



# Indian Institute of Space Science and Technology

Thiruvananthapuram 695 547

## Department of Avionics

Academic Audit Report

2019-2020

### Academic audit committee

#### Internal members

Sl.No.	Faculty Name	Role
1	Dr. N. Selvagesan, Professor, Avionics	Chairman
2	Dr. E. Natarajan, Professor, Mathematics	Member
3	Dr. Anoop C S, Associate Professor, Avionics	Convenor
4	Dr. BASUDEV MAJUMDER, Assistant Professor, Avionics	Member

#### External members

Sl. No.	Name	Designation	Email	Mobile	Name of the Institute	Role
1	Dr. N. Sivakumaran	Professor	nsk@nitt.edu	919443745705	NIT Trichy	Member
2	Dr. Sneha Gajbhiye	Assistant Professor	snehagajbhiye@iitpkd.ac.in	919960727633	IIT Palakkad	Member

#### I Department profile

1	No. of Permanent Faculty Members	22
2	No. of Adjunct Faculty Members	1
3	No. of Contract Faculty Members	0

4	No. of Guest Faculty Members	0
5	No. of Emeritus Professors / Visiting Faculty Members	0
6	No. of Technical Staff / Tutors (Permanent)	3
7	No. of Technical Staff / Tutors (Contract)	6
8	No. of JRFs/ SRF/ JPF (excluding PhD students)	6
9	No. of Project Fellows	9
10	No. of Research Associates	0
11	No. of Post Doctoral Fellows	1

## II Details of academic programmes and student strength in numbers

### A .Undergraduate/ Dual Degree / Postgraduate programmes

Sl. No.	Programme	Year	Sanctioned strength in the academic year	Student strength in the academic year (At the start of even semester)	Female student strength in the academic year	No. of passed out Students	Pass Percentage
1	B.Tech.: Avionics	I Year	0	0	0	0	0.00
2	B.Tech.: Avionics	II Year	0	0	0	0	0.00
3	B.Tech.: Avionics	III Year	0	0	0	0	0.00
4	B.Tech.: Avionics	IV Year	0	0	0	0	0.00
5	B.Tech.: Electronics and Communication Engineering(Avionics)	I Year	66	66	6	0	0.00
6	B.Tech.: Electronics and Communication Engineering(Avionics)	II Year	0	60	2	0	0.00
7	B.Tech.: Electronics and Communication Engineering(Avionics)	III Year	0	60	9	0	0.00

8	B.Tech.: Electronics and Communication Engineering(Avionics)	IV Year	0	60	17	56	107.14
9	M.Tech.: Control Systems (Standalone)	I Year	10	7	1	0	0.00
10	M.Tech.: Control Systems (Standalone)	II Year	0	7	2	5	140.00
11	M.Tech.: Digital Signal Processing (Standalone)	I Year	10	7	1	0	0.00
12	M.Tech.: Digital Signal Processing (Standalone)	II Year	0	5	1	2	250.00
13	M.Tech.: Power Electronics (Standalone)	I Year	10	5	1	0	0.00
14	M.Tech.: Power Electronics (Standalone)	II Year	0	6	1	5	120.00
15	M.Tech.: RF and Microwave Engineering (Standalone)	I Year	10	5	1	0	0.00
16	M.Tech.: RF and Microwave Engineering (Standalone)	II Year	0	3	1	6	50.00
17	M.Tech.: VLSI and Microsystems (Standalone)	I Year	10	7	2	0	0.00
18	M.Tech.: VLSI and Microsystems (Standalone)	II Year	0	6	3	7	85.71
Total			116	304	48	81	

## B. Details of Student Demand Ratio

Programme	No. of students applied	No. of students admitted	Comments	Suggestions
B.Tech.: Avionics	0	0		
B.Tech.: Electronics and Communication Engineering(Avionics)	3597	66		
M.Tech.: Control Systems (Standalone)	374	10		
M.Tech.: Digital Signal Processing (Standalone)	258	10		
M.Tech.: Power Electronics (Standalone)	207	10		
M.Tech.: RF and Microwave Engineering (Standalone)	234	10		
M.Tech.: VLSI and Microsystems (Standalone)	265	10		

## C. Doctoral Degree

PhD	During the academic year			Degree awarded
	Sanctioned seats	No. of students admitted	Current student strength	
PART TIME	1	1	0	0
FULL TIME	9	6	48	3

Total	10	7	48	3
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### III Details of core courses and electives in each programme

Sl. No.	Programme Name	Course code	Course name	Core/ Elective	Credits assigned	As per curriculum revision/ newly added elective course/ syllabus revised
1	B.Tech.: Aerospace Engineering	AV495	Modelling of Launch Vehicle and Spacecraft Dynamics	Elective	3	
2	B.Tech.: Aerospace Engineering	AV435	Instrumentation and Control Systems Lab	Core	2	
3	B.Tech.: Aerospace Engineering	AV315	Automatic Control	Core	3	
4	B.Tech.: Aerospace Engineering	AV493	Machine Learning for Signal Processing	Institute Elective	3	
5	B.Tech.: Aerospace Engineering	AV500	Modelling and Control of Robotic Systems	Institute Elective	3	
6	B.Tech.: Aerospace Engineering	AV111	Basic Electrical Engineering	Core	3	
7	B.Tech.: Aerospace Engineering	AV121	Basic Electronics Engineering	Core	3	
8	B.Tech.: Aerospace Engineering	AV141	Basic Electrical and Electronics Engineering Lab	Core	1	
9	B.Tech.: Avionics	AV411	Navigation Systems and Sensors	Core	3	
10	B.Tech.: Avionics	AV412	Satellite and Optical Communication	Core	3	
11	B.Tech.: Avionics	AV468	Digital Control System	Elective	3	
12	B.Tech.: Avionics	AV484	Wireless Mesh Networks	Elective	3	
13	B.Tech.: Avionics	AV486	Antenna Theory and Design	Elective	3	

14	B.Tech.: Avionics	AV490	Deep Learning for Computational Data Sciences	Elective	3	
15	B.Tech.: Avionics	AV491	Advanced Sensors and Interface Electronics	Elective	3	
16	B.Tech.: Avionics	AV492	Control of Electric Drives	Elective	3	
17	B.Tech.: Avionics	AV495	Modelling of Launch Vehicle and Spacecraft Dynamics	Elective	3	
18	B.Tech.: Avionics	AV431	Navigation Systems and Sensors Lab	Core	1	
19	B.Tech.: Avionics	AV451	Summer Internship and Training	Core	3	
20	B.Tech.: Avionics	AV453	Comprehensive Viva-Voce	Core	3	
21	B.Tech.: Avionics	AV454	Project Work	Core	12	
22	B.Tech.: Avionics	AV311	Digital Signal Processing	Core	3	
23	B.Tech.: Avionics	AV312	Computer Architecture and Organization	Core	3	
24	B.Tech.: Avionics	AV313	RF and Microwave Communication	Core	3	
25	B.Tech.: Avionics	AV314	Communication System I	Core	3	
26	B.Tech.: Avionics	AV331	Digital Signal Processing Lab	Core	1	
27	B.Tech.: Avionics	AV332	Microprocessor and Microcontroller Lab	Core	2	
28	B.Tech.: Avionics	AV333	RF and Microwave Communication Lab	Core	1	
29	B.Tech.: Avionics	AV321	Computer Networks	Core	3	
30	B.Tech.: Avionics	AV322	Power Electronics	Core	3	
31	B.Tech.: Avionics	AV323	VLSI Technology	Core	3	

32	B.Tech.: Avionics	AV324	Communication Systems II	Core	3	
33	B.Tech.: Avionics	AV461	Advanced Control Theory	Elective	3	
34	B.Tech.: Avionics	AV486	Antenna Theory and Design	Elective	3	
35	B.Tech.: Avionics	AV493	Machine Learning for Signal Processing	Institute Elective	3	
36	B.Tech.: Avionics	AVM863	RF Integrated Circuits	Elective	3	
37	B.Tech.: Avionics	AV341	Computer Networks Lab	Core	1	
38	B.Tech.: Avionics	AV342	Power Electronics Lab	Core	1	
39	B.Tech.: Avionics	AV343	Communication System Lab	Core	1	
40	B.Tech.: Electronics and Communication Engineering(Avionics)	AV211	Analog Electronic Circuits	Core	3	
41	B.Tech.: Electronics and Communication Engineering(Avionics)	AV212	Semi Conductor Devices	Core	3	
42	B.Tech.: Electronics and Communication Engineering(Avionics)	AV213	Network Analysis	Core	3	
43	B.Tech.: Electronics and Communication Engineering(Avionics)	AV214	Electromagnetic and Wave Propagation	Core	4	
44	B.Tech.: Electronics and Communication Engineering(Avionics)	AV231	Analog Electronic Circuit Lab	Core	1	
45	B.Tech.: Electronics and Communication Engineering(Avionics)	AV232	E-CAD Lab	Core	1	
46	B.Tech.: Electronics and Communication Engineering(Avionics)	AV221	Digital Electronics and VLSI Design	Core	3	
47	B.Tech.: Electronics and Communication Engineering(Avionics)	AV222	Instrumentation and Measurement	Core	3	
48	B.Tech.: Electronics and Communication Engineering(Avionics)	AV223	Signals and Systems	Core	4	
49	B.Tech.: Electronics and Communication Engineering(Avionics)	AV224	Control System	Core	3	

50	B.Tech.: Electronics and Communication Engineering(Avionics)	AV241	Digital Electronics and VLSI Lab	Core	1	
51	B.Tech.: Electronics and Communication Engineering(Avionics)	AV242	Instrumentation and Measurement Lab	Core	1	
52	B.Tech.: Electronics and Communication Engineering(Avionics)	AV243	Control System Lab	Core	1	
53	B.Tech.: Electronics and Communication Engineering(Avionics)	AV111	Basic Electrical Engineering	Core	3	
54	B.Tech.: Electronics and Communication Engineering(Avionics)	AV121	Basic Electronics Engineering	Core	3	
55	B.Tech.: Electronics and Communication Engineering(Avionics)	AV141	Basic Electrical and Electronics Engineering Lab	Core	1	
56	Dual Degree: Engineering Physics	AV316	Digital Signal Processing	Core	3	
57	Dual Degree: Engineering Physics	AV317	Instrumentation and Measurement	Core	3	
58	Dual Degree: Engineering Physics	AV336	Digital Signal Processing Lab	Core	1	
59	Dual Degree: Engineering Physics	AV337	Instrumentation and Measurement Lab	Core	1	
60	Dual Degree: Engineering Physics	AV493	Machine Learning for Signal Processing	Institute Elective	3	
61	Dual Degree: Engineering Physics	AV215	Signals and Systems	Core	4	
62	Dual Degree: Engineering Physics	AV225	Analog and Digital Circuits	Core	3	
63	Dual Degree: Engineering Physics	AV111	Basic Electrical Engineering	Core	3	
64	Dual Degree: Engineering Physics	AV121	Basic Electronics Engineering	Core	3	
65	Dual Degree: Engineering Physics	AV141	Basic Electrical and Electronics Engineering Lab	Core	1	
66	M.Tech.: Aerodynamics and Flight Mechanics	AVC882	Guidance Navigation and Control	Elective	3	

67	M.Tech.: Aerodynamics and Flight Mechanics	AVC883	Launch Vehicle Modeling and Mission Simulation	Elective	3	
68	M.Tech.: Structures and Design	AVC881	Modelling and Control of Robotic Systems	Elective	3	
69	M.Tech.: RF and Microwave Engineering	AVR865	Phased Array Antennas	Elective	3	
70	M.Tech.: RF and Microwave Engineering	AVR852	Project Work Phase I	Core	12	
71	M.Tech.: RF and Microwave Engineering	AVR853	Project Work Phase II	Core	20	
72	M.Tech.: RF and Microwave Engineering	AVR611	Advanced Electromagnetic Engineering	Core	3	
73	M.Tech.: RF and Microwave Engineering	AVR612	Microwave Circuits and Systems	Core	3	
74	M.Tech.: RF and Microwave Engineering	AVR613	Microwave Semiconductor Devices	Core	3	
75	M.Tech.: RF and Microwave Engineering	AVD613	Communication Systems I	Elective	3	
76	M.Tech.: RF and Microwave Engineering	AVR631	Microwave Circuit Lab	Core	1	
77	M.Tech.: RF and Microwave Engineering	AVR614	Seminar I	Core	1	
78	M.Tech.: RF and Microwave Engineering	AVR621	Antenna Theory and Design	Core	3	
79	M.Tech.: RF and Microwave Engineering	AVR622	Computational Methods for Electromagnetics	Core	3	
80	M.Tech.: RF and Microwave Engineering	AVM863	RF Integrated Circuits	Elective	3	
81	M.Tech.: RF and Microwave Engineering	AVR871	Electromagnetic and Microwave Application of Metamaterials	Elective	3	



82	M.Tech.: RF and Microwave Engineering	AVRD01	RF Engineering Design	Core	2	
83	M.Tech.: RF and Microwave Engineering	AVR641	Antenna Design Lab	Core	1	
84	M.Tech.: RF and Microwave Engineering	AVR851	Seminar - II	Core	2	
85	M.Tech.: Digital Signal Processing	AVD852	Project Work Phase I	Core	17	
86	M.Tech.: Digital Signal Processing	AVD853	Project Work Phase II	Core	18	
87	M.Tech.: Digital Signal Processing	AVD611	Advanced Signal Analysis and Processing	Core	3	
88	M.Tech.: Digital Signal Processing	AVD612	Mathematical Methods for Signal Processing	Core	3	
89	M.Tech.: Digital Signal Processing	AVD613	Communication Systems I	Core	3	
90	M.Tech.: Digital Signal Processing	AVD614	Pattern Recognition and Machine Learning for Data Processing	Core	3	
91	M.Tech.: Digital Signal Processing	AVD632	Digital Image Processing Lab	Core	1	
92	M.Tech.: Digital Signal Processing	AVD633	Communication Systems Lab	Core	1	
93	M.Tech.: Digital Signal Processing	AVD621	Statistical Signal Processing	Core	3	
94	M.Tech.: Digital Signal Processing	AVD622	DSP System Design	Core	3	
95	M.Tech.: Digital Signal Processing	AVD623	Communication Systems - II	Core	3	
96	M.Tech.: Digital Signal Processing	AVD624	Computer Vision and Deep Learning	Core	3	
97	M.Tech.: Digital Signal Processing	AVD871	Applied Markov Decision Processes and Reinforcement Learning	Elective	3	
98	M.Tech.: Digital Signal Processing	AVD872	Internet of Things	Elective	3	

99	M.Tech.: Digital Signal Processing	AVD641	DSP System Design Lab	Core	1	
100	M.Tech.: Digital Signal Processing	AVD642	Deep Learning for Visual Computing Lab	Core	1	
101	M.Tech.: Digital Signal Processing	AVD643	Design Project	Core	1	
102	M.Tech.: VLSI and Microsystems	AVM862	High Frequency VLSI Circuit	Elective	3	
103	M.Tech.: VLSI and Microsystems	AVM853	Project Phase - I	Core	15	
104	M.Tech.: VLSI and Microsystems	AVM854	Project Work Phase - II	Core	18	
105	M.Tech.: VLSI and Microsystems	AVM611	Physics of Micro and Nanoelectronic Devices - I	Core	3	
106	M.Tech.: VLSI and Microsystems	AVM612	Introduction to Micro Electro Mechanical Systems (MEMS)	Core	3	
107	M.Tech.: VLSI and Microsystems	AVM613	Analog VLSI Circuits	Core	3	
108	M.Tech.: VLSI and Microsystems	AVM614	Digital VLSI Circuits	Core	3	
109	M.Tech.: VLSI and Microsystems	AVC614	Applied Linear Algebra	Elective	3	
110	M.Tech.: VLSI and Microsystems	AVM631	VLSI Design Lab	Core	1	
111	M.Tech.: VLSI and Microsystems	AVM621	Mixed Signal VLSI Design	Core	3	
112	M.Tech.: VLSI and Microsystems	AVM622	Micro/Nano Fabrication Technology	Core	3	
113	M.Tech.: VLSI and Microsystems	AVM861	Physics of Micro and Nanoelectronic Devices - II	Elective	3	
114	M.Tech.: VLSI and Microsystems	AVM862	Microsystem Integration	Elective	3	
115	M.Tech.: VLSI and Microsystems	AVM863	RF Integrated Circuits	Elective	3	
116	M.Tech.: VLSI and Microsystems	AVM641	MEMS Lab	Core	1	
117	M.Tech.: VLSI and Microsystems	AVM642	Microelectronics Lab	Core	1	

118	M.Tech.: VLSI and Microsystems	AVM851	Engineering Project Design and Seminar	Core	2	
119	M.Tech.: Control Systems	AVC851	Design Project	Core	3	
120	M.Tech.: Control Systems	AVC852	Seminar	Core	3	
121	M.Tech.: Control Systems	AVC853	Project Work Phase I	Core	15	
122	M.Tech.: Control Systems	AVC854	Project Work Phase II	Core	18	
123	M.Tech.: Control Systems	AVC611	Linear Systems Theory	Core	3	
124	M.Tech.: Control Systems	AVC612	Nonlinear Dynamical Systems	Core	2	
125	M.Tech.: Control Systems	AVC613	Control Systems Design	Core	3	

#### IV Review on Curriculum

Criteria	Reponse	Revision made during this academic year	Comments on curriculum, if any	Suggestions for improvement
Qualitative comment on the content of the curriculum	VERYGOOD			

#### V Review on Teaching, Learning and Evaluation

Sl. No.	Criteria	Response based on criteria	Comments	Suggestions
1	Any innovative teaching methods/aids adopted?	Yes Course webpages were started for a few courses, for easy dissemination of information/assignments/continuous assessment, etc.		
2	Is any e-learning modules developed?	Yes Recorded versions of lecture material were recorded, especially during the pandemic period.		
3	<b>Student evaluation procedure</b>			
Criteria	Response	Comments	Suggestions	
Course evaluation				
Project evaluation				

4 Evaluation components			
Criteria	Response	Comments	Suggestions
Theory	Continuous assesment and end semester exam		
Lab	Continuous assesment and end semester exam Continuous assesment and end semester exam, Continuous assesment and course project		
Project/ Internship/ Seminar	Mid term evaluaion and final evaluation		
5 Continuous Assessment Components			
Theory	Quiz I Quiz II Others - assignments, class tests, term projects, technical report submission, etc.		
Lab	Class exercise evaluation & End Semester Examination Lab exercise evaluation, Attendance, Daily performance viva, report evaluation, mini projects.		
6	Is there any remedial coaching to support weak performers? Yes	Additional class sessions and/or tutorial classes were taken for many of the difficult theory subjects. Compensation lab sessions were also held, in case students were not able to complete the lab within the stipulated time frame. Quiz-3 was conducted for first year students, in case they did not perform well in quiz 1 and 2.	
7	Is academic feedback from students taken regularly? Yes	Academic feedback is taken at the end of every semester, for each course. Students give anonymous feedback on the courses they have attended at the end of each semester.	

8	What are the steps taken based on student's feedback?	Feedback at IIST is taken based on several important parameters that assess the teaching skills. The same is used to improve the instruction, course content, source material preparation, etc, in the forthcoming semesters.		
9	Is Class committee meetings conducted?	Yes Class committee meetings are conducted every semester, for all courses at UG and PG level. The meetings are attended by course instructors and a representative set of students, and minutes are recorded, and adequate corrective actions are taken.		

## VI Department faculty credentials

Sl. No.	Criteria	Response	Comments	Suggestions
1	Percentage of faculty with PhD	95		
2	No. of journal articles published	18		
3	No. of books published	2		
4	No. of book chapters published	0		
5	No. of invited talks/ conferences/ workshops attended	30		
6	No. of research projects funded by IIST	8		
7	No. of research projects funded through ASRG/IIST-ISRO/DoS	3		
8	No. of externally funded research projects like CSIR, DST, DRDO etc.	3		
9	No. of patents published/ awarded	0		
10	No. of patents filed	2		
11	No. of faculty/student awards received	25		
12	No. of conferences/Workshops/ seminars/Colloquium Organized	2		
13	No. of conference paper published	47		

14	No. of visits made by the faculty/student for research collaborations/invited talks/conferences abroad	7		
15	No. of Industry collaborative projects	0		
16	No. of ISRO mission related projects/ activities	3		
17	No. of consultancy services entertained	0		

### VIII Details of student co-curricular activities

Criteria	Response	Comments	Suggestions
Whether students are involved in extra curricular & co-curricular activities?	Yes		
Whether students are doing internship abroad?	Yes Externally sponsored	Anant Kumar T K - Laboratory of Atmospheric and Space Physics (Lasp), University of Colorado Boulder, USA. Mallikarjun Kompella - Laboratory of Atmospheric and Space Physics (Lasp), University of Colorado Boulder, USA.	
Whether students are doing internship at national academic institutes universities?	Yes Self sponsored		
Whether students are doing internship at ISRO/ Industries/ R&D institutes?	Yes Externally sponsored	Pragati Agarwal - INTEL Ajeet Kumar - Mercedes Benz Sanjay G - Alpha ICS (I) Pvt Ltd Sanjuktha Ganguly - ST Microelectronics Gokul P N - KPIT Technologies Ashwathy S Ashok - " VSSC - TVM" Mallika Somanath - " SAC - Ahmadabad" Vaibhav Adhikari - " SCL - Chandigarh" Pranavi G - Robert Bosch Amitesh Sharma - Quantela Srujan K Darshanam - Robert Bosch Srikant Nayak - Robert Bosch	

Whether the department conducts outreach programs?	Yes IEEE MTT-S IIST Student Chapters and One Day Workshop on Microwave Theory Techniques and Application (MTTA 2019), July 29, 2019 IEEE Distinguished Lecture (DL) and One Day Workshop on Recent Advances in Wireless and Space Antennas, 24th Dec 2019.		
Whether department has alumni activities?	No Institute has an active alumni cell, which conducts yearly meetings and programs.		

### IX Details of placement/ higher studies of students

Criteria	UG	PG	PhD	Comments	Suggestions
No. of students placed	39	15	0		
No. of students opted for higher studies	19	0	0		
No. of students cleared GATE/ SLET/ NET/ CSIR/ UGC/ Others etc.	9	0	0		

### X Infrastructure in the Department

Sl. No.	Criteria	Response	Comments	Suggestions
1	No. of classrooms	7		
2	No. of seminar/ conference rooms	1		
3	No. of instruction labs	14		
4	No. of research labs	16		
5	No. of full-fledged e-learning classrooms	1		
6	No. of computing labs	0		
7	Is there any lab with potential for centre of excellence?	Computer Vision and Virtual Reality Lab (CVVR lab) NEMS Nano & Optoelectronics Systems (NEMO)		

8	Is there any labs sponsored by external agency?	No		
9	Inter-disciplinary research facility	Biosensor and Gas sensor lab, SSPACE		
10	Is there any common amenities like restroom, recreation club, etc.?	2 restrooms are available on each floor, 1 Badminton court and 1 Table tennis is also present.		
11	Is there any facilities for differently abled?	Lift facility and Separate restroom for differently abled is available		
12	Is there any Department library?	No, Institute has large library, which has all major books and resources on Electrical, Electronics and Computer science.		

## XII Additional Information

1.	Does the curriculum of each programme offered by the department provide the Programme Educational Objectives (PEOs)/Programme Specific Outcomes (PSOs) and Programme Outcomes (POs)?	No
2.	Do the courses offered in each programme by the department provide the Course Objectives and Course Outcomes (COs) written in clear terms?	No
3.	Give the status of adopting Choice Based Credit System (CBCS) in the programmes offered by the department	Implemented
4.	Give the status of adopting Objective Based Education (OBE) in the programmes offered by the department.	Action Initiated
5.	Satisfaction level of support of academic, administrative, and other support units of the institution	Very good
6.	The status of taking feedback from stakeholders and expert groups for revision and design of curriculum of a programme.	Student Faculty Employers Academic Peers



7.	The list of extension programmes conducted by the department	IEEE MTT-S IIST Student Chapters and One Day Workshop on Microwave Theory Techniques and Application (MTTA 2019), July 29, 2019 IEEE Distinguished Lecture (DL) and One Day Workshop on Recent Advances in Wireless and Space Antennas, 24th Dec 2019
8.	List Faculty Development Programme conducted (any programme aiming at updating the knowledge of faculty of the department).	
9.	Does students take projects involving Field work/Survey. If yes, give the list.	Yes. Many of the internship students have carried out internship/final-year project, involving field work and/or actual implementation
10.	The List of MoU and MoAs, that are currently operational during the year.	MoUs with NTU, University of Colorado, Boulder and Caltech, USA and University of Surrey, UK, LAAS-CNRS), France were operational during this year.

11.	Detail the mechanism adopted to help academically disadvantaged students to cope with academic requirements	Additional class sessions and/or tutorial classes were taken for many of the difficult theory subjects. Compensation lab sessions were also held, in case students were not able to complete the lab within the stipulated time frame.
12.	Detail the mechanism adopted to help students who perform very much below the class averages	Quiz-3 was conducted for first year students, in case they did not perform well in quiz 1 and 2. Supplementary exams were conducted in the summer timeframe for students who could not obtain pass grades.
13.	The total grant/revenue generated/received from different agencies by the department conducting research projects/consultancy services during the year.	40 Lakhs
14.	The suggestions to improve the efficiency and effectiveness of the IIST system.	Refer Section XIV and XV.

### XIII. Strength of the Department (maximum 150 words)

The Avionics department offers in-depth understanding of the fundamentals and advanced courses of Avionics, with a special thrust to enhance research capability of students to undertake the challenges in the field of avionics engineering. There is a strong emphasis on research capability enhancement, which is crucial for tackling challenges in avionics engineering. The department's expertise in RF and Microwave Engineering, Digital Signal Processing, Control Systems, VLSI & Microsystems, and Power Electronics provides a solid foundation for advanced research. The department creates a dynamic research environment within the institute, supported by faculty expertise and resources in various specialized areas. The main R&D laboratories include Gas and Biosensor Facility/ChemiSens lab, power electronics research lab, advanced microwave lab, systems and networks (Sysnet) lab. The research activities led to several journal papers, conference articles, securing of numerous research grants, development of scientific payloads, and award recognitions.

### XIV. Weakness of the Department (maximum 150 words)

The faculty strength increased to 22. However, the teaching load continued to be high. Moreover, the pandemic forced a sudden shift to online learning and remote working, which could have disrupted practical training and hands-on experience in avionics labs. The number of Ph. D. student intake and graduated Ph. D. in the Avionics department, in this year, was relatively on the lower side.

### XV. Challenges (maximum 150 words)

During the academic year 2019-20, the Avionics department at IIST, like many other educational institutions, faced the challenge of disruptions due to COVID-19 pandemic. It was initially a challenge for both students and faculty to adapt to online mode of instruction. Switching to online learning posed challenges in maintaining practical training and hands-on experience in avionics labs and workshops. The research works also suffered as most of the research scholars had to work from home and they lacked access to the laboratory facilities. Logistical issues might have impacted the department's ability to maintain and expand necessary resources. Establishment of a few advanced labs is under progress.

### XVI. Opportunities (maximum 150 words)

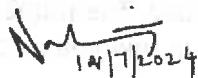
The Avionics Department, IIST focusses on fundamental research and applied research and technology development related to satellite technology and payload development. Being closely associated with the Indian Space Research Organisation (ISRO), Avionics Department have close access and key role in the pioneering activities of ISRO, including satellite launches, interplanetary missions, and technology transfers. The department is well poised to attract research grants from national and international research agencies as well as the Department of Space to advance research and technology. The department has the scope to form partnerships with global universities and research institutions that can facilitate knowledge exchange and joint research projects. The pandemic induced also paved the way to online technical discussions, which provide opportunities for enhanced research collaborations and discussions across the globe.

## Final Recommendations:

Academic audit was conducted to examine and review the teaching and learning mechanisms of the Department of Avionics. The department of Avionics is on the right track and providing excellent performance, in terms of research outputs, sponsored projects, teaching excellence, and industrial collaborations. Faculties are well-motivated and aligned with department goals (mission and vision), and meticulously managing a B.Tech program in Electronics and Communication and five postgraduate programs. Students are given good training and placements and it may further be improved. In view of outreach and strengthening collaboration, students may be motivated to prepare for higher studies, competitive exams, and to start/initiate start-up companies.

On the day of meeting, the team verified all the documents and records available in the department and evaluated the academic process. A detailed report of the audit is given above. The report is signed by the following:

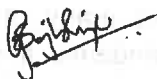
**Date of meeting: 11<sup>th</sup> July, 2024**



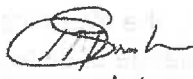
Dr. E. Natarajan,  
Professor, Department of Mathematics,  
IIST



Dr. Anoop C S



Dr. Sneha Gajbiye  
Assistant Professor,  
Department of Electrical Engineering  
IIT Palakkad



11/7/24  
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