

SEMESTER 5
CIVIL AVIATION REGULATION

Course Code	PEAOT525	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3/5	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	NIL	Course Type	Theory

Course Objectives:

1. To teach the civil air rules and regulations to be followed by an aircraft maintenance

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	REGULATORY FRAME WORK Role of International Civil Aviation Organization; The Aircraft Act and Rules made there under; Role of the DGCA; Relationship between CAR-21, CAR- M,CAR-145,CAR-66,CAR147;TheAircraft Rules(Applicable to Aircraft Maintenance and Release).Aeronautical Information Circulars(Applicable to Aircraft Maintenance and Release).	9
2	CARSECTION1–GENERAL: SERIES A Series A: General Policy and Procedures Adopted by DGCA: Part I-Issuance of the Civil Aviation Requirements and revisions thereof etc. - Requirements to be complied with. Part II-Definitions; Part III-Procedure for holding examinations, proficiency checks etc. for Defense personnel to fulfill the requirements for grant of civil licenses. Part IV-Regulatory Document Management System Part V-Procedure for an appeal on orders issued under Rule 3B of the Aircraft Rules, 1937.	7
3	CARSECTION2-AIRWORTHINESS: SERIES B & C Series B: Approval of Cockpit Checklist, MEL, CDL. Part I-Minimum Equipment List (MEL) Series D: Part II-Preparation and use of Cockpit and emergency checklist (Refer Section 8, Series D, Part II); Series C: Defect Recording, Monitoring, Investigation and Reporting: Part I-Defect recording, reporting, investigation, rectification and analysis.	11

4	CARSECTION2-AIRWORTHINESS: SERIES E Series E-Approval of Organizations: Part I-Approval of organization, Part VI-Approval of organization - Cat. E - Aviation Fuel, Aviation Lubricants and special products, Part VIII-Acceptance of Foreign Approved Organization (FAO) - Aircraft Type Rating, Part XI-Acceptance of Foreign Approved Maintenance Organization (FAMO); Part XII-CAR 147-Approved Maintenance Training Organization (Type Training).	9
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Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	15	10	10	40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
2 Questions from each module. - Total of 8 Questions, each carrying 3 marks (8x3 =24 marks)	- Each question carries 9 marks. - Two questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 3 subdivisions. (4x9 = 36 marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Understand the regulatory Framework	K2
CO2	Remember Knowledge About car Section 1 – General: Series A	K1
CO3	Understand the techniques About the Car Section 1 – General: Series B & Series C	K2
CO4	Understand the techniques About the Car Section 2 - Airworthiness: Series B, C & E	K2

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	1	-	1	-	-	-	-
CO2	2	-	-	-	-	1	-	1	-	-	-	-
CO3	2	-	-	-	-	1	-	1	-	-	-	-
CO4	2	-	-	-	-	1	-	1	-	-	-	-

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Aviation Legislation",	Aircraft Tech Book Co.	EASA,"Module-10	EASA,"Module-10
2	DGCA,CARSection1: General			
3	CAR145,CARM			

Video Links (NPTEL, SWAYAM...)	
Module No.	Link ID
Module-I&II	http://dgca.nic.in/rules/rule-ind.htm

SEMESTER 5**PROPULSION LAB**

Course Code	PCAOL 507	CIE Marks	50
Teaching Hours/Week (L: T:P: R)	0:0:3:0	ESE Marks	50
Credits	2	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	Engineering Thermodynamics, Fluid Mechanics	Course Type	Practical

Course objectives:

- 1 To explore practically components of aircraft piston and gas turbine engines and their working principles.
2. To impart practical knowledge of flow through different parts of a gas turbine engine.

Experiment No.	Experiment
1.	Study of aircraft piston and its components.
2.	Study of gas turbine engines and its components.
3.	Port timing of a 2-stroke engine.
4.	Valve timing of a 4 – stroke engine
5.	Determination of Propeller Thrust and Performance
6.	Performance test on a 4-stroke engine
7.	Wall pressure measurements of subsonic diffusers.
8.	Determine Velocity profiles of wall jets.
9.	Wall pressure measurements of supersonic diffusers.
10.	Cascade testing of axial compressor blade row.
11.	Flame stabilization studies using conical and hemispherical flame holders.

12.	Cascade testing of axial Turbine blade row.
13.	Determine the velocity profiles of free jets.
14.	Wall Pressure measurements of nozzle.
15.	Determination of calorific value of a fuel.

Course Assessment Method
Course Assessment Method (CIE: -50 Marks, ESE: 50 Marks)

Continuous Internal Evaluation Marks (CIE):

<i>Attendance</i>	<i>Preparation/Pre-Lab Work, experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)</i>	<i>Internal Exam</i>	<i>Total</i>	<i>Attendance</i>
10	20	20	50	10

End Semester Examination Marks (ESE)

Procedure/ Preparatory work/Design/ Algorithm	Conduct of experiment/ Execution of work/ troubleshooting/ Programming	Result with valid inference/ Quality of Output	Viva voce	Record	Total
10	15	10	10	5	50

- **Submission of Record:** Students shall be allowed for the end semester examination only upon submitting the duly certified record.
- **Endorsement by External Examiner:** The external examiner shall endorse the record.

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Understand the practical working of components of piston and gas turbine engines employed for airplane propulsion.	K2
CO2	Analyse the performance of Inlets diffusers, Combustion Chamber and Nozzle	K4
CO3	Calculate the performance of piston engines.	K3
CO4	Analyse the flow through compressor and turbine cascades.	K4

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	-	-	-	-	1	2	1	-	3
CO2	3	3	2	2	-	-	-	1	2	1	-	1
CO3	3	3	1	2	-	-	-	1	2	1	-	1
CO4	3	3	2	2	-	-	-	1	2	1	-	1

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Gas Turbine Theory	H Cohen. G F C Rogers HIH Saravanamuthoo	Pearson	2008

Reference Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Elements of Propulsion: Gas Turbines and Rockets	Jack D. Mattingly	AIAA Education Series, 3rd Edition,	2006

Continuous Assessment (20 Marks)

1. Preparation and Pre-Lab Work (5 Marks)

- Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
- Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.

2. Conduct of Experiments (5 Marks)

- Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
- Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and troubleshooting skills during the experiments.
- Teamwork: Collaboration and participation in group experiments.

3. Lab Reports and Record Keeping (5 Marks)

- Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
- Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a well-organized fair record.

4. Viva Voce (5 Marks)

- Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

***Final Marks Averaging:** The final marks for preparation, conduct of experiments, viva, and record are the average of all the specified experiments in the syllabus.*

Evaluation Pattern for End Semester Examination (50 Marks)

1. Procedure/Preliminary Work/Design/Algorithm (10 Marks)

- Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
- Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
- Algorithm Development: Correctness and efficiency of the algorithm related to the experiment.
- Creativity and logic in algorithm or experimental design.

2. Conduct of Experiment/Execution of Work/Programming (15 Marks)

- Setup and Execution: Proper setup and accurate execution of the experiment or programming task.

3. Result with Valid Inference/Quality of Output (10 Marks)

- Accuracy of Results: Precision and correctness of the obtained results.

- Analysis and Interpretation: Validity of inferences drawn from the experiment or quality of program output.

4. Viva Voce (10 Marks)

- Ability to explain the experiment, procedure results and answer related questions
- Proficiency in answering questions related to theoretical and practical aspects of the subject.

5. Record (5 Marks)

Completeness, clarity, and accuracy of the lab record submitted.