INDIAN INSTITUTE OF TECHNOLOGY MANDI

KAMAND, DISTT. MANDI – 175075

(HIMACHAL PRADESH)

MINUTES OF 60TH BOARD OF ACADEMICS MEETING

VENUE	:	GUEST HOUSE (NC)CONFERENCE ROOM + ONLINE
DATE	:	30th June, 2025 (MONDAY)
TIME	:	10:00 AM

Following members attended the meeting

1.	Dean Academics	Dr. Venkatesh H Chembrolu
2.	Associate Dean (Courses)	Dr. P Anil Kishan
3.	Associate Dean (Research)	Dr. Maheshreddy Gade
4.	Nominee-1: School of Civil and Environmental Engineering	Dr. Sandip Kumar Saha
5.	Nominee-2: School of Mechanical and Materials Engineering	Dr. Deepak Sachan
6.	Nominee-2: School of Chemical Sciences	Dr. Garima Agrawal
7.	Nominee-1: School of Biosciences and Bioengineering	Dr. Sumit Murab
8.	Nominee-2: School of Biosciences and Bioengineering	Dr. Kasturi Prasad
9.	Nominee-1: School of Physical Sciences	Dr. Arko Roy
10.	Nominee-2: School of Mathematical and Statistical Sciences	Dr. Syed Abbas
11.	Nominee-2: IKSHMA	Dr. Sumit Murab
12.	Nominee-1: School of Humanities & Social Sciences	Dr. Neethi Vadakkan Alexander
13.	Nominee-2: Centre of AI and Robotics	Dr. Jagadeesh
14.	Nominee-2: Centre of Human Computer Interaction (HCI)	Dr. Deepak Sachan
15.	Nominee-1: School of Management (SoM)	Dr. Puran Singh, MBA
16.	Nominee-2: School of Management(SoM)	Dr. Ashish Bollimbala, IMBA
17.	CnP Advisor	Dr. Kala Venkata Uday
18.	Deputy Registrar (Academics): Secretary	Mr. Suresh Rohilla
19.	Academic Affairs Secretary	Mr. Vishnu
20.	PG Academic Secretary	Ms. Anugraha
21.	Research Affairs Secretary	Mr. Santu Shit

Following members could not attend the meeting

Sl. No.		Name	
1.	Chairman Senate Library Committee	Prof. Anjan Kumar Swain	Member
2.	Nominee-1: School of Computing and Electrical Engineering	Dr. Samar	Member
3.	Nominee-2: School of Computing and Electrical Engineering	Dr. Gopi Shrikanth Reddy	Member
4.	Nominee-2: School of Civil and Environmental Engineering	Dr. Vivek Gupta	Member
5.	Nominee-1: School of Mechanical and Materials Engineering	Dr. Gaurav Bhutani	Member
6.	Nominee-1: School of Chemical Sciences	Dr. Bhaskar Mondal	Member
7.	Nominee-2: School of Physical Sciences	Dr. Harsh Soni	Member
8.	Nominee-1: School of Mathematical and Statistical Sciences	Dr. Rajendra K Ray	Member
9.	Nominee-1: IKSHMA	Prof. Aniruddha Chakraborty	Member
10.	Nominee-2: School of Humanities & Social Sciences	Dr. Ramna Thakur	Member

11.	Nominee-1: Centre of Human Computer Interaction (HCI)	Dr. Dinesh Singh	Member
12.	Nominee-1: Centre of AI and Robotics	Dr. Narendra Dhar	Member
13.	Industry Member – 1	Dr. Nadeem Akhtar	Member

Special Invitee

Sl. No.	Name	
1	Dr. Harshad Kulkarni	Asst. Prof., SCENE
2	Dr. Ekta Makhija	Asst. Prof., SBB
3	Dr. Prateek Vishnoi	Asst. Prof., SCEE
4	Dr. Amit Pawar	Assoc. Prof., SCS
5	Dr. Arnav Bhavsar	Prof. , SCEE
6	Dr. Kharerin Hungyo	Asst. Prof., SBB
7	Dr. Bindu Radhamany	Prof. , SPS

PART-A

(Issues discussed by the Board of Academics when the Student Members were present)

60.1 Confirmation of the minutes of 59th meeting of the Board of Academics:

The minutes of the 59th meeting of the Board of Academics held on 16th April, 2025 were confirmed.

60.2 To consider new courses from SCS:

Nominee from SCS presented the proposal for new courses from SCS. After due deliberations, the BoA approved the following courses and the same shall be reported to the Senate:

Sr. No.	Existing Course No.	Course Name	Credits	Remarks
1.	CY-545	Reagents in Organic Synthesis	-	CY-645 is discontinued
2.	DP-401P	Research Literature Presentation I	0-0-2-1	-
3.	DP-402P	Research Literature Presentation II	0-0-2-1	-

The approved proposal is placed as **Annexure – A**

60.3 To consider new courses from SMME:

Nominee, SMME presented the proposal for new courses from SMME. After due deliberations, the BoA approved the following courses and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Credits
1.	ME642	Computational modelling of granular flows	3-0-2-4

The modified proposal is placed as **Annexure – B.**

60.4 To consider new courses from SHSS:

Dr. Neethi, Nominee, SHSS presented the proposal for new courses from SHSS After due deliberations, the BoA approved the following courses with Minor revision and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Credits
1.	HS-557	Rural Development: Structures, Institutions and Processes	3-0-0-3
2	HS-558	Science Fiction	3-0-0-3
3	HS-559	Critical Theory and the Politics of Development	3-0-0-3

The modified proposal is placed as **Annexure – C.**

60.5 To consider Changes in the admission eligibility criteria for the MTech (R) and PhD Programs in Music & Musopathy:

Nominee from IKSMHA presented the proposal for Changes in the admission eligibility criteria for the MTech (R) and PhD Programs in Music & Musopathy. After Due deliberations the BoA recommended the proposal as follows for the consideration of Senate and its approval:

1) **Proposal for changes in the admission eligibility criteria for the MTech (R) / MS (R) and PhD programs**

For MS (R) Programme in Music & Musopathy:

The degree requirement for MS (R) to be a 3-year degree if the candidate has 2 years of professional experience.

For PhD Programme in Music & Musopathy:

Inclusion of Alankar and other equivalent ones (as a valid Master's degree) for PhD + Bachelor's degree (curated with expert opinion)

OR

AIR ranking (B grade or higher) + Bachelor's degree as an eligibility criteria for MS (R) or PhD, in case the candidate does not qualify for some of the other criteria

The professional experience in music, for the music and Musopathy programs, mentioned in required for the eligibility can include the following:

(A) Certification by an established organization for music education such as Acharyanet, Music Academy Madras, Swati Tirunal College of Music, Cleveland Tyagaraja Aradhana, Indian Fine Arts Academy, San Diego etc which have a track record of over 10 years themselves.
(B) One recommendation letter by other established music artists, including the candidate's music teachers.
(C) All India Radio/Doordarshan grading, as recognition from Govt of India.
(D) Letter / Certificate from Sangeet Natak Akademi / Kalakshetra / Gandharva Mahavidyalaya or other Central/State Govt recognised institution

2) Considering NRI candidates, relaxation of the 2-week (continuous residential) requirement, while maintaining the 16-week overall residential requirement (for part time).

60.6 To consider proposal for Change in course code for MBA Courses:

Dr. Puran Singh, Nominee from SoM presented the proposal for change in Course code of following Courses from SOM for the consideration of BoA. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate.:

Sr. No.	Old Course No.	New Course No.	Name of the Course	Credits
1.	MB-525	MB-536	Project Management	2
2	MB-581	MB-538	Management Insights from Indian Knowledge System	2

60.7 To consider new courses from SOM:

Dr. Puran Singh presented the proposal new courses from SoM for the consideration of the BoA. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Credits	Remarks
1.	MB-509	Introduction to Bhagavad Gita	2	The text-books for the approved course have been revised
2	MB535	Marketing Management II	2	-
3	MB536	Project Management	2	-
4	MB537	Business and Data Leadership	2	-

5	MB538	Management Insights from Indian Knowledge System	2	-
6	MB585	Supply Chain Analytics	2	-
7	MB586	Advertising and Brand Management	2	-
8	MB600	Research Methodology	1	-

The modified proposal is placed as **Annexure – D.**

60.8 To consider proposal for revision of Discipline Elective Course List of MBA:

Dr. Puran Singh presented the proposal for revision of Discipline Elective Course List of MBA. After due deliberations, the BoA approved the proposal as follows and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Credits	Remarks
1.	MB-562	Operations Management	2	The MB-562 is Core Courses for MBA programme students (Approved in 59th BoA). Therefore, the same is to be removed from Discipline Elective List from the approved curriculum.

60.9 To consider new courses from SOM for IMBA:

Dr. Ashish, Nominee from SOM, presented the proposal for following new courses for IMBA from for consideration of the BoA. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Credits
1.	MB203	Macroeconomics	3
2	MB205	Written and Verbal Communication	3
	MB206	Excel for Data Analysis	3
3	MB301	Problem Solving and Decision Making for Managers	3
4	MB302	Business Law	3
5	MB303	Financial Accounting	3
6	MB304	Ethics and Values	3
7	MB305	Business Communication	3

The course description is placed at **Annexure -E.**

60.10 To consider new courses from SCENE:

Nominee from SCENE, presented the proposal for the proposal for following new course from SCENE for consideration of BoA. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	LTPC	Remarks
1.	CE-565P	Experimental Techniques in Hydrology	0-0-4-2	New
2	CE566	Disaster-Resilient Mountain Road Engineering	2-1-0-3	New
3	CE 690P	Post Graduate Project -I	0-0-28-14	Starting with the 2024 batch, the course CE 690P will replace the existing CE 688P in the MTech Structural Engineering curriculum. The course

				content of CE 690P will remain the same as that of CE 688P.
4	CE 691P	Post Graduate Project -II	0-0-30-15	Starting with the 2024 batch, the course CE 691P will replace the existing CE 689P in the MTech Structural Engineering curriculum. The course content of CE 691P will remain the same as that of CE 689P.

The modified proposal is placed as **Annexure – F.**

60.11 To consider proposal for modification of courses from SPS:

Prof. Bindu Radhamany, presented the proposal for following new courses from SPS. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate:

Sr. No	Course No.	Name of the Course	Course No. changed to	Remarks
1.	IC 221	Foundations of Electrodynamics	EP321	It was originally an IC course and later changed to an EP course
2	EP 201	Reverse Engineering	-	New

The modified proposal is placed as **Annexure – G.**

60.12 To consider new courses from CAIR:

The agenda item was not presented by the proposer and dropped.

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60.13 To consider proposal for courses for Double major in CSE:

The agenda item was not presented by the proposer and dropped.

60.14 To consider proposal for IDD curriculum (with specialization) for 2019, 2020, 2021 & 2022 batches:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for IDD curriculum (with specialization) for 2019, 2020, 2021 & 2022 batches. After Due deliberations the BoA recommended the proposal for the consideration of Senate and its approval.

The modified proposal is placed as **Annexure – H.**

60.15 To consider proposal for curriculum for those who chose exit option from IDD to B.Tech. Bioengineering for 2022 Batch:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for curriculum for those who chose exit option from IDD to B.Tech. Bioengineering for 2022 Batch. After Due deliberations the BoA recommended the proposal for the consideration of Senate and its approval:

The modified proposal is placed as **Annexure – I.**

60.16 To consider proposal for modification in curriculum of B.Tech. Bioengineering 2023 batch:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for modification in curriculum of B.Tech. Bioengineering 2023 batch. After due deliberation BoA suggested that the proposal should be presented in upcoming BoA with more details.

60.17 To consider proposal for modification in curriculum of B.Tech. Bioengineering 2024 batch:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for modification in curriculum of B.Tech. Bioengineering 2024 batch. After due deliberation BoA suggested that the proposal should be presented in upcoming BoA with more details.

60.18 To consider proposal for curriculum for Double Major and Minor in Bioengineering:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for Double Major and Minor in Bioengineering. After due deliberation BoA suggested that the proposal should be presented in upcoming BoA with more details.

60.19 To consider new codes for courses from SBB:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for new codes for courses from SBB. After due deliberation BoA suggested that the proposal should be presented in upcoming BoA with more details.

60.20 To consider clarification in courses from SBB:

Dr. Ekta Makhija, Nominee from SBB presented the proposal for clarification in courses from SBB. After due deliberations, the BoA approved the following courses and the same shall be reported to the Senate:

Sr. No.	Course No.	Name of the Course	Remarks
1.	BY698	Post Graduate Project I	For M.Tech Students
2	BY699	Post Graduate Project II	
3	BE698	Post Graduate Project I	for IDD students
4	BE699	Post Graduate Project II	
3	BY517	Introduction to Proteomics	There are currently two courses in the system with same number. Old Course with name **Proteomics** is Discontinued

60.21 To consider proposal to issue Transcript with Specialization to MTech (Research Scholars):

The agenda was deferred.

Any other item with the permission of the Chair:

1. **To consider proposal for modification of courses from SMSS :**

   Prof. Manoj Thakur, presented the proposal for following new courses from SMSS. After due deliberations, the BoA approved the proposal and the same shall be reported to the Senate:

Sr. No	Course No.	Name of the Course	LTPC
1	MA-546	Introduction to Quantitative Finance	3-1-0-4

2. BoA deliberated and it was decided that alongwith course proposals a separate sheet giving Learning outcomes/motivation and expert comments with response also should be presented for deliberations of BoA for 06 Level and above courses. Opinion from at least one external expert will be mandatory. Further case of modification/changes of existing courses a table enumerating the details of changes and purpose/remarks should be presented for deliberations of BoA.

-NIL-

PART-B

(Issues discussed by the BoA without the Student Members being present)

-NIL-

The meeting ended with a vote of thanks to and by the Chair.

C. Venkatesh 07/10/25

Chairman, Board of Academics

Secretary, Board of Academics

IIT Mandi
Proposal for a New Course

Course number : **CY 545**
Course Name : **Reagents in Organic Synthesis**
Credit Distribution : *3-0-0-3*
Intended for : **BS/M.Sc. Chemistry and Ph.D. (any discipline)**
Prerequisite : Basic Knowledge in organic reactions and mechanism and Instructor's permission
Mutual Exclusion : None

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1. Preamble:

This course, **"Reagents in Organic Synthesis,"** is designed to provide BS, M.Sc. and Ph.D. students with a deep and systematic understanding of the reagents that drive organic transformations. Going beyond memorization, the course emphasizes **mechanistic insight**, **selectivity principles**, and the **strategic deployment** of reagents in synthesis planning. From classical redox reagents to modern transition-metal complexes, from functional group interconversions to asymmetric catalysis, this course integrates both foundational knowledge and cutting-edge developments. Ultimately, this course aspires to empower students not just to understand how reagents function, but to master how to select and apply them creatively in complex synthetic contexts.

2. Course Modules with quantitative lecture hours:

Module 1. Oxidation Reactions in Organic Synthesis (8 Hours)

Chromium-Based Oxidizing Reagents: Chromic acid (Jones reagent), PCC (Pyridinium chlorochromate), PDC (Pyridinium dichromate), Collins reagent: Preparation, oxidation of primary/secondary alcohols, Selectivity issues: overoxidation, functional group compatibility, Etard reaction

DMSO-Based Oxidizing Ragents: Moffatt Oxidation, Pfitzner–Moffatt oxidation, Parikh–Doering Oxidation, Albright–Goldman Oxidation, Swern Oxidation, Corey-Kim Oxidation, Kornblum oxidation

Oxidation using Organic Peroxide/Peracid: Baeyer-Villiger oxidation, Dakin reaction, Prilezhaev epoxidation, Dioxirane

Other Oxidizing agents: CAN, SeO_2, MnO_2, Fetizon's reagent, TPAP-NMO, IBX, and Dess-Martin periodinane,

Asymmetric Epoxidation and Dihydroxylation: Sharpless Asymmetric Epoxidation, Sharpless Asymmetric Dihydroxylation, Jacobsen-Katsuki Epoxidation, Shi epoxidation

Module 2. Reduction Reactions in Organic Synthesis (8 Hours)

Metal Hydrides: $LiAlH_4$, $NaBH_4$, $NaCNBH_3$, Red-Al, DIBAL-H, $Me_4NBH(OAc)_3$, Et_2BOMe-$NaBH_4$, $LiBH_4$, Luche's reagent, L and K-Selectrides, Superhydrides, BH_3

Single electron reduction: Reduction of aromatics: Birch reduction, mechanism and regioselectivity, Reduction of alkynes and enones

Organic reducing agents like Hantzsch esters and relate their mode of action to biomimetic oxidation and reduction by NADP/NADPH.

Asymmetric Reduction: Alpine borane, CBS

Module 3. Boron-Based Reagents in Organic Synthesis (6 Hours)

Introduction to boron chemistry, Hydroboration: mechanism and stereoselectivity, Hydroboration and oxidation, Carbonylation and Cyanidation, Asymmetric Allylation and Crotylation: Brown approach, Roush approach

Module 4. Palladium-Based Reagents in Organic Synthesis (6 Hours)

Palladium-Catalyzed C–C Bond Forming Reactions: Negishi coupling, Kumada coupling, Suzuki–Miyaura coupling, Stille Coupling, Hiyama coupling, Inter and Intramolecular Heck reactions, Sonogashira coupling, Buchwald–Hartwig amination, Pd-catalyzed carbonylation and cyanation, Tusji-Trost reaction

Palladium-Catalyzed Oxidation Reactions: Wacker oxidation, Saegusa-Ito oxidation

Module 5. Copper-Based Reagents in Organic Synthesis (4 Hours)

Introduction to copper chemistry, Reactions of organocopper reagents with unsaturated carbonyl compounds, acid chloride, epoxides, and vinyl halides

Copper-catalyzed cross-coupling reactions: Cadiot-Chodkiewicz coupling, Glaser coupling, Castro-Stephen's reaction, Ullman coupling, Chan-Lam coupling

Module 6. Phosphorus/Sulfur-Based Reagents in Organic Synthesis (5 Hours)

Name reactions involving Phosphorus Reagents: Staudinger reaction, Corey-Fuchs reaction, Appel reaction, Mitsunobu reaction

Phosphorus Ylides and the Wittig Reaction: Formation and stability of phosphorus ylides, Stabilized vs unstabilized ylides: product control (Z/E selectivity), Schlosser modification of the Wittig reaction

Sulfur Ylides or Sulfur based reagents: Julia olefination and modification, Corey-Chaykovsky Reaction

Module 7. Chiral Auxiliaries in Asymmetric Synthesis (5 Hours)

Introduction to aldol chemistry, Formation of E and Z-enolates, Diastereoselective aldol reaction: Zimmerman–Traxler transition state, Asymmetric aldol reactions using Evans auxiliary, Crimmins auxiliary. Asymmetric alkylation of carbonyl compounds: Evans auxiliary, SAMP/RAMP. Application of asymmetric-aldol reactions in the synthesis of complex natural products.

3. Textbooks:

1. Reagents for Organic Synthesis by Fieser & Fieser (Vols. I–XIV).
2. Strategic Applications of Named Reactions in Organic Synthesis by Kurti & Czako, Elsevier Academic Press, 1st Edition, 2005.
3 Modern Organic Synthesis: An Introduction by Zweifel, Nantz, and Somfai, Wiley, 2nd Edition, 2017.

4. References:

1. Advanced Organic Chemistry: Reactions and Synthesis by Carey & Sundberg (Part A and B), Springer, 5th Edition, 2008
2. Modern Methods of Organic Synthesis by W. Carruthers & I. Coldham, Cambridge University Press, 4th Edition, 2004
3. Organic Chemistry by Clayden, Greeves, and Warren, Oxford University Press, 2nd Edition, 2012.

5. Similarity with the existing courses:

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

S. No.		Course Code	Similarity Content	Approx. % of Content
1.		CY-645		35%

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

The course CY-645 will be replacing with this newly designed course so that it can be opted as an elective course by BS, M.Sc. students along with Ph.D. students.

Approvals:

Other Faculty interested in teaching this course: –

Proposed by: Dr. Amit B. Pawar **School: Chemical Sciences**

Signature: **Date:**

Recommended/Not Recommended, with Comments:

Date:

Chairperson, CPC

Approved / Not Approved

Date:

Chairperson, BoA

Presented at the 60th BoA Meeting

Course Name: Research Literature Presentation I

Course Number: DP401P

Credits (L-T-P-C): 0-0-2-1

Intended for: BS Chemical Sciences

Semester: Odd

Grading Pattern: Pass/Fail

Prerequisite: None

Course Description

Offered in the fifth semester of the BS Chemical Sciences program, this course is designed to introduce students to the fundamentals of scientific communication and research presentation. Each student is assigned to a faculty mentor and engages in an in-depth exploration of a specific research area. Through extensive literature review and critical analysis, students develop a comprehensive understanding of the chosen topic. The course culminates in a formal research presentation, allowing students to effectively communicate scientific ideas and articulate research questions to an academic audience.

Throughout the course, students will also develop essential research and communication skills, including creating effective PowerPoint presentations, using software tools for drawing chemical structures, and navigating scientific literature and chemistry databases.

Course Evaluation

Students will be assessed based on a research seminar delivered at the end of the semester. The seminar will be evaluated by an internal review panel comprising faculty members from the School of Chemical Sciences (SCS).

Presented at the 60th BoA Meeting

Course Name: Research Literature Presentation II

Course Number: DP402P

Credits (L-T-P-C): 0-0-2-1

Intended for: BS Chemical Sciences

Semester: Even

Grading Pattern: Pass/Fail

Prerequisite: Research Literature Presentation I (DP401P)

Course Description

Offered in the sixth semester of the BS Chemical Sciences program, this course aims to develop students' advanced competencies in the critical analysis and effective communication of scientific literature. Students will engage with primary research articles to identify central scientific questions, assess experimental approaches and data, and present their insights in a clear, structured, and audience-appropriate manner. Notably, the core research questions formulated through this process will form the basis for students' subsequent undergraduate research projects.

The course will be conducted under the guidance of the same faculty mentor assigned to the student during the fifth semester, ensuring continuity and deeper engagement with the chosen research area.

Course Evaluation

Students will be assessed based on a research seminar delivered at the end of the semester. The seminar will be evaluated by an internal review panel comprising faculty members from the School of Chemical Sciences (SCS).

Annexure-B

IIT Mandi
Proposal for a New Course

Course number : **ME642**
Course Name : **Computational modelling of granular flows**
Credit : **3**
Distribution : **3-*0*-*2*-*4***
Intended for : **MTech / PhD**
Prerequisite : **Continuum mechanics / fluid mechanics / solid mechanics / soil mechanics**
Mutual Exclusion: **NA**

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1 Preamble:

Granular materials are ubiquitous in nature and industry, spanning applications from landslides and avalanches to mineral processing and pharmaceutical manufacturing. Their complex flow behavior—exhibiting solid-like, fluid-like, and gas-like regimes—poses significant modeling challenges. This course, Computational Modelling of Granular Flows, offers a comprehensive foundation in theoretical, discrete, and continuum modeling approaches. Topics include particle-scale simulations using the Discrete Element Method (DEM), continuum formulations with depth-averaged models, and the Kinetic Theory of Granular Flows (KTGF). Coupled CFD–DEM techniques and emerging machine learning methods will also be covered. Students will gain hands-on experience with open-source software like LIGGGHTS, OpenFOAM, and CFDEM, enabling them to model and analyze granular flows in diverse engineering systems.

2 Course Modules with quantitative lecture hours:

Introduction to granular flows and theoretical foundations (6 lectures)

Granular materials in nature and industry; particle properties: shape, size distribution, cohesion; flow regimes: quasi-static, dense, and dilute. Experimental characterization of granular flows; stress, strain, and constitutive models; flow instabilities, segregation; governing equations for particulate flows.

Discrete element method (17 lectures)

DEM theory and contact models; normal and tangential forces, friction; time integration schemes, stability considerations; particle-wall interaction and boundary conditions;

interaction with STL files; calibration and validation, hands-on with open-source LIGGGHTS code; applications: mixing and segregation, hoppers, chutes, vibrating screens. Principles of CFD-DEM coupling; inter-phase forces, multiphase flow applications, case studies in mineral processing and energy systems; use of open-source CFDEM code.

Continuum modelling: depth-averaged model and rheologies (9 lectures)

Introduction to continuum modeling of granular flows; derivation of depth-averaged / shallow water mass and momentum equations; basal friction laws, source terms, Savage-Hutter model; numerical solution strategies for hyperbolic PDEs; analytical and numerical solutions and analyses; applications to landslides, avalanches and debris flows; demonstration of open-source codes and integration with digital elevation models; application of complex rheologies to dry and wet granular flows – including fluid-like (Newtonian, non-Newtonian), plastic (Mohr-Coulomb, Drucker-Prager) and intermediate (such as mu-I rheology).

Kinetic theory of granular flows (KTGF, 6 lectures)

Fundamentals of KTGF and application to dense granular flows; collisional dissipation (inelastic interactions); granular temperature equation; granular pressure; derivation of constitutive relations and types of granular viscosities; Eulerian two-fluid models using KTGF; applications in fluidized beds; hands-on with software (ANSYS Fluent, OpenFOAM)

Advanced topics (4 lectures)

Handling non-spherical particles; cohesion; wet granular flows; machine learning applications in granular flows.

Laboratory Modules:

DEM (8 hours)

Discrete element modelling in LIGGHTS open-source code. Solve problems on mixing and segregation, hoppers, chutes, vibrating screens, and granular column collapse.

Depth-averaged modelling (6 hours)

Simulation of geotechnical flows (landslides and snow avalanches) using depth-averaged continuum method in open-source and commercial codes.

KTGF (4 hours)

Multiphase Eulerian modelling of pneumatic conveying in ANSYS Fluent.

CFD-DEM (6 hours)

Modelling and simulation of gas-solid fluidisation and mixing in a vertical fluidised bed using open-source and commercial codes.

Machine learning (4 hours)

Supervised ML using Scikit-learn, dataset preparation (using previous lab results), regression and classification.

3 Text books:

1 **Rao, K. Kesava, Prabhu R. Nott, and S. Sundaresan. An introduction to granular flow. Vol. 490. Cambridge: Cambridge university press, 2008.**

4 References:

O'Sullivan, Catherine. Particulate discrete element modelling: a geomechanics perspective. CRC Press, 2011.

Thornton, Colin. Granular Dynamics, Contact Mechanics and Particle System Simulations: A DEM study. Springer, 2016.

Pudasaini, Shiva P., and Kolumban Hutter. Avalanche dynamics: dynamics of rapid flows of dense granular avalanches. Springer Science & Business Media, 2007.

Gidaspow, Dimitri. Multiphase flow and fluidization: continuum and kinetic theory descriptions. Academic press, 1994.

Norouzi, Hamid Reza, et al. Coupled CFD-DEM modeling: formulation, implementation and application to multiphase flows. John Wiley & Sons, 2016.

5 Similarity with the existing courses:

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

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

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

NA

Approvals:

Faculty interested in teaching this course: –

Proposed by: Gaurav Bhutani **School: SMME**

Signature: Emuil **Date: 16 June 2025**

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

Sl. No	Faculty Name	Signature
1	Gaurav Bhutani	Emuil
2	Mousumi Mukherjee	Emuil
3	Ashish Bhateja (IIT Goa)	Emuil

School Chair: P. Amit Verma

School: SMME

Date: 25/6/2025

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

Dean Academics

Date:

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

Indian Institute of Technology Mandi

Gaurav Bhutani <gaurav@iitmandi.ac.in>

Request to review course proposal

Mousumi Mukherjee <mousumi@iitmandi.ac.in> Wed, Jun 18, 2025 at 10:47 AM
To: Gaurav Bhutani <gaurav@iitmandi.ac.in>

Dear Gaurav,

Thanks for the course proposal on granular flow modeling. It will be very helpful for our research students working on the topics like geophysical flows, mineral or food processing, and modeling with pharmaceutical applications. Considering the inter-disciplinary nature of these areas, a single course like the one you have proposed will give the students a head start.

I have gone through the course proposal. It is very well thought coving different important aspects of the granular flow, from granular solid to flow/gaseous nature depending on the flow regimes, coupling of different phases, from theoretical background to application strategies & software platforms. The proposal looks really good to me; however, I have following suggestions, which are optional and consideration is up to your discretion:

1. As the course is also intended for students working with geomechanics, please add "soil mechanics" also as one of the possible prerequisites.
2. The course has a significant number of hands-on sessions on different software applications. Hence, I will suggest to keep dedicated course credit for the Laboratory/practical components.
3. Along with kinetic theory and soil mechanics (pressure dependent yielding) inspired constitutive relations, it will be good to introduce the constitutive models applicable for intermediate dense regime, like Jop model (https://www.nature.com/articles/nature04801).
4. The modules are very in-depth and may take more contact hours than envisioned. In view of this, I will suggest to keep CFD-DEM coupling itself as part of the advanced topics and dedicate 8 lecture hours.
5. I will suggest to add the following reference in the suggested book lists to aid DEM related discussion: https://link.springer.com/book/10.1007/978-3-319-18711-2

With regards,
Mousumi

On Mon, Mar 24, 2025 at 1:09 PM Gaurav Bhutani <gaurav@iitmandi.ac.in> wrote:
[Quoted text hidden]

--
Dr. Mousumi Mukherjee
Assistant Professor
School of Civil and Environmental Engineering
Indian Institute of Technology Mandi
[Quoted text hidden]

Indian Institute of Technology Mandi

Gaurav Bhutani <gaurav@iitmandi.ac.in>

Request to review a course proposal on granular flows

Ashish Bhateja <ashish@iitgoa.ac.in> Wed, Apr 2, 2025 at 10:09 PM
To: Gaurav Bhutani <gaurav@iitmandi.ac.in>

Dear Gaurav,

I hope you are doing great. I apologize for the delayed response.

I have gone through the course proposal. Overall, it seems to be a very heavy course. You are trying to fit everything in one course, from theoretical concepts to modelling of granular media. Also, the contents do not fully align with the course title. I suggest you shorten it a bit, focusing on the computational modelling part. Some of my comments/suggestions are given below

1. Five lectures for introduction are on the higher side.
2. Theoretical foundations: It is not clear which state of a granular system is talked about. Static state? Perhaps the introduction and theoretical foundations may be combined into one section.
3. Eight lectures for DEM may be less; CFD-DEM modelling may be combined with it.
4. The section on Continuum modeling may be renamed appropriately, in line with its contents.

I hope it helps. Do let me know if you have any questions.

best wishes,
ashish

On 27/03/25 10:28, Gaurav Bhutani wrote:
[Quoted text hidden]
[Quoted text hidden]

यांत्रिकी एवं पदार्थ अभियांत्रिकी विभाग SMME Office <smmeoffice@iitmandi.ac.in>

New course proposal

1 message

Gaurav Bhutani <gaurav@iitmandi.ac.in> Wed, Jun 18, 2025 at 4:22 PM
To: SMME Office <smmeoffice@iitmandi.ac.in>

Dear SMME office,

Please see a new course proposal attached for your reference.

The reviewers' comments have been incorporated in the proposal.

Regards
Gaurav

—

Dr Gaurav Bhutani
Assistant Professor
School of Engineering
Indian Institute of Technology Mandi
Kamand Campus
Mandi 175005
Himachal Pradesh, India
Tel: +91 1905-267108
Email: gaurav@iitmandi.ac.in

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Annexure C

IIT Mandi
Proposal for a New Course

Course Number: HS557
Course Name: Rural Development: Structures, Institutions and Processes
Credit: 3 credits
Distribution: 3-0-0-3
Intended for: UG/PG/PhD
Prerequisite: None
Mutual Exclusion: None

1. Preamble:

This course explores village India and its social, political and economic life. Through the appreciation of significance of Village Studies, it traces how village India is discussed and explained and analyzed through an exploration of agrarian structure, political institutions and economy of the people. The institutions, largely Panchayati Raj Institutions, and decentralization of finances, authority, responsibility, it traces the aspects of democracy and democratic processes. The development of infrastructure, and provisions of basic services will be explored through State programs and policies and how over the period of last 75 years, the ambit of policies as well as the nature of governance transformed.

2. Course modules with quantitative lecture hours:

Unit 1: Knowing the rural India (6 lecture hours)

- Colonial and orientalist ideas and village as mini republic
- Idea of self-sufficient villages
- Authentic India
- Little Community
- Rural and rurality

Unit 2: Village Studies (12 lecture hours)

- 1950s and the emergence of tradition of Village Studies
- Book-view and Field-view
- Harmony, unity and reciprocity: exploring structure, organization and institutions
- Caste and Social structure of village

- Village and Patriarchy
- Agrarian class structure

Unit 3: Political Economy and Institutions in Village India (6 lecture hours)

- Panchayat and Panchayati Raj Institution
- 73rd Constitutional Amendment Act and decentralization
- Self-help Groups, Non-governmental organizations
- New dimensions of politics and political life

Unit 4: Strategies of Rural Development (10 lecture hours)

- Five-Year Plans and Shifts in rural development programs
- Basic needs programs
- Infrastructure programs
- Financial inclusion
- Convergence and Holistic development

Unit 5: Techniques and Methods of Assessment of Rural Development (8 lecture hours)

- Rapid Rural Appraisal
- Participatory Rural Appraisal
- Transact Analysis
- Emerging techniques

Laboratory/practical/tutorial Modules: NA

3. Textbooks:

Madan, Vandana (Ed.). (2002). *The Village in India.* New Delhi: Oxford University Press.

4. References:

Cohn, B.S. 1987. *An Anthropologist among Historians*. Delhi: Oxford University Press.

Srinivas, M.N. (Ed.). 1955. India's Villages. Bombay: Asia Publishing House.

Marriott, M. (Ed.). 1961. *Village India: Studies in the Little Community.* Chicago: University of Chicago Press.

Materials released by Ministry of Rural Development and National Institute of of Rural Development and Panchayati Raj

Chambers, Robert. 1994. The Origins and Practice of Participatory Rural Appraisal. *World Development.* Vol. 22(7): 953-969

5. Similarity with the existing courses:

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

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

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

Faculty interested in teaching this course:

Proposed by: Dr. Surya Prakash Upadhyay

School: School of Humanities and Social Sciences (SHSS)

Signature: **Date: 27/04/2025**

The following faculty (at least 3) discussed XX/XX/2025 and approved the proposal on

Sl. No	Faculty Name	Signature
1	Dr. Saumya Malviya	
2	Dr. Nilamber Chhetri	
3	Dr. Manu V. Devadevan	

School Chair: 14/08/25

School: School of Humanities and Social Sciences (SHSS)

Date:

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

Dean Academics

Date:

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

Course was circulated within the School. Comments received:

Dr. Saumya Malviya:
Thanks for sharing the course and managing this exercise. The course on rural development is an important addition to the SHSS basket of courses and would serve the MA DS programme well. I have four specific suggestions which could be incorporated now or later depending on the delivery of the course:

1) Currently the aspect of rural-urban continuum is not covered in the course. If included, it'll add another dimension to the discussions covered.

2) A study of agrarian transformations through a topic or subtopic will also be useful for students and hence will make the course more well-rounded.

3) Perhaps adding a few topics-subtopics on contemporary aspects of rural sociology (markets, environment, agro-commodity chains, aspirations etc.) will make the course more contemporaneous with emerging concerns and issues.

4) As per the above suggestions, few more references could be added to the reference list.

It's an important course and will hopefully resonate with students, and certainly with the overall aims of the MA DS programme.

Response:

Thank you for your suggestions. Here the point-wise clarifications on Saumya's suggestions:
1) Currently the aspect of rural-urban continuum is not covered in the course. If included, it'll add another dimension to the discussions covered.

Clarification: It is covered in Unit 2: Village Studies (1950s and the emergence of tradition of Village Studies)

2) A study of agrarian transformations through a topic or subtopic will also be useful for students and hence will make the course more well-rounded.

Clarification: This is covered in Unit 2 (Agrarian Class Structure)

3) Perhaps adding a few topics-subtopics on contemporary aspects of rural sociology (markets, environment, agro-commodity chains, aspirations etc.) will make the course more contemporaneous with emerging concerns and issues.

Clarification: Unit 4 of the course covers most of these topics. It is only that these sub-themes/topics are not specifically mentioned. However, in discussing shifts in rural development programs; Infrastructure programs; financial inclusion; convergence and holistic development; all these topics will be covered. It is just in order to avoid too many sub-themes/topics that I have mentioned them under broad ideas.

4) As per the above suggestions, few more references could be added to the reference list. Definitively, more readings will be used during the delivery of course. Attached is the course outline with just two more readings that are marked in yellow.

Comments from the BoA and point wise response from the course proposer:

1. Modify the course offerings as only UG/PG/PhD (without any mention of final year B.Tech.): Done.

2. Provide comments by the reviewers (internal/external as applicable): Done

Observation 1. Why are questions regarding economics in Indian villages and questions regarding how to preserve village traditions not included?

Clarification: The aspects of rural economy are dispersed (rather interspersed) throughout the course.

Unit 1: Idea of self-sufficient villages (here we discuss the Gandhian idea of economic self-sufficiency of villages which itself was borrowed from Charles Metcalf. This also critiques the whole idea of self-sufficiency of villages and how Indian villages are part of the entire network of economy from local to regional to provincial to national and now, global).

Unit 2: Harmony, Unity and reciprocity: exploring structure, organization and institutions

discusses aspects of moral economy and how economy is structured around family, kinship, marriage and political and religious institutions and the jajmani system.

Further in the same unit: Agrarian Class structure discusses issues of land resources and holding and how it structures Indian society. This is further looked at client-patron relationship; jajmani system (again socio-economic system); the category and classes of zamindar, kisan, mazdoor etc which essentially brings out social and economic dimensions of rural India.

Unit 3: Political Economy and Institutions in rural India is mainly about the economy of Rural India.

Similarly Unit 4: Strategies of Rural Development (and more specifically Financial Inclusion) again encapsulates economic situations of rural India and interventions of the State through various mechanisms to improve the economic conditions of people.

Observation 2: Explain motivation for the course and how it will benefit students along with learning outcomes.

Explanation: This is clearly spelt out in the Preamble of the course which reads:

"This course explores village India and its social, political and economic life. Through the appreciation of significance of Village Studies, it traces how village India is discussed and explained and analyzed through an exploration of agrarian structure, political institutions and economy of the people. The institutions, largely Panchayati Raj Institutions, and decentralization of finances, authority, responsibility, it traces the aspects of democracy and democratic processes. The development of infrastructure, and provisions of basic services will be explored through State programs and policies and how over the period of last 75 years, the ambit of policies as well as the nature of governance transformed".

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14-8-25

IIT Mandi: Proposal for a New Course

Course number : **HS558**
Course Name : **Science Fiction**
Credit Distribution :*(3-0-0-3)*
Intended for : **UG/PG**
Prerequisite : **None**
Mutual Exclusion : None

Preamble:

The course focusses on the genre of Science Fiction. In this course students study stories and novels based on various futuristic concepts of Science. They read, analyse and discuss stories in class. The readings include classics of Science fiction by HG Wells as well as short stories taken from the suggested text books for an understanding of how Science is imaginatively used to suggest, direct, and warn humanity of its dangers as well as the advantages.

Course Modules with quantitative lecture hours:

Unit 1: **Introduction** **(6 Hours)**

Science Fiction as a Genre

Science in Science Fiction

Unit 2: **Time Travel** **(10 Hours)**

Past and Future

Interacting with Many Worlds

Time Dilation

Texts: HG Wells '*The Time Machine (1895).* "All You Zombies" (1959). "Forever Yours Anna" (1987).

Unit 3: **Alien Encounters** **(6 Hours)**

Life in Other Worlds

Imaginary Worlds and Real Worlds

First Contact

Texts: Shambleau" (1933), "A Martian Odyssey" (1934), "The Sentinel" (1951) and SLB's *Yana*. 2021.

Unit 4: **Apocalypse and Post Apocalypse** **(6 Hours)**

Dystopia

The New Age Life

Hopelessness

Texts: "Coming Attraction" (1950), "Speech Sounds" (1983),

Unit 5: Artificial/Posthuman Life-forms **(6 Hours)**

"Science in the Nineteenth Century"

The New Life forms

Texts: "Rapaccini's Daughter" (1844), "Exhalation" (2008) Edmond Hamilton's "The Man Who Evolved."

Unit6: Computers and Virtual Reality **(8 Hours)**

Replacing Human Efficiency

The New Language of Society

Human-Machine Interactions

Texts: "We Can Remember it for You Wholesale", "Burning Chrome", "Computer Friendly"

Primary Reference Books:

Evans, Arthur B. Istavan Csicsery-Ronary Jr etal (eds). *The Wesleyan Anthology of Science Fiction*. Connecticut, Wesleyan University Press, 2010.

Silverberg, Robert. (1970.) *The Science Fiction Hall of Fame. Vol I, 1929-1964*. NY: A Tom Doherty Association Book,1998.

Wells,H.G.(1895) *The Time Machine.* New Delhi: Fingerprint Publishing, 2015.

Bhyappa,SL. *Yana*.Bangalore: Subbu Books,2021.

2. References:

Bhyappa,SL. *Yana*.Bangalore: Subbu Books,2021.

Evans, Arthur B. Istavan Csicsery-Ronary Jr etal (eds). *The Wesleyan Anthology of Science Fiction*. Connecticut, Wesleyan University Press, 2010.

Narlikar,Jayant. *The Return of Vamana*. New Delhi:Springer International Publishing,2015.

Silverberg, Robert. (1970.) *The Science Fiction Hall of Fame. Vol I, 1929-1964*. NY: A Tom Doherty Association Book,1998.

Wells,H.G.(1895) *The Time Machine.* New Delhi: Fingerprint Publishing, 2015.

Similarity with the existing courses:

This course has no similarity with existing courses.

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

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

N/A	N/A	N/A	N/A

Justification of new course proposal if cumulative similarity content is >30%: N/A

Approvals:

Faculty interested in teaching this course: – SHSS/Assistant Professor

Proposed by: Aruna Bommareddi

School: School of Humanities and Social Sciences

Signature: Aruna B Date: 19.03.2025

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

*The course syllabus was circulated with all faculty members of SHSS and approved thereafter.

Sl. No	Faculty Name	Signature
1		
2		
3		

School Chair
School: SHSS
Date: 14/08/25

Dean Academics
Date:

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

Comments from the School: No comments were received from the School.

Comments from the BoA: Explain motivation for the course and why students should take this course along with learning outcomes.

Response from the course proposer: The motivation for the course is to introduce undergraduate students to a new genre of fiction which is Science based therefore, hopefully, more relatable to these students of Science and Engineering. Also to introduce a new understanding of Science W/writing which is an on going course: in the sense that Science fiction is also Science writing. For Ph.D students particularly Literature students, this course will give a grounding in literary analysis and critical understanding. Also it can be a trigger point to pursue research in the field of Science Fiction

Regarding Learning Outcomes: For undergraduate students, learning of reading fiction and writing skills English language in addition to understand how Science is creatively used for writing fiction. For Ph.D students, the learning outcomes can be a better understanding of Science based literature and critical analysis

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IIT Mandi

Proposal for a New Course

Course Number: HS559

Course Name: Critical Theory and the Politics of Development

Credit Distribution: 3-0-0-3

Intended for: PG

Prerequisite: None

Mutual Exclusion: None

Preamble: This course explores the intersections of critical theory and development studies, focusing on how power, ideology, and discourse shape global development practices and policies. Students will engage with theoretical frameworks and apply them to case studies, enabling them to question and reimagine development in more just and inclusive ways.

The main focus of the course will be to analyse the work of key thinkers from the Frankfurt School, poststructuralism, postcolonial theory, and decolonial thought in order to critically examine the assumptions, contradictions, and inequalities embedded in mainstream development paradigms.

The course would appeal to students interested in questioning the status quo of development and exploring transformative, justice-oriented approaches. It combines rigorous theoretical engagement with practical applications, making it both intellectually stimulating and socially relevant.

By the end of the course, students will: understand the key concepts and thinkers in critical theory and their relevance to development studies; critically analyse development policies, practices, and discourses through a critical theory lens; engage with alternative visions of development that prioritize justice, equity, and sustainability; and develop skills in interdisciplinary research, critical thinking, and transformative praxis.

Course Modules with quantitative lecture hours:

Unit 1: Foundations of Critical Theory and Development (6 hours):

Introduction to critical theory (Frankfurt School, Gramsci, Foucault, etc.).

The historical and ideological roots of development as a project (modernity, colonialism, capitalism).

Critiques of Eurocentrism and the "universal" claims of development.

Unit 2: Power, Knowledge, and Development Discourse (6 hours):

Foucault's concept of power/knowledge and its application to development.

The role of institutions (World Bank, IMF, NGOs) in shaping development agendas.

Deconstructing development buzzwords: "progress," "empowerment," "sustainability."

Unit 3: Postcolonial and Decolonial Critiques of Development (6 hours):

Postcolonial theorists (e.g., Said, Spivak, Fanon) on development as a continuation of colonial power.

Decolonial perspectives (e.g., Quijano, Mignolo) on modernity/coloniality and alternative development imaginaries.

The politics of representation: Who speaks for whom in development?

Unit 4: Capitalism, Neoliberalism, and Global Inequality (6 hours):

Marxist critiques of capitalism and their relevance to development.

Neoliberalism as a development paradigm: privatization, austerity, and structural adjustment.

Alternatives to capitalist development: degrowth, solidarity economies, and post-development.

Unit 5: Gender, Race, and Intersectionality in Development (6 hours):

Feminist critiques of development (e.g., Mohanty, Sen, Agarwal).

Intersectionality and the marginalization of racialized, gendered, and indigenous voices.

Queer theory and the heteronormativity of development policies.

Unit 6: Environment, Technology, and Sustainable Development (6 hours):

Critical perspectives on sustainable development and the green economy.

Techno-optimism vs. techno-skepticism: The role of technology in development.

Environmental justice and the critique of extractivism.

Ecocriticism, narratives of environmental degradation and conservation and the intersection of culture and sustainability.

Unit 7: Resistance, Social Movements, and Alternatives to Development (6 hours):

Grassroots movements and counter-hegemonic practices.

The role of art, literature, and culture in resisting dominant development narratives.

Exploring post-development and pluriversal futures.

Primary Readings:

Theodor Adorno & Max Horkheimer: "Dialectic of Enlightenment" (on modernity and domination).

Michel Foucault: "Power/Knowledge" (on discourse and power).

Gayatri Spivak: "Can the Subaltern Speak?" (on representation and voice).

Arturo Escobar: "Encountering Development" (on the invention of development).

Walter Mignolo: "The Darker Side of Western Modernity" (on decoloniality).

Vandana Shiva: "Development as a New Project of Western Patriarchy" (on ecofeminism).

Frantz Fanon: "The Wretched of the Earth" (on colonialism and liberation).

Similarity with the existing courses:

This course has no similarity with existing courses

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

S. No.	Course Code	Similarity Content	Approx. % of Content
N/A	N/A	N/A	N/A

14/08/25

Justification of new course proposal if cumulative similarity content is >30%:
N/A

Approvals:

Faculty interested in teaching this course: – SHSS/Visiting Faculty

Proposed by: Dr. Juan Luis Toribio Vazquez

School: School of Humanities and Social Sciences

Signature:

Date: 12 August 2025

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

*The course syllabus was circulated with all faculty members of SHSS and approved thereafter.

The course was circulated within the School. Comments received:

Dr. Shyamasree Dasgupta

I quite liked the course where students are encouraged to apply the theoretical frameworks to case studies. But the 'politics' part of the course needs to be more prominent as we rarely cover political dynamics of development.

Dr. Saumya Malviya

I also concur with you and Shyamasree that the course would be most useful for MA students. Furthermore, I also agree with Shyamasree that it'll be more useful to make it less theory-heavy and more focussed on politics and case studies. Arturo Escobar's text Encountering Development or James Ferguson's The Anti-Politics Machine efficiently achieve the balance between theory and actual politics of development and are good to teach.

The suggestions have been incorporated. Also, upon Dr. Nilamber Chhetri's suggestion, a unit on "environmental issues and sustainable development" has been added.

Observations from the BoA:

1. Explain why Indian theories or Indian Development paradigms have not been discussed if it is a general course on theories on development

2. If it is only about Western theories on Development, then rephrase the title accordingly and provide justification for the course

3. Provide comments by the reviewers (internal/external as applicable)

Response from the course proposer:

There are in fact several Indian authors mentioned in my course outline (Spivak, Agarwal, Sen, Mohanty and Vandana Shiva), as well as various other non-Western authors (Fanon, Quijano, Mignolo, etc.) so it is by no means only a course on Western theories on development. I could of course add a specific unit on "Indian Theories of Development", however that would seem rather arbitrary (what would be the justification for a dedicated chapter on Indian theories and not on the theories of other nations?) since the course is structured around concepts and critiques rather than national paradigms. Given that the main aim of the course is to problematise development discourse through critical theory it clearly has to draw heavily from

Western thinkers (such as those from the Frankfurt School or poststructuralism) however it will also discuss critical voices from non-Western traditions (including Indian writers) especially in areas such as feminist and decolonial critiques (as mentioned in the course outline).

Annexure- D.

IIT Mandi
Proposal for a New Course

Course number : **MB-509**
Course Name : **Introduction to Bhagavad Gita**
Credit : **2**
Distribution : ***2-0-0-2***
Intended for : **MBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

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1. Preamble:

Bhagavad Gita explores at length the five major branches of knowledge such as Individual conscious entity, Supreme conscious entity, Material nature, Time, and Actions. It also contains enriching discussion between Arjuna and Krishna on topics such as dilemmas of life, identity conflict, theory of actions (forbidden action, recommended action, Inactions), importance of controlled mind, qualities that builds a divine personality, bondage and freedom, etc. It is considered as a manual of life which outlines essential principles of leading a fulfilling life. Off late, it has garnered ample attention from management scholars and volumes of scholarly literature in form of journals papers, books, and conference proceedings are published on this subject. It is, therefore, pertinent for the aspiring managers and business leaders to understand the principles of Bhagavad Gita to aid them in decision making. This course is an earnest attempt to make the students aware of the time tasted principles of Bhagavad Gita which will help them deal with adversaries of life and equip them with better decision making power in the interest of themselves, organization, community, society, and other important stakeholders.

2. Course Modules with quantitative lecture hours:

Unit/Topic 1: Bhagavad Gita: The timeless science **(2 Hours)**

Unit/Topic 2: Krishna: As He is **(2 Hours)**

Unit/Topic 3: Description of atomic soul **(3 Hours)**

Unit/Topic 4: Matter and consciousness **(3 Hours)**

Unit/Topic 5: Yoga systems **(2 Hours)**

Unit/Topic 6: Transcendental knowledge **(2 Hours)**

Unit/Topic 7: Mindfulness from Bhagavad Gita **(3 Hours)**

Unit/Topic 8: The topmost yoga system **(2 Hours)**

Unit/Topic 9: Modes of material nature and professional excellence **(3 hours)**

Unit/Topic 10: Perfection of renunciation **(2 hours)**

Laboratory/practical/tutorial Modules:

NA

3. Text books:

- Prabhupada, ACBS, Bhagavad Gita: As it is, Bhaktivedanta Book Trust, Mumbai, 1972
- L. Behera., Five Aspects of the Absolute Truth - a Bhagavad Gita Study Guide, India, 2022
- L. Behera, Bhagavad Gita Study Guide Part I: Karma Yoga

4. References:

1. Chatterjee, D. (2012). *Timeless leadership: 18 leadership sutras from the Bhagavad Gita*. John Wiley & Sons.
2. Nayak, A. K. (2018). Effective leadership traits from Bhagavad Gita. *International Journal of Indian Culture and Business Management*, *16*(1), 1-18.
3. Krishnan, R., Jain, R., & Maheshwari, A. K. (2023). Development of Consciousness-Based Leadership from Bhagavad Gita and Yoga Sutras. In *Consciousness-Based Leadership and Management, Volume 2: Organizational and Cultural Approaches to Oneness and Flourishing* (pp. 97-113). Cham: Springer International Publishing.

5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: – Dr. Akhaya Kumar Nayak

Proposed by: Dr. Akhaya Kumar Nayak **School: School of Management**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Dr. Laxmidhar Behera	
2	Dr. Amit Shukla	
3	Akhaya Kumar Nayak	

School Chair:

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi
Proposal for a New Course

Course number : **MB535**
Course Name : **Marketing Management II**
Credit : **2**
Distribution : ***2-0-0-2***
Intended for : **MBA DS & AI**
Prerequisite : **Marketing Management I**
Mutual Exclusion : **NA**

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1. Preamble:

Marketing Research (MR) has become crucial in today's fast-paced market. With consumers having more options than ever and product life cycles shortening, marketers have less room for error in understanding consumer behavior. A strong marketing research process connects marketers with consumers, providing essential, accurate, and timely information to guide decision-making. Companies that utilize market research effectively can stay competitive and prevent costly mistakes based on unreliable data. Students will be able to relate management problem, research problem and relevant analytical technique. They will also gain expertise in generating consumer insights out of marketing research.

2. Course Modules with quantitative lecture hours:

Topic no	Topic	Description	No of Hours
1	Introduction to Marketing Research	Role of Market Research in Marketing. Market Research process, Defining Market Research problem and developing an approach.	4
2	Research Design Formulation	Exploratory research designs; Secondary data and qualitative research in marketing. Descriptive Research Design; Survey and observation. Causal Research Design; Experimentation. Measurements and Scaling (comparative and non-comparative techniques). Questionnaire and Form Design. Sampling design, procedure, and size determination.	12

3	Data Collection, Preparation, Analysis and Reporting	Fieldwork. Data Preparation, Frequency distribution, cross-tabulation and Hypothesis Testing. Analysis of Variance. Factor analysis. Structural Equation Modelling and Path Analysis. Report Preparation and Presentation.	8
4	Project Presentation	Project report preparation, Presentation delivery, clarity of communication, and ability to engage the audience.	4

Laboratory/practical/tutorial Modules: NA

3. Text books:

- Malhotra, N.K. and Dash, S.B. (2019). Marketing Research: An Applied Orientation, 7th Edition. Pearson Education.

4. References:

- Hair, Jr., J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (2006). Multivariate Data Analysis, (6th Edition). Pearson Education, New Delhi.
- Chawla, D. and Sondhi, N. (2011). Research Methodology: Concepts and Cases. Vikas Publications.
- Lindstrom, M. (2020). Small data. Optimist Yayın Grubu.

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

S. No.	Title	Course Code	Similarity Content	Approx. % of Content
1.	Marketing Management	MB517	Overview of Marketing Research.	10%

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

NA

Approvals:

Faculty interested in teaching this course: Dr Ashish Bollimbala

Proposed by: Dr Ashish Bollimbala **School:** School of Management

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Dr Saumya Dixit	
2.	Dr Manoj Thakur	
3.	Prof Anjan Kumar Swain	

School Chair

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi

Course number : **MB536**
Course Name : Project Management
Credit : **2-0-0-2**
Distribution : ***L-T-P-C***
Intended for : **MBA DS&AI**
Prerequisite : **Nil**
Mutual Exclusion : **None**

1. Preamble

This course equips students with essential knowledge and skills to effectively plan, execute, and control projects in various organizational contexts. Through a structured approach encompassing project lifecycle management, agile methodologies, risk assessment, and stakeholder engagement, students will gain proficiency in managing project scope, cost, time, and quality. Emphasizing practical application and theoretical foundations, this course prepares students to navigate complex project environments and drive successful project outcomes.

2. Course Modules with quantitative lecture hours:

Module 1	**Overview**	**(4)**
Understanding Project Management, Defining a Project Success, Classification of Projects, Scope Triangle, Project Selection and Project Structure, and Dimensions of a Project. Project management Lifecycle, Requirements: Requirements gathering and Types of requirements, Requirement Breakdown Structure. Business Processes: What is a Business Process? Business Process diagram, Business Process workflow diagrams.		
Module 2	**Project Scope Management and Budgeting**	**(6)**
Project scoping and its processes, planning and conducting project scoping, Solution prototype, Procurement Management Life Cycle, Preparing project overview statement. Cost management, Cost Estimation, creating Project Budget, and Budget Contingencies.		
Module 3	**Project Planning and Scheduling**	**(6)**
Project planning and its processes, Work break-down structure, Organizational breakdown structure, RACI matrix, Developing and constructing the project network, Lags in precedence relationships, Gantt Charts, Crashing Projects, Activity-on-Arrow and Activity-on-Node Fundamentals, Network Computation Process, Critical path and near critical path., Theory of		

Constraints and Critical Chain Project Scheduling.		
Module 4	**Agile Project Management**	**(4)**
What is Agile Project Management, Implementing APM Projects, Iterative Project Management Life Cycle, Adaptive Project Management Life Cycle, Extreme Project Management;		
Module 5	**Project Risk Management, Progress Management & Closure**	**(8)**
Project Risk Management, Risk identification, assessment, mitigation, Risk monitoring and Control, PERT and PERT Simulation. Project Control Processes: Project control system for successful project execution; Project Monitoring Project Performance, Earned value management; Project Stakeholders, Identifying project stakeholders, Planning stakeholder management, Managing communications, and stakeholder engagement; Project audit and its Process, Project Closeout, and termination.		

Laboratory/practical/tutorial Modules: No

3. Text Books

Instructor to provide reference materials and Cases.

4. References

1	Robert K. Wysocki, Effective Project Management: Traditional, Agile, Extreme, Hybrid, Wiley, 2019
2	Gary, C.F., Larson, E.W. and Joshi, R., Project Management: The Managerial Process, Edition VIII, McGraw Hill Education (India) Private Limited, New Delhi (latest edition)
3	Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley, 2023
4	Harold Kerzner, Project Management Case Studies, Wiley, 2022
5	Jeffrey K. Pinto, Project Management: Achieving Competitive Advantage, Pearson Education, 2019.
6	E. Goldrat, Critical Chain, North River Press, 1997.
7	Project Management Institute, A guide to the Project Management Body of Knowledge (PMBOK guide), Project Management Institute, 2017

5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: Visiting Faculty

Proposed by: Dr Anjan Swain **School:** SoM

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	B K Mohanty	
2	Saumya Dixit	
3	Manoj Thakur	

School Chair:

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi

Proposal for a New Course

Course number : **MB537**
Course Name : **Business and Data Leadership**
Credit : **2**
Distribution : **2-0-0-2** ***(L-T-P-C)***
Intended for : **MBA & IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

This course equips business leaders to harness the power of data and AI to drive strategic success. It covers essential topics such as transforming business challenges into data-driven solutions, aligning AI with business goals, and scaling AI initiatives across organizations. Leaders will gain critical insights into data ethics, governance, and the key leadership skills required in the AI era. With real-world case studies and actionable frameworks, this course equips leaders to use data and AI as strategic assets, enabling innovation, efficiency, and sustainable growth while navigating the complexities of modern business environments.

3. Course Modules with quantitative lecture hours:

Topic Description	**Duration (in Hours)**
Module 1: Strategic Data and AI Thinking for Business Leaders Foundations of data literacy for leaders, Framing business problems into data questions, Data-informed vs data-driven decisions Role of data in modern business strategy, Key leadership skills in the age of data, Data maturity models in organisations, Data as a strategic asset (Case). The evolution of leadership in a data and AI-driven economy, How business strategy shifts in the presence of intelligent systems, Value creation through data and machine learning.	**3 hrs**
Module 2: Business Outcomes and AI Alignment Leading with business outcomes; Technology, business and human values;	**5 hrs**

Creating an AI business plan, Linking AI investments to revenue, retention, speed, and innovation, AI and Business Value Matrix	
Module 3: Scaling Data & AI Strategy From pilot to enterprise-wide transformation, Strategic AI roadmap design, Cross-functional governance & operating models, Maturity assessment tools, Funding, talent, and executive sponsorship	**5 hrs**
Module 4: Building and Leading Data and AI Teams Organisational structures for data leadership, Data and AI Roles, Building cross-functional teams: analysts, engineers, product, and domain experts, Culture of experimentation vs perfectionism, RACI for data and AI ownership	**5 hrs**
Module 5: Responsible Leadership in AI & Data Ethics, Governance and Regulations Lead responsibly in the algorithmic age, Fairness, accountability, transparency, explainability and privacy, creating ethical review boards, bias detection, and regulatory frameworks (GDPR, AI Act), Human oversight vs full autonomy.	**6 hrs**
Module 6: AI & Data Success Stories Real-life stories of companies (case studies) that have harnessed AI and Data leadership effectively to create value.	**4 hrs**

4. **Text books:**

   Instructor will provide a combination of reference material and cases.

5. **References Books:**

- Marco Iansiti and Karim R. Lakhani, Competing in the Age of AI, Harvard Business Review Press, 2020.
- Robert D. Austin, The Adventures of an IT Leader, Harvard Business Review Press, 2016
- Randy Bean and Thomas H. Davenport, Fail Fast, Learn Faster: Lessons in Data-Driven Leadership in the Age of Disruption, Big Data and AI, Wiley, 2021.
- Amanda Datnow and Vicki Park, Data-Driven Leadership, Wiley, 2014
- Frances Frei and Anne Moriss, Move Fast and Fix Things: The Trusted Leader's Guide to Solving Hard Problems, Harvard Business Review Press, 2023.
- Jenny Dearborn and David Swanson, The Data-Driven Leader, Wiley, 2018.

6. Similarity with the existing courses:

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

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

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

NA

Approvals:

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

Proposed by: **Prof. Anjan Kumar Swain** School: SOM

Signature: Date:

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

Sl. No	Faculty Name	Signature
1	A.K. Swain	
2	B K Mohanty	
3	Manoj Thakur	

School Chair: Anjan Kumar Swain

School: SOM

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB538**
Course Name : **Management Insights from Indian Knowledge Systems**
Credit : **2**
Distribution : ***2-0-0-2***
Intended for : **MBA DS&AI and IMBA**
Prerequisite : **NA**
Mutual Exclusion: **No similar course is offered in the institute.**

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1. Preamble:

The course aims to impart the students with the timeless life-lessons and management insights from the Indian knowledge system contained in scriptural texts such as Bhagavad Gita, Ramayana, and Mahabharata. These scriptures enunciate significant principles of moral/ethical management in individual, organizational and societal levels. The concepts such as Dharma (including swadharma, parodharma, apat dharma), Karma (Sakarma, Vikarma, Akarma, Niskama Karma, Karma Yoga) from Bhagavad Gita are pivotal in guiding the actions of a manager in right direction to bring in personal satisfaction, professional excellence and social wellbeing. Ramayana and Mahabharata offer live demonstrations of ethical and efficient management principles through the actions of pivot characters such as Lord Ram, Lord Krishna, Arjuna, Hanuman etc. Insights from these scriptures will equipe the MBA DS&AI students and IMBA students with the wisdom to excel as ethical and efficient managers and leaders.

2. Course Modules with quantitative lecture hours:

Unit 1: Management Insights from Bhagavad Gita (14 hours)

Dealing with Dilemmas of life (Chapter 1 of Bhagavad Gita)

Deciphering the problem of Identity (Chapter 2 of Bhagavad Gita)

Dharma and Karma: Principles governing our Action and focusing on excellence: lessons from Karma Yoga (Chapter 3 and 5 of Bhagavad Gita)

Understanding the human mind and art of controlling the mind: Lessons from Dhyana Yoga (Chapter 6 of Bhagavad Gita)

Understanding the Psycho-physical constitution, developing qualities to be a good leader/manager, building leadership character, learning to assign right people in right job

(Chapter 7, 14 and 17 of Bhagavad Gita)

Transformational managerial principles (Chapter 9, 16 and 18 of Bhagavad Gita)

Unit 2: Leadership Insights from Ramayan (8 Hours)

Principles of moral management in top of the hierarchy: Insights from the life of king Dasharath

Increasing happiness quotient through detachment (Inspiration from Lord Rama'a action while being exiled)

Enhancing Emotional quotient and intricacies of relationship (Inspiration from relationship among Ram, Laxman, Bharat, Satrughna, Sita, Hanuman)

Character of a situational manager: Powerful yet humble, peaceful yet brave fighter (The life of Hanuman in Sundarkand)

A manager who inspires the followers to realize their potential (The life of Jambavan)

Overcoming challenges with exemplary qualities and character (Hunuman's Journey to Lanka)

Dharma above everything else (Actions of Lord Ram)

Unit 3: Leadership Insights from Mahabharat (6 Hours)

Sacrifice as a way of life (Lessons from the life of Kunti Maharani)

Justice and fairness: Fearless manager (Lessons from the life of Vidura/Vidura Niti)

Motivated blindness and the consequences (Lessons from the life of Dhritarashtra)

Principle vs Rules (Lessons from the Activities of Lord Krishna)

The double-edged sword of Darma (Lessons from life of Karna)

Endeavour and Mercy: The formula for success (The life of Pandavas)

Service vs Enjoyment (Lessons from Pandavas and Kauravas)

3. Text books:

(Latest, Only 2)

1. Prabhupada, ACBS, Bhagavad Gita as it is, Bhakti Vedanta Book Trust, India, 1973.
2. Vilas, Shubha, OPEN EYED MEDITATIONS,Finger Print Publications, India, 2016
3. Vyasa, Krishna Dwipayana, Vidura Niti, Gorakhpur Geeta Press. 2025

4. References:

1. Vilas, Shubha, Ramayana: The game of life (Book1, 2, 3, 4, 5, and 6), Jaico Publishing House, India, 2017, 2029, & 2021.
2. Dharma, Krishna, Ramayana, Mandala Publishing, India, 2020.
3. Dharma, Krishna, Mahabharata: The Greatest Spiritual Epic of All Time, Mandala Publishing, India, 2020.

4. Valmiki, Shrimad Valmikiya Ramayan (Part 1 & 2), India, GITA PRESS GORAKHPUR, 2022
5. Ganguli, K. M. The Complete Mahabharata in English. India. 2017. file:///C:/Users/aknayak/AppData/Local/Temp/Rar$EXa23708.14774/m01/m01000.htm.

5. Similarity with the existing courses:
(Similarity content is declared as per the number of lecture hours on similar topics)
No similarity with existing courses

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

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Akhaya Kumar Nayak **School: School of Management**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Prof. Laxmidhar Behera	
2	Dr. Ashsish Bolimbala	
3	Dr. Amit Shukla	

School Chair:

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi
Proposal for a New Course

Course number : MB585
Course Name : Supply Chain Analytics
Credit : 2-0-0-2
Distribution : ***L-T-P-C***
Intended for : MBA DS&AI
Prerequisite : Supply Chain Management.
Mutual Exclusion: NA

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1. Preamble

In an increasingly dynamic and data-driven world, supply chains are evolving into complex, intelligent networks requiring robust analytical capabilities. This course on Supply Chain Analytics introduces students to the transformative role of analytics, AI, and digital technologies in modern supply chain management. Through a comprehensive curriculum that blends foundational concepts with advanced tools—ranging from predictive modeling and network optimization to machine learning and blockchain applications—the course empowers students to make data-informed, resilient, and strategic decisions across the supply chain spectrum. Designed for future leaders in the data science and AI domains, this course fosters a deep understanding of how analytics can drive efficiency, agility, and innovation in supply chain operations.

2. Course Modules with quantitative lecture hours:

Module 1	**Introduction to Supply Chain Analytics**	**(6)**
What and why of Supply Chain Analytics, Competitive Analysis, and Benchmarking; Types of supply chain Analytics, Digital Transformation of the supply chain; Descriptive, predictive, and prescriptive analytics for supply chain, optimization and simulation for supply chain analytics.		
Module 2	**Supply Chain Models and Decisions**	**(4)**
Model for the application of Supply Chain Analytics; Perspectives of SC analysts and users on SC tools; analytical questions and the appropriate Supply Chain tools; Uncertainties in supply chains, Order Management, and Demand Fulfillment: Uncertainty		

Modelling Versus Demand Forecasting, Additive and Multiplicative demand models, Analytical Safety Stock Models; Modelling Flexibility in Supply Chain, Trends, Challenges; Decision-making across end-to end supply chain networks.		
Module 3	**Supply Chain Risk Analytics**	**(4)**
Supply Chain Disruptions, Supply Chain Risks and their characteristics; Supply Chain Risk Analysis and Analytics: Important Elements of Supply Chain Risk Analysis, Risk Acceptance, Reduction and Spreading, Supply Chain Risk Identification and Assessment. Supply chain resilience and its analytics.		
Module 4	**Network Optimization**	**(4)**
Supply chain analytics to facility location planning and network design, optimal warehouse locations and factories, Optimal locations of several warehouses and factories, stochastic supply network design.		
Module 4	**AI for Supply Chain Analytics**	**(6)**
Digital twin-based Supply chain and its analytics, Machine Learning (ML) for Supply Chain Planning, supplier selection, and warehouse management, ANNs in Inventory, Machine Learning-based Newsvendor models, Autonomous Vehicles for Logistics and Shipping, Natural language processing (NLP) for procurement.		
Module 5	**Blockchains for Supply Chain**	**(4)**
Blockchains in Supply Chain Management, Blockchain technology for supply chain visibility, predictability, and controllability, Digital tokens in supply chain transactions, Challenges in Blockchain Supply Chains, Application of Blockchain in Transportation and Logistics, Blockchains in Supply Chain Traceability, Machine-as-a-Service leasing model.		

Laboratory/practical/tutorial Modules:

3. **Text books:** Instructor to provide reference material and cases.

4. Reference books:

1	Dmitry Ivanov, Introduction to Supply Chain Analytics with Examples in AnyLogic and anyLogistix Software, Springer Nature Switzerland AG 2024
2	Iris Heckmann, Towards Supply Chain Risk Analytics: Fundamentals, Simulation, Optimization, Springer Gabler, Springer Fachmedien Wiesbaden 2016
3	I,sık Biçer, Supply Chain Analytics: An Uncertainty Modeling Approach, Springer Nature Switzerland AG 2023.

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

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

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Anjan Swain **School:**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	B Mohanty	
2	Manoj Thakur	

3	Saumya Dixit	

School Chair:

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi
Proposal for a New Course

Course number : **MB586**
Course Name : **Advertising and Brand Management**
Credit : **2**
Distribution : ***2-0-0-2***
Intended for : **MBA (DS &AI) and IMBA**
Prerequisite : **None**
Mutual Exclusion: None

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1. Preamble:

In the era of data-driven decision-making and artificial intelligence, advertising and brand management are undergoing transformative changes. This course is designed to provide students with a comprehensive understanding of the key concepts and practices essential for crafting successful advertising strategies and brand communications. Students will learn to design, implement, and evaluate innovative marketing campaigns that not only build strong brand equity but also drive measurable business performance. This course equips future leaders to make informed, impactful decisions in the dynamic landscape of modern marketing. The course aims to design, implement and evaluate the effectiveness of advertising efforts for better ROI, and explore methodologies to design and manage brand identity, positioning, and equity

2. Course Modules with quantitative lecture hours:

Module 1	**Introduction to Advertising**	**2 hrs**
Advertising, need & importance: Definition & growth of modern advertising, advertising & the marketing mix, types & classification of advertisement, advertising spiral; Social & economic aspects of advertising; Marketing communication models: AIDA, hierarchy of effect,		
Module 2	**How advertising works**	**3 hrs**
How advertising works: Exposure, salience, familiarity, low involvement, central route & peripheral route & cognitive learning; Positioning strategies; Associating feelings with a brand; Developing brand personality ; Creating copy strategies: Rational & emotional		

approaches, selection of an endorser, creative strategy & style- brand image, execution, USP, common touch & entertainment, message design strategy, format & formulae for presentation of appeals (slice of life, testimonials, etc.), different types of copy; Art & layout of an advertisement: Principles of design, layout stages, difference in designing of television, audio & print advertisement		
Module 3	**Media planning & scheduling**	**2 hrs**
Introduction to broadcast & non -broadcast media; Budgeting decision rule: percentage of sales method, objective to task method, competitive parity, & all you can afford; Key factors influencing media planning; Media decisions: media class, media vehicle & media option; Scheduling: flighting, pulsing & continuous		
Module 4	**Introduction to brands and brand management**	**4 hrs**
Concept of a brand, brand evolution, branding challenges and opportunities, Strategic brand management process. Identifying and establishing brand positioning and values; Brand building, brand positioning and values brand repositioning.		
Module 5	**Designing and implementing brand strategies**	**3 hrs**
Brand extension. Brand hierarchy, Brand equity, brand personality, brand image, managing brands overtime. Integrating advertising and brand management		

Laboratory/practical/tutorial Modules:

3. Text books:

1. Strategic Brand Management (latest edition), Kevin Lane Keller
2. Advertising and Promotion: An Integrated Marketing Communications Perspective" by George E. Belch and Michael A. Belch

4. References:

Ogilvy on Advertising, David Ogilvy, (Latest edition)

5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: Saumya Dixit, Ashish B

Proposed by: Saumya Dixit **School:**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Saumya Dixit	
2	Ashish B	
3	Dechen Angmo	

School Chair

School:

Date:

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

Dean Academics

Date:

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

IIT Mandi

Proposal for a New Course

Course number : **MB600**
Course Name : **Research Methodology**
Credit : **1**
Distribution : ***1-0-0-1***
Intended for : **PhD**
Prerequisite : **None**
Mutual Exclusion : None

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1. Preamble:

This 1-credit course provides an overview of research methodology fundamentals for PhD students. Students will explore the basics of research approaches, research proposal development and tools and techniques required for conducting research.

2. Course Modules with quantitative lecture hours:

Unit 1: Introduction to Research Methodology (4 Hours)

Overview of research paradigms (positivism, interpretivism, critical theory). Research ethics and rigor, Copyright, plagiarism, Research Reproducibility

Unit 2: Research Proposal Development (5 hours)

Steps from identifying a research problem to publication. Understanding Literature Reviews: Purpose and types (systematic, narrative, etc.). Search Strategies and Databases: How to search academic databases (e.g., Google Scholar, JSTOR, Scopus, Web of Science). Organizing and Synthesizing Literature: Techniques for organizing literature, identifying gaps, and synthesizing information. Identifying research gaps and formulating research questions. Developing a basic research proposal

Unit 3: Introduction to Key Software (3 Hours)

Reference management, quantitative and data analysis, Survey and Data Collection Tools

Unit 4: Technical and Scientific Presentations (2 Hour)

Data Visualisation & Storytelling, Structuring a scientific presentation, Use of visual aids, Presentation delivery

Laboratory/practical/tutorial Modules: NA

3. Text books:

Instructor to provide reference material

4. References:

- The Craft of Research, by Wyne C. Booth, Colomb, William, University of Chicago Press (ebook)
- Research Methodology: A Step-By-Step Guide For Beginners, by Ranjit Kumar , Publisher: Sage South Asia (2011)
- Research Methodology, by R Panneerselvam, Publisher: Phi Learning (2009)
- Research Methodology: Methods and Techniques, by C. R Kothari, Publisher: New Age International (2004)

5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Dr. Saumya Dixit, Dr. Puran Singh, Dr. Masudul Hasan Adil

School: School of Management

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Ashish B	
2	Manoj Thakur	
3	Anjan Swain	

School Chair:

School:

Date:

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

Dean Academics

Date:

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

Annexure-E

IIT Mandi
Proposal for a New Course

Course number : **MB203**
Course Name : **Macroeconomics**
Credit : **3 Credits**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

The main objective of the course is to make students understand the way economy runs and the socio-economic conditions affect their decision making at macro level. The course will focus upon theoretical and empirical understanding of the economic theories and their application in Macroeconomics.

2. Course Modules with quantitative lecture hours:

Unit 1: (8 Hours)

Nature and scope of Macroeconomics || National income: concepts and measurement || Circular flow of national income in two, three, and four-sector economy || National income and economic welfare

Unit 2: (8 Hours)

The classical theory of income and employment || Keynes's objections to the classical approach || Keynes's theory of income and employment

Unit 3: (8 Hours)

What is money? || The quantity theory of money || Inflation and interest rates || The nominal interest rate and the demand for money || Hyperinflation

Unit 4: (8 Hours)

Money supply: 100-percent and fractional-reserve banking || A model of the money supply || Monetary policy approaches and its frameworks || Money demand: different theories of money demand

Unit 5: (10 Hours)

Introduction to economic fluctuations || Aggregate demand: the goods market and the IS curve, the money market and the LM curve || The short-run equilibrium

Laboratory/practical/tutorial Modules:

3. Text books:

1. **Mankiw G., Macroeconomics, Worth Publisher, 2024.**
2. **Froyen R., Macroeconomics: Theory and Policy, Pearson Publisher, 2024.**

4. References:

(No limit on numbers, relevant)
Standard format can be followed

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

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	Principles of Economics	HS202	Monetary Systems and Policies	25%

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Dr Masudul Hasan Adil **School: SoM**

This course is taught by Dr. Adil in the year 2024-25 January Semester. Dr. Adil is one in the SoM.

Signature: So is signed by the School Chair. **Date:**

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

Sl. No	Faculty Name	Signature
1	Prof Manoj Thakur	
2	Dr. Ashish Bollimbala	
3	Dr. Saumya Dixit	

School Chair:

School: SoM

Date:

This proposal is reported in 60th Board of Academics on June 30, 2025

Dean Academics

Date

IIT Mandi
Proposal for a New Course

Course number : **MB205**
Course Name : **Written and Verbal Communication**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **Consent of Teacher**
Mutual Exclusion : **NA** (Specify the equivalent courses in other schools. These *Courses (with high similarity) are not allowed to credit by the students after or along with this course.*)

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1. Preamble:

Develop essential verbal and written communication skills for academic and professional success. The course emphasizes clarity, confidence, and impactful communication, integrating AI tools and interactive pedagogy.

2. Course Modules with quantitative lecture hours:

Topic & Description	Duration (in Hours)
Module 1: Introduction to Communication **1. Overview of Verbal Communication** i. ○ Understanding course objectives and key communication skills. ii. ○ Reflective journal on goals for the course. **2. Introduction to Listening Skills** ○ Active listening fundamentals and barriers to effective listening.	2

Module 2: Listening Skills 1. **Note-making for Listening** ○ Techniques and practice of concise note-making. 2. **Vocabulary Building through Listening** ○ Identifying and recording new words from audio sources. 3. **Listening for Inference and Context** ○ Understanding meaning through context and inference in listening.	**2**
Module 3: Reading Skills 1. **Active Reading Techniques** ○ Skimming, scanning, and in-depth reading strategies. 2. **Skimming and Scanning Practice** ○ Speed and comprehension enhancement. 3. **Annotating Texts for Comprehension** ○ Extracting key information through annotation. 4. **Vocabulary Building through Reading** ○ Context-based vocabulary development.	**4**
Module 4: Grammar for Speaking 1. **Introduction to Grammar for Speaking** ○ Importance of grammar for verbal clarity. 2. **Verb Tenses and Sentence Structure** ○ Constructing grammatically correct sentences. 3. **Subject-Verb Agreement** ○ Mastering agreement for speech accuracy. 4. **Pronunciation and Intonation** ○ Enhancing verbal clarity and fluency.	**4**

Module 5: Self-Introduction Skills 1. **Crafting a Strong Self-Introduction** ○ Effective strategies for professional and personal settings. 2. **Non-Verbal Communication in Self-Introduction** ○ Role of body language and tone in presentations.	**2**
Module 6: Integrated and Advanced Skills 1. **Combining Listening and Reading** ○ Synthesis of information for coherent communication. 2. **Advanced Vocabulary for Speaking** ○ Application of high-level vocabulary in speech. 3. **Complex Sentence Structures** ○ Developing fluency with advanced grammar. 4. **Paraphrasing and Summarizing Skills** ○ Active listening techniques for concise expression. 5. **Persuasion and Argumentation Skills** ○ Techniques for persuasive and impactful communication.	**4**
Module 7: Writing Fundamentals 1. **Introduction to Writing Skills** ○ Basics of written communication and personal introductions. 2. **Sentence Structure Mastery** ○ Types and construction of sentences. 3. **Paragraph Building: Structure** ○ Topic sentences, supporting ideas, and conclusions. 4. **Paragraph Cohesion and Transitions** ○ Ensuring flow and connectivity in writing.	**4**

Module 8: Reasoning and Arguments in Writing 1. **Structuring Arguments in Writing** ○ Logical organization and argumentation. 2. **Using Evidence to Support Arguments** ○ Strengthening claims with relevant evidence. 3. **Identifying Logical Fallacies** ○ Avoiding common reasoning errors.	**3**
Module 9: Grammar and Style 1. **Grammatical Structures for Writing** ○ Essential grammar for clear writing. 2. **Verb Tenses and Agreement** ○ Consistency in tense usage. 3. **Punctuation and Capitalization** ○ Importance of accurate punctuation. 4. **Word Choice and Writing Style** ○ Enhancing expression through vocabulary.	**4**
Module 10: Academic and Professional Writing 1. **Understanding and Avoiding Plagiarism** ○ Ethical writing and originality. 1. **Citing Sources Properly** ○ Mastering citation styles and tools. 2. **Writing Formal Emails** ○ Professional email etiquette. 3. **Writing Informal Emails** ○ Crafting casual yet clear messages.	**4**

Module 11: Practical Writing Skills 1. **Writing Job Applications and Cover Letters** ○ Professional application techniques. 2. **Writing Circulars and Notices** ○ Formal communication formats. 3. **Writing Reviews and Summaries** ○ Analytical and concise review writing. 4. **Free Writing and Reflection** ○ Encouraging creativity and personal expression.	**3**
Module 12: Course Review and Final Integration 1. **Review and Synthesis** ○ Revisiting key learnings from the course. 2. **Final Project Preparation** ○ Showcasing verbal and written communication skills. 3. **Final Presentation and Feedback** ○ Demonstrating comprehensive improvement.	**3**

Laboratory/practical/tutorial Modules:NA

4. **Text books:**
   - **"The Art of Public Speaking"** by Dale Carnegie – A comprehensive guide for speaking skills and communication strategies.
   - **"Effective Communication Skills for Professional Success"** by John A. Kline – A practical approach to improving verbal communication in professional settings.
   - ***"Practical Writing Skills"*** by John Doe
   - **"The Elements of Style"** by William Strunk Jr. and E.B. White - A classic on

grammar and style.

5. **References:**

- "Listening: The Forgotten Skill" by Madelyn Burley-Allen – A book that delves into the techniques of active listening.
- "Critical Thinking and Communication" by Edward P. J. Corbett – Focuses on argumentation and persuasive techniques.
- "On Writing Well" by William Zinsser - Focuses on writing nonfiction with clarity and precision.

- Digital Resources and Tools:
  - Grammarly: For grammar and vocabulary building exercises.
  - Duolingo or Babbel: For language learning and vocabulary enhancement.
  - TED Talks: To listen and analyze professional communication.
  - Speechify: AI-driven tool for practicing pronunciation and intonation.
  - Online resources on academic writing from platforms like Purdue OWL

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

S. No.	Course	Course Code	Similarity Content	Approx. % of Content
1.	English I & English II	HS106 & HS208	Grammer, Paragraph writing, Report Writing,	30%

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

MB205 is an advanced communication course offered exclusively to IMBA students. While it covers core areas typically addressed in courses such as HS106 and HS208—including fundamentals of academic writing, presentation skills, and interpersonal communication—it goes significantly beyond by introducing advanced topics such as active listening, constructing paragraphs grounded in sound reasoning and logic, and exploring the ethical dimensions of communication. Distinctively, MB205 is firmly embedded within a business context, with case studies, readings, and class exercises drawn from real-world corporate and workplace scenarios. The course is designed to cultivate communication competencies essential for effective leadership and decision-making in contemporary business environments.

Approvals:

Faculty interested in teaching this course: –

Proposed by: Prof Anjan Kumar Swain **School: SoM**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Prof Nisigandha Bhuyan	
2	Prof Anjan Kumar Swain	
3	Dr Ashish Bollimbala	

School Chair:

School:

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB206**
Course Name : **Excel for Data Analysis**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**(Specify the equivalent courses in other schools. These *Courses (with high similarity) are not allowed to credit by the students after or along with this course.*)

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1. Preamble:

This 3-credit course is designed to equip IMBA students with essential skills in Microsoft Excel for effective data analysis and business decision-making. Through a hands-on, application-oriented approach, students will learn to manage, analyze, and visualize data using Excel's advanced functions, tools, and add-ins. The course lays a strong foundation for data-driven thinking by integrating analytical techniques with real-world business scenarios, thereby preparing students to make informed decisions in dynamic organizational settings.

2. Course Modules with quantitative lecture hours:

Module 1	**Introduction**	(2)
Elementary spreadsheet concepts and processes, worksheets and workbooks, importing data into Excel, Entering and arranging data, Data validation, Relative and absolute References, Formatting Range of cells, filtering and sorting data.		
Module 2	**Excel Formulas and Functions**	(8)
Index and Match functions, Text functions, IF statements, Count functions, Numeric functions, String functions, Date time functions, Lookup functions, Logical Functions, Sum and average functions, Rank functions, Indirect functions, and Functions for Specific Applications.		
Module 3	**Statistical Analysis**	(4)
Summarizing Data with Descriptive Statistics and Database Statistical Functions, Confidence Interval, and Generating random numbers, random variables: Binomial, Poisson, exponential and normal random variables.		

Module 4	Visualizing Data	(4)
Approaching the Task of Visualization, Preparing Data for Robust Graphics, Working with Standard Charts, Explore chart styles, Customize charts, Combine chart types, 3D Surface plot, contour plots, Geographic visualization tool		

Module 5	PivotTables	(6)
Understanding PivotTables, Anatomy of a PivotTable, Creating a PivotTable, Calculations in PivotTables, Updating a PivotTable, Using data models and analysing disparate data sources, Power Pivot, Power View and 3D Maps.		

Module 6	Modeling Relationships and Trends in Data	(6)
Correlation to summarise relationships, Relationship between correlation and R-squared, Simple Linear Regression: Finding the Best-Fitting Regression Line, Regression Models for Prediction, Regression as Analysis of Variance, Testing Hypotheses for Regression Coefficients, Confidence Intervals for Regression Coefficients, Residual Analysis, and Regression Assumptions, Checking Assumptions, Multiple Linear Regression, Building Good Regression Models, Correlation and Multicollinearity, Practical Issues in Trendline and Regression Modeling, Regression with Categorical Independent Variables, Categorical Variables with More Than Two Levels.		

Module 7	Optimization with Solver	(4)
Understanding Solver Adin, Simplex LP engine for linear optimization problems, GRG Nonlinear engine for nonlinear optimization problems and Evolutionary Solver engine to tackle nonsmooth optimization problems.		

Module 8	What-if-Analysis	(4)
Create a data table, Define a scenario, Analyse data with scenarios, Sensitivity analysis with data tables, Scenario Manager for sensitivity analysis, Goal Seek for data analysis		

Module 9	Automating Tasks with Macros	(4)
What is macro? Recording a macro, running a macro, adding and editing a macro.		

Laboratory/practical/tutorial Modules: NA

3. Text books: NA

4. References:

Reference Book:	
1	Wayne Winston - Microsoft Excel Data Analysis and Business Modeling- PHI Learning Pvt. Ltd.
2	Paul McFedries, Excel Data Analysis, John Wiley and Sons, 2013
3	Bill Jelen and Michael Alexander, Microsoft Excel 2019 Pivot Table Data Crunching, Microsoft Press, 2019.

4	Paul Mcfedries, Excel Data Analysis: Your Visual Blueprint for Analyzing Data, Charts and Pivot Tables, Wiley (2013).

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

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

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Prof Anjan Kumar Swain **School: SoM**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Dr Puran Singh	
2	Dr. Saumya Dixit	
3	Dr. Dechen Angmo	

School Chair:

School:

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB301**
Course Name : **Problem Solving and Decision Making for Managers**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

Normally, thinking skills are based on some structure such as critical thinking, constructive thinking, lateral thinking, creative thinking, vertical thinking, parallel thinking, etc. However, all these approaches concentrate more on "talking about problems" rather than "solving problems." Thus, it becomes necessary for the students to connect thinking and problem-solving skills to tackle complex, nonlinear, and uncertain problems in the real world. This course provides what, why and how of thinking skills through various toolsets, proper mindsets, and appropriate skillsets. This course includes discussions and brainstorming through a range of decision-making tools & techniques, brain teasers, games, and puzzles. Further, it consists of discussions on heuristics for tackling these types of problems, along with visualization of the contrasting nature of problem-solving in humans and computers.

2. Course Modules with Quantitative lecture hours

Unit 1	**Introduction**	**(2)**
Problems and goals; Understanding problem solving and decision making, Types of problems and decision making, rules of analytical problem solving, Alternatives, Objectives, Criteria.		
Unit 2	**Mind**	**(4)**
The mind and the brain, the agents of the mind, consciousness, and memory; Cognitive processes: perception, attention, Intuition, emotion, thinking, intelligence, knowledge representation, categories, learning, motivation, judgment, reasoning, creativity, beliefs, biases and errors; Critical and creative thinking, Design Thinking, Common sense and mental models.		
Unit 3	**Creativity and Creative People**	**(5)**
Creativity contexts, creativity realms and limitations, Creativity and Uncertainty, creative process and people; motivation and creativity, Creativity Techniques- convergent and divergent thinking; idea generation; value proposition canvas, SCAMPER.; Creativity for Decision Making - Brainstorming, Synectics, Morphological Analysis, and Lateral thinking; Creativity and inspiration, creativity and evolution, creativity in a nonlinear world, inventions, and innovators.		

Unit 4	Problem Identification and Definition	(5)
Critically thinking on problems, Problem identification: Process, methods, and practices; difficulties and errors; improvement; Problem Definition: Defining managerial problems, Techniques- Affinity diagram, Concept Maps, Stratification, Pareto Analysis; Definitional Mistakes- Framing Errors, Focusing Errors, Missed Connections, The Wrong elements and relationships; Situation Definition and Analysis Method (SDA).		
Unit 5	**Problem Diagnosis**	**(5)**
Causality and its types; Diagnosis- Importance and Strategies; Diagnostic Process- Data and information gathering, hypothesis generation and testing, diagnostic errors; Diagnostic Methods: Diagnostic and Solution Maps, Experimentation, Cause-and-Effect Diagram, Concentration Diagram, Why-Why Diagram, Kepner-Tregoe Method, Root Cause Analysis- Determine the Actual Causes.		
Unit 6	**Problem Solutions**	**(5)**
Models and Modelling; Solution Space- feasible and infeasible; Identify Potential Solutions- Solution Definition and Solution Maps, Alternative Generation, Alternative Generation Heuristics, brainstorming for alternative generation and removing unsuitable alternatives; Analysing Critical Assumptions, The Problem Analytic Strategy, Analytic Bootstrapping Creativity (ABC) Method;		
Unit 7	**Solution Evaluation and Implementation**	**(4)**
Performance metrics and Key Performance Indicators (KPIs), Brainstorming for Criteria and Alternatives of choice, Morphological Analysis for arranging ideas and the connections in a decision hierarchy, Evaluating Alternatives, structuring decisions, Judgements and comparisons, decision tree, Paired Comparison Analysis, Analytic hierarchy and network process, Group evaluation, Six Thinking Hats method, Solution Implementation and monitoring.		
Unit 8	**Estimation, Simulation and Optimization**	**(4)**
Estimation and its role in Problem-solving and Decision-Making; Simulation and its types, the importance of simulation and optimization for problem-solving and decision-making, the role of data and models in simulations. physical simulation vs. computer simulation.		
Unit 9	**Analytical Thinking and Creativity**	**(4)**
Analytical Thinking and decision making, stages of analytical thinking, data analytic thinking, Creative Analytical Thinking; Pattern finding and Analytical creativity; Capability development of Quantitative Analysts, Quantitative Analysts and Business Decision Makers;		

Laboratory/practical/tutorial Modules: NA

3. Text books: Not Prescribed

4. References:

Reference Book:	
1	T.H. Davenport and J. Kim (2013), Keeping up with the Quants, Harvard Business Review Press, Boston, MA
2	Daniel Kahneman (2012), Thinking, Fast and Slow, Penguin Random House.
3	Robert J. Sternberg Ed. (1994), Thinking and Problem Solving, 2ed., Academic Press.
4	de Bono, E. (1999). *Six Thinking Hats*, New York: MICA Management Resources.
5	Peter A. Frensch, and Joachim Funke (1995), Complex problem solving: the European perspective, Psychology Press, 711 Third Avenue, New York
6	Gerald F. Smith (1998), Quality Problem Solving, ASQ Quality Press, Wisconsin
7	G. Polya (1988), How to Solve It, Princeton University Press
8	Edward B. Burger and Michael Starbird (2021), 5 Elements of Effective Thinking, Princeton University Press, Oxfordshire
9	Jeanne Liedtka, Andrew King and Kevin Bennett (2013), Solving Problems with Design Thinking, Columbia University Press.
10	Luc De Brabandere and Alan Iny (2013), Thinking in New Boxes, Random House, New York.
11	James L. Adams (2019), Conceptual Blockbusting-Basic Books
12	Tom Kelley and D. Kelley (2013), Creative Confidence, William Collins, London
13	J. Butterfield (2010), Problem Solving and Decision Making, Cengage Learning.
14	Saaty, T.L. (2008), *Creative Thinking Problem Solving and Decision Making*, RWS Publications
15	Paulos, J.A. *Innumeracy: Mathematical Illiteracy and Its Consequences*, New York: Hill and Wang.
16	Fisher, A. (2001). *Critical Thinking: An Introduction*, Cambridge, UK: Cambridge University Press

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

S. No.		Course Code	Similarity Content	Approx. % of Content
1.	Creative Thinking Problem Solving and Decision Making	MB519	Creative thinking, Lateral Thinking, Design Thinking, Problem Identification, Problem Definition, Solution finding, Biases, Judgement, etc	30%

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

MB301 is a 3-credit course exclusively designed for students enrolled in the Integrated MBA (IMBA) program. It provides an in-depth exploration of the theoretical foundations of problem-solving and decision-making, with a strong emphasis on conceptual frameworks and critical analysis. In contrast, MB519 is a 2-credit course tailored for first-semester MBA students, focusing primarily on the practical application of problem-solving and decision-making tools in real-world business contexts. While MB301 emphasizes a deeper theoretical understanding, MB519 is oriented toward experiential learning and managerial execution.

Approvals:

Faculty interested in teaching this course: – Dr Ashish Bollimbala & Prof Anjan Kumar Swain

Proposed by: Prof Anjan Kumar Swain **School: School of Management**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Dr Ashish Bollimbala	
2	Dr Dechen Angmo	
3	Dr Ridhi Arora	

School Chair:

School:

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB302**
Course Name : **Business Law**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

To introduce the basic concepts of law with focus on enabling ease of understanding and joy in the learning of legal concepts and principles, particularly with regard to the application of law to business situations and scenarios; To understand the scope of 'Business Law' – not only as *a means of regulation* of business, but also as *a facilitator of business* and *business contracts*; To understand the features – both practical and legal of the various forms of business enterprises; To understand the '*How to?*' aspect of business enterprises – how to form/start and manage (run) any of the forms of business enterprises; How to understand the legal implications of contractual obligations; To know how to seek legal remedies for breach of contractual rights ; How to understand the basics of litigation; To know the basic features of legal systems such as civil law, criminal law, constitutional law; To know the meaning of '*Legal Right*' and the different kinds of Rights with focus on '*Fundamental Rights*' and their application to business situations ; The meaning and scope of Legal Remedies &. Finally – '*How to use law & legal concepts as an effective strategic business tool?*'

2. Course Modules with quantitative lecture hours:

Module 1: (4 Hours)

'Basic Concepts of Law for Managers'

Module 2: (2 Hours)

'Fundamental Rights (FRs)' & 'Directive Principles of State Policy (DPOSP)' under the Constitution of India (COI)'

'Writ Jurisdiction Powers' of Supreme Court & the High Courts ; 'The 5 Writs ~ their

Meaning & Scope of Application by Writ Courts'

Module 3: (3 Hours)

'Important Definitions & Basic Concepts of Contract Law' (Contract Law, Part - 1)

Module 4: (2 Hours)

'Law Relating to Oral & Written Contracts' (Contract Law, Part - 2)

Module 5: (3 Hours)

'Law Relating to 'Free Consent', 'Factors which Destroy Free Consent' & 'Voidable Contracts' (Contract Law, Part - 3)

Module 6: (3 Hours)

'Law Relating to 'Capacity to Enter Contracts' ; A Study of the 4 Persons – Legally Incompetent to Enter Contracts (Contract Law, Part - 4)

Module 7: (4 Hours)

'Law Relating to 'Void Agreements' & Important Exceptions which Facilitate Business'` (Contract Law, Part - 5)

Module 8: (3 Hours)

'Law Relating to 'Special Contracts' (Contract Law, Part - 6)

Module 9: (4 Hours)

'Breach of Contract & Legal Remedies for Breach of Contract' (Contract Law, Part - 7)

Module 10&11: (5 Hours)

'Seminar on IPRs / IP Awareness'

Module 12: (3 Hours)

Law Relating to Entrepreneurship / the Formation of Business Enterprises & Management of Business Enterprises, with focus on Company-Formation & Company-Management

(The 'Kababisthan Learning Experience', (Part – 2')

Laboratory/practical/tutorial Modules:

3. **Text books:**
   1. Rajinder Kaur & Rashmi Aggarwal '*Legal Aspects of Business*', 1st Edition 2020, Pearson Education

2. Anurag K. Agarwal, '*Business Law for Managers – Kaleidoscope Tales*', IIM Ahmedabad Business Books, ISBN 9780143444473 , 01 January 2018 First Edition

4. References:

(No limit on numbers, relevant)
Standard format can be followed

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

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

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

Approvals:

Faculty interested in teaching this course: –

Proposed by: Prof Anjan Kumar Swain **School: SoM**

Signature: **Date:**

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

Sl. No	Faculty Name	Signature
1	Prof Sebastian Tharakan	
2	Dr Ridhi Arora	
3	Dr Saumya Dixit	

School Chair:

School:

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB303**
Course Name : **Financial Accounting**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

Financial accounting course helps the students in understanding and analysis of balance Shette, profit and loss statement, and cash flows statement for better managerial decision making. The course deals with making financial statements, measurement of a few major line items of financial statements and using such financial statements for decision making from managerial perspective.

2. Course Modules with quantitative lecture hours:

Module 1	**Line items of financial statements**	**(4 hours)**
This module helps the participants in understanding the line items of balance sheet, profit and loss statement and three major categories of cash flows statement of a non-finance company.		
Module 2	**Accounting Principles**	**(2 hours)**
This module enables the participants to understand major accounting principles like double entry principle, accrual accounting principle, money measurement principle, business entity principle, going concern principle, matching principle and conservatism principle.		
Module 3	**Transactional Analysis to make financial statements**	**(3 hours)**
Making balance sheet and profit and loss statement using transactional analysis (equation approach)		
Module 4	**Accounting Records**	**(5 hours)**
This module enables students in understanding preparation of major accounting records like journal book, ledger books and trail balance with/without adjustments. At the end of this module, students should get conversant with the accounting cycle and records.		
Module 5	**Cash Flows Statement**	**(5 hours)**
This module makes students to understand structure, importance, classification of cash flows and construction of cash flows statement. At the end of this module, students should be able to understand cash flows from operating, investing, and financing activities.		

Module 6	Measurement and analysis of Depreciation, Cost of Goods Sold (COGS) and Inventory	(4 hours)
This module enables students to understand different methods of depreciation and inventory valuation. Students should also understand implications of these methods of measurement on statement of profit and loss and balance sheet.		
Module 7	**Measurement of non-current assets and liabilities**	**(4 hours)**
This module makes students to understand expensing versus capitalizing and measurement of contingent liabilities.		
Module 8	**Techniques of Financial Statements Analysis**	**(8 hours)**
This module makes students to understand application of common-size analysis, comparative analysis, and ratio analysis in analysis of balance sheet, statement of profit and loss and statement of cash flows. The financial statements analysis should be from credit analysis, investment analysis and forensic perspective. While analysing financial statements, students should be made to understand implications of major accounting policies related to measurement of assets, revenues and expenses in financial statements analysis.		

Laboratory/practical/tutorial Modules: NA

3. Text books:

1. Anthony, Robert Newton, David F. Hawkins, and Kenneth A. Merchant. *Accounting, text and cases*. McGraw-Hill/Irwin, 1999.
2. Subramanyam K R. *Financial Statement Analysis,* McGraw Hill, 2021.

4. References:

1. Maher, Michael W., Clyde P. Stickney, and Roman L. Weil. Managerial accounting: An introduction to concepts, methods and uses. Rob Dewey, 2006.
2. White, Gerald I., Ashwinpaul C. Sondhi, and Dov Fried. The analysis and use of financial statements. John Wiley & Sons, 2002.
3. Penman, Stephen H., and Stephen H. Penman. Financial statement analysis and security valuation. New York: McGraw-Hill/Irwin, 2010.
4. Graham, Benjamin and David Le Fevre Dodd (6th Edition). Security analysis, McGraw-Hill, 1934.

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

S. No.	Course	Course Code	Similarity Content	Approx. % of Content
1.	Financial Statement	MB515	Accounting Principles,	30%

	Analysis		Balance sheet analysis, Statement of Profit and Loss, Cash flow statement, etc	

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

MB303 – Financial Accounting is a 3-credit foundational course designed specifically for IMBA students, offering a comprehensive introduction to the principles, standards, and practices of financial accounting. The course emphasizes the conceptual underpinnings of accounting, detailed recording and reporting processes, and the interpretation of financial transactions. It aims to build a robust understanding of the accounting cycle and the preparation of key financial statements in accordance with applicable standards.

In contrast, MB515 – Financial Statement Analysis is a 2-credit course offered to MBA students, with a distinct focus on the interpretation and strategic use of financial information for decision-making. Rather than emphasizing the mechanics of accounting, MB515 trains students to analyze financial statements critically to assess a company's performance, risk, and valuation, thereby equipping them to make informed managerial and investment decisions.

Approvals:

Faculty interested in teaching this course: – Dr Puran Singh

Proposed by: Dr Puran Singh **School: SoM**

Signature: 11/8/25 **Date:**

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

Sl. No	Faculty Name	Signature
1	Prof Manoj Thakur	
2	Dr Ashish	

	Bollimbala	
3	Dr. Ridhi Arora	

School Chair:

School:

Date:

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

Dean Academics

Date:

IIT Mandi
Proposal for a New Course

Course number : **MB304**
Course Name : **Ethics and Values**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

The objective of this course is to develop a critical understanding of business ethical theories, moral principles, and core human values, and their relevance in personal, professional and varied cultural contexts among participants. The course attempts to foster ethical reasoning, professional integrity, empathy, and responsible decision-making among learners by encouraging reflection on real-life dilemmas and value-based leadership. Through case studies and interactive discussions, students will get an opportunity to enhance their skills for navigating complex ethical challenges and making contributions towards building inclusive and value-driven society.

2. Course Modules with quantitative lecture hours:

Topic Description	Duration (in Hours)
Module -1 Ethics in the world of business To introduce the basic nature of ethics, Applied Ethics, Law and ethics, Ethics and business	5
Module -2 Ethical Theories Ethical Theories: Utilitarian Theory, Deontological Theory, Virtue Theory	10
Module -3 Ethical code, employer-employee rights and whistle-blowing Ethical codes for various organizations, Employer-Employee Relation, rights and responsibilities, Whistle-Blowing, Wage gap, sexual harassment, Business Ethics,	10

Module:4 Corporate Social Responsibility Stakeholders; Corporate Social Responsibility	3
Module:5 Ethics and its importance for business professionals: Discrimination Management Ethics, Discrimination and Unjust Dismissal,	5
Module:6 Ethics in advertising Values of Trust and Customers, Ethics and advertisement,	5
Module: 7 Environmental sustainability Waste management and Environmental sustainability	4

3. **Text books:**

Boatright, J. R. (2000). *Ethics and the Conduct of Business, 6/e*. Pearson Education India.

4. **References:**

- Aronson, D. (2024). *The Value of Values: How Leaders Can Grow Their Businesses and Enhance Their Careers by Doing the Right Thing*. MIT Press.
- Maddux, D., & Maddux, R. (1989). *Ethics in business: a guide for managers*. Crisp Learning.
- Rowan, J., & Zinaich, S. (2003). Ethics for the Professions.

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

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

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

NA

IIT Mandi
Proposal for a New Course

Course number : **MB305**
Course Name : **Business Communication**
Credit : **3**
Distribution : **3-0-0-3** ***(L-T-P-C)***
Intended for : **IMBA**
Prerequisite : **NA**
Mutual Exclusion: **NA**

1. Preamble:

This course develops essential managerial communication skills with a focus on strategic, effective communication in professional contexts. Through case studies, role-plays, and theoretical insights, students will enhance their ability to convey ideas clearly and lead with impact.

With the rise in Generative AI, communication methods are evolving rapidly. While these tools can enhance productivity, they also introduce cognitive challenges. Students will explore how to engage with such technologies critically-using them to augment, not replace, their communication abilities-preparing them for the demands of a tech-driven workplace.

2. Course Modules with quantitative lecture hours:

Topic Description	Duration (in Hours)
Mastering Communication Skills in the Era of AI Historical evolution of workplace communication, the impact of digital transformation and AI on communication norms, Human vs. machine communication: key distinctions, Capabilities and limitations of AI in communication, Examples of AI-driven communication tasks in business settings, Why Human Communication Still Matters, effective and ineffective use of AI in business communication.	4
Module -2 Foundations of Effective Communication This module introduces essential principles of effective communication within organisations. It addresses communication fundamentals, common barriers and solutions, speaking and listening skills, and an audience-focused approach. Students will develop the ability to create clear, concise, and impactful messages suited to professional contexts.	6

Module -3 Strategic Persuasion and Influence for Business Communication This module introduces students to important strategies for persuasive communication. It combines ideas from different fields like rhetoric, strategy, and negotiation. Students will learn key frameworks such as Aristotle's persuasion model, Toulmin's argument method, and storytelling techniques. These concepts will be explained using real-life case studies. The module also covers topics like "Radical Candor," "Using Humor in Communication," "Being Authentic in the Age of AI," and "Understanding Your Audience."	**6**
Module:4 AI-Enabled Public Speaking and Presentation Skills This module centers on mastering the art of preparing and delivering impactful presentations. Students will learn to create a compelling balance between data and narrative by focusing on content structuring, design principles, multimedia integration, and storytelling techniques. The course also covers essential elements of non-verbal communication, including the use of gestures and posture, managing audience questions, and honing public speaking skills. As a practical component, students will collaborate to prepare and deliver group presentations. Additionally, the module highlights the role of AI tools in enhancing personalized, interactive, and efficient instruction, positioning them as valuable resources in modern communication education.	**12**
Module:5 Master Storytelling aided with AI Tools as assets This module discusses how AI tools play a pivotal role in modern education by enabling personalized, interactive, and efficient instruction in both written communication and public speaking, making them essential assets in today's learning environment.	**6**
Module:6 Modern Interview Techniques and the Use of Technology The final module focuses on developing the communication skills and strategies essential for succeeding in interviews. Delivered in an interactive workshop format, this module will include role-plays, mock interviews, and personalized feedback sessions. Key topics include cross-cultural communication, aligning with industry-specific narratives, effective articulation techniques, and structured approaches to handling interview questions. The module also introduces students to cutting-edge tools, including VR-based technologies designed to enhance interview readiness. Demonstrations from partner startups will showcase how such tools can simulate real-life interview scenarios and support skill development in a dynamic, tech-enabled environment.	**8**

3. **Text books:**

Bovee, Courtland L., John V. Thill and Roshan Lal Raina. Business Communication Today. Tenth Edition. Delhi: Pearson, 2018.

4. **References:**

- Morgan, N., Cialdini, R. B., Review, H. B., Tannen, D. (2013). HBR's 10 Must Reads on Communication (withFeatured Article "The Necessary Art of Persuasion," by Jay A.
- Ethan Mollick, Co-Intelligence: Living and Working with AI , WH Allen; Penguin Random House Ireland Limited, 2024
- Robert Cialdini, Influence: The Psychology of Persuasion, Harper Business, HarperCollins India Private Limited, 2021.
- The Elements of Style" by William Strunk Jr. and E.B. White

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

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

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

NA

Approvals:

Faculty interested in teaching this course: –

Proposed by: Prof Anjan Kumar Swain School: SoM

Signature: Date:

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

Sl. No	Faculty Name	Signature
1	Mr Somjit Amrit	
2	Prof Anjan Kumar Swain	
3	Dr Ashish Bollimbala	

School Chair:

School:

Date:

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

Dean Academics

Date:

Annexure-F.

IIT Mandi
Proposal for a New Course

Course number : **CE565P**
Course Name : **Experimental Techniques in Hydrology**
Credit : **0-0-4-2**
Distribution : ***L-T-P-C***
Intended for : **UG/PG Elective**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

This course aims to provide a comprehensive understanding of the methods and practices used in experimental hydrology. As the name suggests, the focus of the course will be on applying hydrological theories through practical experiments and measurement of hydrological characteristics.

In this course, students will have the opportunity to engage with a range of lab-based activities to understand the physical properties of soils, plot soil moisture retention curves, estimate infiltration rates, simulate rainfall scenarios, measure soil hydraulic conductivity, and study the flow dynamics in open channels. These activities will not only help students in grasping the underlying scientific principles but also in developing the skills required to design and conduct hydrological experiments.

The hands-on nature of the course will allow the students to translate theory into practice, fostering a greater appreciation for techniques in experimental hydrology.

2. Course Modules with quantitative lecture hours:

Laboratory/practical/tutorial Modules:

Module 1 - Determination of Physical Properties of Soil (4 hours)

Theoretical and practical understanding of techniques to determine soil physical properties.

Module 2 – Estimation of Soil Moisture Retention Characteristic Curve (4 hours)

Theory and application of pressure plate apparatus to plot soil moisture retention curve.

Module 3 – Infiltration Capacity of Soil (6 hours)

Estimation of soil infiltration capacity (in lab and field) using various techniques.

Module 4 - Soil Hydraulic Conductivity Experiments (4 hours)

Hands-on exercises on understanding and measuring soil hydraulic conductivity.

Module 5 - Rainfall Simulator Experiments (10 hours)

Simulating various rainfall scenarios by varying the catchment characteristics and understanding their impacts on runoff generation for various soil types.

Module 6 - Flow through Open Channel Experiments (10 hours)

Experiments to understand and analyze flow dynamics in open channels and their interaction with subsurface.

Module 7 – Hydrometry (8 hours)

Methods of in-situ measurement of critical hydrological elements i.e. - rainfall, soil moisture, and streamflow.

Module 8 – Geophysical investigation using non-intrusive techniques (6 hours)

To understand and use the non-intrusive method to map underground utilities and subsurface characteristics.

Module 8: Field Visit (4 hours)

A half-day field visit to nearby hydrometeorological sites.

3. Text books:

a. Brassington, R. (2023). Field hydrogeology. John Wiley & Sons.

4. References:

a. WMO's Guide to Hydrological Practices, Volume I & II. https://library.wmo.int/index.php?lvl=notice_display&id=21815

b. IMD's Instruction to Observers at the Surface Observatories. https://www.imdpune.gov.in/library/instructions_to_observers.pdf

c. CWC's Handbook for Hydrometeorological Observations. https://cwc.gov.in/sites/default/files/hand-book-hydro-meteorological-observations._1.pdf

5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: – Vivek Gupta, Aliva Nanda, and Ranjeet Jha

Proposed by: Vivek Gupta **School:** SCENE

Signature: **Date:**

The following external faculty (at least 2 faculty) provided the feedback and it was discussed among school/centre faculty on……..

Sl. No	Faculty Name	Signature
1	Dr. Ashutosh Sharma Department of Hydrology, IIT Roorkee	Email attached
2	Dr. Priyank Sharma Civil Engineering, IIT Indore	

School Chair:

School: SCENE

Date: 27/08/2025

This proposal is reported in 60th……th Board of Academics on ……

Dean Academics

Date:

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

Comments of the Reviewers:

Vivek Gupta <vivekgupta@iitmandi.ac.in>

Review request for course proposal on Experimental Hydrology

2 messages

Vivek Gupta <vivekgupta@iitmandi.ac.in> Tue, Aug 1, 2023 at 12:51 PM
To: "Dr. Priyank Sharma" <priyanksharma@iiti.ac.in>
Cc: Kala Venkata Uday <uday@iitmandi.ac.in>

Dear Dr. Sharma,

We are starting a 5-level course at the School of Civil and Environmental Engineering course, IIT Mandi. As you are one of the top experts in the field, I would highly appreciate it if you could provide your feedback on the course.

Thanks and regards,
Vivek

--

Vivek Gupta
Assistant Professor
School of Civil and Environmental Engineering,
A11-05-33, North Campus,
IIT Mandi, Kamand (H.P.)
Tel. 01905-267117 | Mob. +91-8958177266
Website

Course Proposal-Experimental Hydrology (1).docx
58K

Dr. Priyank Sharma <priyanksharma@iiti.ac.in> Tue, Aug 1, 2023 at 5:21 PM
To: Vivek Gupta <vivekgupta@iitmandi.ac.in>
Cc: Kala Venkata Uday <uday@iitmandi.ac.in>

Dear Dr. Vivek,

Thank you for sharing the course content with me. The course on 'Experimental Techniques in Hydrology' is nicely designed and well organized. I have marked a few minor changes in the enclosed document for better clarity. Kindly review it once and approve them if found suitable.
Overall, the course structure looks fine to me and perfectly caters to the important aspects of hydrometry. I am sure the students will definitely benefit from this course.

Thanks and Regards!
Priyank Sharma

[Quoted text hidden]

Course Proposal-Experimental Hydrology_Edited.docx
61K

Vivek Gupta <vivekgupta@iitmandi.ac.in>

Review request for course proposal on Experimental Hydrology

2 messages

Vivek Gupta <vivekgupta@iitmandi.ac.in> Tue, Aug 1, 2023 at 12:51 PM
To: Ashutosh Sharma <ashutosh.sharma@hy.iitr.ac.in>
Cc: Kala Venkata Uday <uday@iitmandi.ac.in>

Dear Dr. Sharma,

We are starting a 5-level course at the School of Civil and Environmental Engineering course, IIT Mandi. As you are one of the top experts in the field, I would highly appreciate it if you could provide your feedback on the course.

Thanks and regards,
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Tel. 01905-267117 | Mob. +91-8958177266
Website

Course Proposal-Experimental Hydrology (1).docx
58K

Ashutosh Sharma <ashutosh.sharma@hy.iitr.ac.in> Tue, Aug 1, 2023 at 4:59 PM
To: Vivek Gupta <vivekgupta@iitmandi.ac.in>
Cc: Kala Venkata Uday <uday@iitmandi.ac.in>

Dear Dr Gupta,

Thank you for sharing the course content. The course content is nicely designed and appropriately covers different experiential techniques in hydrology. I am sure the course will be very beneficial for both UG and PG students. I congratulate the course coordinator(s) for their efforts.

I have the following suggestions to enhance the course further:

- A field visit to nearby watersheds, CWC gauging sites or IMD observatories may be included in the course to expose students to the real field functioning of different measurement methods and associated challenges.
- Suggestions for references:
  - WMO's Guide to Hydrological Practices, Volume I & II
  - IMD's Instruction to Observers at the Surface Observatories
  - CWC's Handbook for Hydrometeorological Observations

Please let me know if you need any clarification on any of these suggestions.

Best regards,
Ashutosh

Dr. Ashutosh Sharma, PhD
Assistant Professor, Department of Hydrology
Indian Institute of Technology (IIT) Roorkee

Phone: (+91) 1332 284896 (O), (+91) 78968 80487 (Mobile & WhatsApp)
Email: ashutosh.sharma@hy.iitr.ac.in | ashutosh.hydro@gmail.com
Webpage: https://www.iitr.ac.in/~HY/Ashutosh_Sharma

[Quoted text hidden]

Reviewer-1 : Dr. Ashutosh Sharma

I have the following suggestions to enhance the course further:

A field visit to nearby watersheds, CWC gauging sites or IMD observatories may be included in the course toexpose students to the real field functioning of different measurement methods and associated challenges.

[Reply] We have a meteorological observatory of Jal Shakti Vibhag HP at IIT Mandi campus, the students will be taken to visit the observatory during the course.

Suggestions for references:

WMO's Guide to Hydrological Practices, Volume I & II

IMD's Instruction to Observers at the Surface Observatories

CWC's Handbook for Hydrometeorological Observations

[Reply] Thanks for the suggestion for the references. We have included these references in the course proposal.

Annexure-F.

IIT Mandi
Proposal for a New Course

Course number : **CE565P**
Course Name : **Experimental Techniques in Hydrology**
Credit : **0-0-4-2**
Distribution : ***L-T-P-C***
Intended for : **UG/PG Elective**
Prerequisite : **NA**
Mutual Exclusion : **NA**

1. Preamble:

This course aims to provide a comprehensive understanding of the methods and practices used in experimental hydrology. As the name suggests, the focus of the course will be on applying hydrological theories through practical experiments and measurement of hydrological characteristics.

In this course, students will have the opportunity to engage with a range of lab-based activities to understand the physical properties of soils, plot soil moisture retention curves, estimate infiltration rates, simulate rainfall scenarios, measure soil hydraulic conductivity, and study the flow dynamics in open channels. These activities will not only help students in grasping the underlying scientific principles but also in developing the skills required to design and conduct hydrological experiments.

The hands-on nature of the course will allow the students to translate theory into practice, fostering a greater appreciation for techniques in experimental hydrology.

2. Course Modules with quantitative lecture hours:

Laboratory/practical/tutorial Modules:

Module 1 - Determination of Physical Properties of Soil (4 hours)

Theoretical and practical understanding of techniques to determine soil physical properties.

Module 2 – Estimation of Soil Moisture Retention Characteristic Curve (4 hours)

Theory and application of pressure plate apparatus to plot soil moisture retention curve.

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Estimation of soil infiltration capacity (in lab and field) using various techniques.

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Hands-on exercises on understanding and measuring soil hydraulic conductivity.

Module 5 - Rainfall Simulator Experiments (10 hours)

Simulating various rainfall scenarios by varying the catchment characteristics and understanding their impacts on runoff generation for various soil types.

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Experiments to understand and analyze flow dynamics in open channels and their interaction with subsurface.

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3. Text books:

a. Brassington, R. (2023). Field hydrogeology. John Wiley & Sons.

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5. Similarity with the existing courses:

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

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

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

Approvals:

Faculty interested in teaching this course: – Vivek Gupta, Aliva Nanda, and Ranjeet Jha

Proposed by: Vivek Gupta **School:** SCENE

Signature: Gupta **Date:**

The following external faculty (at least 2 faculty) provided the feedback and it was discussed among school/centre faculty on……..

Sl. No	Faculty Name	Signature
1	Dr. Ashutosh Sharma Department of Hydrology, IIT Roorkee	Email attached
2	Dr. Priyank Sharma Civil Engineering, IIT Indore	

Ashutosh Sharma | Priyank Sharma | 27/08/25

School Chair:

School: SCENE

Date: 27/08/2025

This proposal is reported in 60th……th Board of Academics on ……

Dean Academics

Date:

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

Comments of the Reviewers:

Vivek Gupta <vivekgupta@iitmandi.ac.in>

Review request for course proposal on Experimental Hydrology

2 messages

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Vivek

Vivek Gupta
Assistant Professor
School of Civil and Environmental Engineering,
A11-05-33, North Campus,
IIT Mandi, Kamand (H.P.)
Tel. 01905-267117 | Mob. +91-8958177266
Website

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Thanks and Regards!
Priyank Sharma

[Quoted text hidden]

Course Proposal-Experimental Hydrology_Edited.docx
61K

Vivek Gupta <vivekgupta@iitmandi.ac.in>

Review request for course proposal on Experimental Hydrology

2 messages

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Vivek

Vivek Gupta
Assistant Professor
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Course Proposal-Experimental Hydrology (1).docx
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Cc: Kala Venkata Uday <uday@iitmandi.ac.in>

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- Suggestions for references:
  - WMO's Guide to Hydrological Practices, Volume I & II
  - IMD's Instruction to Observers at the Surface Observatories
  - CWC's Handbook for Hydrometeorological Observations

Please let me know if you need any clarification on any of these suggestions.

Best regards,
Ashutosh

Dr. Ashutosh Sharma, PhD
Assistant Professor, Department of Hydrology
Indian Institute of Technology (IIT) Roorkee

Phone: (+91) 1332 284896 (O), (+91) 78968 80487 (Mobile & WhatsApp)
Email: ashutosh.sharma@hy.iitr.ac.in | ashutosh.hydro@gmail.com
Webpage: https://www.iitr.ac.in/~HY/Ashutosh_Sharma

[Quoted text hidden]

Reviewer-1 : Dr. Ashutosh Sharma

I have the following suggestions to enhance the course further:

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[Reply] We have a meteorological observatory of Jal Shakti Vibhag HP at IIT Mandi campus, the students will be taken to visit the observatory during the course.

Suggestions for references:

WMO's Guide to Hydrological Practices, Volume I & II

IMD's Instruction to Observers at the Surface Observatories

CWC's Handbook for Hydrometeorological Observations

[Reply] Thanks for the suggestion for the references. We have included these references in the course proposal.

Indian Institute of Technology (IIT) Mandi, India
Institute of Hazard, Risk and Resilience (IHRR), Durham University, UK
Proposal for a New Course

Course Number: CE566
Course Name: Disaster-Resilient Mountain Road Engineering
Course credits: 2-1-0-3
Distribution: ***L-T-P-C***
Prerequisites: N/a
Intended for: UG & PG students
Distribution: Discipline elective
Mutual Exclusion: N/a

1. Course Preamble:

Understanding natural hazards, the risks they pose to road infrastructure and its users, and the design of resilient infrastructure is crucial for all stakeholders working in road infrastructure in hilly regions —including engineers, policymakers, and planners. Efficient and effective communication and coordination between all stakeholder groups is essential to ensuring adequate resilience. This course will bridge the gap among the various hill road stakeholders by improving awareness of different roles and responsibilities and introducing common frameworks and terminologies. The course offers foundational knowledge on risk assessment and risk reduction approaches, management and maintenance strategies, and current policy for design, construction, and resilience of hill roads. Real-world case studies from diverse stakeholder perspectives are integrated to ensure participants gain practical, experience-based insights.

By the end of the course, participants will have gained understanding of the key terminologies, frameworks, and concepts in hazards, risk, and resilience for hill roads. This knowledge will enable participants to have effective communication and coordination with other stakeholders. They will also gain practical skills to implement this knowledge effectively in real-world scenarios.

2. Course Modules with Lecture Hours:

1. **Introduction to hazards, risk, and resilience for hill roads:**
   Understanding mountain dynamics (tectonics, rainfall, geology, geomorphology, and slope aspect); Road classification in hilly regions; Hazard types and definitions; Hazard-infrastructure interaction; Introduction to multi-hazards; Impact of climate change on hazards in hilly terrain; Introduction to hazard identification and assessment; Introduction to risk and resilience terminology; Introduction to engineering solutions.
   (14 hours).

2. **Concept of risk assessment:**
   Risk terminology; Hazards Elements at risk/Exposure; Vulnerability; Overview of risk assessment types; total risk, risk tolerance; Strategies to characterize risk based on road characteristics; Risk communication.

   (6 hours).

3. **Risk reduction:**
   Geological, geomorphological, and engineering assessment, Mitigation (including drainage implementation); Role of technology such as early warning and monitoring systems; Indigenous and nature-based solutions; Community participation, education, and preparedness; Accounting for climate change.

   (6 hours).

4. **Hill road operation and maintenance:**
   Role of stakeholders; Operation, monitoring and preventative maintenance; Reconstruction/ rehabilitation; Drainage management; Early warning systems; System recovery.

   (6 hours).

5. **Network resilience and cost-benefit analysis for risk reduction:**
   Prioritization of action on assets; Planning strategy to maintain the road network; Identification of indicators to represent costs and benefits.

   (6 hours).

6. **Policy and governance:**
   Existing policy and guidelines for design, construction, maintenance, and resilience for different categories of roads; Funding and financing mechanisms; Climate goals for resilient roads.

   (4 hours).

Main Text Books

Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge, London.

Fuchs, S., & Thaler, T. (2018). *Vulnerability and resilience to natural hazards*. Cambridge University Press, Cambridge.

Hearn. G. (2011). *Slope Engineering for Mountain Roads.* Geological Society Engineering Geology Special Publication No. 24. The Geological Society, UK.

Infrastructure Resilience Division of ASCE. (2021). *Hazard-resilient infrastructure: Analysis and design*. MOP-144, Edited by B. M. Ayyub, Reston, VA: American Society of Civil Engineers.

Kramer, S. L. (1996). *Geotechnical earthquake engineering*. Prentice Hall, New Jersey.

Semien, J., & Nance, E. (2022). *Hazard mitigation training for vulnerable communities: a KAPS (knowledge, attitude, preparedness, skills) approach*. Routledge, New York.

Additional Reading

Journal papers and reports in the area of disaster risk reduction, hill road construction, and natural hazards

Similarity content declaration with existing courses:

N/a

Justification of new course proposal if cumulative similarity content is:

N/a

Other faculty interested in teaching this course:

1. Dr Uday Kala

Proposed by:

1. Dr Ashutosh Kumar, SCENE

Signature: Ashutosh Kumar **Date: 19/06/2025**

2. Dr Ellen Robson (Institute of Hazard, Risk and Resilience, Durham University, UK)

Signature: E. Robson **Date: 19/06/2025**

Recommended/Not Recommended, with Comments:

_____ **Date:**_____

Chairperson, CPC

Approved / Not Approved

_____ **Date:**_____

Chairperson, BoA

Feedback:

This course is developed by conducting a two days' workshop at IIT Mandi during April 1-2, 2025 as a part of the British Council Funded project "Integrating Disaster Preparedness into the Transportation Engineering curriculum for the Indian Himalayas". The content of the course is thoroughly reviewed and discussed during the workshop and participants included academics Professor David Toll from the Department of Engineering at Durham University, Professor Deepankar Choudhury from Civil Engineering Department at IIT Bombay, and Prof. Bhim Kumar Dahal from the Institute of Engineering at Pulchowk Campus, Tribhuvan University, industry partners including the Coalition for Disaster Resilient Infrastructure (CDRI), Maccaferri, AFRY India Pvt. Ltd, the National Society for Earthquake Technology-Nepal (NSET), and Winter Associates, and policymakers (including from the State Disaster Management Authority).

School/Centre Chair:

School/Centre:

Date:

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

Dean Academics

Date:

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

Comments of the Reviewers:

Files are shared separately.

Annexure-6

IIT Mandi
Proposal for a New Course

Course number : **EP201**
Course Name : **Reverse Engineering**
Credit Distribution : ***0-0-2-1***
Intended for : **BTech Engineering Physics**
Prerequisite : **None (Discipline Core)**
Mutual Exclusion : **None**

---

1. Preamble:

Reverse engineering is a valuable skill required for engineers, experimentalists, software developers and anyone who wants to know how things work. In this course, the focus will be on the reverse engineering of either hardware products or debugging of source code or both. After the completion of the course, students should be able to

- Understand the methodology involved in reverse engineering
- Dismantle and assemble a product
- Test, analyze and evaluate a product
- Propose a better version to create the product
- Document the process involved and reporting.

2. Course Modules with quantitative lecture hours:

During the course, the students will be given the task of

(a) Dismantling and assembling of ***hardware*** like
- electrical appliances (that is working), motors, vacuum pumps etc. to study its internal make. Similar appliances will also be given that are not working and they have to identify the fault in it and make it working.
- mechanical system like a bicycle.
- instrumental set up that is used to study electronic, optical, magnetic properties etc.
- measuring devices and source meters like multimeter, voltage source, current source etc.

(b) Studying a source code and debugging it, fixing the errors.

3. References:

Reverse engineering: Technology of reinvention by Wego Wang

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

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

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

NA

Approvals:

Other Faculty interested in teaching this course:
All the experimental and computational physicist in School of Physical Sciences

Proposed by: Prof. Bindu Radhamany **School:** School of Physical Sciences

Signature: Bindu R 11/09/25 **Date:**

Recommended/Not Recommended, with Comments:

_____ **Date:**_____

Chairperson, CPC

Approved / Not Approved

_____ **Date:**_____

Chairperson, BoA

Indian Institute of Technology Mandi

शैक्षणिक अनुभाग
Inward No. 7068
11 SEP 2025
Academics Section

IIT Mandi
Proposal for a New Course

Course number : **EP321**
Course Name : **Foundations of Electrodynamics**
Credit Distribution : ***2.5-0.-0-3***
Intended for : **BTech Engineering Physics**
Prerequisite : **None (Discipline Core)**
Mutual Exclusion : **None**

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1. **Preamble:** This course offers a unified introduction to classical electrodynamics, starting from the fundamentals of electrostatics and magnetostatics to the full formulation of Maxwell's equations. Part I develops the mathematical and physical foundations, including vector calculus, boundary conditions, dielectric and magnetic media, and electromagnetic induction. Part II applies Maxwell's equations to wave propagation in vacuum and matter, gauge invariance, dispersion, and energy–momentum conservation, and explores modern topics like negative-index materials. The course concludes with guided-wave theory, radiation, and antennas, equipping students with the tools to analyze electromagnetic phenomena in both free space and materials.

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

Part I – Derivation of Maxwell's Equations

• **Review of Vector Calculus and Electrostatics** Vector calculus, Helmholtz equation, Coulomb's law, Gauss's law, Poisson and Laplace equations. [6 Lectures]

• **Electrostatic Boundary Conditions and Dielectrics** Conductors and capacitors; mean-value and uniqueness theorems; separation of variables; dipoles and electric polarization in matter (dielectrics). [6 Lectures]

• **Magnetostatics and Magnetic Materials** Lorentz force law; Biot–Savart law and magnetic vector potential; boundary conditions on B; magnetic materials (paramagnetic, diamagnetic); bound currents; boundary conditions on H; inductance and magnetic energy density. [6 Lectures]

• **Electrodynamics and Maxwell's Equations** Ohm's law; electromotive forces; Faraday's law; full Maxwell's equations in differential and integral form. [5 Lectures]

Part II – Maxwell's Equations and Electromagnetic Waves

• **Waves in Vacuum and Energy–Momentum Conservation** Electromagnetic waves in vacuum; Maxwell's stress tensor; momentum conservation; Poynting theorem (energy and momentum conservation). [5 Lectures]

• **Gauge Transformations** Gauge freedom; Coulomb gauge and Lorentz gauge choices. [3 Lectures]

• **Waves in Matter and Dispersion** Reflection, transmission and polarization at interfaces; electromagnetic waves in dispersive media; Kramers–Kronig relations; Lorentz oscillator model for dispersion and absorption; negative-index materials. [6 Lectures]

• **Waveguides and Radiation** Rectangular and circular waveguides: TE and TM modes; radiated power; electric dipole radiation; basic antenna theory. [6 Lectures]

3. Text Book

D. J. Griffiths, Introduction to Electrodynamics.

4. References:

1. R. P. Feynman, Lectures on Physics Vol. II.
2. D. K. Cheng, Fields and Waves in Electromagnetics.
3. M. N. O. Sadiku, Elements of Electromagnetics.
4. E. M. Purcell and D. J. Morin, Electricity and Magnetism.
5. B. B. Laud, Electromagnetics.
6. J. D. Jackson, Classical Electrodynamics.

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

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

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

NA

Approvals

Other Faculty interested in teaching this course:
All SPS faculty

Proposed by: Dr. Arko Roy (on behalf of SPS) **School:** School of Physical Sciences

Signature: **Date:**

Indian Institute of Technology Mandi

Recommended/Not Recommended, with Comments:

_____ **Date:**_____

Chairperson, CPC

Approved / Not Approved

_____ **Date:**_____

Chairperson, BoA

Proposal

For

B.Tech-M.Tech Integrated Dual Degree

In

Bioengineering

School of Basic Sciences,

School of Computing and Electrical Engineering,

School of Engineering,

Indian Institute of Technology Mandi

Integrated Dual degree (IDD) B.Tech and M.Tech in Bioengineering

Preamble to the programme:

Bioengineering integrates physical, chemical, mathematical, computational and life sciences with core engineering principles driving the technologies towards advances and applications in health, environment, agriculture, energy etc thereby improving the quality of life. It creates knowledge from the molecular to organ systems levels, develops materials, devices, systems, information approaches, technology management, and methods for assessment and evaluation of technology, for the biological applications. The discipline of bioengineering has evolved drastically over the past 50 years, seemingly encompassing all fields that include bioelectric phenomena, bioinformatics, biomaterials, biomechanics, bioinstrumentation, biosensors, biosignal processing, biotechnology, computational biology, medical imaging, etc. The B.Tech and M.Tech dual degree programme on Bioengineering strives to train the students in the field of physical, chemical, mathematical and biological sciences together with engineering principles for inculcating knowledge enabling them in developing and deploying Bioengineering technologies in various fields.

MTech allows the Bioengineers to specialise in four advanced focused areas:

a) Biomedical Engineering aimed at gaining expertise in the areas of diagnostics, therapeutic and assistive support for healthcare applications.

b) Agricultural Automation Technology aimed at providing automation and assistive support to agricultural practices.

c) Environmental Science and Engineering aimed at training bioengineers to develop environment friendly processing technologies involving bio-organisms.

d) Computational Bioengineering aimed at both developing algorithms and models to understand biological systems and processes.

The curriculum will impart training to budding students that will cater to the requirements of Bio-based industries. At IIT Mandi, a student needs to complete 160 credits for B.Tech in 4 years and 70 credits for M.Tech in two years. The integrated dual degree programme in Bioengineering allows the students to go through a rigorous framework of core courses at Bachelors and Masters level and a comprehensive and detailed project and dissertation work which allows a student to graduate in 5 years with a B.Tech-M.Tech integrated dual degree earning 206 credits.

M.Tech Specializations:

1. Biomedical Engineering
2. Agro-Technology
3. Environmental Science and Engineering
4. Computational Bioengineering

A student can choose to take courses across specializations. In such a case, he/she will be awarded M.Tech in Bioengineering without any specialization.

Selection: Students will be selected through Joint Entrance (Advanced) Examination.

Provision of Scholarship in 5th year: Students are eligible for HTRA in the 5th year as per existing IIT Mandi norms for integrated M.Tech programmes.

Duration: 10 semesters. The degrees B.Tech in Bioengineering and M.Tech in specialised areas (Biomedical Engineering/Agro-Technology/Environmental Science and Engineering/Computational Bioengineering) will be awarded on completion of M.Tech. A student can choose to take courses across specializations. In such a case, he/she will be awarded M.Tech in Bioengineering without any specialization.

Objectives of the programme:

1. Assimilate knowledge of physical, mathematical and biological sciences together with engineering principles for the development of diagnostic, therapeutic and assistive technologies as well as developing algorithms and models to understand biological systems and processes.
2. Train manpower for industries dedicated to technologies applied to biological systems.
3. Develop manpower to apply engineering concepts and techniques to the investigation and exploration of biological processes.
4. Train manpower capable of solving problems related to preventive medical approaches, automation based agricultural practices, environmental friendly bioprocesses and computational techniques for understanding biological systems.

How is this programme different?

1. Strong engineering emphasis.
2. Freedom to choose between multiple specializations.
3. Industrial involvement in teaching courses.
4. Wide market opportunities.

Branch change policy: The existing branch change policy at IIT Mandi will be applicable to students enrolled in the IDD (Bioengineering) programme.

Exit option: There is no exit option available after 4th year for a single B.Tech degree in Bioengineering. This is in compliance with the existing practises of IIT s towards Integrated Dual Degree programmes.

Graduation requirements:

1. A student can complete B.Tech (Bioengineering) and M.Tech in X (X=Biomedical Engineering/Agro Technology/Environmental Science and Engineering/Computational Bioengineering) if he/she has earned 206 credits comprising of:

a. 76 credits of institute core,
b. 33 credits of discipline core,
c. 22 credits of free electives,

d. 5 credits of humanities electives,
e. 9 credits of M.Tech core and
f. 21 credits of M.Tech discipline electives,
g. 1 credit of Technical Communication,
h. 1 credit of Bioethics and Regulatory Affairs,
i. 4 credits of Mini project, Term Paper and Seminar, and
j. 34 credits of M.Tech dissertation.

2. In case a student chooses courses belonging to different baskets of M.Tech core and discipline electives, he/she can earn an M.Tech degree in Bioengineering only.
3. A student intending to do B.Tech (Hons.) in Bioengineering instead of B.Tech in Bioengineering is permitted to do so as per IIT Mandi norms.

Core faculty members:

1. Dr. Tulika Yadav (Spl: Bioinformatics, next generation sequencing technologies)
2. Dr. Shyam Kumar Masakapalli (Spl: Metabolic Systems Biology – Metabolomics and Fluxomics, NMR and GC-MS)
3. Dr. Amit Prasad (Spl: Immunology and microbiology)
4. Dr. Prosenjit Mondal (Spl: Molecular endocrinology and metabolism)
5. Dr. Amit Jaiswal (Spl: Nanobiotechnology)
6. Dr. Rajanish Giri (Spl: Biophysics and protein folding, T Cell Engineering, Protein Engineering)
7. Dr. Sarita Azad (Spl: Epidemics and Bio-surveillance)
8. Dr. Syed Abbas (Spl: Ecological modelling)
9. Dr. Rajesh Ghosh (Spl: Biomechanics)
10. Dr. Mohammed Talha (Spl: Biomechanics)
11. Dr. Sunny Zafar (Spl: Biomechanics)
12. Dr. Gaurav Bhutani (Spl: Biomechanics)
13. Dr. Anil Kr. Sao (Spl: Medical Image Analysis)
14. Dr. Arnav Bhavsar (Spl: Medical Image Analysis)
15. Dr. Aditya Nigam (Spl: Medical Image Analysis)
16. Dr. Renu Rameshan (Spl: Medical Image Analysis)
17. Dr. Srikant Srinivasan (Spl: IoT, Plant phenotyping)
18. Prof. Ajit Annachhatre (Spl: Environmental Science and Engineering)
19. Dr. Shubhajit Roy Chowdhury (Spl: Biomedical Systems)

Curriculum:

Semester I

Course Code	L-T-P-C	Course Name
IC110	2.5-0.5-0-3	Engineering Mathematics
IC152	3-0-3-4	Data Science I
IC160	3-0-0-3	Electrical Systems Around Us
IC160P	0-0-3-2	Electrical Systems Around Us Lab
IC140	2-0-3-4	Graphics for Design
IC101P	0-0-3-2	Reverse Engineering
HS106	3-0-0-3	English I
HS10X	1-0-0-1	Creative Understanding
Total	**22 credits**	

Semester II

Course Code	L-T-P-C	Course Name
IC111	2.5-0.5-0-3	Linear Algebra
IC141	2-0-0-2	Product Realization Technology
IC141P	0-0-3-2	Product Realization Technology Lab
IC161	3-0-0-3	Applied Electronics
IC161P	0-0-3-2	Applied Electronics Lab
IC252	3-0-2-4	Data Science II
HSXX1	3-0-0-3	HSS Language competence basket course
IC142	3-0-0-3	Engineering Thermodynamics
Total	**22 credits**	

Semester III

Course Code	L-T-P-C	Course Name
IC260	2.5-0.5-0-3	Signals and systems (Engg. Science basket)
IC136	3-0-0-3	Understanding Biotechnology and its applications (Science II basket)
IC2XX	2-0-2-3	Data Science III
IC240	2.5-0.5-0-3	Mechanics of Rigid Bodies
BEXX1	3-0-2-4	Biology-I
BEXX2	2-0-2-3	Biology-II
HSXX2	3-0-0-3	HSS Communication Skills basket course
Total	**22 credits**	

Semester IV

Course Code	L-T-P-C	Course Name
IC201P	0-0-6-4	Design Practicum

BEXX3	2-0-2-3	Biology-III
BEXX4	3-0-2-4	Physics and modeling of biological systems
BEXX5	2-0-2-3	Computational Biology
BEXX6	3-0-2-4	Biostatistics
BEXX7	3-0-2-4	Biomechanics
Total	**22 credits**	

Semester V

Course Code	L-T-P-C	Course Name
IC221	3-0-0-3	Foundations of Electrodynamics
IC241	3-0-0-3	Material Science for Engineers (Science I basket course)
BEXX8	1-0-0-1	Bioethics and Regulatory affairs
BEXX9	3-0-2-4	Biomaterials
BEXX10	3-0-2-4	Biosensing and Bioinstrumentation
HSXX3	3-0-0-3	HSS basket course
BEMC1	3-0-0-3	M.Tech Core-I
Total	**21 credits**	

Semester VI

Course Code	L-T-P-C	Course Name
IC222P	0-0-3-2	Physics Practicum
BEMC2	3-0-0-3	M.Tech Core-II
BEMC3	3-0-0-3	M.Tech Core-III
BEXE1	3-0-0-3	Discipline Elective-I
BEXE2	3-0-0-3	Discipline Elective-II
BEXE3	3-0-0-3	Discipline Elective-III
FEXX1	3-0-0-3	Free Elective-I
Total	**20 credits**	

Semester VII

Course Code	L-T-P-C	Course Name
ITXX1	0-0-2-2	Industrial Internship
BEXE4	3-0-0-3	Discipline Elective-IV
BEXE5	3-0-0-3	Discipline Elective-V
BEXE6	3-0-0-3	Discipline Elective-VI
HSXE1	3-0-0-3	HSS Elective-I
FEXX2	3-0-0-3	Free Elective-II

FEXX3	3-0-0-3	Free Elective-III
HS541	1-0-0-1	Technical Communication
Total	**21 credits**	

Semester VIII

Course Code	L-T-P-C	Course Name
BEXE7	3-0-0-3	Discipline Elective-VII
FEXX4	3-0-0-3	Free Elective-IV
FEXX5	3-0-0-3	Free Elective-V
FEXX6	3-0-0-3	Free Elective-VI
FEXX7	4-0-0-4	Free Elective VII
BEXE8	0-0-8-4	Mini Project, Term Paper and Seminar
HSXX5	2-0-0-2	HSS Elective-II
Total	**22 credits**	

Semester IX

Course Code	L-T-P-C	Course Name
BEXE9	0-0-34-17	M.Tech Project-1
Total	**17 credits**	

Semester X

Course Code	L-T-P-C	Course Name
BEXE10	0-0-34-17	M.Tech Project-2
Total	**17 credits**	

Total: 206 Credits

Compulsory IC courses in Baskets:

Science I:

Material Science for Engineers

Science II:

Understanding Biotechnology and its applications

Engineering Science:

Signals and Systems

M.Tech Core courses and Electives leading to specializations:

A. Biomedical Engineering:

M.Tech Core:

1. Anatomy and Physiology
2. Biomedical Systems (existing)
3. Analytical biotechniques (existing)

Discipline Electives (any seven):

1. Medical Imaging Systems and Analysis
2. Medical Devices and Packaging
3. Biomedical Instrumentation
4. Embedded Systems (existing)
5. Neuroscience and Cognitive Science
6. Optical Microscopy
7. Next generation biomanufacturing
8. Tissue Engineering
9. Regenerative Medicine
10. Nanobiotechnology (existing)
11. Biomedical Image and Signal Analysis
12. Biosolid Mechanics
13. Biofluid mechanics

B. Agro-Technology:

M.Tech Core:

1. Precision Farming
2. IoT for agriculture
3. Agricultural Biotechnology

Discipline Electives (any seven):

1. Plant phenotyping
2. Machine learning for plant phenotyping
3. Plant genotyping
4. Embedded Systems

5. Bioprocess Technology
6. Post-harvest technology and managment
7. Design of farm machinery/Farm mechanisation
8. Agroresidue management
9. Green House Technology
10. Storage and enhancing shelf life
11. Food processing technologies and devices
12. Agro-cultivation technologies (Hydroponics, Aquaponics etc)
13. Technology for Agribusiness and marketing of produces
14. Irrigation technologies

C. Environmental Science and Engineering:

M.Tech Core:

1. Microbiology for environmental applications
2. Environment friendly bioprocesses
3. Environmental biotechnology practicum

Discipline Electives (any seven):

1. Solid waste management
2. Waste water management
3. Air pollution control techniques
4. Waste reuse and recycle
5. Toxic and hazardous waste management
6. Water quality management
7. Modeling of waste water treatment system
8. Environmental quality management

D. Computational Bioengineering:

M.Tech Core:

1. Bioinformatics
2. Analysis and Design of Algorithms
3. Biological modeling and simulation

Discipline Electives (any seven):

1. Next generation sequencing
2. Biomedical Image and Signal Analysis
3. Computational Neuroscience
4. Deep learning
5. Pattern Recognition

6. Neuroscience and Cognitive Science
7. Modeling of bioprocess parameters
8. Transcriptomics
9. Proteomics
10. Metabolomics
11. Fluxomics
12. Computational drug discovery
13. Finite Element Methods

E. M.Tech in Bioengineering (for candidates choosing courses across specializations)

M.Tech Core courses (Any three):

1. Biomedical Systems
2. Bioinformatics
3. Microbiology for environmental applications
4. Analytical biotechniques
5. Agricultural biotechnology

Discipline Electives: Any seven courses from discipline electives across all specializations

Reviewers'comments:

1. Dr. Atul Minhas, Macquarie University, Australia

Atul Minhas atul.minhas@mq.edu.au via iitmandi.ac.in Wed, Dec 5, 2018, 2:29 AM

to Shubhajit

Dear Dr Shubhajit,

Congratulations on thinking about Bioengineering at IIT Mandi. It is certainly a major in very high demand. I have some quick comments

(1) Introduce at least one course per semester related with biomedical engineering

- at the moment there is no biomedical engineering course in semester 1 and 2
- Like MBBS 1st year, physiology must be taught in 1st year (may be 1st semester and 2nd semester courses as **Physiology-I** and **Physiology-II,** respectively
- **Anatomy** as a separate course can come in semester III and **Systems Biology** in semester 4
- Semester V is very heavy, full of biomedical engineering courses, I do not know what will you cover in **Bomputational Biology,** however **Biostatistics** must be a separate course. So, you might want to move **Biomedical Measurements and Instrumentation** to second year (semester 4?)
- **Ethical Issues in Biomedical Engineering** must be taught in early stage (may be semester V), because this is the course which really inculcates the feeling of biomedical engineering to students. Otherwise, they would never understand the key difference between biomedical engineering and other engineering streams.

(2) **Biomedical Technology**

- What is the difference in the course contents between **Control Systems** and **Biomedical Systems? Control Systems** in biomedical engineering cannot be case as the typical course for electrical/electronics engineers. It must be **Biomedical Systems and Control (refer to IIT Madras's course for MTech students)**.
- What are you covering in **Medical Imaging?** I recommend you make it **Medical Imaging Systems (X-ray, CT, PET, SPECT, MRI, Ultrasound).** I am teaching this course at the monent in Macquarie.
- I do not see any explicit course in **Medical Image Processing (**which is expertise of Anil and others).

Other specializations in your MTech are not my area, so I cannot comment on them.

Hope my comments were helpful. Happy to help more if you are planning to work on these comments.

With warm regards,

Atul Singh Minhas
Senior Lecturer in Biomedical Engineering

School of Engineering - EMC building, Room No 109 (1st floor)
Faculty of Science and Engineering, Macquarie University, North Ryde, Sydney, NSW 2109, Australia.

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2. Prof. Prasun Kumar Roy, IIT BHU, Varanasi

Dr. P K Roy <pkroy.bme@iitbhu.ac.in> Sat, Dec 8, 2018, 8:02 AM

to src

Dear Dr Roy Chowdhury,

Thank you for your mail about your new schema for the IDD Bio-Engg. program.

The proposal indeed looks attractive.

I think some points might be considered.

Recently, after the breakthroughs of the international initiatives as the Human Genome program and the Personalized Medicine Program, the discipline of Bio-Engineering has spawned such that there is equal importance to all the 3 components of the discipline: Biology, Medicine, Engineering.

It would be nice to give also give a good emphasis to both Biology as well as to Medicine (particularly diagnostic and therapeutics) aspects right from the initial year of your program. The program appears more loaded towards the "Engineering" fields. I think shifting some programs between the years may be needed, which I mention later.

Your effective teaching program is 4 years (the 5th year is for only MTech thesis).

In that teaching program's first 50% duration (i.e. the first 2 years), the course deals mainly with Engineering and allied fields, as Basic engineering/I.T./Computing/Physical sciences,. Basic Biology and Basic Medical areas may now be considered. From the bioscience perspective, in the first 2 years, you have only 2 biology subjects, buth they are more technology/mathematics oriented, as Bio-"technology", and Systems Biology (this field is mostly Bio-mathematics).

It may be preferable to have courses in core biology in the first 2 years from the beginning, and at least 1 biological subject every semester. Is it possible to have a foundational course on "Molecular Biology and Genetics" in your First year (Genetics, DNA, RNA and Ribosome machine is very exciting to younsters I find, if put from an "algorithm' and "machine" perspective). Also, is it possible to shift your "Cell biology and cellular processes" subject to the Second year (Medical students do similar courses in first year, after school).

We are having the Indian Academy of Neuroscience annual conference, in AIIMS Delhi, next November, 2019 (we organized this years conference here at BHU here last month). Your faculty and students are welcome to participate (http://neuroscienceacademy.org.in/joinacademy.php#)

Hope this may be useful to you.

It is a very good initiative that you are doing.

All the best,

Prasun

Prof. Prasun Kumar Roy, MBBS, MRCR, FRSM, PhD; J.N. Tata Innovation Fellow (DBT, GOI).
FNAE, FNASc, FNAMedSc.
Professor,
Neuroscience & Neuro-Imaging Laboratory,
School of Bio - Medical Engineering,
Indian Institute of Technology, I. I. T.;
Banaras Hindu University (B.H.U.).
Varanasi 221 005, U.P., India. Email: pkroy.bme@iitbhu.ac.in, Cell 99108-31172.

Council Member, CTSI, International Neuroinformatics Coordination Facility, Karolinska Institute, Stockholm.
Principal Investigator, National Consortium Program (Multimodal Brain Imaging), Ministry of I.T., Govt. of India.
Former Director, Incharge & Professor, National Brain Research Centre, NBRC-Deemed University, DBT, GOI;
Gurgaon (Delhi).

3. Prof. M. Manivannan, IIT Madras

Manivannan M **mani@iitm.ac.in via iitmandi.ac.in** Wed, Dec 19, 2018, 8:49 PM

to Shubhajit

Nice Curriculum designed, congratulations.

Few minor suggestions:

V, VI semesters can have few specialization labs such as (a) Biomedical Instrumentation Lab, Biomechanics Lab, (b) Systems Biology Lab, Omics Lab, (c) Biosensors Lab, Nanotechnoligy lab.

Can you think of adding a biomaterials course.

Can you think of adding a ANalog and Digital Circuits course

Can you think of adding a modeling and simulation course

In summary, I am for master level programme alone, with various specialization as designed.

Hope this is useful.

-M Manivannan

Dr.M.Manivannan
Touch Lab
Biomedical Engineering Group
Department of Applied Mechanics
IIT Madras - Chennai-36

http://apm.iitm.ac.in/biomedical/mani

http://apm.iitm.ac.in/biomedical/touchlab
https://scholar.google.co.in/citations?user=-a9uJFYAAAAJ&hl=en

Annexure I

(Proposed in 60th BoA meeting on 30th June 2025)

B.Tech. Bioengineering Curriculum for Exit Option

[Intended for 2022 intake students exiting from Integrated BTech-MTech Bioengineering to BTech Bioengineering]

Note 1: Changed 206 credits of IDD to 160 credits for BTech

Note 2: Added list of DE courses

Table 1: Credit Distribution for Exit Option

Division	Subdivision	Credits
IC Core Courses	Compulsory	39
	Basket	6
	HSS	12
	IKS	3
Discipline Courses	Discipline Core	42
	Discipline Electives	24
Electives	Free Electives	22
	MTP + ISTP or equivalent	12
TOTAL		**160**

Table 2: List of IC Courses

Course No.	Course name	Credits
IC010	Internship	2
IC102P	Foundations of Design Practicum	4
IC112	Calculus	2
IC113	Complex and Vector Calculus	2
IC114	Linear Algebra	2
IC115	ODE and Integral Transform	2
IC140	Graphics for Design	4
IC152	Introduction to Python and Data Science	4
IC161	Applied Electronics	3
IC161P	Applied Electronics Lab	2
IC202P	Design Practicum	3
IC222P	Physics Practicum/ Practicals	2
IC252	Probability and Statistics	4
IC272	Data Science III	3
TOTAL		**39**

Table 3: List of IC Basket Courses

Course No.	Course name	Credits
IC136	Understanding Biotechnology and its Application	3
IC240	Mechanics of Rigid Bodies	3
TOTAL		**6**

Table 4: List of IKS Courses

Course No.	Course name	Credits
IC181	Introduction to Consciousness and Holistic Wellbeing	3
TOTAL		**3**

Table 5: List of Discipline Core Courses

Course No.	Course name	Credits
BE101P	Reverse Engineering for Bioengineers	1
BE201	Cell Biology	4
BE202	Biochemistry and Molecular Biology	4
BE203	Enzymology and Bioprocessing	4
BE301	Biomechanics	4
BE303	Applied Biostatistics	4
BE304	Bioinformatics	4
BE305	Bioethics and Regulatory Affairs	1
BE306	Genetic Engineering: Principles and Applications	4
BE308	Introduction to biomanufacturing	4
BE309	Biosensing and Bioinstrumentation	4
BE310	Biomaterials	4
TOTAL		**42**

Table 6: List of Discipline Electives for BTech Bioengineering

Note: All non-Core Courses from SBB (BEXXX or BYXXX) of level 3 and above can be chosen as discipline electives. Following courses from other departments can also be chosen as discipline electives. Additionally, any other course with the approval of course coordinator can also be chosen as discipline elective.

Course No.	Course Name	Relation to 'Bioengineering'
BEXXX	Any non-core Bioengineering Course	Must be of level 3 or higher
BYXXX	Any Biotechnology Course	Must be of level 3 or higher
AR506	Cognitive Robotics	Architecture of brain, theories of intelligence, human-robot interaction
CE521	Ecology and Environment Microbiology	Ecology and Microbiology
CE559	Biological Wastewater Treatment	Biological growth kinetics, Biofilms, Biogas
CS212	Design of Algorithms	

CS309	Introduction to Databases	Important for handling large biological datasets
CS606	Computational Modeling of Social Systems	Modeling epidemics like HIV/ AIDS
CS671	Deep Learning and its applications	Artificial neurons, Computational models of neurons, Structure of neural networks
CY344	Food chemistry: Processing, Preservation and Storage	Proteins, Carbohydrates, Lipids, Enzymes, Vitamins, Minerals
CY550	Bioinspired Materials	biomimetic, self-assembly, self-replication, biofuels, tissue engineering
CY642	Molecular and Bio-electronics	DNA sensors, biofuel cells, bio-nano hybrid systems for electronic devices
CY643	Advanced Analytical Techniques	Microscopy (SEM, AFM), Spectroscopy (Absorption, Emission), Purification (HPLC)
CY644	Bioinorganic chemistry	Na-K ion pump, oxygen transport (haemoglobin), electron transport (cytochromes)
CY670	Fluorescence spectroscopy, microscopy and applications	Confocal microscopy, FRET, FLIM, FCS, TIRF
DS201	Data Handling and Visualization	Data collection (sampling), Pre-processing (normalization), Representation (curve-fitting, histogram)
DS303	Statistical foundations of data science	Probability density, Autocorrelation, Bayesian network, Random variables, Markov and Poisson process
DS313	Statistical foundations of data science	Probability density, Autocorrelation, Bayesian network, Random variables, Markov and Poisson process
EE305	Digital Signal Processing	Sampling, Filtering, Transforms (Discrete & Fast Fourier Transform, Wavelets)
EE314	Digital Signal Processing	Sampling, Filtering, Transforms (Discrete & Fast Fourier Transform, Wavelets)
EE516	Biomedical Systems	Sensing (ECG, EEG, EMG, ERG, ENG), Signal processing, Embedded systems, Ethics
EE574	Biomedical Signal and Image Analysis	electrophysiology (ECG, EEG, EMG), medical imaging (ultrasound, X-ray, CT, MRI, PET)
EE608	Digital Image Processing	Thresholding, Segmentation, Smoothing, Sharpening, Edge detection

EEXXX	Medical Imaging and Applications	X-ray, CT-scan, MRI, ultrasound image processing
IK502	Introduction to Bio-signals	Brain signals, Cardiac signals, Muscle signals, Pulse signals, blood pressure etc.
IK507	Neuroscience and Mental Health	Nervous system, Neuropsychology, Mental Health Disorders
IK510	Cognitive Neuroscience	Nervous system, sensation, perception, attention, memory, emotions, etc.
IK511	Science of Ayurveda	Ayurveda and Western medicine, Ayurvedic pharmacology, diet and nutrition, etc.
MA621	Modeling Population Dynamics	Population growth models, predator-prey systems, single- and multi- species communities
MA650	Mathematical Models for Infectious Diseases	Dynamics of viral and bacterial infections, deterministic and stochastic models
ME527	Biofluid Dynamics	Circulation in heart, blood vessels, lymphatics vessels. Flow in lungs, upper & lower airways
ME612	Introduction to Bio-materials	Structure & properties of biological cells & tissues; cell-material interactions; biocompatibility
ME622	Biomechanics of Musculoskeletal System	Biomechanics of bone, articular cartilage, muscle, tendon, ligament, joints. Gait analysis.
MT506	Biomaterials	Types of biomaterials, cell interactions, application in medical conditions

Annexure J

IIT Mandi
Proposal for a New Course

Course number	**: MA 546**
Course Name	**: Introduction to Quantitative Finance**
Credit Distribution	**: 3-1-0-4**
Intended for	**: B.Tech/ MS/PhD**
Elective or core	**: Elective**
Prerequisite	**: Probability and Statistics, Linear Algebra, Optimizations, Programming Language**
Mutual Exclusion	**: NA**

1. Preamble:

This course introduces students to the quantitative foundations of investment and portfolio management. It integrates concepts from mathematics, statistics, and optimization with real-world financial applications, enabling students to understand and model the behavior of financial markets. The course begins with an overview of financial instruments and markets, followed by mathematical preliminaries essential for investment analysis. It then delves into core topics such as portfolio optimization, risk measures, pricing models, and option valuation. Emphasis is placed on the quantitative modeling of investments, including mean-variance analysis, Capital Asset Pricing Model (CAPM), and the introduction to Black-Scholes framework. By the end of the course, students will be equipped to analyze, construct, and evaluate investment portfolios with a strong quantitative grounding. This elective is ideal for students interested in careers or research in quantitative finance, financial engineering, or investment analytics.

2. Course Modules with quantitative lecture hours:

Unit/Topic 1: Financial Markets and Instruments (6 Lectures)

Introduction to Financial Markets, Stock Exchanges and IPOs: Functions of exchanges, IPO process. Market Indices calculation and interpretation. Time Value of Money, Financial Instruments: Stocks, Bonds, and Derivatives.

Unit/Topic 2: Mathematical Preliminaries (4 Lectures)

A quick review of essential concepts from Linear Algebra, Probability and Statistics, and convex Optimization.

Unit/Topic 3: Portfolio Optimization Foundations (8 Lectures)
Asset returns and properties, Risk types and key measures, Two-asset and multi-asset portfolio, Optimal portfolio return and efficient frontier, Portfolio with a risk-free asset, tangency portfolio, Capital allocation line (CAL).

Unit/Topic 4: Risk Measures (4 Lectures)
Types of Risk and Risk Measures, Volatility, Value at Risk (VaR): properties and limitations. Conditional VaR (CVaR): Definition, calculation, and advantages over VaR, Skewness and Kurtosis, Systematic risk measure: calculation, and interpretation.

Unit/Topic 5: Optimization, Pricing Models, and Performance (12 Lectures)

Capital Asset Pricing Model (CAPM): Assumptions, beta, Security Market Line, introduction to factor models. Portfolio Performance Metrics, Mean-Variance Optimization: the mathematical framework, Portfolio with Practical Constraints: Short-selling constraints, cardinality constraints, and transaction costs. Portfolio optimization a with Factor Models, Black-Litterman Model, Portfolio Rebalancing Strategies:

Unit/Topic 6: Option Pricing Fundamentals (8 Lectures)
Arbitrage & Risk-Neutral Valuation, Introduction to Black–Scholes Model, European vs. American Options, Binomial Tree Model and convergence to Black–Scholes, Introduction to stochastic processes, geometric Brownian motion as a stock price model, intuitive link to Black–Scholes.

Laboratory/practical/tutorial Modules: This course will also include one tutorial session every week dedicated to solving exercises relevant to the studied topics.

3. Text books:

1. **Elton, E. J., Gruber, M. J., Brown, S. J., and Goetzmann, W. N.** *Modern Portfolio Theory and Investment Analysis.* Wiley, 9th Edition, 2014.
2. **Luenberger, D. G.** *Investment Science.* Oxford University Press, 2nd Edition, 2014.

4.References:

1. **Hull, J. C.** Options, *Futures, and Other Derivatives*. Pearson Education, 11th Edition, 2022.
2. **Bodie, Z., Kane, A., and Marcus, A. J.** *Investments*. McGraw Hill, 13th Edition, 2024.

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

S. No.	Course Name	Course Code	Similarity Content	Approx. % of Content
1.	Computational Financial Modelling	MA653	Portfolio Selection Model in Crisp Environment.	6%
2	Financial Engineering	MA654	Basic Option Theory, The Binomial Model	8%

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

Approvals:

Other Faculty interested in teaching this course: –

Proposed by: Manoj Thakur

School: School of Mathematical and Statistical Sciences

Signature: **Date:**

The following faculty (at least 3 faculty) discussed on 24th June, 2025 **and approved the proposal on ……..**

Sl. No	Faculty Name	Signature
1	Tanmay Kayal Rishikesh Yadav	Rishi
2	Preeti	Preeti

School Chair: 7/10/2025

School:

Date:

This proposal is reported in 60th Board of Academics on 30th June, 2025

Dean Academics

Date:

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