

# Course Structure of MS (Research) + Ph.D. dual degree in Space Sciences and Engineering

## Minimum Educational Qualification:

A four year bachelor's degree (BE or BTech), or a two years or five years integrated master's degree (MSc or MTech or ME) with first class or first division (as decided by the awarding institute/university), in Physics, Applied Physics, Astronomy, Astrophysics, Space Science and Engineering, Earth and Atmospheric Science and Engineering, Remote Sensing, Engineering Physics, Aerospace Engineering, Aeronautics, Electronics and Communications Engineering, Electrical Engineering.

## Qualifying Examination:

(a) International Students: Valid score of TOEFL or IELTS.

(b) Indian Students: Valid GATE qualification in the relevant disciplines.

Relevant GATE papers: AE, EC, EE, PH, XE

## Categories of Admission:

(a) International Students: (i) International self-financed (ISF) students; (ii) International students sponsored by non-government organizations or by a reputed industry (ISW); (iii) International students sponsored by foreign government or its organizations or through mutual collaborative programs of India with other countries (GSW)

(b) Indian Students: Teaching Assistantship (TA); (ii) Highly motivated sponsored candidate (SW) on full-time basis from highly reputed R & D organizations such as DRDO, ISRO, BHEL, C-DAC, ADE, ADA, etc. and highly reputed Industries; (iii) Defense Forces (DF): Candidates sponsored by the Defense Forces; (iv) Regular institute staff (IS) of IIT Indore on part-time basis only.

Candidates of SW, DF and IS categories will not be provided any scholarship

**Duration of Program:** 2 years on full-time basis with maximum extension of one semester.

**Evaluation of Research Work and Thesis:** Students are expected to identify their Thesis Supervisor(s) within one month of joining the programme so that PG Student Progress Committee (PSPC) can be formed and students can start research work from the beginning of the programme. Progress of the M.S. thesis will be monitored by PSPC through CERP to be conducted at the end of every semester with preferably Mid Semester evaluation as well. Final evaluation of M.S. thesis will be done by at-least one External Examiner. Student must have one journal publication in SCI index from his/ her M.S. thesis for completion of the degree.

**Programme Structure:****1st Year, Semester - I**

Course Code	Course Name	Contact Hours (L-T-P)	Credit
AA XXX	Elective - I	X-X-X	3
ZZ XXX	Elective - II	X-X-X	3
ZZ XXX	Elective - III	X-X-X	3
AA 697	PG Seminar Course	0-2-0	2
AA 791	M S Thesis (Stage-1)	0-0-14	7
<b>Total minimum credits earned during the semester</b>			<b>18</b>
HS 641	English Communication Skills	2-0-2	Non-credit course (with PP/NP grade)

**1st Year, Semester - II**

Course Code	Course Name	Contact Hours (L-T-P)	Credit
AA 792	M S Thesis (Stage-2)	0-0-36	18
<b>Total minimum credits earned during the semester</b>			<b>18</b>

**2nd Year, Semester - III**

Course Code	Course Name	Contact Hours (L-T-P)	Credit
AA 793	M S Thesis (Stage-3)	0-0-36	18
<b>Total minimum credits earned during the semester</b>			<b>18</b>

**2nd Year, Semester - IV**

Course Code	Course Name	Contact Hours (L-T-P)	Credit
AA 794	M S Thesis (Stage-4)	0-0-36	18
<b>Total minimum credits earned during the semester</b>			<b>18</b>

**Courses for Elective I-III from AASE:**

(In addition to these courses the students can also take courses offered by other disciplines based on their learning needs/ interests for Elective II and III)

<b>Course code</b>	<b>Course Title</b>	<b>Contact Hours (L-T-P)</b>	<b>Credits</b>
AA 478/678	Space Weather	2-1-0	3
AA 404/604	Spacecraft and Payload Attitude Dynamics, Control and Pointing	2-1-0	3
AA 606	Random Signals and Applied Kalman Filtering	2-1-0	3
AA 476/676	Satellite Based Navigation Systems	2-1-0	3
AA 601N	Astrophysical Fluids and Plasma	2-1-0	3
AA 471N/671N	Relativity and Cosmology	2-1-0	3
AA 474N/674N	Radio Astronomy	2-1-0	3
AA 472N/672N	Galactic and Extragalactic Astronomy	2-1-0	3
AA 602N	Astrostatistics	2-1-0	3
AA 405/ 605	Detectors and Sensors for Space Observations	2-1-0	3
AA 603/AA 403	Space Engineering System	2-1-0	3
AA 4XX /6XX	Remote sensing for Atmospheric and Space Sciences	2-1-0	3
AA 6XX	Computational Methods in Astronomy and Space Sciences	2-1-0	3