Academic Council

IIT MANDI

ACADEMIC DISCUSSION

B.Tech & B.S. 2023

POINTS OF DISCUSSION

- Total Credit Requirement
- Distribution of Credits
- Institute Core Courses
- ISTP, MTP, Research Projects
- Discipline Courses
- Electives
- Pass Fail & Audit Courses
- Semester Exchange
- Internships: Types, Approvals
- Honours Degree
- Minor Degree
- Backlog Courses
- Double Major & IDD
- Sources

Total Credit Requirement

- For graduating with a B.Tech degree (excluding B.Tech in Electrical Engineering & B.S. in Chemical Sciences), you need to complete at least 160 credits

- For graduating with a B.Tech in Electrical Engineering or B.S. degree in Chemical Sciences, you need to complete at least 161 or 163 credits respectively.

DISTRIBUTION OF CREDITS

B.Tech Credit Distribution

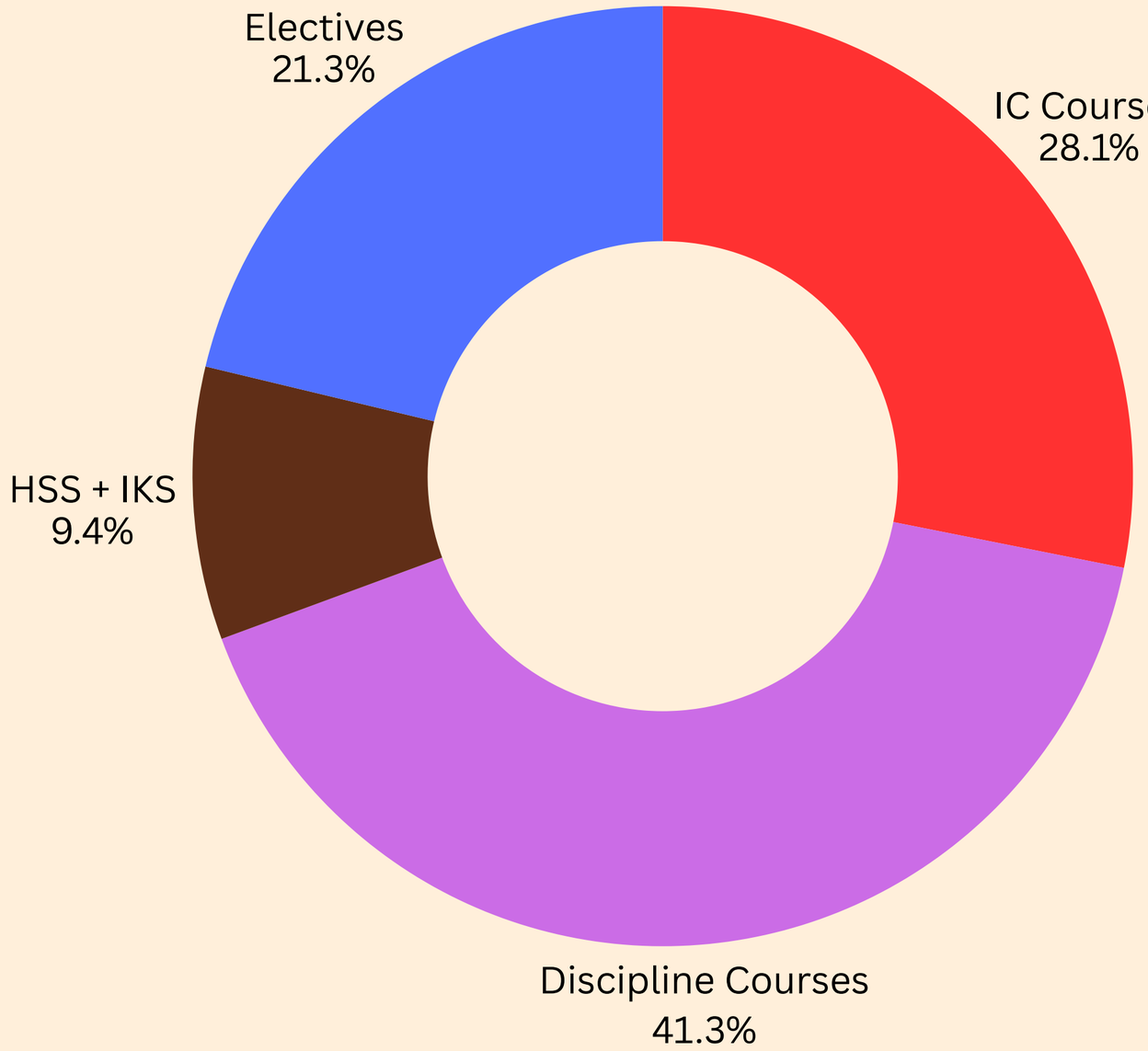
Division	Sub-Division	Credits
Institute Core	IC Compulsory	39
	IC Basket	6
	HSS	12
	Indian Knowledge System	3
Discipline	Discipline Core	66
	Discipline Electives	
Electives	Free Electives	22
	MTP + ISTP or Equivalent	12
Total		160

B.S.-CS Credit Distribution

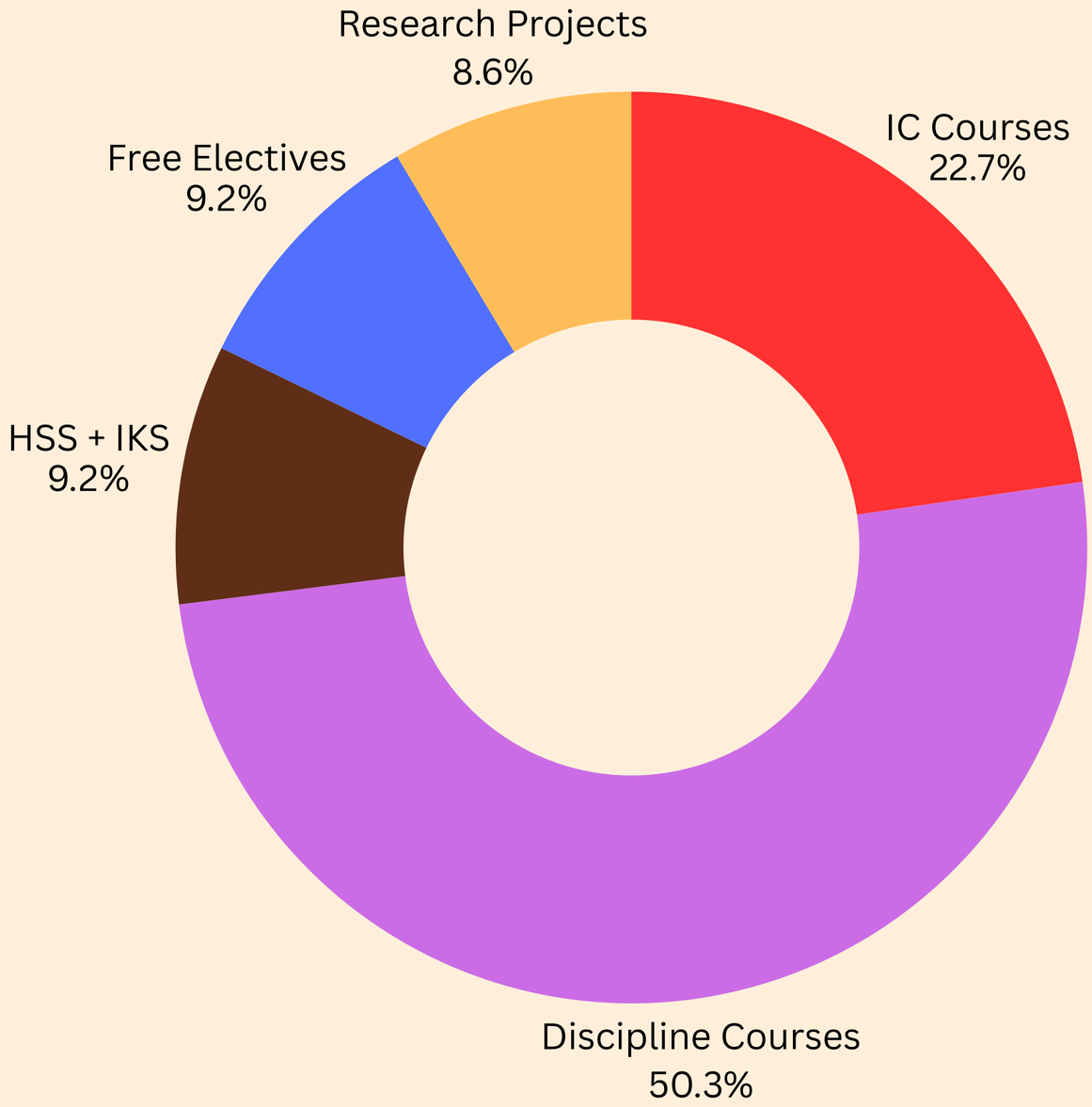
Division	Sub-Division	Credits
Institute Core	IC Compulsory	31
	IC Basket	6
	HSS	12
	Indian Knowledge System	3
Discipline	Discipline Core	82
	Discipline Electives	
Electives	Free Electives	15
Research Projects	Research Communication Projects or Equivalent	14
Total		163

NOTE: For EE branch, DC + DE is 72 & FE is 17, according to the latest curriculum

Distribution - B.Tech



Distribution-B.S.



Institute Core Courses

IC Compulsory Courses (B.Tech)

Course Code	Course Name	Credits	Course Code	Course Name	Credits
IC112	Calculus	2	IC114	Linear Algebra	2
IC113	Complex Variables and Vector Calculus	2	IC115	ODE & Integral Transforms	2
IC140	Engineering Graphics for Design	4	IC102P	Foundations of Design Practicum	4
1C152	Computing and Data Science	4	IC202P	Design Practicum	3
1C252	Probability and Statistics	4	IC161	Applied Electronics	3
IC272	Machine Learning	3	IC161P	Applied Electronics Lab	2
IC010	Internship	2	IC222P	Physics Practicum	2
Total					39

IC Baskets

Basket	Course Code	Course Name	Course Credits	Basket Credits Credits
IC-I	IC131	Applied Chemistry for Engineers	3	3
	IC136	Understanding Biotechnology and its Applications	3	
	IC230	Environmental Science	3	
IC-II	IC121	Mechanics of Particles and Waves	3	3
	IC240	Mechanics of Rigid Bodies	3	
	IC241	Material Science for Engineers	3	
	IC253	Data Structures and Algorithms	3	
Total				6

IC Basket Compulsions

Branch	Basket	Course Code	Course Name
Bio-Engineering	IC-I	IC136	Understanding Biotechnology and its Applications
	IC-II	IC240	Mechanics of Rigid Bodies
Civil Engineering	IC-I	IC230	Environmental Science
	IC-II	IC240	Mechanics of Rigid Bodies
CSE/DSE	IC-II	IC253	Data Structures and Algorithms
Engineering Physics	IC-I	IC230	Environmental Science
	IC-II	IC121	Mechanics of Particles and Waves
Mechanical Engineering	IC-II	IC240	Mechanics of Rigid Bodies

IC Basket Compulsions

Branch	Basket	Course Code	Course Name
Chemical	IC-I	IC131	Applied Chemistry for Engineers
	IC-II	IC121	Mechanics of Particles and Waves
Mathematics and Computing	IC-I	IC136	Understanding Biotechnology and its Applications
	IC-II	IC253	Data Structures and Algorithms
Material Science	IC-I	IC131	Applied Chemistry for Engineers
	IC-II	IC240	Mechanics of Rigid Bodies
General Engineering	IC-I	IC230	Environmental Science
	IC-II	IC240	Mechanics of Rigid Bodies

ISTP & MTP

- ISTP: Interactive Socio-Technical Practicum is a 4-credit 6th Semester practicum course that involves development of useful products and technologies that require an understanding of the socio-economic context in which they will be used.
- MTP (MTP-1 + MTP-2): Major Technical Project (BTech final year project) is a 3 (MTP-1) + 5 (MTP-2) credit course where students work on projects of their interest under the supervision of a faculty. This project could be outside the field of your discipline.
- Course code for MTP-1 is DP-498P; DP will be replaced by your respective program. For eg CS-498P, DS-498P, EE-498P and so on.

	ISTP : ✓ MTP : ✓	**ISTP : ✗ MTP : ✓**	**ISTP : ✓ MTP : ✗**	**ISTP : ✗ MTP : ✗**	**ISTP : ✓ MTP -1: ✓ MTP-2: ✗**
DE	x	x	x + 8	x + 8	x + 5
FE	y	y + 4	y	y + 4	y

MTP

- If a student opts to do MTP, but obtain grade point 6 or below in MTP-1 (XX498P), he/she will not be allowed to continue on to the second stage of MTP-2 (XX499P). The grade earned by the student in MTP-1 (XX498P) will be included in the grade sheet and transcript. The student will have to make up for the remaining MTP credits by taking 5 credits from the Discipline Electives basket in next semester.
- However, if such a student wishes to continue doing the MTP, he/she may appeal giving justification to the Dean (Academics) with the recommendation of the MTP guide(s) and Faculty Advisor.
- If a student has earned a grade point of 7 (’B-’ grade) or above in MTP-1 (XX498P), they will be required to continue on to MTP-2 (XX499P).
- However, if such a student wishes not to pursue MTP-2 (XX499P), he/she may appeal to Dean (Academics) through the Faculty Advisor and the guide(s), with strong justification from both student and guide(s). Since huge efforts are put by the guide also(s) in MTP, dropping MTP-2 (XX499P) is highly discouraged and rarely permission will be given for dropping MTP-2.
- If allowed to drop MTP-2 (XX499P), the grade earned by the student in MTP-1 (XX498P) will be included in the grade sheet and transcript. Then the student will have to make up for the remaining MTP credits by taking 5 credits from the Discipline Electives basket.
- If a student opts to do MTP completely in a different discipline, they would be awarded 8 credits from Free Elective basket.

Research Projects

- Undergraduate Research Project:
  - B.S. Students are highly encouraged to opt for undergraduate research projects aligned with their specific research and scientific interest in their 7th and 8th semesters.
  - This research-based learning provides a great opportunity for the students to learn research methodology and instrumentation, which can be aligned to the stream specialization or minors.
  - The research-based learning is optional, and if not opted for, the credit requirements need to be fulfilled through discipline elective courses.
- Post-Graduate Project (PGP):
  - This must be done by the students who opt for the B. Tech - M. Tech or B.S. - M.S. program. The project will be a single project spanned over the 9th and 10th semesters or last two semesters.
  - Each student will be assigned to a supervisor(s) at IIT Mandi to pursue the project. An external co-supervisor can be opted for as per the Institute’s Senate approved norms.
  - After completion of the project, students need to submit a detailed project report.
- All courses, other than Discipline core in a parent branch will be by default discipline electives. For outside discipline courses, a separate list is available in the respective curriculum.
- Any discipline elective course, beyond the minimum limit may also be counted as free elective.

HSS & IKS

- 12 credits can be completed by taking any HSS course
- HSS courses cover various domains such as -
  - Sociology
  - Economics
  - Literature
  - Entrepreneurship
- A maximum of 20 HSS credits can count towards the 160 credits required for the BTech degree
- This doesn’t mean you can’t do more than 20 HSS credits! You are free to do more than 20 credits that will count outside the 160 credits requirement
- One course on Indian Knowledge System (worth 3 credits) is compulsory for everyone.

Discipline Courses - B.Tech

1. Discipline Core
   - These are compulsory courses related to your major degree
   - The number of credits may vary depending on your branch
   - These courses start from your 3rd semester
   - There could be some overlap among branches

2. Discipline Electives
   - These are courses related to your major degree, but you would have a choice among a pool of elective courses
   - The number of credits again vary depending on your branch

   Detailed Curriculum Folder: Link

DC-DE Split

Discipline	BS CS	BioE	Civil	CSE	DSE	EE	EP	GE	MSE	MnC	ME	ME VLSI
DC	59	42	49	38	33	52	37	36	45	51	50	54
DE	23	24	17	28	33	20	29	30	21	15	16	12
Total	82	66				72	66					

B.S. in Chemical Sciences

Course Code	Course Name	Credits	Course Code	Course Name	Credits
CY301	Principles and Theories of Physical Chemistry	3-0-0-3	CY512P	Physical Chemistry Laboratory	0-0-6-3
CY302	Principles of Organic Chemistry	3-0-0-3	CY533P	Inorganic Chemistry Laboratory	0-0-6-3
CY303	Fundamentals of Inorganic Chemistry	3-0-0-3	CY532	Photochemistry and Pericyclic Reactions	3-0-0-3
CY201P	Physical Chemistry Laboratory	0-0-4-2	CY534	Chemistry of Transition Elements	3-0-0-3
CY401	Introduction to Quantum Chemistry and Molecular Spectroscopy	3-0-0-3	CY511	Group Theory and Spectroscopy	3-0-0-3
CY304	Fundamental Analytical Chemistry	3-0-0-3	CY531P	Organic Chemistry Laboratory	0-0-6-3
CY202P	Organic Chemistry Laboratory	0-0-4-2	CY514	Chemical and Statistical Thermodynamics	3-0-0-3
CY203P	Inorganic Chemistry Laboratory	0-0-4-2	CY535	Introduction to Organometallic Chemistry	3-0-0-3
CY531	Organic Reactions and Mechanisms	3-0-0-3	CY513	Chemical Kinetics and Reaction Dynamics	3-0-0-3
CY533	Chemistry of Main Group Elements	3-0-0-3	CY504	Heterocyclic Chemistry	2-0-0-2
CY512	Advanced Quantum Chemistry	3-0-0-3	Total		62

BioEngineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
BE201	Cell Biology	3-0-2-4	BE304	Bioinformatics	3-0-2-4
BE202	Biochemistry and Molecular Biology	3-0-2-4	BE305	Bioethics and Regulatory Affairs	1-0-0-1
BE203	Enzymology and Bioprocessing	3-0-2-4	BE306	Fundamentals of Genetic Engineering	3-1-0-4
BE301	Biomechanics	3-0-2-4	BE309	Biosensing & Bioinstrumentation	3-0-2-4
BE308	Introduction to Biomanufacturing	3-0-2-4	BE310	Biomaterials	3-0-2-4
BE303	Applied Biostatistics	3-0-2-4	BEXXX	Reverse Engineering	0-0-2-1
Total					42

Civil Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
CE201	Surveying Traditional and Digital	2-0-4-4	CE352	Transportation Engineering	3-0-0-3
CE251	Hydraulics Engineering	3-0-0-3	CE352P	Transportation Engineering Lab	0-0-2-1
CE252	Geology and Geomorphology	2-0-2-3	CE354P	Construction Materials Lab	0-0-2-1
CE202	Introduction to Civil Engineering Profession	1-0-0-1	CE401	Design of Steel Structures	2-1-0-3
CE203	Construction Materials	3-0-0-3	CE403	Water and Wastewater Engineering	3-0-0-3
CE301	Strength of Materials and Structures	3-0-0-3	CE404	Analysis of Structures	3-0-0-3
CE301P	Strength of Materials and Structures Lab	0-0-2-1	CE402	Geotechnical Engineering II	3-0-0-3
CE302	Geotechnical Engineering I	3-0-0-3	CE303	Water Resources Engineering	3-0-0-3
CE302P	Geotechnical Engineering Lab	0-0-2-1	CE351	Design of Reinforced Concrete Structures	2-1-0-3
CE304P	Hydraulics Engineering Lab	0-0-2-1	CE353P	Civil Engineering Drawing	0-0-2-1
CE305P	Environmental Engineering Lab	0-0-2-1	CEXXX	Reverse Engineering	0-0-2-1
Total					49

Computer Science Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
CS214	Computer Organization	3-0-2-4	CS303	Software Engineering	3-0-2-3
CS208	Mathematical Foundations of Computer Science	3-1-0-4	CS305	Artificial Intelligence	3-0-0-3
CS302	Paradigms of Programming	3-0-2-4	CS313	Computer Networks	3-0-2-4
CS304	Formal Language and Automata Theory	3-0-0-3	CS212	Design of Algorithms	3-0-2-4
CS309	Information Systems and Databases	3-0-2-4	CS312	Operating Systems	3-0-2-4
CS213	Reverse Engineering	0-0-2-1	Total		38

Data Science Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
DS201	Data Handling and Vizualisation	2-0-2-3	DS411	Optimization for Data Science	3-1-0-4
DS301	Mathematical Foundations of Data Science	3-1-0-4	CS305	Artificial Intelligence	3-0-0-3
DS302	Computing Systems for Data Processing	3-0-2-3	DS412	Matrix Computations for Data Science	3-0-2-4
DS313	Statistical Foundations of Data Science	3-0-2-4	DS413	Introduction to Statistical Learning	3-0-2-4
DS404	Information Security and Privacy	3-0-0-3	CS213	Reverse Engineering	0-0-2-1
Total					33

Electrical Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EE261	Electrical Systems Around Us	3-0-3-5	EE211	Analog Circuit Design	3-0-2-4
EE260	Signals and Systems	2.5-0.5-0-3	EE304	Communication Systems	3-0-2-4
EE210	Digital System Design	3-0-2-4	EE301	Control Systems	3-0-2-4
EE203	Network Theory	2.5-0.5-0-3	EEXXX	Power and Energy Systems	3-1-0-4
EE311	Device Electronics	3-0-0-3	EE314	Digital Signal Processing*	3-0-0-3*
EE202	Electromagnetic Theory	3-0-0-3	EE326	Computer Organization & Processor Architecture Design	3-0-2-4
EE231	Measurement and Instrumentation	2-0-2-3	EEXXX	Reverse Engineering	0-0-2-1
EE201	Electro-Mechanics	2.5-0.5-2-4	Total		52

Engineering Physics

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EP321	Foundations of Electrodynamics	3-0-0-3	EP402P	Engineering Physics Practicum	1-0-5-4
EP301	Engineering Mathematics 2	3-1-0-4	PH502	Photonics	3-0-0-3
PH301	Quantum Mechnanics and Applications	3-0-0-3	EP403	Physics of Atoms and Molecules	3-0-0-3
PH302	Introduction to Statistical Mechanics	3-0-0-3	EP401P	Engineering of Instrumentation	1-0-5-4
EE311	Device Electronics for Integrated Circuits	3-0-0-3	PH501	Solid State Physics	3-0-0-3
EP302	Computational Methods for Engineering	2-1-0-3	EPXXX	Reverse Engineering	0-0-2-1
Total					37

General Engineering (Robotics and AI)

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EE201	Electromechanics	3	ME309	Theory of Machines	4
EE261	Electrical System Around Us	3	AR501	Robot Kinematics, Dynamics and Control	4
IC241	Material Science for Engineers	3	AR503	Mechatronics	3
IC253	Programming and Data Structures	3	AR504	Robot Programming	3
DS201	Data Handling and Vizualization	3	ME305	Design of Machine Elements	4
EE301	Control Systems	3	Total		36

General Engineering (Communication Engineering)

Course Code	Course Name	Credits	Course Code	Course Name	Credits
ME100	Reverse Engineering	1	EE203	Network Theory	3
EE261	Electrical System Around Us	3	IC253	Programming and Data Structures	3
EE231	Measurementation and Instrumentation	3	EE260	Signals and Systems	3
EE304	Communication Theory	3	CS313	Computer Networks	4
EE201	Electromechanics	3	EE314	Digital Signal Processing	4
DS404	Information Security and Privacy	3	EE202	Electromagnetic Theory	3
Total					36

General Engineering (Mechatronics)

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EE201	Electromechanics	3	ME309	Theory of Machines	4
EE261	Electrical System Around Us	3	EE326	CO and Processor Architecture Design	4
EE260	Signals and Systems	3	AR503	Mechatronics	3
EE211	Analog Circuit Design	3	EE311	Device Electronics for Integrated Circuits	3
ME206	Mechanics of Solids	3	ME305	Design of Machine Elements	4
EE301	Control Systems	3	ME100	Reverse Engineering	1
Total					36

Material Science and Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
MT-201	Physics of Solids	3-0-0-3	MT-206	Extraction and Materials Processing	3-0-2-4
MT-203	Material Synthesis and Characterisation	2-0-2-4	ME-206	Mechanics of Solids	2.5-0.5-0-3
MT-301	Phase Transformations	3-0-0-3	MT-302	Transport Phenomena	3-0-0-3
MT-204	Thermodynamics and Kinetics and Materials	3-0-0-3	MT-303	Computational Materials Science	3-0-2-4
MT-304	Mechanical Behaviour of Materials	3-0-2-4	ME-212	Product Realization (Manufacturing) Technology	2-0-2-3
MT-205	Functional Properties of Materials	3-0-2-4	ME-100	Reverse Engineering	0-0-2-1
MT-202	Quantum Mechanics and Applications	3-0-0-3	IC-240	Mechanics of Rigid Bodies	3-0-0-3
Total					45

Mathematics and Computing

Course Code	Course Name	Credits	Course Code	Course Name	Credits
CS208	Mathematical Foundations of Computer Science	3-1-0-4	MA310	Matrix Computation and Lab	3-0-2-4
MA211	Ordinary Differential Equations	3-1-0-4	CS304	Formal Language and Automata Theory	3-0-0-3
MA220	Partial Differential Equations	3-1-0-4	CS312	Design of Algorithms	3-0-2-4
CS214	Computer Organisation	3-0-2-4	MA311	Mathematical Modelling	3-0-0-3
MA210	Real and Complex Analysis	2.5-0.5-0-3	MA323P	Applied Databases Practicum	0-0-3-2
MA221	Numerical Analysis	3-1-0-4	MA321	Numerics of Differential Equation	3-0-2-4
MA222	Applied Linear Programming	3-1-0-4	MA322	Applied Graph Theory	3-0-0-4
Total					51

Mechanical Engineering

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EE261	Electrical Systems Around Us	3-0-0-3	ME308	Manufacturing Engineering 1	3-0-0-3
ME212	Product Manufacturing Technologies	2-0-2-3	ME309	Theory of Machines	4-0-0-4
ME213	Engineering Thermodynamics	3-0-0-3	ME310	System Dynamics and Control	3-0-0-3
ME205	Machine Drawing	1-0-3-3	ME311P	Design Lab 1	0-0-2-1
ME206	Mechanics of Solids	3-0-0-3	ME312P	Design Lab 2	0-0-2-1
ME210	Fluid Mechanics	3-0-0-3	ME210P	Fluid Mechanics Lab	0-0-2-1
ME303	Heat Transfer	3-0-0-3	ME315	Manufacturing Engineering 2	3-0-0-3
ME305	Design of Machine Elements	3-1-0-4	ME303P	Heat Transfer Lab	0-0-2-1
ME307	Energy Conversion Devices	3-0-0-3	ME100	Reverse Engineering	0-0-2-1
IC241	Material Science for Engineers	3-0-0-3	Total		50

Microelectronics and VLSI

Course Code	Course Name	Credits	Course Code	Course Name	Credits
EE260	Signals and Systems	2.5-0.5-0-3	VL311	CMOS Processing and Practicum	3-0-2-4
EE210	Digital System Design and Practicum	3-0-2-4	VL402	RF IC Design	3-0-0-3
EE203	Network Theory	2.5-0.5-0-3	VLXXX	Electronic System Packaging	3-0-0-3
VLXXX	Semiconductor Devices for IC’S	3-0-0-3	VL404	CMOS Analog IC Design	3-0-2-4
EE301	Control Systems	3-0-2-4	VL403	CMOS Digital IC Design	3-0-2-4
EE202	Electromagnetic Theory and Transmission Lines	3-0-0-3	VL401	RTL Design and Verification	2-0-2-3
EE326	Computer Organization and Design	3-0-2-4	VL405	Design for Testability	3-0-2-4
EE211	Analog Circuit Design	3-0-2-4	VLXXX	Reverse Engineering	0-0-2-1
Total					54

Free Electives

- Any course which you can take in the institute can be counted towards your FE
- Not just a complete course, but the partial remains of overflowing credits from some other baskets can also count towards FE, making FE like a SINK
    - Example 1: Let’s say you took both IC240 - Mechanics of Rigid Bodies and CS202 - Data Structures and Algorithms from IC - II basket. One course would count towards IC requirements (the compulsory one) and the other would count under FE.
    - Example 2: If you wish to do more than 12 credits under HSS, the remaining credits would count under FE (till it isn’t 20).
    - Example 3: If you wish to do more DE courses than the specified limit of your branch, again, the extra credits would count under FE.
    - Example 4: If you do an internship that is longer than the minimum requirement of 6 weeks, then the extra credits go to FE.
    - Example 5: If you tried to count up some courses for Minor, they go to FE.

Pass/Fail Courses	Audit Courses
Grades are Pass (P) or Fail (F)	Grades are Audit Pass (AP) or Audit Fail (AF)
The grades are binary in both of them. These won't affect your CGPA.	
P/F Courses count towards the B.Tech requirement & contribute to the Free Electives Basket.	Audit Courses do not count towards B.Tech requirements.
A maximum of 9 P/F credits can be taken and not more than 6 in a given semester (excl. SemLong Intern)	No limit on taking Audit courses in B. Tech
• P/F credits can be used for - ◦ a. Semester Internship ◦ b. Self Study Courses (via NPTEL, SWAYAM) ◦ c. Research work/project under a professor of IIT Mandi, in Industry or Academia	• Audit courses are useful to include any workshops, conferences, etc that you have attended, on your BTech transcript
• Courses offered at IIT Mandi: ◦ Must declare the course as P/F at the beginning of the semester. ◦ 'P' grade will be awarded if student obtains the minimum passing grade 'D'	Students will have the option to Add/Drop an audit course upto 2 weeks after the normal Add/Drop date for the semester

NOTE

- The credit limit for a semester ranges from a minimum of 12 credits to 22 credits.
- However, AD Courses can increase the credit limit to 25 credits in order to meet up with the degree requirements.
- If a student goes for a vacation semester or a semester long internship, then the minimum credit limit for the semester can be relaxed to 9 credits.
- If you want to take more than 25 credits, then you may take permission from AD Courses before the add/drop period.

Course List for Even Semester 2026: Link (Educational Access)

Semester Exchange

- IIT Mandi has signed various MoUs with national and international institutes.
- UG students can visit these institutes in their 5th - 7th semesters (at most 2 contiguous semesters).
- Shortlisting is solely done on the basis of your CGPA at the time of application.
- Students will not have to pay any fees to the host institute, but any cost for travel, stay (hostel), food, etc must be borne by students.
- Scholarships may be provided to some students by some host institutes.
- Students usually prefer going to a Semester Exchange because of the following:
  - Exploring/pursuing courses not offered at IIT Mandi that interest you
  - Learning about the culture of a new country
  - Traveling & tourism

Colleges with an active MoU with IIT Mandi as of December’25			UniversitÃ© de Pau et des Pays de l'Adour (UPPA), France
TU Munich	TU Dresden	TU Darmstadt	TU Braunschweig
Kyushu University, Japan	National University Corporation, Japan	Chung Yuan Christian University (CYCU), Taiwan	Missouri University of Science and Technology, US
University of Agder, Norway	Karlsruhe Institute of Technology, Germany	RWTH Aachen, Germany	Leibniz University, Hannover

Semester Exchange

The Senate approved the proposal for the management of attendance for students going for the International Semester Exchange Program.

- The students are permitted to register for ongoing semester's courses, however, their attendance will count from the day they report to the institute. They need to fulfil the attendance criterion specified by the institute once they join the campus in person.
- The students may be provided with the video recordings of the classes (if available/made available), link for online classes, or equivalent courses on NPTEL/SWAYAM etc. The student(s) may work with the instructor and FA to identify the online courses, if available. Students will be attending the lectures / watching the lectures online till they are back on campus.
- The mid sem exams for those students need to be conducted during the makeup slots. They have to attend the end semester exam, as per the regular schedule.

For TU9 & European Colleges

ECTS Grades	IIT Mandi Grades
A	A
B	A-
C	B
D	B-
E	C
FX	F
F	F
1.5 ECTS credit is equivalent to 1 IIT Mandi Credit.	

Semester Exchange

- Credits and grades earned during semester exchange visits will be converted to IIT Mandi equivalent credits and grades as per the Senate approved conversion criteria in each case.
- The committee notified/authorized by the Senate confirms the equivalence of courses taken during the semester exchange.
- Since the students miss significant portion of the course before physically joining the course, instructors may impose 100% attendance, excluding medical absence

For Kyushu, Japan

Kyushu University Grades	**IIT Mandi Grades**
S (4)	A
A (3)	B
B (2)	C
C (1)	D
F (0)	F
1 Kyushu University credit is equivalent to 1 IIT Mandi Credit.	

Internships (2 Month)

- It is compulsory for all students to do an internship of at least 6 weeks duration in or outside India.
- It is worth 2 credits and to be done after your 5th semester. This will count as P/F for IC-010 under Semester-8 credits & also towards the credit limits of the semester.
- Internships are usually of 3 types -
  - Industrial - Internships that offer industrial experience
  - Research - Internships that are research-oriented, in industry or academia
  - Academic - Internships under professors of other institutes
- On-campus internships are usually industrial internships, whereas students look for opportunities off-campus for research and academic internships in prestigious institutes.
- This internship needs to be completed before the commencement of the final semester.
- You need not register for this course exclusively.
- The two credits for the mandatory industrial internship are only given at the sole judgment of the respective faculty advisor. Students are advised to get their faculty advisor's consent before applying for internships. This is particularly important for general/non-core company.

Semester Long Internship

- Similar to a 2 month internship, you can do this internship in the industry or academia inside or outside India
- A semester internship gives more extended exposure and is quite useful for your career growth
- A minimum credit limit requirement of 105 credits by the end of 5^{th} semester might be imposed by some FA's if your on-site internship is in 6^{th} semester just to ensure you meet up the degree requirements. There is no restriction on the minimum credit requirements before going to a semester-long internship by CnPC.
- There are also opportunities to do an semester internship in programmes like MITACS
- Semester Internship could be of 2 types
    - Semester Long Onsite Internships
    - Semester Long Remote Internships
- Projects under IIT Mandi Faculties cannot count toward internships credits.

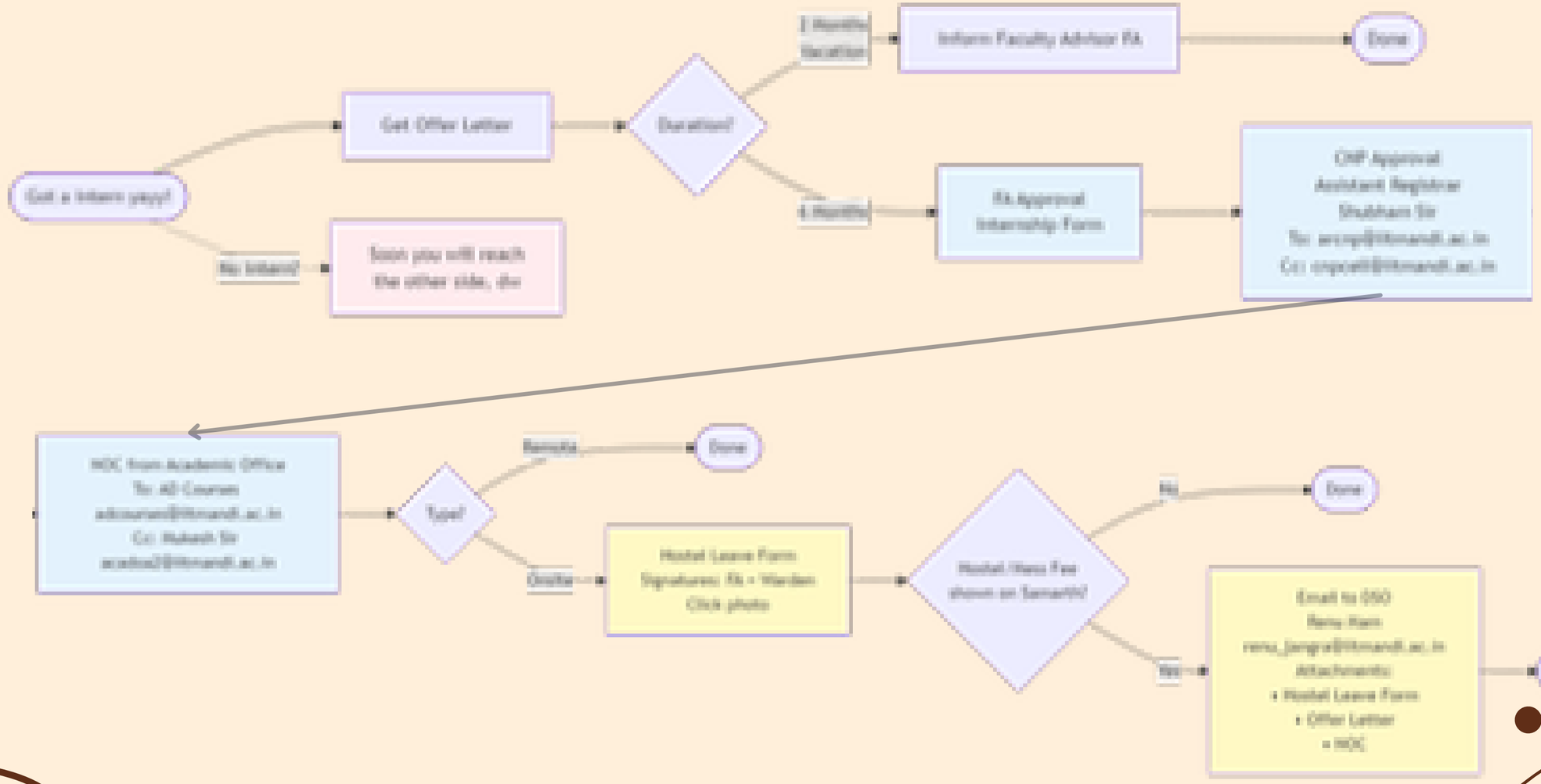
Semester Long Remote Internships

- This option allows the student to stay at IIT Mandi and opt for certain courses along with managing the internship
- Semester long remote internships are worth 6 P/F FE credits & could be done in your 6th, 7th or 8th semesters. It should be of a minimum 14 weeks.
- Students can do a maximum of 9 credits worth courses along with 6 credits of online internship
- You have to register for the course DP-396P, where DP is replaced by branch specific codes, for eg. CS-396P, DS-396P, EE-396P and so on.
- (Most of the 6 month internships are of 20 weeks, so you get 2 credits of IC-010 & 6 P/F FE credits of DP-396P).
- You need to obtain approval from your Faculty Advisor (FA), after which you must request a No Objection Certificate (NOC) from the Academic Section.
- The NOC should be obtained before the add/drop deadline of the semester in which you are undertaking the internship.

Semester Long Onsite Internships

- Semester long onsite internships are worth 9 P/F FE credits.
- This could be done in your 6th or 7th semesters. For 8th semester onsite internships, special approval of Dean Academics is required.
- It should be of minimum 14 weeks
- Students are not permitted to do any offline/online courses during the onsite internship period.
- You have to register for the course DP-399P, where DP is replaced by branch specific codes, for eg. CS-399P, DS-399P, EE-399P and so on.
- (Most of the 6 month internships are of 20 weeks, so you get 2 credits of IC-010 & 9 P/F FE credits of DP-399P).
- You need to obtain approval from your Faculty Advisor (FA), after which you must request a No Objection Certificate (NOC) from the Academic Section.
- The NOC should be obtained before the add/drop deadline of the semester in which you are undertaking the internship.

Approvals & Procedures for Internship



Faculty Advisor Email-IDs

Branch Name	FA Email ID	Branch Name	FA Email ID
Chemical Sciences	bhaskarmondal@iitmandi.ac.in	Engineering Physics	nirmalya@iitmandi.ac.in
Bio Engineering	baskar@iitmandi.ac.in	General Engineering	gajendra@iitmandi.ac.in
Civil Engineering	vivekgupta@iitmandi.ac.in	Materials Science and Engineering	rahul@iitmandi.ac.in
Computer Science and Engineering	varunkumar@iitmandi.ac.in	Mechanical Engineering	dsachan@iitmandi.ac.in
Data Science and Engineering	dineshsingh@iitmandi.ac.in	Mathematics & Computing	muslim@iitmandi.ac.in
Electrical Engineering	moumita@iitmandi.ac.in	Microelectronics & VLSI	robin@iitmandi.ac.in

Internship Form: Link

Grading based on Company Feedback Process

- The FA can choose the scheme of evaluation for internship credit which is Pass/Fail.
- If a company shares negative feedback due to the underperformance of the student throughout the internship, then the following steps would be taken:
  - The company and students’ feedback form will be considered before validating the company's remarks.
  - A committee, including FA, Advisor CnP / TnI, Dean Academics/representative, and designated CnPC coordinators, will be formed to investigate the cases.
  - If a student's work is insufficient, he will be given partial or no credits.
- Internship drop is allowed before mid-semester in case of stressed or negative feedback from students on discontinuation, which will be evaluated accordingly.

Honours Degree

Honours

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

- Students admitted to B.Tech./B.S. program can opt for Honours degree during the fourth or fifth semester if they did not earn any ‘F’ grade till fourth or fifth semester.
- B.Tech./B.S./B.Tech.-M.Tech. Students must complete 8-credits of DP498P & DP499P: Major Technical Project in their own (parent) discipline. Since the students of integrated dual degree leading to B.Tech-M.Tech., B.S.-M.S. are required to do PGP, the requirement of 8 credits of MTP is waived off.
- Student should not have received an ‘F’ grade throughout the program.
- On fulfilling the above relevant requirements, student can obtain the Honours degree by satisfying either of the modes below:
  - Mode A : Have a CGPA of 8.5 or more out of the total credits completed
  - Mode B : Have a CGPA of 8.0 or more out of the total credits completed along with either an original research article published/accepted in a prestigious Q1 SCI journal or Patent granted in relevant discipline (i.e 160 credits of B.Tech/BS + one Q1 SCI Journal (Q1 at the time of submission/acceptance).

Article/Patent Granted as per guidelines below:
“Incase of student is not eligible for Honours degree and he/she has accepted/published research article (SCI Journal) on the recommendation of MTP evaluation Committee. The Committee may recommend for additional work during MTP-1 evaluation and can be graded by school/centre committee.”

Honours degree would be awarded as follows -

- For B.Tech./B.S. students: B.Tech. (Honours) / B.S. (Honours) in
- For IDD students: B.Tech. (Honours) and M.Tech. / B.S. (Honours) and M.S.
- For B.Tech. Double Major students : B.Tech. (Honours) With Second Major in

Guidelines for considering Journal articles/Patent granted:

- Article should be submitted and accepted during student registration in IIT Mandi and should be declared by student to Academic office (duly recommended by supervisor/FA/Chairperson) before the last date of Grade submission of 8th Semester.
- Research article/patent should be published with IIT Mandi affiliation.
- Student should be the first author of the journal article. In case of patent granted the student should be one of the main inventors as declared by other co-inventors.
- Same research article/patent will not be considered for academic requirements by more than one student.

Notification:
https://insite.iitmandi.ac.in/circulars/show.php?ID=IITMandi/Acad/Senate/2023/2067-71

Minor Degree

Minor Degree

- A minor is intended for a student to gain expertise in an area outside his/her major B.Tech. discipline. The area of the Minor must be different from the Major discipline of the student.
- A specialist basket of at least 3 courses is identified for each Minor.
- In order to successfully complete a Minor, a student needs to take atleast 9 credits (credit count may differ based on minor) with a minimum CGPA of 7.0 out of the courses defined in that Minor basket.
- At present, the institute offers a total of 15 different minor programs.
- All Courses counting towards any Minor will go to the FE Basket.
- 1 Course can contribute to not more than 1 Minors.

Minors Offered

Minor in Computer Science Engineering	Minor in Management
Minor in Intelligent Systems	Minor in German Language
Minor in Power Engineering	Minor in Thermo-Fluid Systems
Minor in Electronics Engineering	Minor in Mechanical Design
Minor in Communication Engineering	Minor in Device / Structural Materials
Minor in Measurement and Instrumentation	Minor in Applied Physics
Minor in Control Engineering	Minor in Quantum Technologies
Minor in Robotics	

Minor in Intelligent Systems

Course Code	Course Name	No compulsory courses, any course if counted towards minor will go to FE & should be non P/F and non Audit Course	
EE511	Computer Vision	**Course Code**	**Course Name**
CS673	Advanced Computer Vision	**CS305**	Artificial Intelligence
CS671	Deep Learning and Applications	**DS412**	Matrix Computation for Data Science
CS672	Advanced Deep Learning	**EE608**	Digital Image Processing
DS413	Introduction to Statistical Learning	**BY606**	Bioinformatics Applications for System Analysis
DS411	Optimization for Data Science	**CS630**	Speech Technology
CS683	Generative AI	**CS660**	Data Mining for Decision Making
CS685	Natural Language Processing	**CS609**	Speech Processing

MINOR IN COMPUTER SCIENCE ENGINEERING	
Course Code	**Course Name**
Compulsory: CS212	Design of Algorithms
CS313	Computer Networks
CS302	Paradigms of Programming
CS305	Artificial Intelligence
CS214	Computer Organization
CS304	Formal Language & Automata Theory
CS309	Information Systems & Databases
CS208	Mathematical Foundations of CS
CS312	Operating Systems
IC-253 (Data Structures & Algorithm) is a pre-requisite for CS212 but credits of IC-253 don’t count towards Minor in Computer Science	

MINOR IN COMMUNICATION ENGINEERING	
Course Code	**Course Name**
Compulsory: EE304	Communication Theory
EE503	Advance Communication Theory
EE314	Digital Signal Processing
EE530	Optimization Theory

MINOR IN MEASUREMENT AND INSTRUMENTATION	
Course Code	**Course Name**
Compulsory: EE313	Measurement and Instrumentation
EE301	Control Systems
EE314	Digital Signal Processing
EE620_24	Advance Digital Signal Processing

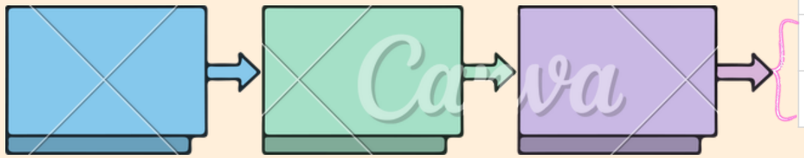
Minor in Management

Prerequisites for Minor in Management:

- IC 252: Data Science II (3-0-2-4)
- One course from the Communicative Competence basket:

Basic Communication Skills	HS-105
Public Speaking and Debating Skills	HS-206
Policy Analysis and Advocacy Skills	HS-301
Science Writing	HS-305
Creative Writing	HS-357

Core Courses (6-credits):



Principles of Economics HS-202
Organizational Management HS-304

Basket Elective Courses (Any 2 courses need to be done out of these 9):

HS 205	Financial Accounting	HS 616	Managerial Thinking and Decision Making	HS 307	Macroeconomics I
HS 403	Organizational Behaviour	HS 461	Consumer Behaviour	HS 481	International Economics
HS 551	Financial Management	HS 510	Essentials of Entrepreneurship	HS 504	Personal Finance and Portfolio Management

MINOR IN POWER ENGINEERING		MINOR IN THERMO-FLUID SYSTEMS	
Course Code	**Course Name**	**Course Code**	**Course Name**
Compulsory: EE201	Electromechanics	**ME210**	Fluid Mechanics
Compulsory: EE309	Power Electronics	**ME303**	Heat Transfer
CS403	Algorithms Design and Analysis	**ME307**	Energy Conversion Devices
CS304	Formal Languages and Automata Theory	**ME356**	Principles of Energy Conversion
CS214	Computer Organization	**ME451**	Refrigeration and Air Conditioning
CS309	Information and Database Systems	**ME614**	Compressible Flow and Gas Dynamics
CS671	Deep Learning and its Applications	**ME615**	Applied Computational Fluid Dynamics
MINOR IN CONTROL ENGINEERING			
Compulsory: EE301	Control Systems	**EE509**	Linear Dynamical Systems
Compulsory: EE301P	Control System Laboratory	**EE514**	Robust Control Systems

Minor in Robotics

(2 Compulsory Courses & Any 2 out of 14 Electives)

Course Code	Course Name	Course Code	Course Name
Compulsory: AR 501 / ME 452	Robot Kinematics, Dynamics, and Control	**AR 509**	Deep Learning for Robotics
Compulsory: AR 503	Mechatronics	**AR 510**	Underactuated Robotics
AR 502	Advanced Design Practicum	**AR 511**	Autonomous Mobile Robots
AR 504	Robot Programming	**AR 512**	Rapid Prototyping and Tooling
AR 505	Principles of Robot Autonomy	**AR 513**	Unmanned Aerial Systems (UAS)
AR 506	Cognitive Robotics	**AR 514**	Vision and Learning Based Control
AR 507	Probabilistic Robotics	**AR 515**	Sensors and State Estimation
AR 508	Marine Robotics	**AR 519 / EE 555**	Intelligent Control System

MINOR IN ELECTRONICS ENGINEERING			
Course Code	**Course Name**	**Course Code**	**Course Name**
Compulsory: EE203	Network Theory	**EE305**	Digital Signal Processing
Compulsory: EE210	Digital System Design	**EE311**	Device Electronics for Integrated Circuits
EE211	Analog Circuit Design	**EE312P**	Microelectronics Circuits Design Practicum
MINOR IN MECHANICAL DESIGN			
Course Code	**Course Name**	**Course Code**	**Course Name**
ME205	Machine Drawing	**ME309**	Theory of Machines
ME206	Mechanics of Solids	**ME352**	Finite Element Methods in Engineering
ME305	Design of Machine Elements	**ME602**	Mechanical Vibration

Minor/Specialisation in Quantum Technologies

Specialization requires 18 or more credits & **Minor** requires 12 or more credits

Atleast one of QT 01 & QT 02 is mandatory

QT 301	Survey of Quantum technologies and Applications	3-0-0-3
QT 302 / PH 513 / EP 301	Foundations of Quantum Technologies	3-0-0-3

Atleast one of QT 03 & QT 04 is mandatory

QT 303P	Basic Programming Lab	2-0-1-3
QT 304P / QT501P	Basic Laboratory Course for Quantum Technologies	2-0-1-3

Atleast one of QT 05, QT 06, QT 08 & QT 09 is mandatory

QT 405 / CS 520	Introduction to Quantum Computation	3-0-0-3
QT 406	Introduction to Quantum Communication	3-0-0-3
QT 407	Introduction to Quantum Sensing	3-0-0-3
QT 408 / PH 532 / PH 501	Introduction to Quantum Materials	3-0-0-3

Atleast one of QT 05, QT 06, QT 08 & QT 09 is mandatory

QT 509	Engineering Foundation of Quantum Technologies	3-0-0-3
QT 510 / PH 601	Solid State Physics for Quantum Technologies	3-0-0-3
QT 511 / PH 550	Introduction to Quantum Optics	3-0-0-3
CS 521	Introduction to Post Quantum Security	3-0-0-3

MINOR IN DEVICE / STRUCTURAL ENGINEERING			
Course Code	**Course Name**	**Course Code**	**Course Name**
ME353	Electronic Materials and Their Applications	**ME609**	Functional Materials
ME607	Materials Science for Failure Analysis	**ME619**	Experiments in Materials Science
MINOR IN GERMAN LANGUAGE			
HS352	German II	**HS372**	German IV
HS362	German III	**HS373**	Readings from German History
HS363	Post-war Germany: A Literary Perspective	**HS539**	Post-War Germany: Politics, Society and Culture
MINOR IN APPLIED PHYSICS			
EP-502	Informatics for Materials Design	**PH302 / PH522**	Introduction to Statistical Mechanics / Statistical Mechanics
PH301 / PH513	Quantum Mechanics and Applications / Quantum Mechanics	**PH501 / PH523**	Solid State Physics / Condensed Matter Physics

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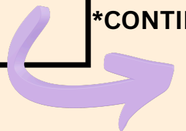

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Minor in Applied Physics

Course Code	Course Name	Course Code	Course Name
PH-502	Photonics	**PH-603**	Advanced Condensed Matter Physics
PH-503	Laser and Applications	**PH-604**	Optical Properties of Solids
PH-504	Organic Optoelectronics	**PH-605**	Superconductivity
PH-505	Electronic Structure	**PH-606**	Quantum Field Theory
PH-506	Project	**PH-607**	Physics of Ultracold Quantum Gases
PH-507	X-rays as a probe to study material properties	**PH-608**	Computer assisted quantum mechanics
PH-508	Magnetism and Magnetic Materials	**PH-609**	Theory of quantum collision and spectroscopy
PH-511	Mathematical Physics	**PH-612**	Nuclear and Particle Physics
PH-528	Introduction to General Relativity	**PH-701**	Introduction to Molecular Simulations
PH-601	Mesoscopic Physics and Quantum Transport	**PH-706**	Introduction to Stochastic Problems in Physics

Backlog Courses

- Students are not allowed to take backlog courses during the regular semester viz. ODD and EVEN semester of Academic Year.
- Backlog course can be taken during Winter or Summer Term only.
- Students having backlogs will have to register the courses during summer/winter vacation semesters.
- Supplementary exams for these courses will only be conducted in summer/winter break and grades will be included under vacation semester.
- Students have to take prior permission/consent from the concerned course instructor and approval from Dean (Academics) for supplementary exams.
- Students should be in touch with course instructor regarding their exams. Course instructors will submit the grades, before commencement of subsequent regular semester.
- Students can register for equivalent course in place of backlog course with the condition to provide recommendation of Faculty advisor and approval of AD (Courses) latest within first 5 days of the corresponding semester.
- Courses that you have failed, even if later cleared, will still be shown on your transcript.

Notification: https://insite.iitmandi.ac.in/circulars/show.php?ID=IITMandi/Acad/Senate/2023/2067-71

Conversion to 5-year programmes

B.Tech to B.Tech Double Major

- Students will be able to get a major degree in 2 fields, i.e. degree awarded would be BTech/BTech + MTech in <First Major> with Second Major in <Second Major>
- Students would have to complete roughly 38-40 extra credits in the second major by staying back an additional one year
- Eligibility criteria: CGPA ≥ 7.0, with not more than one F grade at the time of application
- Application period:
  - At the end of 4th and 6th semesters for 4-year BTech programs
  - At the end of 6th and 8th semesters for 5-year BTech programs
- Benefits:
  - Students with a second major in “X” can sit for intern/placement in “X” profiles too
  - Additional opportunity for students who missed the branch change

B.Tech to B.Tech - M.Tech IDD

- Students would be awarded BTech/BTech (Honours) + MTech in <First Major>
- Eligibility criteria:
  - CGPA ≥ 8.0, with no F/I grade at the time of application
  - All degree requirements to get B.Tech./B.Tech. (Honours) must be completed by 8th semester
- Application period:
  - At the end of 6th semester to the beginning of 8th semester
  - Submit a formal application with a supporting letter from the FA and School Chair
- Students would have to complete 46 extra credits (5 or above level courses) by staying back an additional one year
- Students will be given MHRD HTRA on-par with MTech students, provided CGPA ≥ 8.0 at the end of 8th semester or students have a valid GATE score
- Fees for 5th year would be paid as applicable to MTech students

Sources

- Minutes of the Senate Meetings
- Minutes of the BoA Meetings
- B.Tech. Ordinances and Regulations
- Insite Notifications

All Documents used/referenced in this PPT: Link

Academic Council
IIT MANDI

THANKS

Do you have any questions?

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Credits: Current & Previous Academic Secretaries and Academic Council, IIT Mandi