JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada-533003, Andhra Pradesh, India

M.Tech in Avionics

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1:To adapt to any AVIONICS related industry Graduates of the programme will have the necessary academic training.

PEO 2:To have successful technical and professional careers, as well as management roles, in the Avionics and allied industries.

PEO 3: To have fresh ideas and the capacity to contribute to the avionics industry's growth and current demands.

PEO 4: To will have a strong willingness to continue learning and adapting new technologies and development to meet changing industry needs. Graduates of the programme will acquire appropriate academic input to enable them to adjust to any aviation related industry.

PROGRAM OUTCOMES (POs)

At the end of the course an Avionics Student attains the following student learning Program Outcomes:

- The graduate will have solid math, physics, and engineering foundations.
- The capacity to plan and perform experiments, as well as analyse and interpret data, will be acquired by the graduates.
- Graduates will be able to develop a system or component that meets design criteria while adhering to Avionics Engineering limitations.
- As a part of interdisciplinary teams, graduates will learn how to use current engineering tools and evaluate issues in the disciplines of Avionics Engineering.
- Graduates will be able to recognise, formulate, and solve difficult technical challenges in the field of avionics.
- Graduates will get a better grasp of professional and ethical responsibilities in relation to their careers in Avionics Engineering and other sectors.
- Graduates will be taught in creating and comprehending the relevance of aircraft design and development from the standpoint of system integration.
- Graduates will be able to appreciate the importance of lifelong learning.
- Graduates will demonstrate understanding of current challenges, with an emphasis on the need for novel materials, design, testing, and solutions for environmental difficulties in the aircraft sector.
- Graduates will be able to employ the techniques, abilities, and current engineering tools required in the area of Avionics Engineering.
- Graduates will have a strong scientific, technological, and communication foundation, which will aid them in finding employment in the aviation sector and R&D organisations in disciplines such as Avionics Engineering and other professional fields.
- Graduates will be able to pursue advanced study and research in interdisciplinary and transdisciplinary fields.

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COURSE OUTCOMES

Course Code	Flight Mechanics
M9701	

After completion of course, students would be able to:

CO1 The student will analyze the basics of flight mechanics, aerodynamic equations, aircraft engine and propulsion system, aeroplane performance.

Course Code	Avionics Systems
M9702	

After completion of course, students would be able to:

CO1 The students will analyze the basic concepts of core avionic systems, advanced radar systems – synthetic aperture radar.

CO2 Students will get an exposure to electro-optics in the avionics engineering.

Course Code	Flight Instrumentation (Elective-I)
M9703	

After completion of course, students would be able to:

CO1 The students will understand the mechanism of instrumentation in the flight and their importance in the avionics engineering.

Course Code	Advanced Digital Image Processing (Elective-I)
M9704	

After completion of course, students would be able to:

CO1 The students will analyze the basics of digital image processing and will acquire necessary knowledge that can be applied in the field of signal and image processing.

Course Code	Missile And Space Vehicle Mechanics (Elective-I)
M9705	

After completion of course, students would be able to:

CO1 The students will understand the basics of missile systems – its operating mechanism and aerodynamics.

CO2 Students will be able to understand the ideology of orbital mechanics.

Course Code	Aircraft Communication Systems (Elective-II)
M9706	

After completion of course, students would be able to:

CO1 The student will understand the terminology of aircraft communication.

CO2 The student will learn the modulation types to be used for effective communication.

CO3 Student will be aware of encryption standards in communication systems and aircraft data links, communication band allotted for different satellites.

CO4 They will get brief insight of future airborne communication systems – software defined radio.

Course Code	Cyber Security (Elective-II)
M9707	

After completion of course, students would be able to:

CO1 The student will analyze the importance of encryption in secure communication and will be able to convert the normal text into cipher text.

Course Code	MULTI SENSOR DATA FUSION
N9705	

After completion of course, students would be able to:

CO1 The students will understand the basics of multi sensor data fusion, representation, alignment and normalization.

CO2 The student will also have an exposure of different topics such as Bayesian inference, robust parameter estimation, Bayesian decision theory, and pattern recognition and sensor management.

Course Code	RESEARCH METHODOLOGY AND IPR
M0109	

After completion of course, students would be able to:

CO1 Understand research problem formulation.

CO2 Analyze research related information

CO3 Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

CO4 Understanding that when IPR wold take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

CO5 Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.

Course Code	FLIGHT CONTROL SYSTEMS
M9701	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Students will understand the essence of Auto pilot and its design.

Course Code	AIRCRAFT NAVIGATION SYSTEMS
N9702	

After completion of course, students would be able to:

CO1 The students will analyze the importance of navigation tools and their operation in the heading of aircraft.

CO2 Student will student will understand the operation of SSR, Traffic Alert and Collision Avoidance System and ADS-B.

Course Code	AVIONICS EMBEDDED SYSTEMS
N9703	

After completion of course, students would be able to:

CO1 Students will know the key elements and design process of model based embedded system design and different avionics hardware and software standards.

Course Code	AVIONICS NETWORK TECHNOLOGY
N9704	

After completion of course, students would be able to:

CO1 The students will analyze the basics of avionics network technology.

Course Code	MISSILE AND SPACE VEHICLE GUIDANCE AND CONTROL
N9705	

After completion of course, students would be able to:

CO1 The students will analyze the basic concepts of missiles and their design system.

CO2 The students will also have an exposure on various topics such as satellite missiles, orbital transfers, space flight, Space vehicle guidance.

Course Code	AIRCRAFT UTILITY SYSTEMS
N9706	

After completion of course, students would be able to:

CO1 The students will understand the mechanical, electrical and avionics subsystems in the aircraft.

CO2 Students will get an exposure of environmental controls and emergency systems in the aircraft.

Course Code	FLYING ROBOTICS

After completion of course, students would be able to:

CO1 The students will analyze the basics of embedded robotics and their design and operation.

CO2 The students will also have an exposure on various topics such as neural networks and genetic algorithms.

Course Code	NETWORK CENTRIC WARFARE
M9708	

After completion of course, students would be able to:

CO1 The student will understand equipment associated with electronic warfare and their operating mechanism.

Course Code	AEROSPACE ELECTROMAGNETIC COMPATIBILITY
P9702	

After completion of course, students would be able to:

CO1 The students will analyze the sources of EMI and EMC, Electromagnetic environment in aircraft, Effects of EMI on aircraft.

CO2 The students will also have an exposure on EMI mitigation techniques and industrial standards of avionics system engineering.

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Course Code	UNMANNED AIRCRAFT SYSTEMS
P9703	

After completion of course, students would be able to:

CO1 Upon completion of this course, students will explain the advanced concepts of UAV System design to the engineers and provide the necessary mathematical knowledge that is needed in modeling and analyzing an unmanned system.

CO2 The students will have an exposure on various topics such as design and development of UAVs, payloads and design standards, concluding with case studies of different such unmanned systems and will be able to deploy these skills effectively in the solution of problems in avionics engineering.

Course Code	GEOSPATIAL SIMULATIONS LABORATORY
N3310	

After completion of course, students would be able to:

CO1 Differentiate between various Interpolation methods

CO2 Delineate watersheds based on DEM and SWAT models

CO3 Build models using Model Builder in ArcGIS & QGIS

CO4 Perform various analysis on Hydrology using Hydrological models

CO5 Program on R software and Python scripting

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Course Code	ENGLISH FOR RESEARCH PAPER WRITING
MAC01/NAC01	

After completion of course, students would be able to:

CO1 Students will demonstrate creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

CO2 Students will effectively develop, interpret and express ideas through written, oral and visual communication.

Course Code	DISASTER MANAGEMENT
MAC02/NAC02	

After completion of course, students would be able to:

CO1 Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

CO2 Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.

Course Code	SANSKRIT FOR TECHNICAL KNOWLEDGE
MAC03/NAC03	

After completion of course, students would be able to:

CO1 Understanding basic Sanskrit language

CO2 Ancient Sanskrit literature about science & technology can be understood

CO3 Being a logical language will help to develop logic in students.

Course Code	VALUE EDUCATION
MAC04/NAC04	

After completion of course, students would be able to:

CO1 Knowledge of self-development

CO2 Learn the importance of Human values

CO3 Developing the overall personality

Course Code	CONSTITUTION OF INDIA
MAC05/NAC05	

After completion of course, students would be able to:

CO1 Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.

CO2 Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.

CO3 Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.

Course Code	PEDAGOGY STUDIES
MAC06/NAC06	

After completion of course, students would be able to:

CO1 What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries.

CO2 What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners

CO3 How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy.

Course Code	STRESS MANAGEMENT BY YOGA
MAC07/NAC07	

After completion of course, students would be able to:

CO1 Develop healthy mind in a healthy body thus improving social health also

CO2 Improve efficiency

Course Code	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS
MAC08/NAC08	

After completion of course, students would be able to:

CO1 Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life

CO2 The person who has studied Geeta will lead the nation and mankind to peace and prosperity

CO3 Study of Neetishatakam will help in developing versatile personality of students.

Course Code	BUSINESS ANALYTICS
POE13	

After completion of course, students would be able to:

CO1 Students will demonstrate knowledge of data analytics.

CO2 Students will demonstrate the ability of think critically in making decisions based on data and deep analytics.

CO3 Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making.

CO4 Students will demonstrate the ability to translate data into clear, actionable insights