IEOR B.Tech

Registration and orientation

Program structure

- 8 semesters (can finish earlier!)
- Minor
- Honours
- IDDDP

253 credits over 4 years (basic course)

What is a credit? In IIT Bombay, 1 credit is roughly 1 hour a week on a semester long course. E.g. 6 credits means 6 hours a week for 14 weeks.

Sem 1 has 31 credits → 31 work hours a week

9 lecture hours (+ 9 hours of study per week), 3 lab hours and Makerspace activity

Semester 1

IEOR B Tech students

IE 101 - Intro to IEOR - 6 credits - Jayendran Venkateswaran (IEOR) - Tue-Fri 330-500 pm - ——-> **CLRL (Collaborative Learning and Research Laboratory), 1st floor DESE**

BB 101 - Biology - 6 credits - Swati Patankar (Bio) - Tue-Fri 200-330 pm - **LA 202** **+ Tutorial slot (Monday 1130-1230 - pl confirm venue)**
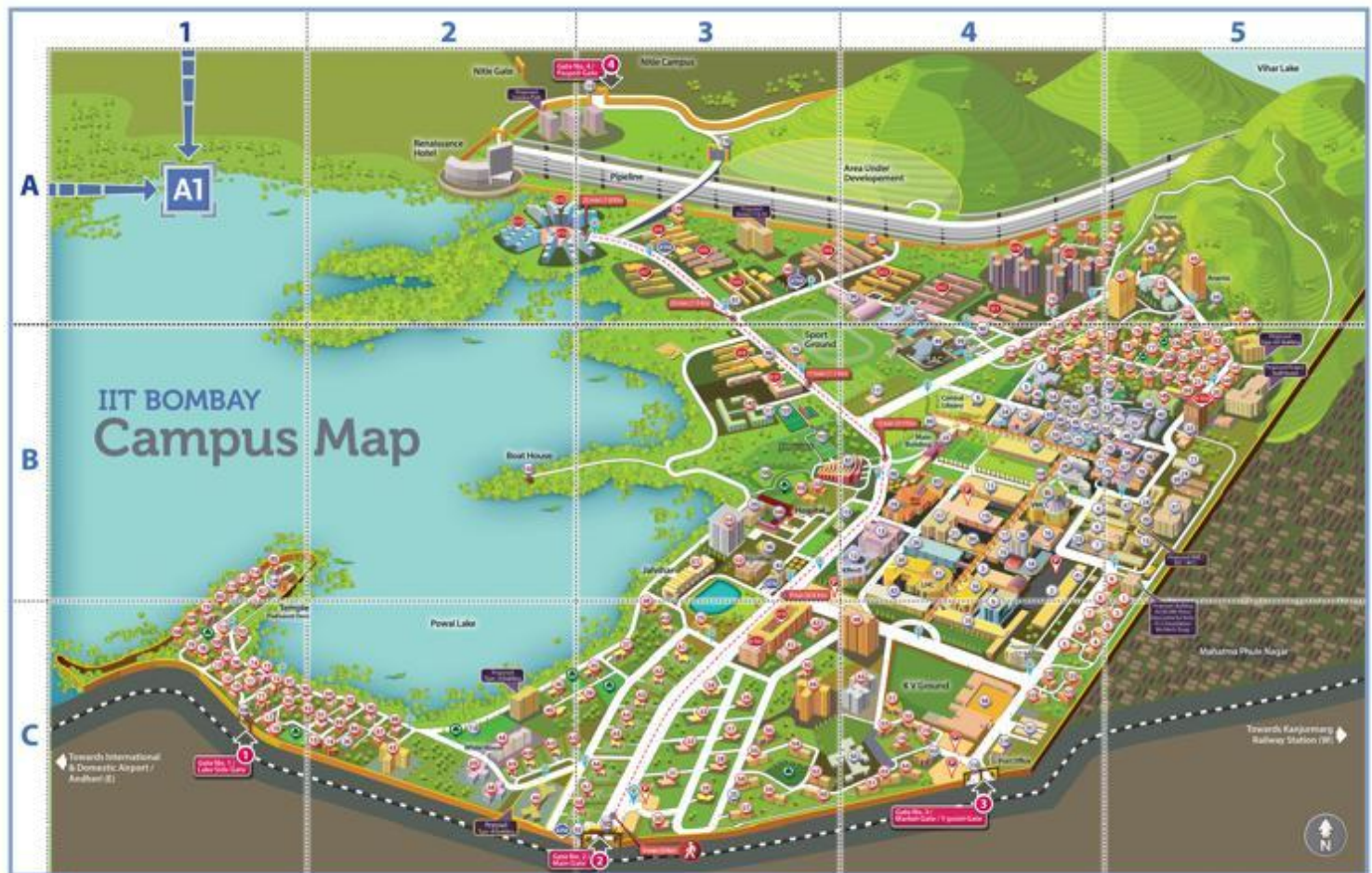
MA 105 - Calculus - 8 credits - Swapnil Mahajan (Maths) - - Mon-Thu 200-330 pm - **LA 201** + **tutorial slot**

MS 101 - Makerspace - 8 credits - Mech and Elec faculty - Tue 830-1130 a.m. and Friday 930 am - 1230 pm **+ lecture slot**

CH 117 - Chemistry Lab - 3 credits - Chemistry Faculty - Thu 830-1130 am - Pre-engineered building (about 100 meters from IDC going towards hostels)

31 credits

Time/Day	8.30 9.25	9.30 10.25	10.35 11.30	11.35 12.30	L u n c h R e c e s s	2.00 3.25	3.30 4.55	Break (5.00 pm to 5.30 pm)	5.30 6.55	7.00 8.25
Mon	1A	2A	3A	4A		8A ____L1____ 9A			12A	13A
Tue	4B	1B	2B	3B		10A ____L2____ 11A			14A	15A
Wed	7A	5A (9.30 to 10.55) --- L		6A (11.05 to 12.30) 5---	12.30 to 2.00 pm	X1 X2 X3 ____ Lx ____			XC	XD
Thu	3C	4C	1C	2C		8B ____L3____ 9B			12B	13B
Fri	7B	5B (9.30 to 10.55 ---L		6B (11.05 to 12.30) 6---		10B ____L4____ 11B			14B	15B

IIT BOMBAY
Campus Map

1 **2** **3** **4** **5**

A

B

C

Vihar Lake

Nitie Gate
Nitie Campus
Renaissance Hotel
Pipeline
Area Under Development

Sport Ground

Boat House

Powai Lake

Jalvihar

K V Ground

Mahatma Phule Nagar

Towards International & Domestic Airport / Andheri (E)

Towards Kanjurmarg Railway Station (W)

N

Parking   Bus Stop   Garden

IE and OR

Industrial Engineering

Consider any **product** (e.g. a guitar)

It has to be **designed** for functionality, cost, aesthetics, durability, etc.

Consider a **facility** for making a product (e.g. a guitar)

This facility has to be **designed** too (for functionality, cost etc)!

Industrial Engineering is to do with the design and operation of all sorts of human activities, including manufacturing, retailing, services … in an effective and cost efficient manner

Examples:

- Should Flipkart have direct to door delivery of some items or should we move goods via a transit hub?
- What is a good way to assemble laptops in a manufacturing facility?
- What is the organization of departments in a large hospital?
- How many people does the IIT Bombay security service need to employ?

IE and OR

Operations Research

Historical term, which arose from the rigorous approach to planning, starting with wartime applications, but now used for several peaceful purposes

Systematic and often quantitative analysis of any techno-human system, with the appropriate computational and information support

The underlying mathematics and rigorous analysis of such systems

Several examples:

- How to design a good schedule for the English Premier League football games?
- How to design good insurance policies for a trucking company that wants to operate across India?
- How to conduct elections effectively?
- How to distribute consumer products through factories, warehouses and retail stores? …

Those who like Mathematics, Computation …

Optimization has a long history

Probability and statistics an even longer history!

Newer paradigms like Game Theory, Simulation, …

Computing developments in the last two decades requires a strong foundation in mathematics

Machine learning is now very closely intertwined with developments in Operations Research

We have some of the strongest researchers in these areas in IEOR@IIT Bombay

SEMESTER I		L	T	P	C	SEMESTER II		L	T	P	C
IE101	Introduction to IE and OR (DIC-1)	3	0	0	6	IE102	Probability and Statistics	3	0	0	6
MA105	Calculus	3	1	0	8	MA110	Linear Algebra & Differential Equations	3	1	0	8
BB101	Biology	3	0	0	6	CS101	Computer Programming & Utilization	2	0	2	6
MS101	Makerspace				8		HASMED (2 half)				8
CH117	Chemistry Lab	0	0	0	3	PH117	Physics Lab	0	0	3	3
	NCC/NSS/NSO						NCC/ NSS/ NSO				
	Gender Sensitisation										
	TOTAL				31		TOTAL				31

SEMESTER III		L	T	P	C	SEMESTER IV		L	T	P	C
EC101	Economics	3	0	0	6		Design Thinking -				6
IE209	Linear Optimization and Network Flows	3	0	0	6	IE208	Nonlinear and Discrete Optimization	3	0	0	6
IE207	Industrial Systems	3	0	0	6	IE210	Optimization Modeling Lab	0	0	3	3
IE205	Industrial Engineering Lab	0	0	3	3	IE206	Introduction to AI/ML	3	0	0	6
IE203	Data Structures and Algorithms	3	0	0	6	IE201	Data Analytics, AI/ML Lab	0	0	3	3
IE211	Programming & Computing Lab	0	0	3	3	IE204	Feedbacks and Dynamics	3	0	0	6
ES/HS250	Environmental Studies	3	0	0	6	IE202	Digital Enterprise Systems Lab	0	0	3	3
	TOTAL				36		TOTAL				33

SEMESTER V		L	T	P	C	SEMESTER VI		L	T	P	C
IE301	Operations Analysis	3	0	0	6	IE302	Logistics and Supply Chains	3	0	0	6
IE303	Simulation	3	0	0	6	IE304	Risk and Uncertainty	3	0	0	6
IE307	Stochastic Processes & Queueing Systems	3	0	0	6		Department Elective 1				6
IE305	Simulation Lab	0	0	3	3		STEM Elective 1				6
	HASMED Elective 1				6		HASMED Elective 2				6
	Flexible Elective 1				6						
	TOTAL				33		TOTAL				30
	(Honors Elective 1)				6		Honors Elective 2				6

SEMESTER VII	L	T	P	C		SEMESTER VIII	L	T	P	C
BTech Project - 1 or Dept Elective				6		BTech Project - 2 or two Dept Electives				12
Department Elective 2				6		Department Elective 3				6
Flexible Elective 2				6		Flexible Elective 4				6
Flexible Elective 3				6		Flexible Elective 5				6
STEM Elective 2				6						
TOTAL				30		TOTAL				30
Honors Elective 3				6		Honors Elective 4				6

Know your Faculty

Prof. Jayendran Venkateswaran (Head)

Industrial Engineering and Operations Research
Indian Institute of Technology Bombay

Know your Faculty

N. Hemachandra

Narayan Rangaraj

Ashutosh Mahajan

K.S. Mallikarjuna Rao

Know your Faculty

Industrial Engineering and Operations Research
Indian Institute of Technology Bombay

Manjesh Hanawal

P Balamurugan

Vishnu Narayanan

Veeraruna Kavitha

Industrial Engineering and Operations Research
Indian Institute of Technology Bombay

Avinash Bhardwaj

Urban Larsson

Saurabh Jain

Priyank Sinha

Madhu Belur

Jaykrishnan Nair

Industrial Engineering and Operations Research
Indian Institute of Technology Bombay

IEOR IIT BOMBAY

Office Staff

Mr. Amlesh Kumar
Administrative Assistant

Ms. Anita Kharat
Asst. Project Manager

Mr. Abasaheb Molavane
Jr. Assistant

Mr. Pramod Pawar
Attendant

Languages

Medium of instruction - **English**

However, many languages spoken on campus, and you can express yourself in almost any language

Faculty and staff speak **English, Hindi (incl variants), Marathi, Telugu, Tamil, Kannada, Malayalam, Swedish, German …**

Faculty, staff and students in IEOR speak almost all languages of India/Nepal/Bangladesh and perhaps some more

Communicate with others freely in whatever languages you are comfortable and try to gain working, professional knowledge of English before you graduate

Moodle and other resources

You already know asc.iitb.ac.in

Another good resource is
www.ieor.iitb.ac.in

Many instructors will use Moodle
https://moodle.iitb.ac.in/login/index.php for administering their courses

Laptop - you should plan to get a laptop soon (help is available for those who need it) as it will help in many ways

SC/ST cell at IIT Bombay:
https://www.scstcell.iitb.ac.in/

Gender cell at IIT Bombay:
https://gendercell.iitb.ac.in/

Computer center:
https://www.cc.iitb.ac.in/

Revise the IT policy, safety procedures and other material when you can

General advice

Drink a lot of water

Keep physically active

Stay healthy

Talk to everyone - it's ok to talk about your problems and share your enthusiasm

Attend classes and sit in the front half

Check your email (including moodle announcements) at least once a day

Come to the department once in a while, just to take a look at what is going on!