	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Minor Degree in Aerospace Engineering**	Year of Regulation	**2026**
Department	**Mechanical Engineering**	Semester	**V**

Course Code	Course Name	Credit Structure				Marks Distribution		
		L	T	P	C	Continuous evaluation	Quiz/Viva	Total
ME 365	**Computational Laboratory**	**0**	**0**	**2**	**1**	**70**	**30**	**100**

Course Objectives	To develop proficiency in computational tools and numerical methods for solving aerospace engineering problems.	Course Outcomes	ME365.1	Apply computational tools and numerical methods to solve basic aerospace engineering problems. (Apply)
			ME365.2	Develop and analyze aerodynamic models to compute lift and drag using thin airfoil theory, panel methods, and potential flow simulations. (Analyze)
	To enable modeling and simulation of key aerospace systems including aerodynamics, orbital mechanics, and structural behavior.		ME365.3	Model and simulate orbital mechanics problems including two-body motion, orbit types, numerical integration methods, and orbital maneuvers such as Hohmann transfer. (Analyze)
			ME365.4	Evaluate structural behavior of aerospace components by predicting stress, strain, and deformation using numerical techniques for beams and truss systems. (Analyze)
	To foster the ability to design, analyze, and present integrated computational solutions for real-world aerospace applications.		ME365.5	Design and implement a mini-project integrating aerospace concepts and present results. (Create)

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	ME365.1	**3**	**2**	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**2**
2	ME365.2	**3**	**3**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**2**
3	ME365.3	**3**	**3**	**2**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**
4	ME365.4	**3**	**3**	**2**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**2**
5	ME365.5	**2**	**2**	**3**	**3**	**3**	**1**	**1**	**1**	**2**	**3**	**2**	**2**	**2**	**3**

SYLLABUS

No.	Content	Hours	COs
I	**Overview of computational tools** Solution methods using open-source/commercial softwares; Numerical methods.	4	ME365.1
II	**Aerodynamics and Propulsion** Study of aerodynamic characteristics such as drag, lift and pressure coefficients of airfoils, wings, bluff bodies; Propulsion and combustion of gas turbines and rockets.	6	ME365.2
III	**Orbits and Trajectories** Two body problem, Simulation of circular and elliptical orbits; Comparison of Euler and RK4 methods; Mathematical modelling of Hohmann transfer; Orbital decay due to drag.	6	ME365.3
IV	**Aerospace Structures** Prediction of stress, strain and deformation; Beam deflection; Wing bending under lift, Stress analysis of truss.	6	ME365.4
V	**Mini Project** To solve an aerospace related problem; Preparing a project report; Seminar presentation.	6	ME365.5
	Total Hours	**28**	

Supplementary Readings

1. R. Pratap, “Getting Started With MATLab: A Quick Introduction for Scientists and Engineers”, Oxford University Press, 7th Edition, 2016
2. R. W. Hamming, “Numerical Methods for Scientists and Engineers”, Dover, 2nd Edition, 2012
3. J. D. Anderson Jr., “Computational Fluid Dynamics”, McGraw-Hill., 1995
4. H. D. Curtis, “Orbital Mechanics for Engineering Students”, Butterworth-Heinemann, 3rd Edition, 2013