B.TECH. PROGRAMME

AEROSPACE ENGINEERING

CURRICULUM

for 2010 admissions onwards

GENERAL INFORMATION

In this section, category-wise distribution of credits for B.Tech (Aerospace Engineering) program for all semesters are given, followed by curriculum.

Code Numbering

Each course is assigned a code number consisting of two letters followed by three digits. The two-letter code indicates the department offering the course. The digit code indicates the level of the course (100,200,300,400 etc..). The odd number indicates courses offered in odd semesters and even number indicates courses offered in even semesters. When a subject is offered in both even and odd semesters, the digit code ends with a zero. Generally Elective courses begin with * 51 and lab courses begin with *90. Courses in humanity subjects (except language) are offered by any department where expertises are available.

ABBREVIATIONS

Curriculum

L	-	Lecture	H	-	Humanities
T	-	Tutorial	S	-	Science
P	-	Practical	M	-	Mathematics
Cr	-	Credit	G	-	General Engg.
Cat	-	Category	C	-	Core Engg.
ES	-	Exam Slot	Pr	-	Project

Departments

AES	-	Aerospace Engineering
CHE	-	Chemical Engineering
CHY	-	Chemistry
CSE	-	Computer Science and Engineering
CVL	-	Civil Engineering
ECE	-	Electronics and Communication Engineering
EEE	-	Electrical and Electronics Engineering
EIE	-	Electronics and Instrumentation Engineering
HUM	-	Humanities and Languages
MAT	-	Mathematics
MEC	-	Mechanical Engineering
PHY	-	Physics

B Tech Programme
AEROSPACE ENGINEERING
REVISED CURRICULUM
(2010 admissions onwards)

SEMESTER I:

Cat.	Code	Course Title	L-T-P	Cr	ES
H	ENG111	Communicative English	2 0 2	3	G
S	PHY100/ CHY100	Physics/ Chemistry	3 0 0	3	B
M	MAT111	Calculus, Matrix Algebra and Ordinary Differential Equations	3 1 0	4	A
G	EEE100	Electrical Engineering	3 0 0	3	C
G	MEC100/ CSE100	Engineering Mechanics/ Computer Programming	3 1 0 / 3 0 0	4 / 3	D
G	MEC181	Engineering Drawing	1 0 3	2	-
S	PHY181/ CHY181	Physics Lab./ Chemistry Lab.	0 0 3	1	-
G	MEC180/ EEE180	Workshop A/ Workshop B	1 0 2	2	-
G	CSE180	Computer Programming Lab.	0 0 3	1	-
H	CUL101	Cultural Education I	2 0 0	2	H

H = 5 S = 4 M = 4 G = 11 **Total = 24**

SEMESTER II:

Cat.	Code	Course Title	L-T-P	Cr	ES
H	ENG112	Technical Communication	2 0 2	3	G
S	CHY100/ PHY100	Chemistry/ Physics	3 0 0	3	B
M	MAT112	Vector Calculus, Fourier Series and Partial Differential Equations	3 1 0	4	A
G	ECE100	Electronics Engineering	3 0 0	3	C
G	CSE100/ MEC100	Computer Programming/ Engineering Mechanics	3 0 0 / 3 1 0	3 / 4	D
G	MEC182	Computer Aided Drawing	1 0 3	2	-
S	CHY181/ PHY181	Chemistry Lab./ Physics Lab.	0 0 3	1	-
G	EEE180/ MEC180	Workshop B/ Workshop A	1 0 2	2	-
G	CSE180	Computer Programming Lab.	0 0 3	1	-
H	CUL102	Cultural Education II	2 0 0	2	H

H = 5 S = 4 M = 4 G = 11 **Total = 24**

III Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
M	MAT211	Integral Transforms and Complex Analysis	3 1 0	4	A
C	AES211	Introduction to Aerospace Technology	3 0 0	3	B
C	AES221	Mechanics of Fluids	3 1 0	4	D
C	AES241	Mechanics of Materials	3 1 0	4	E
C	MEC220	Engineering Thermodynamics	3 1 0	4	C
H		Humanities Elective I	1 0 2	2	H
C	AES291	Materials Testing Lab.	0 0 3	1	-
C	MEC290	Machine Drawing	1 1 3	3	-

M = 4 H = 2 C = 19 **Total = 25**

IV Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
M	MAT212	Mathematical Statistics and Numerical Methods	3 1 0	4	A
C	AES222	Fundamentals of Aerodynamics	3 1 0	4	C
C	AES232	Introduction to Control Theory	3 0 0	3	D
C	AES242	Aerospace Structures	3 1 0	4	E
S		Science Elective I	3 0 0	3	B
H		Humanities Elective II	1 0 2	2	H
C	AES292	Mechanics of Fluids Lab.	0 0 3	1	-
C	AES294	Instrumentation Lab.	0 0 3	1	-
H	SSK111	SOFT SKILLS I	0 0 3	1	-

M = 4 H = 3 S = 3 C = 13 **Total = 23**

V Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
C	AES321	Compressible Fluid Flow	3 1 0	4	C
C	AES331	Introduction to Aerospace Propulsion	3 1 0	4	E
C		Elective I	4 0 0	4	F
S		Science Elective II	3 0 0	3	B
H	ENV200	Environmental Studies	3 1 0	4	D
C	AES391	Control Lab.	0 0 3	1	-
C	AES393	Aero-structures Lab.	0 0 3	1	-
H	SSK112	SOFT SKILLS II	0 0 3	1	-

H = 5 S = 3 C = 14 **Total = 22**

VI Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
C	AES312	Flight Mechanics and Static Stability	3 1 0	4	B
C	AES322	Computational Aerodynamics	3 0 3	4	D
C	AES332	Introduction to Avionics	2 0 0	2	E
C	AES344	Finite Element Analysis	3 0 3	4	C
C		Elective II	4 0 0	4	F
C	AES392	Propulsion Lab.	0 0 3	1	-
C	AES394	Low-speed Aerodynamics Lab.	0 0 3	1	-
Pr	AES397	Seminar	0 0 3	1	-
H	SSK113	SOFT SKILLS III	0 0 3	1	-

C = 20 H = 1 Pr = 1 **Total = 22**

VII Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
C	AES411	Flight Dynamics	3 1 0	4	D
C		Elective III	4 0 0	4	E
C		Elective IV	2 0 0	2	F
H	MNG400	Principles of Management	3 0 0	3	C
C	AES491	Aero-Design Lab.	2 1 3	4	-
C	AES493	Flight Testing Lab.	0 0 3	1	-
Pr	AES498	Project Phase I		3	-

H = 3 C = 15 Pr = 3 Total = 21

VIII Semester

Cat.	Code	Course Title	L-T-P	Cr	ES
C		Elective V	4 0 0	4	F
H		Management Elective	3 0 0	3	C
Pr	AES499	Project Phase II		9	-

H = 3 C = 4 Pr = 9 Total = 16

Total credits for the programme = 177

ELECTIVES

AERODYNAMICS /AEROPROPULSION

AES351 Boundary Layer Theory
AES352 Turbulent Flows
AES356 Heat Transfer
AES357 Rocket and Spacecraft Propulsion
AES451 Hypersonic Flow Theory
AES453 Advanced Computational Fluid Dynamics (2cr)
AES456 Air-breathing Engines

AEROSTRUCTURES

AES361 Analysis of Aero-structures
AES362 Engineering Fracture Mechanics
AES363 Vibration Analysis
AES461 Composite Mechanics and Materials
AES462 Aero-elasticity
AES463 Matrix Methods in Structural Analysis

AVIONICS AND FLIGHT CONTROL, DESIGN AND MANUFACTURING / GENERAL AEROSPACE

AES471 Advanced Avionics (2cr)
AES472 Space Flight Mechanics
AES473 Flight Control Systems (2cr)
AES476 Manufacturing Processes
AES477 Multidisciplinary Design Optimisation

MANAGEMENT ELECTIVES

MEC461 Quality Control and Reliability Engineering
MEC462 Simulation Modelling of Manufacturing Systems
MEC484 Project Management

SCIENCE ELECTIVES (3 0 0 3)

CHY250	Catalytic Chemistry
CHY251	Chemistry of Engineering Materials
CHY252	Chemistry of Advanced Materials
CHY253	Advanced Polymer Chemistry
CHY254	Polymers for Electronics
CHY255	Chemistry of Toxicology
CHY256	Chemistry of Nanomaterials
CHY257	Biomaterials Science
CHY258	Environmental Chemistry
CHY259	Instrumental Methods of Analysis
CHY260	Organic Synthesis and Stereochemistry
CHY261	Unit Processes in Organic Synthesis
CHY262	Medicinal Organic Chemistry
CHY263	Organic Reaction Mechanisms
CHY264	Green Chemistry and Technology
CHY270	Corrosion Science
CHY271	Electrochemical Energy Systems and Processes
CHY272	Computational Chemistry and Molecular Modelling
CHY273	Fuel Cells – Principles and Applications
CHY274	Solid State Chemistry
PHY250	Electrical Engineering Materials
PHY251	Optoelectronic Devices
PHY252	Physics of Semiconductor Devices
PHY253	Electromagnetic Fields and Waves
PHY254	Microelectronic Fabrication
PHY255	Electronic Materials Science
PHY260	Physics of Lasers and Applications
PHY261	Lasers in Material Processing
PHY262	Non-linear Dynamics
PHY263	Concepts of Nanophysics and Nanotechnology
PHY264	Thin Film Physics
PHY270	Medical Physics
PHY271	Advanced Classical Dynamics
PHY272	Quantum Physics and its Applications
PHY273	Computational Physics
PHY274	Astrophysics

HUMANITIES ELECTIVES (1 0 2 2)

CUL151	Achieving Excellence in Life - An Indian Perspective
CUL152	Exploring Science and Technology in Ancient India
CUL153	Excellence in Daily Life
CUL154	Yoga Psychology
ENG250	Professional Communication
ENG251	Business Communication
ENG252	Indian Thought in English
ENG253	Insights into Life through English Literature
FRE201	Proficiency in French Language (Lower)
FRE202	Proficiency in French Language (Higher)
GER201	Proficiency in German Language (Lower)
GER202	Proficiency in German Language (Higher)
GER211	German for Beginners I
GER212	German for Beginners II
HUM250	Indian Classics for the Twenty-first Century
HUM251	Introduction to India Studies
HUM252	Glimpses of Eternal India
HUM253	Glimpses into the Indian Mind - The Growth of Modern India
HUM254	Glimpses of Indian Economy and Polity
HUM255	Science and Society – An Indian Perspective
JAP201	Proficiency in Japanese Language (Lower)
JAP202	Proficiency in Japanese Language (Higher)