

**Curriculum of B.Tech. Program  
in  
Space Science and Engineering**

**(from AY 2023-24 onwards)**



**2<sup>nd</sup> Year B.Tech. (Space Science and Engineering)**

All 2nd-year core courses and labs are common between SSE and EP programs.

**Semester III**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
ZZ 2XX	Course I - Minor Program	X-X-X	3
MA 205	Complex Analysis	3-1-0 (1/2 semester)	2
MA 207	Differential Equations-II	3-1-0 (1/2 semester)	2
AA 203/ PH 203	Classical Mechanics	2-1-0	3
AA 205/ PH 205	Electronics Devices and Circuits -I	2-1-0	3
AA 207/ PH 207	Wave Phenomenon and Optics	2-1-0	3
AA 209/PH 209	Fundamental Concepts of Solid-State Engineering	2-1-0	3
AA 251/ PH 251	Physics lab -II (General Physics Lab)	0-0-3	1.5
AA 255/ PH 255	Electronics Devices and Circuits Lab - I	0-0-3	1.5
AA 2XX	Departmental Elective - I	2-1-0	3
	<b>Total</b>	<b>13-6-6</b>	<b>22/25</b>

**Departmental Electives for Semester III\***

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 201	Introduction to Astronomy	2-1-0	3
AA 211	The Blue Planet: Introduction to Earth System Sciences	2-0-2	3

**Semester IV**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
ZZ 2XX	Course II - Minor Program	X-X-X	3
MA 204N	Numerical Methods	2-0-2	3
AA 206/ PH 206	Electronics Devices and Circuits - II	2-1-0	3
AA 208/ PH 208	Electrodynamics	2-0-0	2
AA 210/ PH 210	Fundamentals of Quantum Mechanics	2-1-0	3
AA 212/ PH 212	Thermal Physics	2-1-0	3
AA 256/ PH 256	Electronics Devices and Circuits Lab - II	0-0-3	1.5
AA 252/ PH 252	Scientific Computing	0-0-2	1
AA 2XX	Departmental Elective - II	2-1-0	3
ZZ 2XX	Institute Open Elective - I	2-1-0	3
	<b>Total</b>	<b>14-5-7</b>	<b>22.5/25.5</b>

**Departmental Electives for Semester IV\***

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 202N	Astronomical Techniques	2-1-0	3
AA 204	Introduction to Space Exploration	2-1-0	3
AA 214	Stellar and Planetary Science	2-1-0	3
AA 216	Flight mechanics and classical control	2-1-0	3

**3<sup>rd</sup> Year B.Tech. (Space Science and Engineering)**

**Semester V**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
ZZ 3XX	Course III - Minor Program	X-X-X	3
AA 307	Space Systems - Orbits and Payloads	2-1-0	3
AA 309	Space Instrumentation	2-1-0	3
AA 311	Statistical Physics and Radiative Transfer	2-1-0	3
AA 313	Fluid Dynamics	2-0-0	2
AA 315	Data Analytics and Visualization for Space	1-0-4	3
AA 3XX	Departmental Elective III	2-1-0	3
ZZ 3XX	Institute Open Elective-II	2-1-0	3
	<b>Total</b>	<b>13-5-4</b>	<b>20/23</b>

**Departmental Electives for Semester V\***

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 303	IoT for Space	2-1-0	3
AA 317	Galaxies and Cosmology	2-1-0	3
AA 319	Launch Vehicle and Propulsion Systems	2-1-0	3

**Semester VI**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
ZZ 3XX	Course IV - Minor Program	X-X-X	3
AA 304	Radiowave Propagation & Antenna Applications	2-0-2	3
AA 306	Signals & Communication in Space	2-0-2	3
AA 308	Guidance, Navigation and Control	2-1-0	3
AA 312	Atmospheric Physics and Remote Sensing	2-0-2	3
AA 3XX	Departmental Elective IV	2-1-0	3
AA 3XX	Departmental Elective V	2-1-0	3
ZZ 3XX	Institute Open Elective - III	2-1-0	3
	<b>Total</b>	<b>14-4-6</b>	<b>21/24</b>

**Departmental Electives for Semester VI\***

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 310	Satellite Imaging	2-0-2	3
AA 318	Meteorology and Climate Modelling	2-0-2	3
AA 320	Advanced Space Instrumentation	2-0-2	3
AA 322	Computational Electromagnetics	2-1-0	3
AA 301	High Energy Astrophysics and Transient Sky	2-1-0	3
AA 324	Space Informatics	2-1-0	3
AA 374	Computational Fluids and Structures	2-1-0	3

**4<sup>th</sup> Year B.Tech. (Space Science and Engineering)**

**Semester VII**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
ZZ 4XX	Course V - Minor Program Minor Project/ Seminar Course/ Term Paper	0-0-4	2
AA 493	B Tech Project (BTP)	0-0-32	16
	Internship		2
	<b>Total</b>	<b>0-0-32</b>	<b>18/20</b>

**Semester VIII**

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 4XX	Departmental Elective - VI	2-0-2	3
AA 4XX	Departmental Elective - VII	2-0-2	3
ZZ 4XX	Institute Open Elective - IV	2-1-0	3
ZZ 4XX	Institute Open Elective - V	2-1-0	3
ZZ 4XX	Institute Open Elective - VI	2-1-0	3
	<b>Total</b>	<b>10-5-0</b>	<b>15/21</b>

**Departmental Electives for Semester VIII\***

<b>Course Code</b>	<b>Course Name</b>	<b>Weekly Contact Hours L-T-P</b>	<b>Credit</b>
AA 476/676	Satellite-Based Navigation Systems	2-0-2	3
AA 412/612	Microwave Remote Sensing	2-0-2	3
AA 409/609	Computational Methods in Astronomy and Space Sciences	2-0-2	3
AA 404/604	Spacecraft Attitude Control and Dynamics	2-0-2	3
AA 408/608	Astrostatistics	2-1-0	3
AA 474/674	Radio Astronomy	2-1-0	3
AA 472/672	Galactic and Extragalactic Astronomy	2-1-0	3

\*The list of departmental electives will be updated as and when new courses get approved for the same.