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Exploring Space Engineering and Astronomy

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Looking at the rise in the popularity of courses in Space Sciences, Astronomy and Astrophysics, IIT Kanpur has recently announced a new Department, which will be devoted to the study of Space, Planetary and Astronomical Sciences and Engineering. While the exact details of the course structure for the MTech are yet to be finalised, the institute will initiate admission for the same from the next semester.

About the programme

Pankaj Jain, professor (Physics), is part of the team that has proposed the new department at IIT Kanpur. He says, "Courses in Astronomy and Planetary Sciences are popular globally. Various degrees, both at the undergraduate (UG) and postgraduate (PG) level are available at numerous institutes. In India, while few institutes offer a PG degree in the field, UG courses remain uncommon."

Anandmayee Tej, professor, Department of Earth and Space Science, Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, Kerala, says, "In the institute's dual degree programme, students get a BTech in Engineering Physics and a Master's in any of the four branches on offer, including Earth System Science, Astronomy and Astrophysics, Optical Engineering and Solid State Physics."

The other programme is a standalone Masters in Astronomy and Astrophysics. "A dedicated



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programme for Astronomy is required for those Engineering students who are interested in pursuing a career in Space Science," says Tej.

Admission process

At IIST, the dual degree has 22 seats, while the standalone Master's course offers 10 seats. "For the dual degree, students are required to clear JEE (Advanced), while the Master's programme requires high GATE scores, followed by an interview. Since its inception, all seats in the dual degree course have mostly been filled. Despite a high number of applications for

the Master's course, there have been cases where few seats remained vacant. This is due to a stringent interview process, which helps us classify and choose the best candidates," tells Tej.

IIT Kanpur also plans to keep the initial criteria for the MTech programme as GATE scores, followed by an intensive interview. All Physics and Engineering students will be eligible for the course, tells Jain. "With a dearth of UG courses in Space Sciences, during the interview we plan to focus on excellence in Maths and basic understanding in the field of studies among candidates," he adds.

Course structure

IIT Kanpur plan to offer courses in three streams, including Space and Astronomical Instrumentations, Planetary Science and Technology, as well as Radio Astronomy.

At IIST, Master's students credit several advanced courses such as Astronomical Techniques, Radiation Processes in Astrophysics, Structure and Evolution of Stars, and Cos-

mology. The second year is dedicated to research.

Clubbed with Physics

Thus far, most institutes have been offering courses in Astronomy, Astrophysics and Space Sciences under the umbrella of the Physics department. However, both Jain and Tej feel that from an emphasis on competence in Physics and Maths alone,

the multidisciplinary nature of the field of Space requires talent from across spectra of education. "Thus, clubbing the subjects of Astronomy and Space Sciences with Physics departments might not be a completely accurate move now," tells Jain.

It is futuristic

The recent privatisation of the field of Space has led to vario-

us changes, tells Jain. "Space is now more accessible, wherein countries will compete to tap the commercial potential of space. With the entry of private players, the scope of work has increased manifold. There will be emphasis on various fields, such as Instrumentation, for which skilled youngsters trained in Astronomy and Space Engineering will be in demand," he says.