

FRESHIE'S HANDBOOK

METALLURGICAL ENGINEERING AND
MATERIALS SCIENCE



2024-25

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CURRICULUM

Along with the detailed semester wise curriculum on the following pages, we have included some key points to keep in mind. While you are not required to make any choices in your first year, we hope that this section leaves you excited about the wide range of possibilities and also helps you plan your next few years here at IIT Bombay.

Out of the 261 credits required for the degree, 90 are electives. This means that you can choose courses of your choice worth 90 credits. The breakdown of these credits is below:

1. 18 (BTP/Equivalent Elective Courses)
2. 18 (Department Electives)
3. 30 (Flexible electives)
4. 12 (HASMED electives)
5. 12 (STEM electives)
6. With this curriculum structure, you have the choice to really delve deep into specializations of your choice by taking relevant electives and also optionally doing six month long research projects (BTP) in a domain of your choice.
7. On the other hand, it also gives you the freedom to explore courses in our department and others as well. There is an exhaustive list of courses that can be taken as electives to ensure you get ample of choice.
8. For course reviews and resources you can head on to ResoBin at <https://resobin.gymkhana.iitb.ac.in/courses>, search the course you are looking for and go to the reviews or resources tab.



CURRICULUM

Semester 1	BTech Credits = 33	Dual Degree Credits = 0	Total Credits = 33
Course Code	Course Name	Category	Credits
CH 111	Chemistry	Basic Sciences and Mathematics	8
CS 101	Computer Programming	Engineering Sciences and Skills	6
GC 101	Gender sensitisation course	Non-Credited Compulsory Courses	0
HSS/IDC/ENT	Introduction to HASMED	HASMED Core	8
MA 105	Calculus	Basic Sciences and Mathematics	8
NOCS 01	NCC/NSS/NSO	Non-Credited Compulsory Courses	0
PH 117	Physics Lab	Basic Sciences and Mathematics	3

Semester 2	BTech Credits = 33	Dual Degree Credits = 0	Total Credits = 33
Course Code	Course Name	Category	Credits
CH 117	Chemistry Lab	Basic Sciences and Mathematics	3
MA 110	Linear Algebra and Differential Equations	Basic Sciences and Mathematics	8
MM 105	Its a Materials World!	Department Core	6
MS 101	Makerspace	Engineering Sciences and Skills	8
NOCS 02	NCC/NSS/NSO	Non-Credited Compulsory Courses	0
PH 110	Introduction to Classical and Quantum Physics	Basic Sciences and Mathematics	8

Semester 3	BTech Credits = 34	Dual Degree Credits = 0	Total Credits = 34
Course Code	Course Name	Category	Credits
MM 219	Structure of Materials	Department Core	6
MM 221	Thermodynamics of Materials	Department Core	6
BB 101	Biology	Basic Sciences and Mathematics	6
MM 223	Sensors and Measurements Lab	Department Lab and SLP/PT/Works Visit	4
MM 225	AI and Data Science	Engineering Sciences and Skills	6
EC 101	Economics	HASMED Core	6



CURRICULUM

Semester 4	BTech Credits = 36	Dual Degree Credits = 0	Total Credits = 36
Course Code	Course Name	Category	Credits
MM 210	Numerical methods for Material Engineering	Department Core	6
MM 218	Process Kinetics and Transport	Department Core	6
MM 222	Electrochemistry and its Applications	Department Core	6
MM 220	Computation Lab	Department Lab and SLP/PT/Works Visit	3
MM 224	Electrochemistry and Corrosion Lab	Department Lab and SLP/PT/Works Visit	3
DE 250	Design Thinking	HASMED Core	6
HS 250 & ES 250	Environmental Studies	HS 250 and ES 250	6

Semester 5	BTech Credits = 31	Dual Degree Credits = 0	Total Credits = 31
Course Code	Course Name	Category	
		HASMED Elective	6
MM 329	Diffusion and Phase transformations	Department Core	6
MM 331	Mechanical Behaviour of Materials	Department Core	6
MM 333	Electrical, Magnetic and Optical properties of materials	Department Core	6
MM 335	Alloy Processing and Characterisation Lab	Department Lab and SLP/PT/Works Visit	4
MM 337	Processing and Characterisation of non-metallic materials	Department Lab and SLP/PT/Works Visit	3

Semester 6	BTech Credits = 34	Dual Degree Credits = 6	Total Credits = 40
Course Code	Course Name	Category	
MM 324	Introduction to Polymers	Department Core	6
	Thin Films Processing and Characterisation Lab	Department Lab and SLP/PT/Works Visit	4
	Department Elective 1	Department Electives	6
	Department Elective 2	Department Electives	6
		HASMED Elective	6
		STEM Elective	6
	Honors elective 1	Honors	6

CURRICULUM

Semester 7	BTech Credits = 30	Dual Degree Credits = 12	Total Credits = 42
Course Code	Course Name	Category	Credits
	Department Elective 3	Department Electives	6
		BTP/Equivalent Elective courses	6
		STEM Elective	6
		Flexible Elective	6
		Flexible Elective	6
	Honors Elective 2	Honors	6
	Honors Elective 3	Honors	6

Semester 8	BTech Credits = 30	Dual Degree Credits = 12	Total Credits = 42
Course Code	Course Name	Category	
		BTP/Equivalent Elective courses	6
		BTP/Equivalent Elective courses	6
		Flexible Elective	6
		Flexible Elective	6
		Flexible Elective	6
	Honors Elective 4	Honors	6
MM 406 (Ceramics & Composites) OR MM 656 (Metal Process Engineering)	Semiconductor Devices and Processing (Ceramics and Composites) OR Simulation and Optimisation (Metallurgical Process Engineering)	PG Electives	6

Semester 9	BTech Credits = 0	Dual Degree Credits = 42	Total Credits = 42
Course Code	Course Name	Category	
	PG Elective 1	PG Electives	6
	PG Elective 2	PG Electives	6
	Dual Degree Project Stage I	Dual Degree Project	30

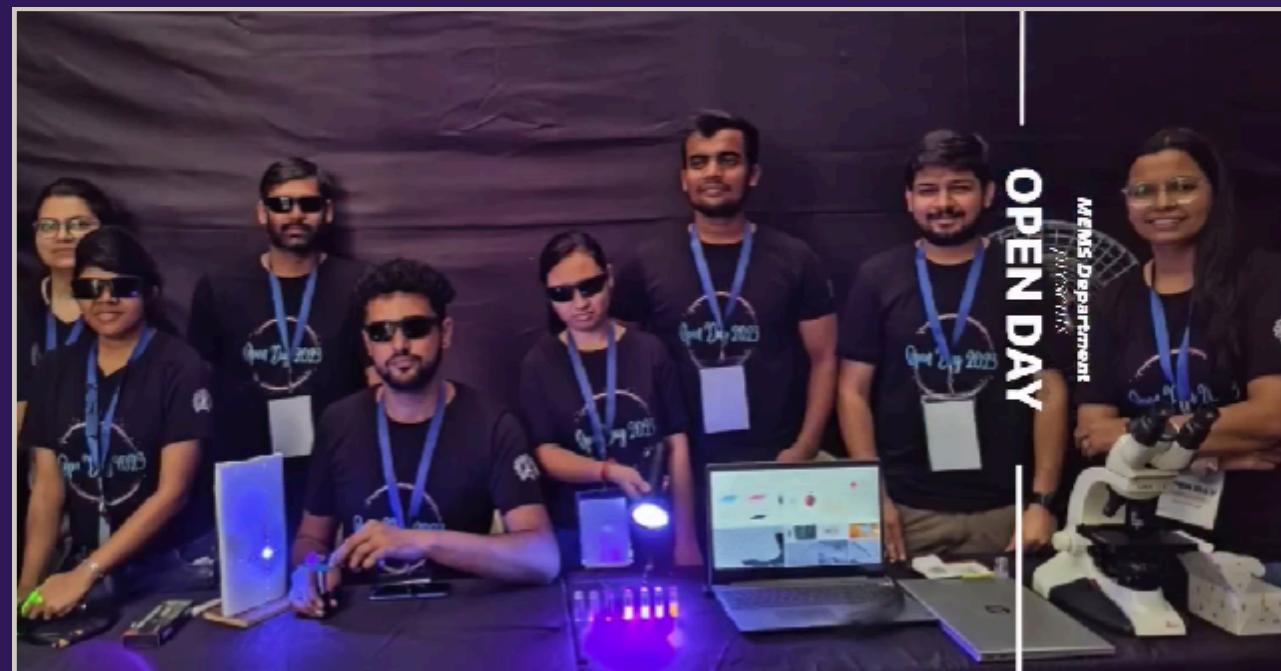
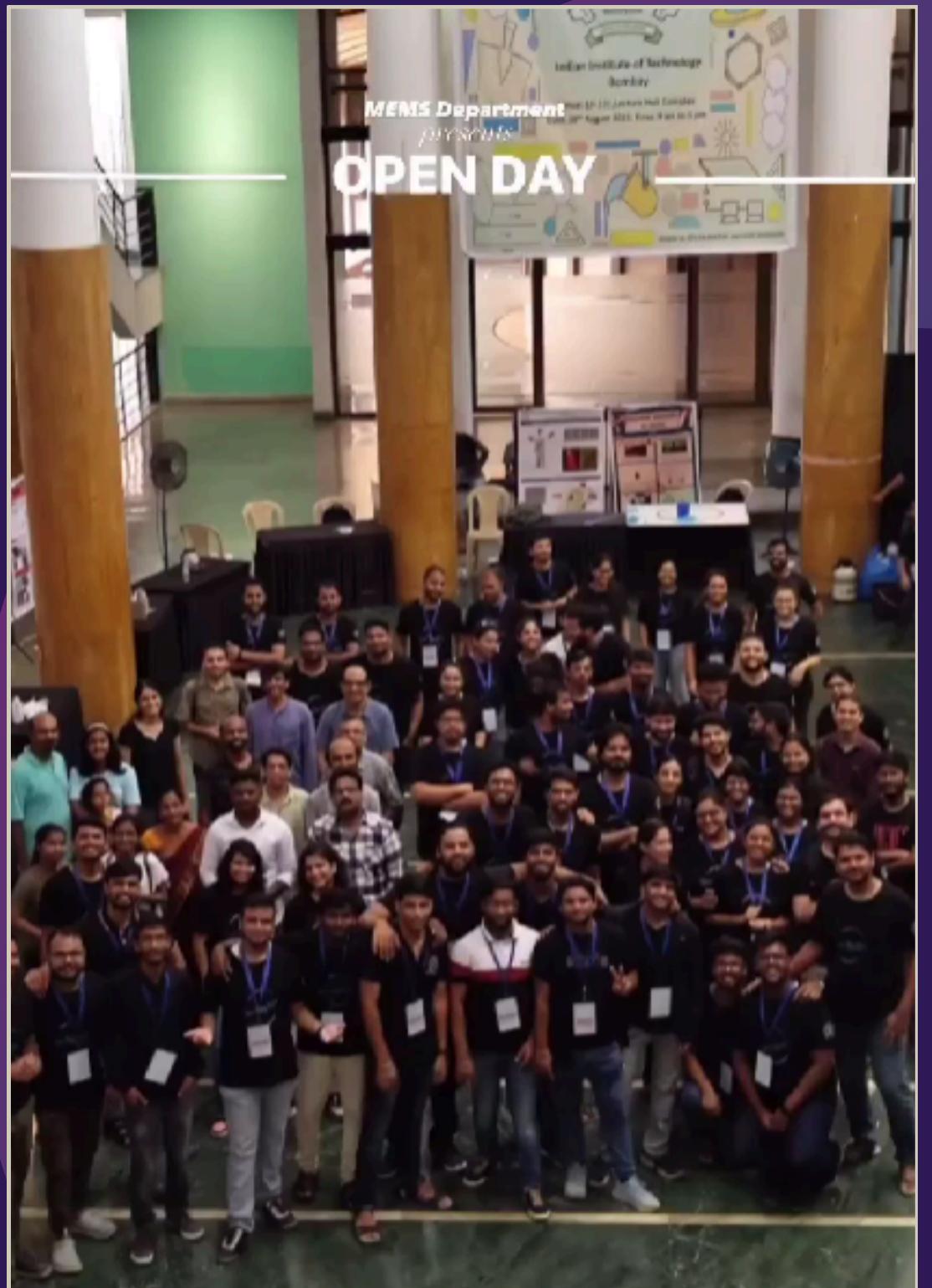
Semester 10	BTech Credits = 0	Dual Degree Credits = 48	Total Credits = 48
Course Code	Course Name	Category	
	PG Elective 3	PG Electives	6
	Dual Degree Project Stage III	Dual Degree Project	42

EVENTS

- Convocation ceremony



- Open day



• Department Trip



• Freshie night





- Sports weekend



- MMA Summit



- Traditional Day



- Valedictory function





INSTI LINGOS

Heyyyy there freshie janta, now that you've officially landed in the heart of the campus, its time to immerse yourself in the insti life and ofc get comfortable with the lingos. Trust me, these slang words will be your survival kit. (Seriously, isse toh ratt hi lena!💡)

- All-nighter
 - refers to staying up all night
- Ex : Kal quiz hai toh kya hua all nighter maar lenge

- Acads
 - Academics
- Ex : Acads mere liye vaisa hain jaisa adrak bandar ke liye

- Anti
 - against with
- Ex : Uss TA (teaching assistance) se mera anti hain yaar.

- BT
 - Bad trip
- Ex : CS101 bada BT de raha hain bro

- Compi
 - Competition
- Ex : GC compi mein machana hain guys

- Cult
 - culturals
- Ex : Sports? Na bhai I'm into Cult





- Enthu
- Enthusiasm

Ex: Every anchor be like, " enthu dikhao yaar "

- Farra
- Fr grade

Ex : Padh le bhai farra chahiye kya?

- Freebies
- Free gifts

Ex : Freebies nahi hote toh orientation attend karte tum?

- Freshie
- you guys 😊

Ex : Freshie year toh chill hota hai

- Gpl
- G*nd pe laat

Ex : Bhai ka bday hain, chalo gpl dene

- GC
- General championship

Ex : Hostel jitaana hain , GC machana hain

- Insti
- Institute

Ex : insti itna bada hain pehle hi din ghum ho gaya lol

- Machax
- The cool ones

Ex : Meta machax guys!!!





- Maggu
 - All study no play makes jack a maggu
- Ex : Aaj class bunk karte hain notes maggu de dega

- Oreo
 - short version for orientation
- Ex : thak gaya hu bro saare oreo attend karke

- Polt
 - politics
- Ex : Isse lagta hain Polt karne se isse fayda milega 😊

- Poltu
 - politically inclined person
- Ex : Poltu aur RG logo se 10 kadam dur

- RG
 - stands for relative grading, an evil maggu?
- Ex : you really thought that rg queen would help you?

- Sophie
 - sophomores (2nd year guys)
- Ex : sophie banne pr samjha freshie year chill tha

- TA
 - teaching assistant
- Ex : TA se panga nahi re baba



RESEARCH

- Ceramics and glasses

Have you ever wondered what materials are used in areas that require high heat and temperature tolerance (where metals would melt, making them a bad option), say the turbine blades in high speed jet planes? Inorganic, non metallic materials (like carbides, nitrides and oxides), called ceramics, become the life saviour in such cases. They are hard and heat and corrosion resistant.

At IITB, you will have the chance to explore research in many arenas of ceramics and glasses. Our faculty members have been researching on topics like high temperature protective coatings - which can shield other materials from high temperatures and corrosion, electronic polymers - which are polymers that exhibit electrical conductivity and are used over traditional conductors due to their unique properties and advantages, and many others.

- Energy storage

Energy storage is a potential substitute for, or complement to, almost every part of a power system, including generation, transmission, and demand flexibility. And arguably the most important aspect to energy storage is the materials used.

Our professors work on the synthesis of novel materials for energy storage, materials for fuel cells, electrode/electrolyte interfaces in batteries, printed electronic and energy storage devices and many such topics.

- Metals & alloys- forming & processing

Metals and alloys form the backbone of modern engineering and manufacturing. It covers everything from how different techniques like casting and forging are used to create metals into things like car parts to processing methods like heat treatment and alloying which improve metal properties. This field is a mix of chemistry, physics, and engineering, all aimed at solving real-world problems and creating new technologies.

There is extensive work going on in our department on metal refining and alloy development related areas, thin films, protective coatings and oxidation behaviours, mechanical behaviour of materials etc.



- Micro and Nanostructures

Imagine structures so small that thousands could fit on the head of a pin! These tiny marvels possess extraordinary properties that have led to groundbreaking advancements in electronics, medicine, materials science, and beyond. Learning about how they're created, characterized, and utilized is amazing and, who knows, maybe you'll even invent the next big thing!

Here in our department you'll have the opportunity to explore the wonders of nano-biotechnology, nano structured materials, synthesis methods of nanostructured materials in bulk, microstructural characterization and much more.

- Polymers

Welcome to the world of polymers. Polymers play a crucial role in our everyday lives, from the plastics we use to natural substances like rubber and DNA. This field offers a blend of chemistry, materials science, and engineering, by exploring synthesis, properties and applications of various polymers. So if you share an interest with other faculty in effects of materials in immiscible polymer blends, prosthetics or polymer encapsulation related topics, this domain is exclusively for you.

- Corrosion

Ever seen that rusty old bike lying around? Or that green stuff on a copper statue? That's corrosion doing its thing. It's basically when stuff like metal breaks down over time because of its surroundings. It might sound boring, but it's actually pretty cool to learn about. You'll figure out different types of corrosion, such as uniform corrosion, pitting, and stress corrosion cracking, and how to prevent or mitigate them using protective coatings, corrosion inhibitors, and material selection. Novel corrosion inhibitor systems, high temperature corrosion, corrosion resistant alloys and coating development, and high temperature protective coatings are few among the exciting stuff happening in the department. It's like being a detective for materials, figuring out what's happening and how to protect them.





- Electrochemical aspects of materials

This field deals with figuring out how stuff reacts when you zap it with electricity. It's like the science behind batteries, rust, and even your phone charging. You'll learn why some things conduct electricity while others don't, and how to make materials do cool stuff like store energy or prevent corrosion. It's a mix of chemistry, physics, and materials science, and it's super important for solving problems like climate change and creating new tech.

- Semiconductors

Wanna know about semiconductors? They're the brains behind all your gadgets. Imagine tiny little switches that control the flow of electricity - that's what they are. From your phone to your gaming console, these little guys make it all work. They're like the superheroes of the tech world, powering everything from simple calculators to supercomputers.

- Photovoltaics and optoelectronics

Photovoltaics and optoelectronics are like the magic behind the way we interact with light. Imagine turning sunlight into electricity to power your home, or creating tiny devices that can manipulate light in incredible ways. That's the exciting world you're stepping into! These fields blend physics, engineering, and materials science to explore how light behaves and how we can harness its power. Whether you're fascinated by renewable energy or cutting-edge technology, there's a lot to discover.





INSTI FOOD OUTLETS

You guys must be exhausted after roaming around this massive campus on an empty stomach. Trust us, we feel your pain—we've been there too! That's why we've got your back with some insider recommendations on the must-visit eateries around campus. These spots are legendary, and you definitely don't want to miss out on their specialties!

1. Aromas

Speciality : Shawarma
(for my non vegetarian peeps)

2. H2 canteen

Speciality : Sandwiches

3. H3 fruit juice centre

Speciality : All fruit juices are


4. H6 canteen

Speciality : Biryani and rice

5. Amul ice cream and canteen

Speciality : Momos

6. Chaayos

Speciality: Bun maska & chai

7. Dominos

Speciality : (you guys decide ☺)

8. CCD

Speciality: Devil's own

9. Cafe 92

Speciality : Mayo french fries

10. Civil cafe

Speciality : Coffee

11. Kresit cafe

Speciality : Indian snack

12. Library cafe

Speciality : Sasti chai

13. Gulmohar

Speciality : (melody khao khud jaan jao :))





KNOW YOUR FACADS

On joining the Institute, each student is assigned to a Faculty Adviser. You can consult the Faculty Adviser on any matter relating to your academic performance and they will guide you on completing your courses required for your degree. To ensure the best use of the opportunities at IITB, the planning of your academic journey needs careful consideration, and hence constant consultation with the Faculty Advisers is very important.

Please make sure you meet your faculty advisor offline as early on as possible so that they can guide you through your first semester as well.

You can find who your faculty advisor is by following these steps:

1. Visit asc.iitb.ac.in
2. Login using your LDAP credentials
3. In the panel on the left, click on Academic → Faculty Advisor → Display List → Faculty Advisor
4. Select the following options:

Type: ALL

Department: Metallurgical Engineering and Material Science

Programme: UG → BTech

Specialization: ALL

Batch year: 2024

5. Click on Get Report and search for your roll number in the Roll No field

On the next page, we have contact details of the faculty advisors for your batch so that you can easily approach them.





KNOW YOUR FACADS

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