Joint MTech Programme

Centre for Atmospheric and Oceanic Sciences (CAOS)

&

Centre for Earth Sciences (CEaS)

Course Structure

- **Total Credits: 64**
  - Mandatory — **6 credits**
  - Core — **12 credits (Minimum)**
  - Mathematics — **3 credits (Minimum)**
  - Writing/Communication — **1 credit (Minimum)**
  - Project — **18 credits**
  - Electives

Course Structure

Total Credits: 64

- **Mandatory: 6 credits**
- Core: 12 credits
- Mathematics : 3 credits
- Writing/Commuication 1 credit
- Project: 18 credits
- Electives

Mandatory: Two laboratory courses (3 credits each)

1. **ES207**. Earth Science Lab (*August Term; 3rd Semester*)
2. **AS211**. Lab course: Observational Techniques (*January Term*)

Course Structure

Total Credits: 64

- Mandatory : 6 credits
- **Core: 12 credits**
- Mathematics : 3 credits
- Writing/Commuication 1 credit
- Project: 18 credits
- Electives

Core Courses: At least 2 courses from each department

Core Basket CAOS
(minimum credits = 6, maximum credits = 12)

1. **AS203**. Atmospheric Thermodynamics (*Aug.*)
2. **AS207**. Intro. to Atmospheric Dynamics (*Aug.*)
3. **AS205**. Ocean Dynamics (*Jan.*)
4. **AS216**. Intro. To Climate System (*Aug.*)

Core Basket CEaS
(minimum credits = 6, maximum credits = 15)

1. **ES201.** Intro. to Earth Systems (*Jan.*)
2. **ES204**. Origin and Evolution of the Earth (*Aug.*)
3. **ES206**. Solid Earth Geophysics (*Aug.*)
4. **ES215**. Intro. to Chemical Oceanography (*Aug.*)
5. **ES218**. Intro. To Seismology (*Aug.*)

→ Being offered in August 2025

*Target on **finishing as many core courses** as you can by the end of Year 1 (2 semesters).*

Course Structure

Total Credits: 64

- Mandatory : 6 credits
- Core: 12 credits
- **Mathematics : 3 credits**
- Writing/Commuication 1 credit
- Project: 18 credits
- Electives

Recommended:

→ **ES205. Mathematics for Geophysicists** (*Aug.*)
ES222. Data Analysis for Earth System Science (*Jan.*)
AS209. Mathematical Methods in Climate Science (*Jan.*)

ME 278. A Practical Introduction to Data Analysis
CE 206A. Math. Methods for Machine Learning
PH205. Math. Methods in Physics
AE211. Math. Methods for Aerospace Engineers

Or, any other Mathematics course offered at IISc., as approved by the Programme Curriculum Committee (PCC)

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Course Structure

Total Credits: 64

- Mandatory: 6 credits
- Core: 12 credits
- Mathematics : 3 credits
- **Writing/Commuication 1 credit**
- **Project: 18 credits**
- Electives

Writing / Communication (1 credit):

1. **ES225**. Scientific Writing & Communication (*Jan.*)
2. **NE200**. Technical Writing & Presentation (*Aug.*)

Project (AS298, 18 credits)

- Credited in the final semester.
- Evaluation in two stages:
  - End of Semester 3 (30% weightage)
  - End of Semester 4 (70% weightage)

Course Structure

Total Credits: 64

- Mandatory : 6 credits
- Core: 12 credits
- Mathematics : 3 credits
- Writing/Commuication 1 credit
- Project: 18 credits
- **Electives**

Elective Courses (CAOS and CEaS):

CAOS:

1. **AS202:** Geophysical Fluid Dynamics (*Jan.*)
2. **AS208:** Satellite Meteorology (*Aug.*)
3. **AS210:** Numerical Methods in Atmos. Modeling (*Jan.*)
4. → **AS215**: Environmental Fluid Mechanics (*Aug.*)
5. **AS217:** Modelling and Forecasting (*Jan.*)
6. → **AS308:** Ocean Modelling (*Aug.*)
7. **AS313:** Nonlinear Models in Climate Science (*Jan.*)

CEaS:

1. **ES203:** Intro. to Petrology (*Jan.*)
2. **ES208:** Mantle Convection (*Jan.*)
3. → **ES209**: Biogeochemistry (*Aug*)
4. **ES213:** Isotope Geochemistry (*Jan.*)
5. **ES216:** Advanced Chemical Oceanography (*Jan.*)
6. → **ES220:** Intro. to Satellite Geodesy (*Aug.*)
7. **ES221:** Dynamics of Planetary Interiors (*Jan.*)

Electives can be **any course** offered at the Institute.

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You will have to finish at least 16 courses (exceeding 64 credits is allowed). *We recommend that you:*

- ✓ *Try to **credit/complete 4 or 5 courses per semester** in the first 3 semesters.*

- ✓ *Target on **finishing as many core courses** as you can by the end of Year 1.*

- ✓ *Keep **minimal course load in the final (4th) semester** so that you have enough time for your project*

A few things to remember…

- Copying and plagiarisation are considered serious offences (**refer to student handbook).**
- Attendance in courses is mandatory, students found missing lectures will be given incomplete grades in the course (r**efer to student handbook).**
- Any prolonged absence must be recorded in SAP, and **approved by the advisor/mentor.**
- Make up tests/exams **will not be offered** unless **there is a medical reason.**

A few things to remember…

- Students have to **meet with their mentors** at least three times in a semester: at the beginning, after the first mid-term and at the end of the semester.

- Between the two years, MTech students are **encouraged to apply for summer internships** in the industry (no academic credits).

- Note that the **summer is a working period**, and students without an internship are expected to be present in the department **working on their projects.**

Project (AS298, 18 credits)

- Credited in the final semester.
- Evaluation in two stages:
  - **End of Semester 3 (30% weightage)**
  - **End of Semester 4 (70% weightage)**

You are welcome to reach out to the **PCC** (Programme Curriculum Committee) for any academic matters.

PCC (Joint MTech Programme)

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