B.TECH IV SEMESTER SYLLABUS

VECTOR CALCULUS AND PROBABILITY STATISTICS

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5BS06	BSC	3	0	--	3	30	70	100

COURSE OBJECTIVES

1.Evaluation of definite integrals using Beta and Gamma functions.
2.Verification of vector integral theorems.
3.The concepts of discrete and continuous random variables, probability distribution and density function.
4. The concept of correlation and regression to find covariance.
5. Evaluation of the given data for appropriate test of hypothesis and finding the variance.

UNIT-I BETA GAMMA FUNCTIONS AND VECTOR DIFFERENTIATION

Beta- Gamma Functions and their Properties-Relation between them- Evaluation of improper integrals using Gamma and Beta functions.
Scalar and vector point functions - Gradient, divergence, curl and their related properties -Solenoidal and irrotational vector point functions - Scalar potential function - Laplacian operator

UNIT-II VECTOR INTEGRATION AND VECTOR INTEGRAL THEOREMS

Line integral - work done - surface integrals - volume integral - Vector integral theorems - Green's theorem in a plane - Stoke's theorem - Gauss divergence theorem (all theorem statements and their verification).

UNIT-III SINGLE RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS

Basic definitions of probability, Random Variables – Discrete and Continuous. Probability distributions, mass function/ density function of a probability distribution- mathematical expectation,Mean, Variance.
Binomial, Poisson & Normal distributions and their Properties.

UNIT-IV CORRELATION & REGRESSION AND SAMPLING DISTRIBUTIONS

Coefficient of correlation, the rank correlation, Covariance of two random variables. Regression- Regression Coefficient, The lines of regression.
Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance.
Parameter estimation- Point estimationand interval estimation.

UNIT-V TESTING OF HYPOTHESIS

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I & type II errors – critical region, confidence interval, Level of significance. One sided test, two sided test,
Large sample tests:(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of
known variance & unknown variance, equal and unequal variances)
(ii) Tests of significance of difference between sample S.D and population S.D.
(iii) Tests of significance difference between sample proportion and population proportion &difference between two sample proportions.
SMALL SAMPLE TESTS:Student t-distribution, its properties; Test of significance sample mean and

population mean, difference between means of two small samples.
Snedecor's F- distribution and its properties. Test of equality of two population variances.
Chi-square distribution, it's properties, Chi-square test of goodness of fit.

Text Books:

1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.
3. Probability and Statistics for Engineers and Sciences by Jay L. Devore, Cengage Learning

Reference Books:

1. Fundamentals of Mathematical Statistics by S.C. Guptha&V.K. Kapoor, S. Chand
2. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press

Web references:

1. https://www.efunda.com/math/math_home/math.cfm
2. https://www.ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -Text Books:

1.https://www.e-booksdirectory.com/details.php?ebook=10166
2. https://www.e-booksdirectory.com/details.php?ebook=10166

COURSE OUTCOMES

At the end of the course, student will be able to:

1. Evaluate of definite integrals using Beta and Gamma functions
2. Verify vector integral theorems.
3. Evaluate the discrete and continuous random variables, mathematical expectation of mean and variance.
4. Apply theconcepts of correlation and regression to find covariance and sampling distribution of mean and variance.
5. Evaluate the given data for appropriate test of hypothesis.

PYTHON LAB

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5ME40	PCC	1	-	2	2	30	70	100

COURSE OBJECTIVES :

1. Understand the basics and function of Python Programming Language.
2. Understand the string operation and sequences used in Python Programming Languages.
3. Understand the data structures used in Python Programming Languages.
4. Know the classes and objects in Python Programming Language.
5. Use the reusability concepts in Python Programming Language.

LIST OF PYTHON PROGRAMS

1. Write a program to find root of quadratic equation.
2. Write a program to find and delete repeating number in Given List.
3. Write a program to perform equations of uniform motion of kinematics :
   i. $v = u + at$
   ii. $s = ut + ½(at^2)$
   iii. $v^2 = u^2 – 2as$
4. Write a menu driven program to perform following properties of thermodynamics as given below:
   i. First Law of thermodynamics (U = Q - W), where ΔU is the change in the internal energy. Q is the heat added to the system, and W is the work done by the system.
   ii. Efficiency of Heat Engine = (TH – TC) / TH where TH & TC is the temperature of HOT and COLD Reservoirs.
5. Write the menu program to find the relationship between stress and strain curve as given below:
   i. Young's Modulus
   ii. Shear Modulus
   iii. Poisson Ratio
6. Write the program to determine the shear force and bending moment in beams.
7. Write a program to find maxima/minima of functions of two variables and evaluate some real definite and finite integrals.
8. Write a Program to find out unknown magnitude of T_B and T_D of unknown tensions can be obtained from two scalar equations of equilibrium i.e. ΣFx = 0 and ΣFy =0.
9. Write a program to perform interpolation of equally and unequally spaced data.
10. Write a program to calculate total pressure exerted in ideal fluid as equation is given below:
    P+1/2(ρv2) + ρgh = constant
    Where P is Pressure, V is Velocity of fluid, ρ is density and h is the height of the container.
11. Write a program to input and print the element sum of user defined matrix.
12. Write a program to input and multiply two different matrices.
13. Write a program to compute eigen value and vector of a given 3*3 matrix using NumPy.
14. Write a program to find a solution of linear equations in y=mx+c
15. Write a program to draw line using equation y=mx+c
16. Write the program to determine the intersection point of two lines.
17. Draw various types of charts using matplotlib.
18. Write a program to find numerical differentiation using Finite differences Method by importing NumPy and plot the numerical values using matplotlib libraries of python.
19. Write a program for bresenham's line drawing algorithm.
20. Write a program for geometric transformation of a given object.

Note: Minimum 12 experiments are to be conducted.

COURSE OUTCOMES:

1. Apply conditional statement, loops condition and functions in python program
2. Solve mathematical and mechanical problems using python program
3. Plot various type of chart using python program
4. Analyze the mechanical problem using python program
5. Illustrate programs on various python libraries such as numpy, pandas and matplotlib

AERODYNAMICS-I

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE11	PCC	3	1	-	4	30	70	100

COURSE OBJECTIVES

1. Understand the theoretical concepts underlying the development of lift, drag, and movement forces on aeronautical vehicle
2. Understand the concept of superposition of elementary flows for linear incompressible flow
3. Analyze the characteristics of airfoil and wing geometries and plan-form shapes to assist in determining aircraft performance
4. Analyze the characteristics of wing geometries and plan-form shapes to assist in determining aircraft performance
5. Be equipped to evaluate new lift-enhancement or drag-reduction devices and appreciate the directions and promise of upcoming developments in aerodynamic technology

UNIT-I BASICS OF AERODYNAMICS

NEW: Review of Fluid flow parameters, Flow regimes, Wing and airfoil geometry, aerodynamic force and moments,estimation of lift, drag and pitching moment from the pressure distribution, aerodynamic centre, centreof pressure, types of drag.
Governing Equations in integral and differential forms

UNIT-II ELEMENTARY FLOWS & COMBINATION OF FLOWS

Scalar and vector fields(revision), Velocity Potential and Stream function for 2-Dincompressible flow, Governing equation for irrotational incompressibleflow- Laplace‘s equations, boundary conditions – Wall boundary and Free stream boundary
Uniform flow, source flow, doublet flow and vortex flow, Combinationof uniform flow with a Source and Sink, Doublet, non-lifting and lifting flow over a circular cylinder . Kutta- Joukowski theorem and Magnus Effect, D Alembert s paradox.

Assignment/Project submission: Program to plot pressure distribution over a non-rotating cylinder and a spinning cylinder

UNIT-III AIRFOIL CHARACTERISTICS & THIN AIRFOIL THEORY

Introduction to airfoils- nomenclature, Types of Airfoils- NACA Series and their applications, Laminar flow airfoils, Low Reynolds number airfoils, Subsonic compressible flow past airfoils; Critical Mach number, drag divergence Mach number, supercritical airfoils, area rule.

THIN AIRFOIL THEORY: Vortex Filament, The vortex sheet, Kutta condition and Kelvin‘s circulation theorem. Classical thin airfoil theory: symmetric and cambered airfoil.

Assignment/Project submission: Program to calculate lift over NACA 2412 at a given angle of attack using thin airfoil theory

UNIT-IV FINITE WING THEORY

Downwash, induced drag, Biot-Savart’s law and Helmholtz’s theorem. Prandtl’s classical lifting line theory and fundamental equations. Elliptic and general lift distribution over finite unswept wings, effect of aspect ratio, taper and thickness to chord ratio, **Subsonic** flow past swept and delta wings.

Assignment/Project submission: Program to calculate lift over wing Prandtl's classical lifting line theory

UNIT-V	APPLIED AERODYNAMICS

Lift augmentation and Drag Reduction methods - Flaps, slats, slots, winglets, Leading edge root extensions, Large Eddy Breakup device, Co-flow jet, Cuffs and vortex generators Circulation control, strakes. Drag augmentation methods – spoilers, Air brakes.
Propellers: Airscrew geometry, Froude Momentum Theory,Thrust Co-eff, Torque Co-eff, Power Co-eff, Efficiency, Activity factor, Blade element theory
Assignment/Project submission: Prepare models for wings different flap positions, and leading edge devices

Text Books:

1. Anderson J .D.(2011), Fundamental of Aerodynamics, 5th edition, McGraw-Hill International Edition, New York
2. E. L. Houghton, P.W. Carpenter (2010), Aerodynamics for Engineering Students, 5th edition, Elsevier, New York.

Reference Books:

1. L. J. Clancy, Aerodynamics, 1/e, Shroff Publications, 2006
2. J. J. Bertin and R. Cummings, Aerodynamics for Engineers, 6/e, Pearson, 2013.
3. B. W. McCormick, Aerodynamics, Aeronautics and Flight Mechanics, 2/e, John Wiley and Sons, 1995

Web References:

https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-aerodynamics-k4.html

E-Text Books:

Arnab Roy, A First Course on Aerodynamics

MOOC Course

https://nptel.ac.in/courses/101105059/
https://www.edx.org/course/introduction-to-aerodynamics

COURSE OUTCOMES

1. Upon successful completion of this course, the student will have
2. The student shall be able to determine the dimensional parametersAnalyze Pressure distribution on airfoil, Estimation of lift, drag and pitching moment coefficient.
3. The student shall be able to propose the combination of elementary flows to solve the real time problem theoretically.
4. The student shall be able to solve wing section properties by using thin airfoil theory.
5. The student shall be able to determine the flow around wing, circulation distribution, downwash distribution, wake and relationship between them.
6. Apply the concept of aerodynamic theories to produce high lift and reduce drag..

AEROSPACE VEHICLE STRUCTURES – I

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE12	PCC	3	1	-	4	30	70	100

COURSE OBJECTIVES:

Upon the completion of course students should be able to understand.

1. Understanding the basic concepts of stresses and strains on the 3D elastic body
2. Apply the degree of redundancy (DOR) for statically determinate and indeterminate beam structure.
3. Evaluate the deflection and slope using energy methods
4. Demonstrate the knowledge of the critical loading conditions of the columns.
5. Summarize the direct application of concepts of shear flow for a closed thin walled section beam to aircraft structures

UNIT-I INTRODUCTION TO THEORY OF ELASTICITY

Introduction To Aircraft Structural Components, Equilibrium and Compatibility conditions for elastic solids, 2D elasticity equations for plane stress, plane strain and generalized plane strain causes Airy's stress function. Simple problems in plane stress/plane strain stresses and strains on arbitrary planes and transformations.

UNIT-II REDUNDANT STRUCTURES

Indeterminate structure**,** order of redundancy, Introduction to redundant analysis, use of free body diagrams to explain compatibility and redundant analysis principles, moment area method analysis of various types of beams, three moment equation (Clapeyron theorem) of a continuous beams

UNIT-III ENERGY PRINCIPLES AND THEORIES OF FAILURE

Introduction to energy principle and methods. Principle of virtual Displacements and principle of Virtual Force Castigliano's theorems, maxwell's reciprocal theorem and unit load method.

Introduction – Various theories of failure - Maximum Principal Stress Theory, Maximum Principal Strain Theory, Strain Energy and Shear Strain Energy Theory (Von Mises Theory) and fracture modes

UNIT-IV STABILITY OF COLUMNS

Stability of structural systems, Models of instability of columns. Euler's formula for critical loads of column, end conditions of a column,Slenderness ratio, Effect of boundary conditions on mode shapes and critical loads. Column with initial curvature, effect of eccentricity Long, Medium and short column ranges. Rankine and Johnson's formulae. Effect of intermediate supports. Concept of beam column.

UNIT-V TORSION OF THIN WALLED CLOSED SECTION

Bredt- Batho formula. Single and multi-cell closed box structures. Semi monocoque and moncoque structures. Approximate method for box beams. Shear flow in single and multicell monocoque and semi monocoque box beams subject to torsion.

Text Books:

1. Megson T. H. G (2012), Aircraft Structures for Engineering Students, 5th edition, Elsevier, New York.
2. Strenght of Materials by R.K Rajput S.chand publishers.

Reference Books:

1. Irving Herman Shames, Clive L. Dym (2003), Energy and finite element methods structural analysis, McGraw Hill, New Delhi, India.
2. B. C. Punmia (2011), Theory of Structures, 13th edition, Laxmi Publications Ltd, Hyderabad.
3. Donaldson B. K (2008), Analysis of Aircraft Structures an introduction to Aeronautical Structures Analysis, 2nd edition, Cambridge University Press, USA.

Web References:

1.https://cosmolearning.org/courses/introduction-aerospace-structures/

2.http://www.triumphgroup.com/business-units/aerospace-structures/

E-Text Books:

Aircraft Structures (Dover Books on Aeronautical Engineering)
Aircraft Structures - Federal Aviation Administration

MOOC Course

https://www.edx.org/course/introduction-to-aerospace-structures-and-materials

COURSE OUTCOMES:

This course uses lectures, assignments and home works to the students. The teaching methods include regular class work, Problem solving, technical quiz and seminars to enable the students:

1. Develop stress strain relationships for a three dimensional body,
2. Analyze indeterminate structures using various methods
3. Determine deflection and slopes using energy methods
4. Estimate buckling loads for different boundary conditions of the columns
5. Analyze the shear flow distribution in an aircraft structural components wings & fuselage

AIRPLANE PERFORMANCE

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE13	PCC	3	-	-	3	30	70	100

COURSE OBJECTIVES:

Upon the completion of course students should understand

1. Demonstrate competence in evaluating lift and drag of airplanes, and installed thrust of their engines
2. To familiarize with the concepts of Flight performance
3. To understand the parameters effecting the performance
4. To familiarize with the concept of Stability and control of Aircraft
5. To familiarize with the concept of dynamic stability of Aircraft
6. Ability to understand and apply the governing equations related to longitudinal and lateral static stability and control of an aircraft
7. Effects of the aerodynamic design, center of gravity location and moments of inertia on static and dynamic stability and control of an aircraft

UNIT-I	INTRODUCTION TO AIRCRAFT PERFORMANCE

The role and design mission of an aircraft specification of the performance requirements and mission profile. Importance of performance analysis, estimation and measurements .Scheduled performance and operational performance of aircraft. The international standard Atmosphere. Off - design atmosphere. Measurements of air data. Air data computers.

UNIT-II	THE FORCE SYSTEM OF THE AIRCRAFT, CRUISE PERFORMANCE

The aircraft force system. The lift force, side force the drag force. Total airplane drag- drag estimation - drag reduction methods. The propulsive forces the thrust producing engine, power and specific fuel consumption with altitude and flight speed. The minimum drag speed, minimum power speed. Aerodynamic relationships for a parabolic drag polar.

The maximum & minimum speeds in level flight -Range and Endurance of aircraft with thrust producing engines and with power producing engines. Cruise techniques: constant angle of attack, constant Mach number, constant Mach number methods, comparison of performance. The effect alternative fuel flow laws, the effect of weight, altitude and temperature on cruise performance.

UNIT-III	CLIMB AND DESCENT PEROFRMANCE,AIRCRAFT MANEUVER PERFORMANCE

Importance of climb and descent performance- safety considerations. Climb and descent techniques, generalized performance analysis for thrust producing, power producing and mixed power plants, maximum climb gradient, climb rate. Energy height and specific excess power, energy methods for optimal climbs, minimum time climbs, minimum fuel climbs, Measurements of climb performance. Descent performance in aircraft operations. Effect of wind on climb and descent performance.

UNIT-IV	TAKE-OFF AND LANDING PERFORMANCE PLANNING, AIRCRAFT PERFORMANCE MESUREMENTS AND DATA HANDLING

Flight safety criteria. Performance classification civil. Flight plans, performance planning and fuel planning Estimation of take off distances. The effect on the take – off distance, of weight wind runaway conditions, ground effect. Take off performance safety factors. Estimation of landing distances, the discontinued landing baulked landing air safety procedures and requirements on performance. Fuel planning fuel requirements trip fuel, fuel reserves, tankering. Purpose of performance measurements in flight.Flight testing Principle performance variables weight, altitude and ambient temperature (WAT).

UNIT-V	THE APPLICATION OF PERFORMANCE DATA

The performance summary and fleet selection-the block performance,payload – range diagram. Route analysis and optimization. Operational analysis procedure. Operational performance data for flight planning, take off field performance runaway correction chart, aircraft datum performance (WAT) chart, determination of the maximum takeoff weight

Text Books:

1. Eshelby M. E (2000), *Aircraft performance: Theory and Practice*, AIAA Education Series, USA.
2. Brandt S. A. et al (2004), *Introduction to Aeronautics: A Design perspective*, 2nd edition, AIAA Education Series, USA.
3. Anderson J. D. (2011), *Aircraft Performance and Design*, international edition, McGraw Hill, New Delhi.

Reference Books:

1. Dole C. E. (2010), *Flight Theory and Aerodynamics; a practical Guide for Operational Safety*, Wiley India Ltd, New Delhi, India.
2. Mc Cormic B. W.(2010), *Aerodynamics, Aeronautics and Flight Mechanics*, 2nd edition, Wiley India Ltd. India
3. Raymer D. P (2006), *Aircraft Design: A Conceptual Approach*, 4th Edition, AIAA Education Series, USA
4. Yethout (2003),*Introduction to Aircraft Flight Mechanics*, AIAA Education Series, USA

Web References:

https://nptel.ac.in/courses/101106041/

E-Text Books:

https://soaneemrana.org/onewebmedia/MECHANICS%20OF%20FLIGHT%20BY%20A.C%20KERMODE.pdf

MOOC Course

https://nptel.ac.in/courses/101104062/

COURSE OUTCOMES:

Students should be able to:

1. Compare and contrast between the performance parameters for civil transport and military aircrafts
2. Calculate the range and endurance of a fixed-wing aircraft with either a jet or a propeller-driven propulsion system in straight and level flight and analyze the various types of cruise techniques
3. Evaluate the performance of an aircraft during its climb and descend
4. Evaluate the factors effecting the take-off and landing performance of the aircraft
5. Apply flight mechanics analytical concepts and aircraft performance data to the preliminary design of a new aircraft to meet defined performance requirements

AERODYNAMICS LAB

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE14	PCC	-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

The course should enable the student:

1. To understand and study the operation of subsonic wind tunnel.
2. To study experimentally the pressure distribution of circular, symmetric and cambered airfoil
3. To study Flow visualization studies in low speed flow over airfoil with different angle of incidence and over cylinder
4. To determine the drag coefficient for a Cylinder.
5. They can analyse the performance of axial and centrifugal compressors.

LIST OF EXPERIMENTS

1. Calibration of subsonic wind tunnel.
2. Pressure distribution over smooth and rough cylinder.
3. Pressure distribution over symmetric airfoils.
4. Pressure distribution over cambered airfoils
5. Flow visualization studies in low speed flows over sphere.
6. Flow over a flat plate at different angles of incidence.
7. Flow visualization studies in low speed flows over cylinders.
8. Flow visualization studies in low speed flows over airfoil with different angle of incidence.
9. Fluid flow studies using a blower.
10. Drags of different bodies.
11. Performance of Axial flow compressor.
12. Performance of Centrifugal flow compressor.

Note: Ten experiments should be performed.

Reference Books:

Anderson J .D.(2011), Fundamental of Aerodynamics, 5th edition, McGraw-Hill International Edition, New York

Web References:

https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-aerodynamics-

COURSE OUTCOMES:

The students should be able to:

1. Illustrate the pressure distribution over different aerodynamic shapes
2. Analyze the air flow pattern over different aerodynamic bodies using visualization techniques
3. Estimate the efficiencies of axial and centrifugal compressor
4. Determine the efficiency and flow rate of blower
5. Asses the aerodynamic characteristics of different bodies

INTRODUCTION TO IOT

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5EC01	ESC	-	-	3	1.5	30	70	100

COURSEOBJECTIVES:

The course should enable the student:

1. To develop basic programming skills through graphical programming
2. To learn hardware interfacing and debugging techniques
3. To design and develop android app

LIST OF EXPERIMENTS

Introduction to IOT

1. Introduction to basic electronic components and digital electronic
2. Introduction to sensors and Actuators
3. Introduction to microcontroller
4. Introduction to Arduino IDE

EXPERIMENT PROGRAMS:

1. Blinking of LED with different delays
2. Digital I/O Interface [IR Sensor, PIR Sensor]
3. Analog Interface [ADC, Temperature Sensor]
4. Motor speed And Direction control
5. Serial Communication
6. Wireless Interface –Bluetooth & Wi-Fi Technologies
7. Wireless Control of wheeled robot
8. Smart Home Android App Development

Reference Books:

1. Sylvia Libow Martinez, Gary S Stager, Invent To Learn: Making, Tinkering, and Engineering in the Classroom, Constructing Modern Knowledge Press, 2016

2. Michael Margolis, Arduino Cookbook, Oreilly, 2011

COURSE OUTCOMES:

The students should be able to:

1. Able to demonstrate various sensor interfacing using Visual Programming Language.
2. Able to analyze various Physical Components.
3. Able to demonstrate Wireless Control of Remote Devices.
4. Able to design and develop Mobile Application which can interact with Sensors

AIRCRAFT INTERIOR DESIGN LAB

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5AE16	PCC	-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

1. To design various Aircraft interior components in lab.
2. To design various individual components, sub-assemblies and main assemblies in lab.
3. Discuss the importance of design process and studying the different phases of designing process involved in the design.
4. Understand the design of aircraft concepts.
5. To design various aircraft components by using Catia software

LIST OF EXPERIMENTS

1 Aircraft Seating Design Arrangements (General Class & Business Class) (2D)
2 Aircraft Single Aisle Design(3D & 2D)
3 Aircraft Twin Aisle Design(3D & 2D)
4 Aircraft Seat Design (3D- Business Class)
5 Aircraft Seat Design (3D- First Class)
6 Design of Laptop Tray Sizing for Seating in Civil Aircrafts.
7 Design of Window for Civil Aircraft
8 Design of Wind Shield for Fighter Aircraft(Select any one airplane)
9 Design of Wind shield for Passenger Aircraft(Select any one Airplane)
10 Design of Arm rest cap height from surface in Civil Aircraft
11 Design of Joystick(Spacing) in Fighter Aircraft

Note: Ten experiments should be performed.

Reference Books:

Basics in Catia V5 with Simulation by Ranjan Chikesh

Web References:

https://www.youtube.com/channel/UCKgI0VNNToH-xje5XIwBAhg

COURSE OUTCOMES:

1. Understand the importance of drawing and design process and phases involved in the design process
2. Design various individual components, sub-assemblies and main assemblies in design lab
3. Design various orthographic and isometric projections in drawing sheets
4. Develop the basic concepts of aircraft interiors
5. Design and develop aircraft interior components

GENDER SENSITIZATION

IV Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5HS03	HSMC	1	0	0	0	30	70	100

COURSE OBJECTIVES:

1. To provide a critical perspective on the socialization of men and women.
2. To introduce students to information about some key biological aspects of genders.
3. To expose the students to debates on the politics and economics of work.
4. To help students reflect critically on gender violence.
5. To expose students to more egalitarian interactions between men and women.

UNIT-I	UNDERSTANDING GENDER

Introduction: Introduction to Gender, What is Gender, Why should we study it.. Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste: Different Masculinities.

UNIT-II	GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination- Missing Women-Sex Selection and Its Consequences Declining Sex Ratio. Demographic Consequences- Gender Spectrum: Beyond the Binary

UNIT-III	GENDER AND LABOUR

Di Valuation of Labour-Housework: The Invisible Labor- “My Mother doesn’t Work.” “Share the Load.”-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

UNIT-IV	GENDER - BASED VIOLENCE

Sexual Harassment: Say No! -Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”. Domestic Violence: Speaking Out Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life….” Additional Reading: The Caste Face of Violence.

UNIT-V	GENDER AND COEXISTENCE

Gender Issues- Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks The Brave Heart.

Text Books:

All the five Units in the Textbook, “Towards a World of Equals: A Bilingual Textbook on Gender” written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad,Telangana State in the year 2015.

Reference Books:

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdulali Sohaila. "I Fought For My Life…and Won."Available online at:
http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/

Web References:

1.http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/

E-Text Books:

1. Abdulali Sohaila. "I Fought For My Life…and Won." Available online at:
http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/

COURSE OUTCOMES:

1. Develop a better understanding of important issues related to gender in contemporary India.
2. Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender
3. Attain a finer grasp of how gender discrimination works in our society and how to counter it
4. Men and Women students and professionals will be better equipped to work and live together as equals.
5. Create a sense of appreciation of women in all walks of life.