving skills in a variety of fields in science and engineering.
- Our graduates will be trained to become world leaders in the field of scientific computing with strong fundamentals and analytical abilities, and critical thinking.
- With a focus on both theoretical and practical aspects of mathematics and computing, this program will prepare graduates for a wide range of careers in industries, academia and research & development.

E. Credit Structure of the program.

The typical credit structure of the institute will be followed as shown below.

Division	**Sub division**	**Credits**
Institute Core	IC Compulsory	39
	IC Baskets	06
	Humanities and Social Sciences (HSS)	12
	Indian Knowledge System (IKS)	03
Discipline	Discipline Core (DC)	52
	Discipline Electives (DE)	15
Electives	Free Electives (FE)	21
	Major Technical Project (MTP) Interactive Socio Technical Practicum (ISTP)	08 04
	TOTAL	**160**

The credit structure will be followed as per the existing norms of the institute. Out of 160 credits, 52 credits will be dedicated to discipline core courses and 15 credits will be assigned for discipline electives. Total of 67 credits will be maintained for discipline (i.e., DC (52 credits) and DE (19 credits)) courses while the rest of the credits will be kept for IC and other institute level courses (93 credits). The semester wise distributions of all the courses along with credits details are given below:

B.Tech. (Mathematics and Computing) –1st Semester

S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	ICXXX	Calculus	2	0	0	2
2	ICXXX	Complex variables and Vector Calculus	2	0	0	2
3	IC140	Engineering Graphics	2	0	3	4
4	IC152	Introduction to Python and Data Science	3	0	2	4
5	IC131	Understanding Biotechnology & its Applications (basket – 1)	3	0	0	3
6	IC241	Data Structure & Algorithms (basket-2)	3	0	0	3
7	YYXXX	IKSHMA Course	3	0	0	3
8	ICXXX	Data Structure & Algorithm Lab	0	0	2	1

Total Credits: 22

B.Tech. (Mathematics and Computing) –2nd Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	ICXXX	Linear Algebra	2	0	0	2
2	ICXXX	ODE & Integral Transforms	2	0	0	2
3	IC161	Applied Electronics	3	0	0	3
4	IC 161P	Applied Electronics Lab	0	0	3	2
5	IC252	Probability and Statistics	3	0	2	4
6	ICXXX	Foundations of Design Practicum	1	0	6	4
7	IC221P	Physics Practicum	0	0	3	2
8	HSXXX	HSS Course	3	0	0	3

Total Credits: 22

B.Tech. (Mathematics and Computing) –3rd Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	IC201P	Design Practicum	0	0	6	3
2	IC272	Machine Learning	2	0	2	3
3	MAXXX	Real and Complex Analysis	3	1	0	4
4	CS208	Mathematical Foundation of Computer Sciences	3	1	0	4
5	MA513	Ordinary Differential Equation	3	1	0	4
6	FE	Free Elective				3

Total Credits: 21

B.Tech. (Mathematics and Computing) – 4th Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	MA522	Partial Differential Equation	3	1	0	4
2	CS201	Computer Organization	3	0	0	3
3	CS201P	Computer Organization Laboratory	0	0	2	1
4	MA523	Numerical Analysis	3	1	0	4
5	MA515	Applied Mathematics Programming	3	1	0	4
6	HSXXX	HSS Course				3
7		Discipline Basket -I				3

Total Credits: 22

B.Tech. (Mathematics and Computing) – 5th Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	MAXXX	Matrix Computation & Lab	3	0	2	4
2		Formal Language and Automata Theory	3	0	0	3
3	CSXXX	Design of Algorithms	3	0	2	4
4	DE	Discipline Elective				3
5	MAXXX	Mathematical Modelling	3	0	0	3
6	HSSXXX	HSS or Management course				3
7	MAXXX	Reverse Engineering				1

Total Credits: 21

B.Tech. (Mathematics and Computing) – 6th Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1		Applied Databases Practicum				2
2		Discipline Basket-II	3	0	0	3
3	MA609	Numerics of PDE	3	0	0	3
4	FE	Free Elective	3	0	0	3
5	HSSXX	HSS or Management course				3
6	ISTP	ISTP				4
7	MAXXX	Applied Graph Theory	3			3

Total Credits: 21

B.Tech. (Mathematics and Computing) – 7th Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	DE	Discipline Elective				3
2	FE	Free Elective				3
3	FE	Free Elective				3
4	MTP-1	MTP-1				4
5	IC 010	Internship				2

Total Credits: 15

B.Tech. (Mathematics and Computing) –8th Semester						
S.No	Code	Course Name	Lecture	Tutorial	Practical	Credit
1	DE	Discipline Elective				3
2	FE	Free Elective				3
3	FE	Free Elective				3
4	FE	Free Elective				3
5	MTP-2	MTP-2				4

Total Credits: 16

Grand Total: 160 credits for B.Tech. Mathematics and Computing

Two discipline elective baskets are proposed for two discipline electives to give a flexibility to the students to choose their free electives in a particular direction.

Discipline electives Basket-I:

Course Numbers	Course Titles	Credits
MA549 (3)	Abstract Algebra	3
MA521 (4)	Functional analysis	4
MA528 (4)	Measure Theory	4
MA516 (4)	Topology	4
MA552 (3)	Number Theory	3

Discipline electives Basket-II:

Course Number	Course Titles	Credits
MAXXX	Climate Modelling	
MA653 (4)	Computational Financial Modelling & Lab	4
MAXXX	Modelling of infectious disease	
MAXXX	Mathematical Image Processing	
MAXXX	Mathematical Control Theory	
ME620 (3)	Modelling and Simulation	3
MA-705(3)	Modelling Population Dynamics	3

Students can take other discipline electives from the proposed list of the discipline electives. The list will be revised/modified time to time to include new discipline electives.

Discipline Electives: Discipline electives will be provided according to the requirement of the students and the availability of the faculties. The list of discipline electives are attached herewith. More elective courses will be added time to time as required.

Course Numbers	Course Titles	Credits
MA-550(3)	Statistical Data Analysis	3
MA-553(3)	Mathematical Foundations of Financial Engineering	3
MA-565(3)	Numerical Methods in Quantitative Finance	3
MA-605(3)	Statistical Data Analysis	3
MA-608(3)	Computational Fluid Dynamics	3
MA-654(3)	Financial Engineering	3
MA-656(3)	Stochastic Calculus for Financial Engineering	3
MA-665(3)	Semigroup of Bounded Linear Operators	3
MA-765 (3)	Topics in Semigroup Theory	3
MA-765(4)	Fractional Differential Equations	4
EE-510 (4)	Mathematical Method for Signal Processing	4
EE-511 (4)	Computer Vision	4
EE-608 (3)	Digital Image Processing	3
CS-580 (4)	Advanced Data Structure and Algorithms	4
CS-609 (3)	Speech Processing	3
CS-669 (3)	Pattern Recognition	3
CS-677 (3)	Soft Computing	3
CS-502 (3)	Compiler Design	3
CS-562 (3)	Artificial Intelligence	3
CS-XXX (4)	Computer Networks	4
CS- XXX (4)	Operating Systems	4
DS-XXX (3)	Time Series Analysis	3

Overall, the credits distribution is as follows:

Total- 160 Credits

Discipline Core- 52 Credits

Discipline Elective- 15 Credits (out of which 6 credits would be chosen from two baskets, i.e., baskets-I and baskets-II)

Free Electives- 21 Credits

Institute Core & other required courses: 72

Requirements:

Lab requirement: A Computer Lab with 30 computers for first year. Number will be increased with increasing student strength.

Class rooms requirement: Two dedicated class rooms with 30 student seating capacities.

Project Evaluation: As per institute rule. A continuous evaluation process will be followed to evaluate the project/thesis work progress to award letter grades for the credits assigned to project/thesis component, as mentioned in the institute's Ordinance for B.Tech. program.

Support Staff requirement: Minimum two staffs required; one non- technical staff for office work and one technical staff for the Computer Lab.

Current Faculty strength at SMSS:

Sl. No.	Name	Designation	Research Area
1	Prof. Syed Abbas	Professor	Differential Equation and Ecological Modelling
2	Prof. Rajendra Kr. Ray	Professor	Computational Fluid Dynamics & Numerical Methods for PDEs, Image Processing
3	Prof. Manoj Thakur	Professor	Optimization, Soft Computing, Machine Learning & its Application to Computational Finance
4	Dr. Muslim Malik	Associate Professor	Differential Equations and Mathematical Control Problems
5	Dr. Nitu Kumari	Associate Professor	Mathematical Modelling, Nonlinear Dynamics, Differential Equations
6	Dr. Sarita Azad	Associate Professor	Statistical Time Series Analysis
7	Dr. Qaiser Jahan	Assistant Professor	Harmonic and Wavelet Analysis
8	Dr. Samir Shukla	Assistant Professor	Applied Topology and Combinatorics
9	Dr. Sampat Kumar Sharma	Assistant Professor	Classical K-theory
10	Dr. Saswata Adhikari	Assistant Professor	Harmonic Analysis
11	Dr. Preeti	Assistant Professor	Operations Research
12	Dr. Amulya Kumar Mahto	Assistant Professor	Statistical Inferences