

## **MTech Dual Degree (BTech Other + MTech SPASE) Course Structure (as in Nov 2025)**

1. **Credit requirements:** 128 credits (minimum), breakdown semester-wise
  - a. 7th semester: 29 credits (4 modular courses + 1 semester-long course)
  - b. 8th semester: 29 credits (4 modular courses + 1 semester-long course)
  - c. 9th and 10th semester: MTech thesis of 72 credits
2. **7th semester:**
  - a. Students would take 4 department compulsory (modular) courses.
  - b. And one open (offered by SPASE) or department elective (at least 9 credits).
3. **8th semester:**
  - a. In terms of specialization **one compulsory course (9 credit; or two modular courses) from a basket of courses** within a stream can be taken. We have identified two broad streams named: (1) Planetary science and technology (**PST**) and (2) Space Astronomy and Instrumentation (**SAI**)
  - b. And two open (offered by SPASE) or department electives (total 18 credits or more).

<b>Semester - 7</b>	<b>Semester - 8</b>
SPA 614M Introduction to Celestial Mechanics	One FULL course (generally 9 credits) from the basket of either <b>PST</b> or <b>SAI</b> (see table below)
SPA 618M Introduction to Radiative Processes in Space	Two Department Electives (generally totaling 18 credits)
SPA 613M Introduction to Celestial Observational Techniques	
SPA 617M Space Instrumentation Laboratory	
One Open (offered by SPASE) or Department Elective (at least 9 credits)	
<b>Total credits: 4x5 + 9 = 29 credits</b>	<b>Total credits: 27 credits</b>

Odd Semester Department Electives / Open Electives:

- SPA 660 High Energy Astrophysics of Binary Systems
- SPA 616 Stars and Stellar Evolution
- SPA 401 Galaxies and Observational Cosmology
- SPA 402 Introduction to Manmade Satellite System and its Environment OE
- SPA 404: Introduction to SPASE Technology

<b>Baskets for Semester 8</b>	
<b>Planetary Science &amp; Tech (PST)</b>	<b>Space &amp; Astronomical Instr (SAI)</b>
SPA 631 M Statistical Methods and Applications (5 credit)	SPA 631 M Statistical Methods and Applications (5 credit)
SPA 627 M Introduction to Fluid Mechanics in Space (5 credit)	SPA 635M Study of compact objects using real space data (X-ray lab)
SPA 637 Spacecraft Dynamics (9 credit)	SPA 624M Optical Instrumentation lab (5 credit)
	SPA 636 Radio instrumentation, Observing techniques and data analyses lab (5 credit)
	SPA 611 Radio Astronomy (9 credit)

Even Semester Department Electives / Open Electives:

- SPA 634 Rays and Optics (8 credits)
- SPA 633 Introduction to Astrobiology (7 credits)
- SPA 402 Introduction to Manmade Satellite System and its Environment (9 credits)
- SPA 610 Fundamentals of Astronomy & Astrophysics (9 credit) (except when SPA201 is taken)
- SPA 626 Space environment and Space systems (9 credit)
- SPA 403M Observing the Milky Way (galaxy) - Our Home in the Cosmos (5 credit)