B.S. Abdur Rahman®
Crescent
Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

Regulations 2021
Curriculum and Syllabi
(Approved as per 24th Academic Council – August 2025)

B.Sc. (Aviation)

B.S. Abdur Rahman® Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

REGULATIONS 2021

CURRICULUM AND SYLLABI (I to IV semesters)

(As approved by 24th Academic Council – August 2025)

B.Sc. AVIATION

VISION AND MISSION OF THE INSTITUTION

VISION

B.S. Abdur Rahman Crescent Institute of Science and Technology aspires to be a leader in Education, Training and Research in multidisciplinary areas of importance and to play a vital role in the Socio-Economic progress of the Country in a sustainable manner.

MISSION

- To blossom into an internationally renowned Institute.
- To empower the youth through quality and value-based education.
- To promote professional leadership and entrepreneurship.
- To achieve excellence in all its endeavors to face globalchallenges.
- To provide excellent teaching and research ambience.
- To network with global Institutions of Excellence, Business, Industry and Research Organizations.
- To contribute to the knowledge base through Scientific enquiry,Applied Research and Innovation.

DEPARTMENT OF AEROSPACE ENGINEERING

VISION AND MISSION

VISION

Department of Aerospace Engineering aspires to be a premier hub in Aerospace Engineering Education, Training and Research and contribute to the development of Aerospace Technology.

MISSION

- To provide quality education and training in Aerospace Engineering to bring out motivated and capable aerospace engineers.

- To create stimulating environment and supportive infrastructure for knowledge development in Aerospace and related areas.

- To develop analytical skills and undertake collaborative research in Aerospace and related industries.

- To provide leadership qualities and team spirit through a balanced curriculum along with co-curricular, extra-curricular and professional society activities.

PROGRAMME EDUCATIONAL OBJECTIVES AND OUTCOMES
B.Sc. (AVIATION)

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: Graduates will build successful careers in the aviation industry by using their knowledge and skills in areas like flight operations, air traffic control, and airport management.

PEO 2: Graduates will keep learning through higher studies, training, or certifications to stay updated with new technologies and grow in their careers.

PEO 3: Graduates will demonstrate leadership, collaborate effectively with others, and adhere to safety and ethical guidelines in their professional capacities.

PEO 4: Graduates will make responsible choices that advance environmental preservation, aviation safety, and societal well-being.

PROGRAMME OUTCOMES

- PO 1: Demonstrate profound knowledge of aircraft systems and components essential for ensuring safe and efficient flight operations.
- PO 2: Display a comprehensive understanding of air traffic control systems and procedures critical to airline operations.
- PO 3: Interpret meteorological data effectively to support informed and safe aviation decision-making.
- PO 4: Exhibit proficiency in the accurate and safe handling, maintenance, and operation of aviation tools, instruments, and equipment.

- PO 5: Uphold strong social and ethical values, promoting professionalism and a culture of safety within aviation environments.
- PO 6: Embody the principles of airmanship through responsible behaviour and commitment to aviation standards.
- PO 7: Demonstrate excellent communication skills and interpersonal effectiveness in enhancing passenger service and team interactions.
- PO 8: Apply principles of crew resource management, including coordination, teamwork, and sound decision-making during flight operations.
- PO 9: Utilize effective time management strategies to reduce operational delays and support sustainable, eco-friendly aviation practices.

PROGRAMME SPECIFIC OUTCOMES

- PSO 1: Demonstrate operational knowledge of airport systems, including aviation instruments, lighting, signage, ground equipment, and interpretation of meteorological and coded aviation data.
- PSO 2: Apply skills in flight planning and operational communication to support efficient airline operations and prepare for specialized roles within the aviation sector.

REGULATIONS - 2021
B.A. / BBA/ B.Com. / BCA / B.Sc. DEGREE PROGRAMMES
(Under Choice Based Credit System)

(Amendments Approved by the 22nd Academic Council – September 2024)

1.0 PRELIMINARY DEFINITIONS & NOMENCLATURE

In these Regulations, unless the context otherwise requires:

i) **"Programme"** means B.A. / BBA / BCA / B.Com. / B.Sc. Degree Programmes.

ii) **"Course"** means theory / practical / laboratory integrated theory / seminar / internship / project and any other subject that is normally studied in a semester like English, Mathematics, Environmental Science, etc.,

iii) **"Institution"** means B.S. Abdur Rahman Crescent Institute of Science and Technology.

iv) **"Academic Council"** means the Academic Council, which is the apex body on all academic matters of this Institute.

v) **"Dean (Academic Affairs)"** means the Dean (Academic Affairs) of the Institution who is responsible for the implementation of relevant rules and regulations for all the academic activities.

vi) **"Dean (Student Affairs**)" means the Dean (Students Affairs) of the Institution who is responsible for activities related to student welfare and discipline in the campus.

vii) **"Controller of Examinations"** means the Controller of Examination of the Institution who is responsible for the conduct of examinations and declaration of results.

viii) **"Dean of the School"** means the Dean of the School of the deparment concerned.

ix) **"Head of the Department"** means the Head of the Department concerned.

2.0 PROGRAMMES OFFERED AND ELIGIBILITY CRITERIA FOR ADMISSION

2.1 UG Programmes Offered

Degree	Mode of Study
B.A.	Full Time
BBA	
B.Com.	
BCA	
B.Sc.	

2.2 Eligibility Criteria

Students for admission to the first semester of the undergraduate degree programme must have passed the Higher Secondary Examination of the 10 +2 curriculum (Academic stream) or any other examination of any authority accepted by this Institution as equivalent thereto.

S.No.	Programme	Eligibility Criteria
1	BCA	10+2 (Higher Secondary) with Mathematics or equivalent subject
2	B.Sc. Computer Science	10+2 (Higher Secondary) with Mathematics or equivalent subject
3	B.Sc. Biotechnology	10+2 (Higher Secondary) with Chemistry and Biology as subjects
4	B.Sc. Aviation	10+2 (Higher Secondary) with Mathematics or equivalent subject
5	BBA (Financial Services)	10+2 (Higher Secondary)
6	BBA (General)	
7	B.Com. (General)	10+2 (Higher Secondary) with Mathematics, Physics and Chemistry / Physics, Chemistry, Botany and Zoology / Commerce / Statistics as subjects.
8	B.Com (Accounts and Finance)	
9	B.Com. (Hons.)	
10	B.A. English (Hons.)	10 +2 (Higher Secondary)
11	B.A. Islamic Studies	
	B.A. Public Policy	

2.4 The eligibility criteria such as marks, number of attempts and physical fitness shall be as prescribed by the Institution in adherence to the guidelines of regulatory / statutory authorities from time to time.

3.0 STREAMS / SPECIALISATION OF STUDY

The following are the details of specialization / streams offered in various programmes:

S.No.	Program	Streams / Specialisation of Study
1.	**BCA**	i. Cloud Technology and Information Security ii. Mobile Applications and Information Security iii. Data Science iv. Multimedia and Web Application Development v. Artificial Intelligence vi. Cyber security vii. Datascience
2.	**B.Sc.**	i. Computer Science ii. Biotechnology iii. Aviation
3.	**BBA**	i. General ii. Financial Services
4.	**B.Com**	i. General ii. Honours iii. Accounts and Finance
5.	**B.A.**	i. English (Honours) ii. Islamic Studies iii. Public Policy

4.0 STRUCTURE OF THE PROGRAMME

4.1 The curriculum of the UG programmes consists of the following components:

- Core Courses (CC)
- Allied Courses (AC)
- Ability Enhancement Courses (AEC)
- Skill Enhancement Courses (SEC)

- Elective Courses (EC)
- Laboratory Courses (LC)
- Laboratory Integrated Theory Courses (LITC)
- Value added courses
- Mandatory courses (MC)
- Project - PROJ (Project work, seminar, and internship in industry or at appropriate workplace)

4.1.1 Personality and Character Development

All students shall enroll, on admission, in any of the following personality and character development programmes:

- National Cadet Corps (NCC)
- National Service Scheme (NSS)
- National Sports Organization (NSO)
- Youth Red Cross (YRC)
- Rotaract
- Crescent Indian Society Training Development (ISTD – C)
- Crescent Creative Strokes
- Crescent Technocrats Club

The training activities / events / camp shall normally be organized during the weekends / vacation period.

4.1.2 Online Courses for Credit Transfer

Students are permitted to undergo department approved online courses under SWAYAM up to 40% of credits of courses in a semester excluding project semester (if any) with the recommendation of the Head of the Department / Dean of School and with the prior approval of Dean Academic Affairs during his/ her period of study. The credits earned through online courses ratified by the respective Board of Studies shall be transferred following the due approval procedures. The online courses can be considered in lieu of core courses and elective courses.

4.1.3 Value Added Courses

The students are permitted to pursue department approved online courses (excluding courses registered for credit transfer) or courses offered / approved by the department as value added courses.

The details of the value added course viz., syllabus, schedule of classes and the course faculty shall be sent to Dean, Academic

Affairs for approval. The students may also undergo the valued added course offered by other departments with the consent of the Head of the Department offering the course.

These value added courses shall be specified in the consolidated mark sheet as additional courses pursued by the student over and above the curriculum during the period of study.

4.1.4 Industry Internship

The students shall undergo training for a period as specified in the curriculum during the summer vacation in any industry relevant to the field study.

The students are also permitted to undergo internship at a research organization / eminent academic institution for the period prescribed in the curriculum during the summer vacation, in lieu of Industrial training.

In any case, the student shall obtain necessary approval from the Head of the Department / Dean of School and the training has to be taken up at a stretch.

4.1.5 Industrial Visit

The student shall undergo at least one industrial visit every year. The Heads of Departments / Deans of Schools shall ensure the same.

4.2 Each course is normally assigned certain number of credits:

- One credit per lecture period per week
- One credit per tutorial period per week
- One credit for two to three periods and two credits for four periods of laboratory or practical sessions per week
- One credit for two periods of seminar / project work per week
- One credit for two weeks of industrial training or 80 hours per semester.

4.3 Each semester curriculum shall normally have a blend of lecture courses, laboratory courses, laboratory integrated theory courses, etc.

4.4 For successful completion of the programme, a student must earn a minimum total credit specified in the curriculum of the respective programme of study.

4.5 The medium of instruction, examinations and project report shall be English, except B.A. Islamic Studies (Arabic medium) and for courses in languages other than English.

5.0 DURATION OF THE PROGRAMME

5.1 A student is expected to complete the programme in 6 semesters but in any case not more than 10 continuous semesters reckoned from the date of first admission.

5.2 Each semester shall consist of a minimum of 90 working days including the days of examinations.

5.3 The maximum duration for completion of the programme as mentioned in clause 5.1 shall also include period of break of study vide clause 7.1 so that the student may be eligible for the award of the degree.

6.0 REGISTRATION AND ENROLLMENT

6.1 The students of first semester shall register and enroll for courses at the time of admission by paying the prescribed fees. For the subsequent semesters registration for the courses shall be done by the student one week before the last working day of the previous semester.

6.2 A student can enroll for a maximum of 38 credits during a semester including Redo / Predo Courses.

6.3 Change of Course

A student can change an enrolled course within 10 working days from the commencement of the course, with the approval of the Dean (Academic Affairs), on the recommendation of the Head of the Department / Dean of School of the student.

6.4 Withdrawal from a Course

A student can withdraw from an enrolled course at any time before the first continuous assessment test for genuine reasons, with the approval of the Dean (Academic Affairs), on the recommendation of the Head of the Department / Dean of School of the student.

7.0 BREAK OF STUDY FROM PROGRAMME

7.1 A student may be allowed / enforced to take a break of study for two semesters from the programme with the approval of Dean (Academic Affairs) for the following reasons:

7.1.1 Medical or other valid grounds

7.1.2 Award of 'I' grade in all the courses in a semester due to lack of attendance

7.1.3 Debarred due to any act of indiscipline.

7.2 The total duration for completion of the programme shall not exceed the prescribed maximum number of semesters (vide clause 5.1).

7.3 A student who has availed break of study in the current semester (odd/even) can rejoin only in the subsequent corresponding (odd/even) semester in the next academic year on approval from Dean, Academic affairs.

7.4 During the break of study, the student shall not be allowed to attend any regular classes or participate in any activities of the institution. However he / she shall be permitted to enroll for the 'I' grade courses and appear for the arrear examinations.

8.0 CLASS ADVISOR AND FACULTY ADVISOR

8.1 Class Advisor

A faculty member will be nominated by the Head of the Department / Dean of School as class advisor for the class throughout the period of study.

The class advisor shall be responsible for maintaining the academic, curricular and co-curricular records of students of the class.

8.2 Faculty Advisor

To help the students in planning their courses of study and for general counseling, the Head of the Department / Dean of School of the students will attach a maximum of 20 students to a faculty member of the department who shall function as faculty advisor for the students throughout their period of study. Such faculty advisors shall guide the students in taking up the elective courses for registration and enrolment in every semester and also offer advice to the students on academic and related personal matters.

9.0 COURSE COMMITTEE

9.1 Each common theory course offered to more than one group of students shall have a "Course Committee" comprising all the course faculty teaching the common course with one of them nominated as course coordinator. The nomination of the course coordinator shall be made by the Head of the Department / Dean (Academic Affairs) depending on whether all the course faculty teaching the common course belong to a single department or from several departments. The course committee shall ensure preparation of a common question

paper and scheme of evaluation for the tests and semester end examination.

10.0 CLASS COMMITTEE

A class committee comprising faculty members handling the courses, student representatives and a senior faculty member not handling the courses as chairman will be constituted semester-wise by the Head of the Department.

10.1 The composition of the class committee will be as follows:

- One senior faculty member preferably not handling courses for the concerned semester, appointed as chairman by the Head of the Department.
- All the faculty members handling courses of the semester.
- Six student representatives (male and female) of each class nominated by the Head of the Department in consultation with the relevant faculty advisors.
- All faculty advisors and the class advisors
- Head of the Department - Ex-Officio Member

10.2 The class committee shall meet at least three times during the semester. The first meeting shall be held within two weeks from the date of commencement of classes, in which the components of continuous assessment for various courses and the weightages for each component of assessment shall be decided for the first and second assessment. The second meeting shall be held within a week after the date of first assessment report, to review the students' performance and for follow up action.

10.3 During these two meetings the student members shall meaningfully interact and express opinions and suggestions to improve the effectiveness of the teaching-learning process, curriculum, and syllabi, etc.

10.4 The third meeting of the class committee, excluding the student members, shall meet after the semester end examinations to analyse the performance of the students in all the components of assessments and decide their grades in each course. The grades for a common course shall be decided by the concerned course committee and shall be presented to the class committee(s) by the

course faculty concerned.

11.0 ASSESSMENT PROCEDURE AND PERCENTAGE WEIGHTAGE OF MARKS

11.1 Every theory course shall normally have a total of three assessments during a semester as given below:

Assessments	Course Coverage in Weeks	Duration	Weightage of Marks
Assessment 1	1 to 6	1.5 hours	25%
Assessment 2	7 to 12	1.5 hours	25%
Semester End Examination	Full course	3 hours	50%

11.2 Theory Course

Appearing for semester end theory examination for each course is mandatory and a student shall secure a minimum of 40% marks in each course in semester end examination for the successful completion of the course.

11.3 Laboratory Course

Every practical course shall have 60% weightage for continuous assessments and 40% for semester end examination. However, a student shall have secured a minimum of 50% marks in the semester end practical examination for the award of pass grade.

11.4 Laboratory integrated theory courses

For laboratory integrated theory courses, the theory and practical components shall be assessed separately for 100 marks each and consolidated by assigning a weightage of 75% for theory component and 25% for practical components. Grading shall be done for this consolidated mark. Assessment of theory components shall have a total of three assessments with two continuous assessments carrying 25% weightage each and semester end examination carrying 50% weightage. The student shall secure a separate minimum of 40% in the semester end theory examination. The evaluation of practical components shall be through continuous assessment.

11.5 The components of continuous assessment for theory / practical /

laboratory integrated theory courses shall be finalized in the first class committee meeting.

11.6 Industry Internship

In the case of industry internship, the student shall submit a report, which shall be evaluated along with an oral examination by a committee of faculty members constituted by the Head of the Department. The student shall also submit an internship completion certificate issued by the industry / research / academic organisation. The weightage of marks for industry internship report and viva voce examination shall be 60% and 40% respectively.

11.7 Project Work

In the case of project work, a committee of faculty members constituted by the Head of the Department / Dean of the School shall carry out three periodic reviews. Based on the project report submitted by the students, an oral examination (viva voce) shall be conducted as semester end examination by an external examiner approved by the Controller of Examinations. The weightage for periodic reviews shall be 50%. Of the remaining 50%, 20% shall be for the project report and 30% for the viva voce examination.

11.8 Assessment of seminars and comprehension shall be carried out by a committee of faculty members constituted by the Head of the Department.

11.9 For the first attempt of the arrear theory examination, the internal assessment marks scored for a course during first appearance shall be used for grading along with the marks scored in the arrear examination. From the subsequent appearance onwards, full weightage shall be assigned to the marks scored in the semester end examination and the internal assessment marks secured during course of study shall become invalid.

In case of laboratory integrated theory courses, after one regular and one arrear appearance, the internal mark of theory component is invalid and full weightage shall be assigned to the marks scored in the semester end examination for theory component. There shall be no arrear or improvement examination for lab components.

12.0 SUBSTITUTE EXAMINATIONS

12.1 A student who is absent, for genuine reasons, may be permitted to

write a substitute examination for any one of the two continuous assessment tests of a course by paying the prescribed substitute examination fee. However, permission to take up a substitute examination will be given under exceptional circumstances, such as accidents, admission to a hospital due to illness, etc. by a committee constituted by the Head of the Department / Dean of the School for that purpose. There is no substitute examination for semester end examination.

12.2 A student shall apply for a substitute exam in the prescribed form to the Head of the Department / Dean of the School within a week from the date of assessment test. However, the substitute examination will be conducted only after the last instructional day of the semester.

13.0 ATTENDANCE REQUIREMENT AND SEMESTER / COURSE REPETITION

13.1 A student shall earn 100% attendance in the contact periods of every course, subject to a maximum relaxation of 25% to become eligible to appear for the semester end examination in that course, failing which the student shall be awarded “I” grade in that course.

13.2 The faculty member of each course shall cumulate the attendance details for the semester and furnish the names of the students who have not earned the required attendance in the concerned course to the class advisor. The class advisor shall consolidate and furnish the list of students who have earned less than 75% attendance, in various courses, to the Dean (Academic Affairs) through the Head of the Department/ Dean of the School. Thereupon, the Dean (Academic Affairs) shall officially notify the names of such students prevented from writing the semester end examination in each course.

13.3 If a student secures attendance between 65% and less than 75% in any course in a semester, due to medical reasons (hospitalization / accident / specific illness) or due to participation in the institution approved events, the student shall be given exemption from the prescribed attendance requirement and the student shall be permitted to appear for the semester end examination of that course. In all such cases, the students shall submit the required documents immediately after joining the classes to the class advisor, which shall be approved by the Head of the Department / Dean of the School. The Vice

Chancellor, based on the recommendation of the Dean (Academic Affairs) may approve the condonation of attendance.

13.4 A student who has obtained an "I" grade in all the courses in a semester is not permitted to move to the next higher semester. Such students shall repeat all the courses of the semester in the subsequent academic year.

13.5 The student awarded "I" grade, shall enroll and repeat the course when it is offered next. In case of "I" grade in an elective course either the same elective course may be repeated, or a new elective course may be taken with the approval of Head of the Department / Dean of the School.

13.6 A student who is awarded "U" grade in a course shall have the option to either write the semester end arrear examination at the end of the subsequent semesters, or to redo the course in the evening when the course is offered by the department. Marks scored in the continuous assessment in the redo course shall be considered for grading along with the marks scored in the semester end (redo) examination. If any student obtains "U" grade in the redo course, the marks scored in the continuous assessment test (redo) for that course shall be considered as internal mark for further appearance of arrear examination.

13.7 If a student with "U" grade, who prefers to redo any particular course, fails to earn the minimum 75% attendance while doing that course, then he / she is not permitted to write the semester end examination and his / her earlier "U" grade and continuous assessment marks shall continue.

14.0 REDO COURSES

14.1 A student can register for a maximum of three redo courses per semester without affecting the regular semester classes, whenever such courses are offered by the concerned department, based on the availability of faculty members and subject to a specified minimum number of students registering for each of such courses.

14.2 The number of contact hours and the assessment procedure for any redo course shall be the same as regular courses, except there is no provision for any substitute examination and withdrawal from a redo course.

15.0 PASSING AND DECLARATION OF RESULTS AND GRADE SHEET

15.1 All assessments of a course shall be made on absolute marks basis. The class committee without the student members shall meet to analyse the performance of students in all assessments of a course and award letter grades following the relative grading system. The letter grades and the corresponding grade points are as follows:

Letter Grade	Grade Points
S	10
A	9
B	8
C	7
D	6
E	5
U	0
W	-
I	-

"W" - denotes withdrawal from the course.

"I" - denotes inadequate attendance in the course and prevention from appearance of semester end examination

"U" - denotes unsuccessful performance in the course.

15.2 A student who earns a minimum of five grade points ('E' grade) in a course is declared to have successfully completed the course. Such a course cannot be repeated by the student for improvement of grade.

15.3 Upon awarding grades, the results shall be endorsed by the chairman of the class committee and Head of the Department / Dean of the School. The Controller of Examination shall further approve and declare the results.

15.4 Within one week from the date of declaration of result, a student can apply for revaluation of his / her semester end theory examination answer scripts of one or more courses, on payment of prescribed fee, through proper application to the Controller of Examinations. Subsequently the Head of the Department/ Dean of the School offered the course shall constitute a revaluation committee consisting of chairman of the class committee as convener, the faculty member of the course and a senior faculty member having expertise in that

course as members. The committee shall meet within a week to revalue the answer scripts and submit its report to the Controller of Examinations for consideration and decision.

15.5 After results are declared, grade sheets shall be issued to each student, which contains the following details: a) list of courses enrolled during the semester including redo courses / arrear courses, if any; b) grades scored; c) Grade Point Average (GPA) for the semester and d) Cumulative Grade Point Average (CGPA) of all courses enrolled from first semester onwards.

GPA is the ratio of the sum of the products of the number of credits of courses registered and the grade points corresponding to the grades scored in those courses, taken for all the courses, to the sum of the number of credits of all the courses in the semester.

If C_i, is the number of credits assigned for the i^{th} course and GP_i is the Grade Point in the i^{th} course,

$$GPA = \frac{\sum_{i=1}^{n}(C_i)(GPi)}{\sum_{i=1}^{n} C_i}$$

Where n = number of courses

The Cumulative Grade Point Average (CGPA) is calculated in a similar manner, considering all the courses enrolled from the first semester.

“I” and "W" grades are excluded for calculating GPA.

"U", “I”and **"W"** grades are excluded for calculating CGPA.

The formula for the conversion of CGPA to equivalent percentage of marks shall be as follows:

Percentage equivalent of marks = CGPA X 10

15.6 After successful completion of the programme, the degree shall be awarded to the students with the following classifications based on CGPA.

Classification	CGPA
First Class with Distinction	8.50 and above and passing all the courses in first appearance and completing the programme within the prescribed period of six semesters.
First Class	6.50 and above, having completed within a period of eight semesters.
Second Class	Others

15.6.1 Eligiblity for First Class with Distinction

- A student should not have obtained “U” or “I” grade in any course during his/her study.
- A student should have completed the UG programme within the minimum prescribed period of study (except clause 7.1.1)

15.6.2 Eligibility for First Class

- A student should have passed the examination in all the courses not more than two semesters beyond the minimum prescribed period of study (except clause clause 7.1.1)

15.6.3 The students who do not satisfy clause 16.6.1 and clause 16.6.2 shall be classified as second class.

15.6.4 The CGPA shall be rounded to two decimal places for the purpose of classification. The CGPA shall be considered up to three decimal places for the purpose of comparison of performance of students and ranking.

16.0 SUPPLEMENTARY EXAMINATION

Final year students and passed out students can apply for supplementary examination for a maximum of three courses thus providing an opportunity to complete their degree programme. The students can apply for supplementary examination within three weeks of the declaration of results in the even semester.

17.0 DISCIPLINE

17.1 Every student is expected to observe discipline and decorum both inside and outside the campus and not to indulge in any activity which tends to affect the reputation of the Institution.

17.2 Any act of indiscipline of a student, reported to the Dean (Student Affairs), through the Head of the Department / Dean of the School concerned shall be referred to a Discipline and Welfare Committee constituted by the Registrar for taking appropriate action. This committee shall also address the grievances related to the conduct of online classes.

18.0 ELIGIBILITY FOR THE AWARD OF DEGREE

18.1 A student shall be declared to be eligible for the award of B.A. / BBA / BCA / B.Com. / B.Sc. degree provided the student has:

i) Successfully earned the required number of total credits as specified in the curriculum of the programme of study within a maximum period of 10 semesters from the date of admission, including break of study.

ii) Successfully completed the requirements of the enrolled professional development activity.

iii) No dues to the Institution, Library, Hostel, etc.

iv) No disciplinary action pending against him/her.

18.2 The award of the degree must have been approved by the Institution.

19.0 POWER TO MODIFY

Notwithstanding all that has been stated above, the Academic Council has the right to modify the above regulations from time to time.

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B.S. ABDUR RAHMAN CRESCENT INSTITUTE OF SCIENCE AND TECHNOLOGY

REGULATIONS 2021
CURRICULUM & SYLLABI FOR B.Sc. AVIATION
(SIX SEMESTERS / FULL TIME)

SEMESTER I

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1.	AEC	END 1183	General English – I	3	0	0	3
2.	AEC	LND 1181	General Tamil – I	2	1	0	3
	AEC	LND 1182	German – I	2	1	0	3
	AEC	LND 1183	Arabic Language	3	0	0	3
3.	AC	PHE 1184	Physics	3	0	0	3
4.	CC	AVD 1101	Introduction to Airline Industry	3	0	0	3
5.	CC	AVD 1102	Aviation Meteorology	3	1	0	4
6.	CC	AVD 1103	Principles of Flight	3	0	0	3
7.	LC	AVD 1104	Workshop Practices	0	0	4	2
8.	SEC	END 1184	Essential Communication Skills	0	0	2	1
			Total Credits				**22**

SEMESTER II

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1	AEC	END 1283	General English – II	3	0	0	3
2	AEC	LND 1281	General Tamil – II	2	1	0	3
	AEC	LND 1282	German – II	3	0	0	3
	AEC	LND 1283	Modern Communicative Arabic	3	0	0	3
3	AC	MAD 1286	Mathematics	3	1	0	4
4	CC	AVD 1201	Aircraft Structures	3	0	0	3
5	CC	AVD 1202	Air Regulation	3	0	0	3
6	AC	GED 1207	Environmental Studies	2	0	0	2
7	LC	AVD 1203	Technical Drawing – Laboratory	0	0	4	2
8	AEC	COD 3103	NSS	1	1	0	2
			Total Credits				**22**

SEMESTER III

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1.	CC	AVD 2101	General Navigation	4	0	0	4
2.	CC	AVD 2102	Aircraft Systems	3	0	0	3
3.	CC	AVD 2103	Airline and Airport Operations	3	0	0	3
4.	CC	AVD 2104	Radio Navigation	4	0	0	4
5.	EC	AVDX ..	Professional Elective Course				3
6.	CC	AVD 2105	Flight Instruments	3	0	0	3
7.	LC	AVD 2106	Flight Simulator Laboratory	0	0	4	2
			Total Credits				**22**

SEMESTER IV

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1.	CC	AVD 2201	Piston Engine and Propeller	3	1	0	4
2.	CC	AVD 2202	Operational Procedures	3	0	0	3
3.	CC	AVD 2203	Mass and Balance	3	0	0	3
4.	EC	AVDX ..	Professional Elective Course				6
5.	CC	AVD 2204	Composite Materials and Structures	3	1	0	4
6.	LC	AVD 2205	Aero Engine Laboratory	0	0	4	2
7.	PROJ	AVD 2206	Internship	0	0	2	1
			Total Credits				**23**

SEMESTER V

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1.	CC	AVD 3101	Radio Telephony Restricted	3	0	0	3
2.	CC	AVD 3102	Gas Turbine Engine - Module 15	3	1	0	4
3.	CC	AVD 3103	Aircraft Performance	4	0	0	4
4.	EC	AVDX ..	Professional Elective Courses				6
5.	CC	AVD 3104	AI and its application in Aviation	2	0	1	3
6.	SEC		Aptitude	0	0	4	2
7.	LC	AVD 3105	UAV Design Laboratory	1	0	1	2
			Total Credits				**24**

SEMESTER VI

Sl. No.	Course Group	Course Code	Course Title	L	T	P	C
1.	CC	AVD 3201	Airport and Airline Passenger Management	3	0	0	3
2.	CC	AVD 3202	Civil Aviation Requirements (CAR) & Safety Management System (SMS)	3	0	0	3
3.	EC	AVDX …	Professional Elective Course				6
5.	PROJ	AVD 3203	Project work	0	0	18	9
			Total Credits				**21**

PROGRAMME ELECTIVE COURSES FOR B.Sc. AVIATION - R 2021

Sl. No.	Course Code	Course Title	L	T	P	C
1.	AVDX 01	Non-Destructive Testing	3	0	0	3
2.	AVDX 02	Aircraft Design	3	0	0	3
3.	AVDX 03	Airframe Construction & Maintenance Procedures	3	0	0	3
4.	AVDX 04	Flight Planning & Monitoring	3	0	0	3
5.	AVDX 05	Operations Control Centre (OCC)	3	0	0	3
6.	AVDX 06	Aircraft Materials & Hardware	3	0	0	3
7.	AVDX 07	Aviation Security	3	0	0	3
8.	AVDX 08	Dangerous Goods & Cargo	3	0	0	3
9.	AVDX 09	ATC Communication & its Systems	3	0	0	3
10.	AVDX 10	Human Factors & Performance	3	0	0	3
11.	AVDX 11	Aircraft Electricals & Electronics	3	0	0	3

SEMESTER I

END 1183	GENERAL ENGLISH - I	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To enable students to read, comprehend and appreciate the value of literature to life

COB2: To help them acquire language skills through Literature

COB3: To develop LSRW skills through practice in variety of contexts

COB4: To improve their vocabulary and correct English usage.

MODULE I **9**

Poetry: No Man is an Island – John Donne;
O Captain! My Captain! –Walt Whitman Speaking: Introducing oneself and introducing each other Writing: Hints Development
Language: Articles, Adjectives & Adverbs (comparisons), Punctuation, Vocabulary: Homophones and homographs

MODULE II **9**

Prose: “Spoken English and Broken English” – G.B.Shaw
Listening: Listening for gist (general meaning)
The Speech that made Obama President. (6.12 minutes) Speaking: Conversations - formal and semi formal contexts writing: Jumbled sentences
Language: Pronouns and Linking words, Conjunctions
Vocabulary: Register – Formal, semi-formal and Informal

MODULE III **9**

Short story: “The Cherry Tree” - Ruskin Bond
Speaking: Asking questions (about companies. Products, Jobs)
Creative Writing: Open ended stories
Language: Question Forms – ‘Wh’ & Yes/No
Vocabulary: Prefixes and Suffixes, negative prefixes

MODULE IV **9**

Short story: “The Last Leaf" - O. Henry
Speaking: Role play (Telephone call to a supplier, enquiry about products)
Writing: Letter of Enquiry, Replies to Enquiry

Language: Tenses

Vocabulary: Synonyms and Antonyms

MODULE V **9**

Prose: “Voluntary Poverty” – Mahatma Gandhi

Listening: Listening for specific information - You must follow if you want success by Sundar Pichai. (8.42 minutes)

Speaking: Giving the summary of an article (from newspapers)

Writing: Order Letter, Complaint Letter

Language: Subject -Verb Agreement

Vocabulary: Business Vocabulary (marketing, air travel)

L – 45 ; TOTAL HOURS – 45

REFERENCES:

1. Guy Brook-Hart, Business Benchmark Upper- Intermediate Student’s Book, CUP, 2006
2. Sriraman.T, Macmillan College Prose, Laksmi Publications, 2015
3. Whitby, Norman, Business Benchmark: Pre-intermediate to Intermediate, 2nd Edition, CUP, 2014.
4. Swan.M, Practical English Usage, OUP, 2005.
5. https://www.thehindu.com/opinion/open-page/it-has-done-more-harm-than-good/article5129459.ece
6. https://www.youtube.com/watch?v=OFPwDe22CoY
7. https://www.youtube.com/watch?v=iAlsg_orac8

COURSE OUTCOMES:

CO1: Respond to literary texts efficiently

CO2: Appreciate and critically analyse literary texts

CO3: Display effective LSRW skills in academic and professional contexts

CO4: Demonstrate a range of appropriate vocabulary in a variety of situations

CO5: Communicate effectively using grammatically correct language

Board of Studies (BoS):	**Academic Council:**
13th BOS of Department of English held on 17.06.2021	22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	H	H	H	M	H	H	L	L	M
CO2	H	H	H	H	H	M	H		L	M
CO3	M	H	H	L	M	H	H	M		L
CO4	H	H	H	H	H	H	H	H	L	
CO5	L	H	L	H	H	M	H			

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Statement: The acquisition of LSRW skills of English language could help students in promoting lifelong learning opportunities.

LND 1181	பொதுத் தமிழ் - I	L	T	P	C
நோக்கங்கள்	GENERAL TAMIL - I	2	1	0	3

- சமூக மாற்றச்சிந்தனைகளை உள்ளடக்கிய தற்காலஇலக்கியங்களை அறிமுகம் செய்தல்
- இருபதாம் நூற்றாண்டு மரபுக்கவிதைகளை அறிமுகம் செய்தல்
- புதுக்கவிதை, சிறுகதை, உரைநடை ஆகிய இலக்கியங்களை நயம் பாராட்டுதல்
- புதுக்கவிதை மற்றும் சிறுகதையின் தோற்றம் வளர்ச்சி குறித்து எடுத்துரைத்தல்
- சந்திப் பிழையின்றி எழுத மாணவர்களைப் பயிற்றுவித்தல்
- கவிதை மற்றும் சிறுகதை எழுத மாணவர்களை ஊக்கப்படுத்துதல்

அலகு I இருபதாம் நூற்றாண்டு மரபுக்கவிதைகள் 8

கவிமணி தேசிய விநாயகம் பிள்ளை - உடல் நலம் பேணல், பாரதியார்– செந்தமிழ் நாடு, பாரதிதாசன்– நீங்களே சொல்லுங்கள், கண்ணதாசன்– குடும்பம் ஒரு கதம்பம்.

அலகு II புதுக்கவிதைகள் 8

இன்குலாப்– போராட்டம், அப்துல்ரகுமான்– மண், வைரமுத்து–விதைச் சோளம், நா.காமராசன்–அலிகள், ஆண்டாள் பிரியதர்சினி– தொலைந்து போனது, மு.மேத்தா– தேசப்பிதாவுக்கு ஒரு தெருப்பாடகனின் அஞ்சலி, ஹைக்கூ கவிதைகள்.

அலகு III சிறுகதைகள் 8

ஜெயகாந்தன்–நந்தவனத்தில் ஓர் ஆண்டி, கி.இராஜநாராயணன்– கதவு, சு.சமுத்திரம் - ஏழை-ஆப்பிள்-நட்சத்திரம், மாதவிக்குட்டி–நெய்ப்பாயாசம், தி.ஜானகிராமன்– முள்முடி.

அலகுIV மொழிப்பயிற்சி 7

கலைச்சொல்லாக்கம், பிழைத்திருத்தம் (ஒருமை, ல-ள-ழகர, ர-ற-கர, ண-ந-னகரவேறுபாடுகள்), அயற்சொற்களைதல்.

அலகு V இலக்கிய வரலாறு 7

பாடந்தழுவியது (இருபதாம் நூற்றாண்டு மரபுக் கவிதைகள், புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும், சிறுகதையின் தோற்றமும் வளர்ச்சியும்)

அலகு VI படைப்பிலக்கியம் 7

கவிதை எழுதுதல், சிறுகதை வரைதல்

L – 45 ; T – 15 ; TOTAL HOURS – 45

குறிப்புகள்

1. பொதுத் தமிழ் – செய்யுள் திரட்டு – தமிழ்த் துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு –சோம. இளவரசு
3. சிறுகதைத் தொகுப்பு (கட்டுரைக் களஞ்சியம்)

வெளிப்பாடு

- மாணவர்கள் சமூக மாற்றச்சிந்தனைகளை அறிந்து கொள்வர்
- இருபதாம் நூற்றாண்டு மரபுக்கவிதைகள் குறித்த அறிவினைப்பெறுவர்.

- சந்திப்பிழைகளைநீக்கி எழுதும் திறன் பெறுவர்
- இருபதாம் நூற்றாண்டு தமிழ் இலக்கியத்தின் வரலாறு, வளர்ச்சி, பாடுபொருள் ஆகியவற்றை உணர்ந்து கொள்வர்.
- இருபதாம் நூற்றாண்டு தமிழ் இலக்கியப் படைப்பாளர்களைப் பற்றி அறிந்து கொள்வர்.
- புத்திலக்கியங்களைப் படைக்கும் திறனையும் திறனாய்வு செய்யும் திறனையும்பெறுவர்

Board of Studies (BoS):
14th BOS of Department of Commerce held on 22.4.2021

Academic Council:
22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							M	M	M	M		M
CO2							L	L	L	M		M
CO3							L	M	L	L		L
CO4							L	L	M	L		L
CO5							L	L	L	L		L
CO6							M	M	M	M		L

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 16: Peace, Justice and Strong Institutions

Statement: Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime through the Quranic, Vedic and Biblical literature.

LND 1182	GERMAN - I	L	T	P	C
SDG: 4		2	1	0	3

COURSE OBJECTIVES:

COB1: To improve the proficiency of students in German language.

COB2: To create awareness of using vocabulary among students.

COB3: To expose them to correct grammatical forms of the language.

COB4: To empower them for successful communication in the society..

COB5: To understand matters which are of daily usage.

COB6: To understand them for describe the people need and their requirements.

MODULE I GUTEN TAG! 7

Learn alphabet, introduction to German -greetings, identifying countries and their capital cities and languages, introducing oneself, read and write Cardinal numbers till 100, Read and write telephone numbers and e-mail addresses. Grammar - question words, sentence structure and formation, Regular verbs - Conjugation and personal pronouns.

MODULE II FREUNDE, KOLLEGEN UND ICH 7

Introducing Others and Family Members, To speak about hobbies, jobs, learn Cardinal numbers from 101, Days, Months, Seasons, Colours, Day Timings, directions; Vocabulary: related to the topic; Grammar: Definite Articles, Irregular Verbs & Conjugations, Auxiliary verbs, ja/nein Fragen und Antworten, Nouns singular/plural.

MODULE III IN DER STADT 8

To know places, buildings, know transport systems, understand international words, Shopping, talk to sales person while purchasing goods, return faulty goods at a shop, asking someone to repeat something , read and write Ordinal numbers till 100,; Vocabulary: related to the topic; Grammar: Indefinite articles, Negotiation, Imperative - Sie form.

MODULE IV GUTEN APPETIT! 8

To speak about food, Daily routine ,Going to the market – asking prices, filling up simple forms; Vocabulary: related to the topic; Grammar: Verb position, Simple Present Tense with regular and irregular verbs.

MODULE V TAG FÜR TAG 7

To learn time related expressions and asking Time , speak about family, ask excuse; Vocabulary: related to the topic; Simple Conversation skills (pertaining chiefly to simple dialogues in everyday situations), Grammar: Preposition – am, im, um, von bis, Modal verbs, Present perfect Tense with regular and irregular verbs

MODULE VI ZEIT MIT FREUNDEN 8

To speak about birthdays, understand and write an invitation, converse in the restaurant and Pay; Vocabulary: related to the topic; Simple Text -Translation and Reading Comprehension Practice German Into English Vice versa: Grammar: Accusative personal pronouns, Possessive Pronomen, Verbs and prepositions, Gern - word Usage in Sentence formation.

L – 30; T – 15; TOTAL HOURS – 45

TEXT BOOKS:

1. Stefanie Dengler, “Netzwerk A1.1”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2015.Sriraman.T, Macmillan College Prose, Laksmi Publications, 2015

PRACTICE BOOKS:

1. Johannes Gerbes, “Fit fürs Goethe-Zertifikat A1”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2010.

REFERENCES:

1. Paul Rusch, “Einfach Grammatik”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2012.
2. Hermann Funk, “studio d A1”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2009. 15OH78 German Language.

COURSE OUTCOMES:

On successful completion of this course learners will be able to:

CO1: Show their proficiency in German Language.

CO2: Use appropriate vocabulary in real life contexts.

CO3: Use appropriate grammatical forms while communicating with people.

CO4: Effectively use the language in social and academic contexts

CO5: Comprehend matters which are of daily usage

CO6: Communicate as per people’s need and requirement.

Board of Studies (BoS):

14th BOS of Department of Commerce held on 22.4.2021

Academic Council:

22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H	M	H		H	H	H	M	H	M	H		
CO2				H		H	H	H	H	H		H		
CO3				H		H	H	H	H	H		H		
CO4				H		H	H	H		H		H		
CO5				H		H	H	H		H		H		
CO6				H		H	H	H		H		H		

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 4 : Quality Education

Statement: The substantially improve the relevant skills which develop the confidence in young people, including technical and vocational skills, help for employment, decent work and entrepreneurship.

LND 1183	ARABIC LANGUAGE	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

The course aims to teach:

COB1: Arabic alphabets, reading and writing and pronunciation.

COB2: Listening and writing of words related to market, doctor, parts of body, dining.

COB3: Arabic simple sentences using names of animals, birds, singular and plural.

COB4: Listening and writing of Countries' names, singular, dual and plural.

COB5: Arabic sentences using verbs, tenses and numbers.

MODULE I INTRODUCTION TO ARABIC READING AND WRITING 9

Introduction to Arabic alphabets - reading from right to left - Listening to audio & video – practice correct pronunciation – Writing join letters from right to left - (lessons: 1 and 2): (حجرة الدراسة ، حجرة الدراسة 2، المرور) - introduction to Arabic words in and around the classroom – Transport - Vocabulary related to market - introduction of verbs (lessons: 4 – 6).

MODULE II LISTENING ARABIC COMMUNICATION 9

Reading skill: Lessons 4 – 6. Words related to doctor, parts of body, dining, fruits, food items, family members, house and air travel (أعضاء الجسم والمطعم والفواكه وغيرها أسماء) Vocabulary related to names of animals, birds (lessons: 7 – 12).

MODULE III SIMPLE SENTENCES 9

Home – singular and plural - introduction to gender: irst person, second person and third person – inerrogatory sentences - arabic simple sentences – nominal sentence and verbal sentence (الجملة االسمية والفعلية) (lessons: 13 & 14) Words related to kitchen utensils – cooking (المطبخ والطبخ أسماء أواني)– introduction to gender: firt person, second person and third person (التذكير والتأنيث) – singular and plural – vocabulary related to office – possession (االضافة) - (lessons: 15 – 17)

MODULE IV COMMUNICATION PRACTICE 9

Countries names – world map - performing ablution – vocabulary related to prayer - singular, dual and plural - situational communication - emphasis on interrogation (المحادثة العربية) (lessons: 18 – 20)

MODULE V TENSE, SINGULAR & PLURAL 9

Sentence making – words related to prayer – verbs and tenses – communication on

dining – gender - singular and dual – numbers – discussion of evening – dining manners (المفرد والتثنية والجمع والعدد) (lessons: 21 – 25)

L – 45; Total Hours – 45

TEXT BOOKS:

1. Al QirathulArabiyya Lil Mubtadiyeenالقراءة العربية للمبتدئين (UmmulQura University, Makkah), Bukhari Aalim Arabic College, 2005.

REFERENCES:

1. Al Arabiya Lin Nashiyeen (Education Ministry, K.S.A.), Bukhari Aalim Arabic College, 2005.
2. Dr. V. Abdur Raheem, Durus Al LugathilArabiyya Li Ghairin Natiqeen Biha, Islamic Foundation Trust, Chennai, 2002.

COURSE OUTCOMES:

At the end of the course, the student is expected to:

CO1: Vocabulary related to the market, doctor, parts of body, dining.

CO2: Identify Arabic names of animals, birds, singular and plural, interrogatory sentences.

CO3: Recognize Arabic alphabets, reading and writing and pronunciation.

CO4: Use countries names, singular, dual and plural.

CO5: Form Arabic sentences using verbs, tenses and numbers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						L								
CO2							M							
CO3							M							
CO4						L								
CO5							M							

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.4. Developing Language skill

Statement: Arabic language enhances effective communication in the workplace.

PHE 1184	PHYSICS	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To build a solid foundation in classical mechanics

COB2: To develop a comprehensive understanding of thermodynamics

COB3: To gain expertise in wave phenomena and optics.

COB4: To acquire a deep knowledge of electrostatics COB 5: To master the principles of electricity and circuits

MODULE I MECHANICS 9

Forces and Newton's law of motion: Introduction to forces, Newton's first, second and third laws. Equations of motion: Kinematic equations, Applications. Motion in a uniform gravitational field: Understanding gravity, Free fall and projectile motion. Motion of charges particles in uniform electric and magnetic fields: Electric fields, Magnetic fields. Conservation of momentum and Friction: Conservation of momentum, Friction. Problems.

MODULE II THERMODYNAMICS 9

Introduction to thermodynamics: Thermodynamic systems, Thermodynamic properties and variables, thermodynamic Equilibrium. Zeroth law and temperature: The zeroth law of thermodynamics. First law of thermodynamics: Origin of the first law, First law of closed systems, Applications of the first law. Enthalpy and second law: Enthalpy, The second law of thermodynamics, Heat engines. Carnot cycle and refrigeration: Carnot cycle, Carnot engine as a refrigerator. Problems.

MODULE III WAVES AND OPTICS 9

Simple harmonic motion (SHM): Introduction to oscillations, Differential equations of SHM, Graphical representation of SHM, Types of vibrations, Resonance and sharpness of resonance. Interference: Analytical treatment of interference, Conditions for maxima and minima, Coherent sources, Interference in thin films, Michelson interferometer. Problems and Applications.

MODULE IV ELECTROSTATICS 9

Introduction to electric charges: Properties of electric charges, Coulomb's law. Electric field and superposition principle: Electric field, Superposition principle. Electric potential and its relation to electric field: Electric potential, Relationship between electric field and potential. Electric flux and Gauss's law: Electric flux, Gauss's law. Charge distribution and electric dipole: Linear, surface and volume charge distributions, Stability of charges, Electric dipole. Problems.

MODULE V ELECTRICITY 9

Introduction to electrical circuits: Basic concepts, Resistors in series and parallel, Specific resistance. Capacitors and Capacitance: Capacitors, Capacitors in series and parallel. Kirchhoff's laws and Bridge Circuits: Kirchhoff's laws, Wheatstone bridge, Carey Foster's bridge. Measurement Techniques and Potentiometer: Measurement of resistance, Measurement of specific resistance, Determination of temperature coefficient of resistance, Potentiometer.

L – 45 ; TOTAL HOURS – 45

TEXT BOOKS:

1. Jearl Walker, "Halliday & Resnick: Fundamentals of Physics", Wiley, New Jersey (2018)
2. Richard Wolfson, "Essential University Physics", Addison-Wesley, Boston (2012).
3. David Young and Shane Stadler, "Cutnell & Johnson: Physics", Wiley, New Jersey (2018)
4. Paul A. Tipler and Gene Mosca, "Physics for Scientists and Engineers with Modern Physics", W.H. Freeman, Co., (2008).
5. Paul G. Hewitt, "Conceptual Physics", Pearson, Boston (2023).

REFERENCES:

1. D. Kleppner, R. Kolenkow, An Introduction to Mechanics, McGraw Hill Education; 1st edition (1 July 2017).
2. Merle C. Potter & Craig W. Somerton, "Schaum's outlines: Thermodynamics for Engineers", McGraw-Hill, New York (2020).
3. Eugene Hecht, "Optics", Pearson, Boston (2017).
4. Joseph A. Administer & Mahmood Nahvi, "Schaum's outlines: Electromagnetics", McGraw-Hill, New York (2014).
5. Charles K. Alexander & Matthew N.O. Sadiku, "Fundamentals of Electric Circuits", McGraw-Hill, New York (2021).

COURSE OUTCOMES:

Upon successful completion of this course, students will be able to:

CO1: analyze and solve complex mechanics problems

CO2: evaluate thermodynamic systems and processes

CO3: describe and interpret wave phenomena

CO4: calculate electric fields and potentials CO5: design and analyze electrical circuits

Board of Studies (BoS) :

14th BOS of Department of Physics held on 07.06.2022

Academic Council:

22nd ACM held on 04.09.2024

AVD 1101	INTRODUCTION TO AIRLINE INDUSTRY	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: Understanding about the airline industry, its regulatory bodies

COB2: Understanding the characteristics of Aircraft and Airline Industry

COB3: Understanding the organisational structure and various passenger handling methods.

MODULE I GENERAL INTRODUCTION OF AVIATION 9

Aviation – Introduction - Meaning & Genesis of Aviation – Introduction to Regulatory Bodies DGCA, BCAS, ICAO, IATA – Phonetics alphabets & Terminology - Airport and Airline Codes - World Time Zone - Land side and Airside Areas – Terminal Building – Apron & Runway.

MODULE II INTRODUCTION TO AIRCRAFT SCIENCE 9

History of Aircraft-Difference between Aircraft and Airplane-List of Civil Aircraft Manufacturing Companies – Classification of Airplanes- Classification of Parts of an Aircraft with definitions

MODULE III PASSENGER TYPES AND HANDLING 9

Types of Passengers and Handling Procedure – Expectant Mother Handling – Handling Procedure for Infant, Minor (including UMNR) - Ambulatory and Non-Ambulatory Passenger – Wheel Chair Passenger and Types– Blind Pax and seeing eye dog policy– Mentally Disabled Passenger Handling - Disruptive Passenger Handling and Regulatory guidelines - Death During Flight - Handling of CIP, VIP & VVIP - Exit Row Seating

MODULE IV PASSENGER SERVICES AT TERMINAL BUILDING AND RAMP 9

Reservation and Ticketing Procedures – Check in & types -Customs and Immigration formalities –Security procedure and clearance –Boarding Gate Procedure – Baggage claim and Property Irregularity Report (PIR) - Passenger service at Departure and arrival –Passenger and baggage Reconciliation - Gate no Show (GNS)- Denied Boarding and categories - Flight Cancellation, delay and Compensation Procedures

MODULE V AIRPORT INFRASTRUCTURES 9

Terminal building – Runway: configuration, its naming, markings, Signaling panel and area, lightings – Taxiway: naming, types and markings, lighting – Apron: various types, sign boards - control tower, hangar, refueling facility, Rescue and Fire Fighting (RFF).

L – 45 ; TOTAL HOURS – 45

TEXT BOOKS:

1. FlySky Aviation, “Airport and Airline Management”, 2020 Edition.
2. B.Young, “Airport planning and management” McGraw-Hill Education, 6th Edition,2011
3. Airline and Airport Operation -Edissa Uwayo - Notion Press; 1st edition.
4. Introduction to Airline Ground Service - Colin C. Law, Mary R. Doerflein – Cengage Learning Asia; 1st edition.

REFERENCES:

1. IATA books on airline customer service – 2020 Edition.
2. IATA manual on Passenger Ground Services.

COURSE OUTCOMES:

CO1: Students will gain strong basic foundation on aviation, regulatory bodies and Airport familiarisation.

CO2: Students will gain knowledge on basic science behind flight, parts of airplane, different manifesting companies.

CO3: Students will understand various types of passenger handling on-ground and in air.

CO4: Students will gain knowledge on procedures and practices implemented in airport to manage passenger traffic.

CO5: Students will gain broad knowledge on various airport infrastructures.

Board of Studies (BoS) : 19th BOS of Aerospace Engg held on 17.15.2024

Academic Council: 22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	L	M	M	L	M	L	L	L	H
CO2	H	L	H	M	L	M	L	L	M	H
CO3	H	L	H	H	L	L	H	L	M	H
CO4	H	L	M	H	L	M	L	L	M	H
CO5	H	L	H	M	L	M	L	L	H	H

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 9 - Industry, Innovation, and Infrastructure

Statement: the airline industry significantly impacts global connectivity and economic development, it faces considerable challenges in aligning with the SDGs, particularly in terms of environmental sustainability and social responsibility. The industry's future success will depend on its ability to innovate and collaborate to reduce its environmental footprint, improve labor practices, and contribute to the broader sustainable development agenda.

AVD 1102	AVIATION METEOROOGY	L	T	P	C
SDG: 4		3	1	0	4

COURSE OBJECTIVES:

COB1: Understanding of the physical properties of the atmosphere.

COB2: To learn how they affect the weather.

COB3: Observation and reporting of weather for aviation purpose.

MODULE I MET SERVICES FOR AVIATION 9

Met. Organisation- national and international, Types of Met observations, Met communication network, Met forecasting office, world weather watch, Area forecast center, Pressure, temperature, humidity, wind, cloud, visibility, rainfall, aircraft weather reports.

MODULE II THE ATMOSPHERE 9

Composition of the atmosphere, pressure system on the surface, pressure gradient, pressure tendency, vertical variation of pressure, altimetry, pressure altimeter, source of heat in the atmosphere, surface temperature, upper air temperature, airfield reference temperature. vertical variation of density. Lapse rate.

MODULE III WIND 9

Definition, Buys Gallot's law, effects of earth rotation, Coriolis force, Geostrophic wind, Gradient wind, thermal wind, veering and backing. Local winds -Land and sea breezes, Katabatic, anabatic winds, valley wind and local winds.

MODULE IV STABILITY AND INSTABILITY 9

Atmospheric stability, stability of dry air, conditional stability, lateral stability, T-gram. Vertical motion in the atmosphere – Types of vertical motion, frictional eddies, convergence and divergence.

MODULE V CONDENSATION AND PRECIPITATION 9

Lifting condensation level, condensation nuclei. Formation, classification, nomenclature futures and estimation of clouds, flying in clouds. Physics of precipitation, theories of precipitation, nature of clouds and precipitation, snow and sleet. Orographic rain, seasonal variation of precipitation.

L -30; T – 15; TOTAL HOURS - 60

TEXT BOOKS:

1. Introduction of Meteorology, S. Patterson, (Mc-Graw Hill).
2. Weather and climate, R.C. Sutecliffe, (Weidenfied and Nicholson)
3. Om Prakash Agarwal, “Aviation meteorology for pilots” Blue Rose Publishers, 1st edition, January 2018.
4. R.B. Underdown and John Standen, “Ground studies for Pilot’s meteorology, Wiley India Pvt Ltd, 3rd Edition, March 2008.

REFERENCES:

1. Manual of meteorology of aircrew.
2. Handbook of aviation meteorology.
3. Elementary for Meteorology.

COURSE OUTCOMES:

CO1: Examine the effect of weather elements on aircraft operation.
CO2: Classify the different types of atmospheres.
CO3: Predict weather hazards and explain its effects.
CO4: Predict the stability of the atmosphere.
CO5: To identifying the effects of condensation and precipitation.

Board of Studies (BoS) :
19th BOS of Department of Aerospace Engg held on 17.05.2024

Academic Council:
22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	L	M	L	L	H	L	M	H	H
CO2	H	L	M	L	L	H	L	M	M	H
CO3	H	L	H	M	L	H	L	H	H	H
CO4	H	L	H	M	L	H	L	H	H	H
CO5	H	L	H	M	L	H	L	H	M	H

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
Statement: aviation meteorology is a critical component in achieving sustainable development within the aviation sector by enhancing safety, reducing environmental impact, and supporting economic efficiency. It directly and indirectly contributes to several Sustainable Development Goals, particularly in the areas of climate action, clean energy, and innovation.

AVD 1103	PRINCIPLES OF FLIGHT	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the aviation atmosphere

COB2: To learn about the basic aspects of aerodynamics

COB3: To understand the basic components of aircraft.

COB4: To understand the basic ideas of power plants.

MODULE I INTRODUCTION 9

History of aviation, types of aviation. The atmosphere, ISA, the principles of continuity, Bernoulli's theorem, dynamic pressure, static pressure, pressure gradient, pressure distribution over an aircraft wings.

MODULE II AIRPLANE STRUCTURAL COMPONENTS 9

Introduction, airplane structure, fuselage construction and its types, types of wings, wing construction, structural components of wing and fuselage, fail safe design, primary, secondary and auxiliary control surfaces, wing planform, landing gear, high lift devices.

MODULE III BASICS OF AERODYNAMICS 9

Newton's law of motion, forces acting on the flight, lift equation, controlling of lift. Drag and its types L/D ratio, airfoil design, airfoil construction, pressure distribution, airfoil behaviors, concept of streamline types of flight, factors affecting lift and drag, drag polar.

MODULE IV AIRPLANE PERFORMANCE AND STABILITY 9

Stability, stable, unstable and neutral stability, concept of static stability and dynamic stability. Airplane axis system, forces and moments about longitudinal, lateral and vertical axes, equilibrium of forces developed on wing and horizontal tail, centre of gravity, its importance in stability and control. Control surfaces elevators ailerons and rudder.

MODULE V POWER PLANT AND PROPELLERS 9

Basics about piston engine, jet engines and turboprop, performance parameters, types of propellers. Detailed functioning of components of a Piston-Prop engine. Use of propellers as means of producing forward thrust, functioning of Jet engine, turbo-prop, turbo-fan, turbo-shaft, Prop-fan, possible locations of power plant on airplane.

L – 45 ; TOTAL HOURS – 45

TEXT BOOKS:

1. CAE, Oxford Aviation Academy, “Principles of Flight”
2. A.C. Kermode, “Mechanics of flight”, Pearson Education Limited,11th edition, 2006.
3. Anderson., “introduction to flight”, 8th edition, McGraw-Hill Higher education, 2015.

REFERENCES:

1. Jeppesent, EASA ATPL Training, “Principles of Flight aero planes”, Jeppesen GMbh (January 2014)
2. Clancy, “Aerodynamics” Shroff, January 2006.
3. Fundamentals of Flight, Dr. O. P. Sharma and Lalit Gupta.

COURSE OUTCOMES:

CO1: Understand the atmosphere and its types.
CO2: Analyze the forces and its effects on the aircraft.
CO3: Understand the construction of various aircraft components.
CO4: Demonstrate the concept of stability and its performance.
CO5: Understand the basic concept of various power plants used in aircraft.

Board of Studies (BoS):	**Academic Council:**
19th BOS of Aerospace Engg held on 17.05.2024	22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	L	M	L	L	L	L	H	M	H
CO2	H	L	H	M	H	M	L	H	M	H
CO3	H	L	H	M	H	M	L	H	H	H
CO4	H	L	H	H	H	H	L	H	H	H
CO5	H	L	H	M	H	H	L	H	H	H

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 9 - Industry, Innovation, and Infrastructure

Statement: Innovations in aircraft design, materials, and flight technologies can make aviation more efficient and sustainable. This includes the development of lighter materials, improved aerodynamics, and electric aircraft.

AVD 1104	WORKSHOP PRACTICES	L	T	P	C
SDG: 9		0	0	4	2

COURSE OBJECTIVES:

COB1: To offer students practical exposure through hands-on experience in various foundational engineering practices.

COB2: To engage in the study and practical application of operations conducted on lathes, shapers, drilling machines, milling machines, and similar equipment, aiming to acquire the practical skills essential for employment in core industries.

COB3: To gain expertise in a range of fundamental machining operations conducted using special purpose machines, as well as to comprehend their practical utilization in the real-time manufacturing of industrial components.

List of Experiments:

1. Wood cutting and planning
2. Fabrication of Dove tail joint
3. Sheet metal marking, and cutting.
4. Study of TIG, MIG, Arc welding machines
5. Fabrication of model using Butt joint and inspect
6. Fabrication of model using Lap joint and inspect
7. Fabrication of model using V-Joint and inspect
8. Demonstration and marking using Radius gauge.
9. Pipe flaring and bending.
10. Riveted patch repairs.
11. Cable swag test using tensiometer and splicing
12. Internal and external threading using Taps and dies.

P – 60 ; TOTAL HOURS – 60

TEXT BOOKS:

1. S.Gowri and T.Jeyapoovan, “Engineering Practices Lab Manual – Civil, Mechanical, Electrical, Electronics included”, Vikas Publishing, 5th Edition, 2019.
2. Sathish.D, “Engineering Workshop Practices Laboratory Manual”, Notion Press; 1st edition, 2019

REFERENCES:

1. Sk Hajra Choudhury, Ak Hajra Choudhury, Nirjhar Roy, “Elements of Workshop Technology”, Media Promoters & Pub Pvt Ltd, 2015.
2. James Anderson, “Shop Theory”, McGraw Hill Education; 6th edition, 2017.

COURSE OUTCOMES:

Students will be able to:

CO1: Use sheet metal fabrication tools and make simple models as per the given diagram.

CO2: Fabricate carpentry components and pipe connections including plumbing works.

CO3: Use welding equipment to join the structures.

CO4: Utilize different machine tools like Surface Grinding Cylindrical Grinding etc.,

CO5: Inspect Taps, Dies and Thread cutting components.

Board of Studies (BoS):	**Academic Council:**
19th BOS of Aerospace Engineering held on 17.05.2024	22nd ACM held on 04.09.2024

SDG 9 - Industry, Innovation, and Infrastructure

Statement: Emphasize the use of sustainable materials and processes that minimize waste and reduce environmental impact.

Promote the development and use of innovative technologies that enhance productivity and sustainability in the workshop.

END 1184	ESSENTIAL COMMUNICATION SKILLS	L	T	P	C
SDG: 4		0	0	2	1

COURSE OBJECTIVES:

COB1: To develop students' proficiency in English at CEFR B2 level (Business Vantage)

COB2: To develop students' receptive skills (Listening and Reading) in a wide range of situations

COB3: To develop students' productive skills (Speaking and Writing) in a wide range of situations

COB4: To expose students to the nuances of the English language, grammar and usage.

MODULE I BRIEF EXCHANGES OF COMMUNICATION 4

Listening to telephonic conversations - gap filling exercises- short conversations – Promoting a product-Reading short passages and answering matching tasks- Writing short notes and messages. - Framing questions

MODULE II WORKPLACE COMMUNICATION 4

Listening to monologues - gap filling exercises - Mini presentations- role play- Reading longer texts – gap filling- Writing memo , emails and Fax - Writing reports on conferences, seminars.

MODULE III INTERPERSONAL COMMUNICATION 3

Listening to conversations – Collaborative discussion using prompts - Reading comprehension-multiple choice-texts - Writing enquiry letters & replies to customers

MODULE IV NEGOTIATING AND PERSUADING 4

Listening to interviews - Group Discussions - Multiple choice and gap filling- writing work reports- cause and effect - Complaint letter and sales letter.

P – 30 ; TOTAL HOURS – 30

REFERENCES:

1.Guy Brook-Hart, 'Business Benchmark-Upper Intermediate, 2nd edition, Cambridge University Press, Shree Maitrey Printech Pvt. Ltd, Noida, 2016.

2.Leo Jones, 'New International Business English' Students book, Cambridge University Press, Cambridge, 2003.

Board of Studies (BoS) :
17th BOS of Department of English held on 02.12.2024

Academic Council:
23rd ACM held on 28.02.2025

SDG No.: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Statement: Strong communication skills are essential for educators to convey information effectively and engage students. They also help in creating an inclusive learning environment where everyone feels heard

SEMESTER II

END 1283	GENERAL ENGLISH – II	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To enable students to read, comprehend and appreciate the value of literature to life.

COB2: To help them acquire language skills through Literature.

COB3: To develop LSRW skills through practice in variety of contexts.

COB4: To improve their vocabulary and correct English usage.

MODULE I **9**

Poetry: The Second Coming – W. B. Yeats

Speaking: Expressing one's opinion /Asking for others' opinion, agree, disagree

Writing: Movie / Book Review, Slogan Writing

Language: Modals, Prepositions

Vocabulary: Business Vocabulary (advertisements, sales)

MODULE II **9**

Poetry: "Where the Mind is Without Fear" (Gitanjali 35) - Rabindranath Tagore

Listening: For understanding speaker's opinion

How books can open your mind by Lisa Bu. (6.16 minutes)

Reading: To understand the meaning and purpose of short texts (mails, memos)

Writing: Email Writing, Memo writing

Language: If Clause

Vocabulary: Finance vocabulary

MODULE III **9**

Prose: "The Civilization of To-day" – C.E.M.Joad

Reading Comprehension: Digital habits across generations (learn English)

Speaking: Discussions

Writing: Fax

Language: Relative Clause

Vocabulary: Collocations – verb-noun collocations

MODULE IV **9**

Short story: "The Sparrows" - K. A. Abbas

Speaking: Making small talk Writing: Job Application Letter Language: Voice

Vocabulary: Employment vocabulary

MODULE V **9**

Short story: "First Confession"– Frank O' Connor

Listening: Listening and taking short notes - Inspirational lesson for lifetime- How to manage failure and success by Dr. APJ (8.21 minutes)

Writing: Report Writing – Survey Reports

Language: Reported Speech

Vocabulary: Collocation sets about time and money

L – 45 ; TOTAL HOURS – 45

REFERENCES:

1. Guy Brook-Hart, Business Benchmark Upper- Intermediate Student's Book, CUP, 2006.
2. S.Mythili, V.Kadambari. Ed. Plumes of Many Colours: A Collection of Short stories, Blackie Books, 1994.
3. Sriraman.T. Macmillan College Prose, Laksmi Publications, 2015.
4. Swan.M. Practical English Usage, OUP, 2005.
5. Whitby, Norman. Business Benchmark: Pre-intermediate to Intermediate, 2nd Edition, CUP, 2014.
6. https://learnenglish.britishcouncil.org/skills/reading/intermediate- b1/the-martian-a-book-review.
7. https://learnenglish.britishcouncil.org/skills/reading/intermediate- b1/digital-habits-across-generations.
8. https://www.youtube.com/watch?v=6ibCtsHgz3Y.
9. https://www.youtube.com/watch?v=7E-cwdnsiow.

COURSE OUTCOMES:

CO1: Respond to literary texts efficiently.

CO2: Appreciate and critically analyse literary texts.

CO3: Display effective LSRW skills in academic and professional contexts.

CO4: Demonstrate a range of appropriate vocabulary in a variety of Situations.

CO5: Communicate effectively using grammatically correct language.

Board of Studies (BoS):

13th BoS held in the Department of English 0n 17.6.2021

Academic Council:

22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
CO1													M
CO2													M
CO3						M	H						
CO4						L	M						
CO5						M	H						

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Statement: This course helps the students to read, comprehend and appreciate the value of literature to life. It also helps them to enrich LSRW skills in academic and professional contexts.

LND 1281	**பொதுத் தமிழ் -II** **GENERAL TAMIL – II**	**L T P C** **2 1 0 3**

நோக்கங்கள்

- சங்க இலக்கியங்களையும்சங்கப்புலவர்களையும் அறிமுகம் செய்தல்.
- பழந்தமிழர்களின்அகப்புறவாழ்வினையும்பண்பாட்டினையும் எடுத்துரைத்தல்.
- அற இலக்கியங்கள், பக்தி இலக்கியங்கள், காப்பியங்களை அறிமுகம் செய்தல்
- பல்வேறு சமயக்கோட்பாடுகளையும்உண்மைகளையும் உணர்த்துதல்
- கட்டுரைகளை எழுத மாணவர்களைப் பயிற்றுவித்தல்
- சந்திப் பிழையின்றி எழுத மாணவர்களைப் பயிற்றுவித்தல்

அலகு I **சங்க/அற இலக்கியங்கள்** **8**

புறநானூறு - 143 - ஆவது பாடல், நற்றிணை - 19 - ஆவது பாடல், திருக்குறள் - நட்பு>காலமறிதல், நாலடியார் - அவையறிதல், பழமொழி நானூறு - இன்னா செய்யாமை (5 பாடல்கள்), இனியவை நாற்பது -முதலைந்துபாடல்கள்

அலகு II **பக்தி இலக்கியங்கள்** **8**

திருவாசகம்-எட்டாம் திருமுறை (5 பாடல்கள்), நம்மாழ்வார்-(5பாடல்கள்,)திருமந்திரம் (தேர்ந்தெடுக்கப் பெற்ற 5 பாடல்கள்).

அலகு III **காப்பியங்கள்;** **8**

சிலப்பதிகாரம் - வழக்குரைகாதை 50-73(23அடிகள் மட்டும்;), கம்பராமாயணம் - பாலகாண்டம்-நாட்டுப்படலம் (10 பாடல்கள்), இரட்சண்யயாத்ரிகம்-சிலுவைப்பாடு (10 பாடல்கள்), சீறாப்புராணம் -மானுக்குப் பிணை நின்ற படலம் (தேர்ந்தெடுக்கப் பெற்ற 5 பாடல்கள்

அலகு IV **கட்டுரைகள்;** **7**

உ.வே.சாமிநாதையர் - தமிழ்நாட்டு வணிகம், மா.இராசமாணிக்கனார் -சித்தன்னவாசல், ம.லெ.தங்கப்பா - எது வாழ்க்கை, பி.எஸ்.அப்துர்ரஹ்மானின் வாழ்க்கை வரலாறு..

அலகு V **இலக்கிய வரலாறு** **7**

எட்டுத் தொகை, பத்துப்பாட்டு

அலகு VI **மொழிப்பயிற்சி** **7**

இலக்கணக்குறிப்புத் தருதல், வல்லினம் மிகுவிடங்களும்மிகாவிடங்களும், மொழிபெயர்ப்பு (ஆங்கிலத்திலிருந்துதமிழில்பெயர்த்தல்)கடிதங்களும்வகைகளும்

L – 30; T – 15; TOTAL HOURS – 45

குறிப்புகள்

1. பொதுத்தமிழ்–செய்யுள்திரட்டு–தமிழ்த்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு –சோம.இளவரசு
3. சிறுகதைத் தொகுப்பு (கட்டுரைக் களஞ்சியம்)

வெளிப்பாடு

- சங்க இலக்கியங்கள் குறித்தும் சங்ககால மக்களின் வாழ்வு குறித்தும் உணர்ந்து கொள்வர்.
- சங்கப்புலவர்கள் பற்றிய தகவல்களையும் அவர்தம்படைப்பாளுமை பற்றியும் அறிந்து கொள்வர்.
- தமிழர்களின்ஆன்மீகச்சிந்தனைகளைப் பற்றியும் அறச்சிந்தனைகள் பற்றியும் அறிந்து கொள்வர்,
- மாணவர்கள்பல்வேறு சமயச்சிந்தனைகள் குறித்துதெரிந்து கொள்வர்.
- தமிழ் இலக்கணங்கள் பற்றி அறிந்து கொள்ளவும் மொழிபெயர்ப்புசெய்யும்

திறனும்பெறுவர்.
- புத்திலக்கியங்களைப் படைக்கும் திறனையும் திறனாய்வு செய்யும் திறனையும்பெறுவர்

Board of Studies (BoS):

14th BOS of Department of Commerce held on 22.4.2021

Academic Council:

22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1							M	M	M	M		M		
CO2							L	L	L	M		M		
CO3							L	M	L	L		L		
CO4							L	L	M	L		L		
CO5							L	L	L	L		L		
CO6							M	M	M	M		L		

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.16: Peace, Justice and Strong Institutions

Statement: Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime through the Quranic, Vedic and Biblical literature.

LND 1282	GERMAN - II	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To enable the learners to listen and understand the spoken German language which uses the elementary spoken structures.

COB2: To enable the learners to speak and engage in simple dialogues in German.

COB3: To enable the learners to read and understand the elementary texts in German.

COB4: To enable the learners to write simple sentences and short paragraphs in German.

COB5: To demonstrate Proficiency in reading, writing, and speaking in basic German. Learning vocabulary related to profession, education, day-to-day activities, food, culture, sports and hobby, family set up, workplace, market and classroom activities are essential.

COB6: To make the students industry oriented and make them adapt in the German culture.

MODULE I KONTAKTE 7

To arrange appointments, understand and give instructions, understand and reply letters, find information in the text, identify the situations and understand the conversation; Vocabulary: related to the topic; Grammar: Dative personal pronomen, Possessive Pronomen, verbs and Preposition.

MODULE II MEINE WOHNUNG 7

To understand the advertisements related to flats/houses, describe a flat, write a text about a flat; Vocabulary: related to the topic; Grammar: Adjective with sein (sehr/zu), wechsel preposition with Dative.

MODULE III ALLES ARBEIT? 7

To describe daily routine, talk about the past, speak about jobs, position, advertisements, prepare telephone conversation; Vocabulary: related to the topic; Grammar: Imperativ -Du form, Simple Past tense (regular & irregular verbs).

MODULE IV KLEIDUNG UND MODE 8

KLEIDUNG UND MODE – LEARNING: To speak about clothes, understand the conversation at shopping centers, shopping for dresses, lead a discussion on purchasing dresses and orient oneself about a shopping complex. Vocabulary:

related to the topic; Grammar: Trennbare & Untrenn bareverben, Introduction to reflexive pronoun und Reflexive verbs.

MODULE V GESUND UND MUNTER 8

To make personal statements, name body parts, understand sport activities, conversation with the doctor, get & give tips to healthy life, The prefix Lieblings - Sentence formation; Advanced Conversation skills (pertaining chiefly to simple dialogues in everyday situations), Vocabulary: related to the topic; Grammar: Simple Future Tense, Esgibt, Gibtes? -sentence formation.

MODULE VI AB IN DEN URLAUB! 8

To suggest a city tour, describe the directions, write a Simple Email and reply, describe the weather, make a complaint in the hotel, speak about the trips; Advanced Text - Reading Comprehension And Translation Practice from German Into English Vice versa; Vocabulary: related to the topic and related to School, University, Professions; Grammar: Adverbs (time), Join sentences with “und”, “oder”, and “aber”.

L – 45; TOTAL HOURS – 45

TEXT BOOKS:

1. Stefanie Dengler, “Netzwerk A1.2”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2015.

PRACTICE BOOKS:

1. Johannes Gerbes, “Fit fürs Goethe-Zertifikat A1”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2010.

REFERENCES:

1. Paul Rusch, “Einfach Grammatik”, Goyal Publishers & Distributors Pvt. Ltd., Delhi, 2012.
2. Hermann Funk, “studio d A1”, Goyal Publishers & Distributors

COURSE OUTCOMES:

On successful completion of this course learners will be able to:

CO1: remember greeting people, introducing oneselfand understanding basic expressions in German.

CO2: read and describe basic German sentences relating to routine situations.

CO3: introduce him / her and others as well as ask others about themselves and communicate using simple sentences.

CO4: write simple sentences and short paragraphs in German.

CO5: identify and deal with social and cultural aspects of Germany and other German speaking countries.

CO6: listen and identify individual sounds of German and simple day- to-day conversations.

CO7: speak simple sentences using basic sounds and words

CO8: read and understand short passages on familiar topics

CO9: apply basic sentence structures while writing

Board of Studies (BoS):

14th BOS of Department of Commerce held on 22.4.2021

Academic Council:

22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
CO1	H	H	M	H		H	H	H	M	H	M	H		
CO2				H		H	H	H	H	H		H		
CO3				H		H	H	H	H	H		H		
CO4				H		H	H	H		H		H		
CO5				H		H	H	H		H		H		
CO6				H		H	H	H		H		H		

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.4: Quality Education

Statement: The substantially improve the relevant skills which develop the confidence in young people, including technical and vocational skills, help for employment, decent work and entrepreneurship.

LND 1283	MODERN COMMUNICATIVE ARABIC	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

The course aims to teach:

COB1: communication in the situations of marketing clothes, food, etc.

COB2: vocabulary about the climates, seasons and hold telephonic conversations

COB3: vocabulary related to various games, students' associations.

COB4: communication in Work place like ticketing, booking, confirmation & passport procedures.

COB5: vocabulary related to illness, numbers and communication with doctors.

MODULE I BUSINESS PLACE COMMUNICATION 9

Reading and listening Lesson 9: marketing (التسويق) –vocabulary related to marketing clothes, food, different types of contracts- conversation in business place - price, marketing, subject and predicate (المبتدأ والخبر), using interrogating form of (بكم - أي)

MODULE II USAGE OF TENSES 9

Situational conversation - Lesson 10: climate (الج 'و) – vocabulary related to climate, places& seasons, discussion question and answers – telephonic conversations – order (فعل االمر) – interrogative form (كيف) - negative form of المضارع.

Lesson 11: people and places (الناس واألماكن) – vocabulary related to people and places, colours, feminine gender – place of work – transportation – question and answer – past tense – usage of articles (إلى – في: مع استخدام الحروف - من –)

MODULE III SENTENCES IN COMMUNICATION 9

students' games, various to related vocabulary -)الهوايات(hobby : Lesson12 الفعل ااإلشارة (– synonyms and adjectives – associations) – المخاطبة ياء إلى المسند المضارع.

MODULE IV CONVERSATION OF BUSINESS CONVERSATION 9

Lesson:13 travel (السفر) - vocabulary related to ticket booking – confirmation – passport procedures – resident permits (الحجز والتأكيد والجوازات والإقامة)– lost luggages – four directions – conversation about services – seeking information of luggage lost.

Lesson:14 haj and umrah (الحج والعمرة) - vocabulary related to haj and umrah – expression of arabic numbers – procedures of umrah and haj – (كيف – بم - أين االستفهام: متى –)

MODULE V SITUATIONAL CONVERSATION 9

Lesson 15: health (الصحة) - vocabulary related to illness – numbers 100 and 1000 –

doctor's visit – communication with doctor – (االستفهام : لماذا)

Lesson 16: vacation (العطلة) - vocabulary related to holidays – festivals – travel – spending holidays – Arabic months – interrogative form (واو مع المضارع ،أين (–االستفهام: كم ستقضون :الجماعة

L – 45; TOTAL HOURS – 45

TEXT BOOKS:

1. I, Part),العربية اللغة ، ألول الصف ، ألول الجزء(Arabiya Lughathul Al 1. 2004. College, Arabic Aalim Bukhari

REFERENCES:

1. Dr. F. Abdur Raheem, Durus Al LugathilArabiyya, Islamic Foundation Trust, Chennai, 2002.
2. Al QirathulArabiyya Lil Mubtadiyeen (UmmulQura University, Makkah), Bukhari Aalim Arabic College, 2005.

COURSE OUTCOMES:

At the end of the course, the student is expected to:

CO1: communicate in the situation of marketing clothes, food, etc.

CO2: discuss about the climates, seasons and hold telephonic conversations

CO3: discuss in the playground, students' gatherings

CO4: communicate in certain work places

CO5: recognize proper usage of sentences in communication.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						L								
CO2							M							
CO3							M							
CO4						L								
CO5							H							

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.4 Developing Language skill

Statement: Arabic language enhances effective communication in the workplace.

MAD 1286	MATHEMATICS	L	T	P	C
SDG: 9		3	1	0	4

COURSE OBJECTIVE:

CO1: To learn the basic units and how to convert the units, algebraic expressions and simplify algebraic expressions involving exponents and radicals.

CO2: To identify trigonometric functions and their features.

CO3: To understand basic rules of derivative and the Calculations of Estimated Time for different phases of Flight.

CO4: To understand algebraic and geometric representations of vectors in Rn and their operations, including addition, scalar multiplication and dot product.

CO5: To understand the basic knowledge on data representation and various statistical elementary tools.

MODULE I BASIC MATHEMATICS AND ALGEBRA 12

Conversions between units - Kilometres, Statute mile, Nautical Mile, Feet, Meter - Conversion between Kelvin to Celsius, Celsius to Kelvin, Fahrenheit to Celsius - Expressions and Equations – Roots and solution of equations.

MODULE II TRIGONOMETRY AND GEOMETRY 12

12 hrs. Trigonometric Functions and Identities - Trigonometric Equations and Graphs - Properties of Triangles - Coordinate Geometry: Points, Lines, and Circles.

MODULE III CALCULUS 12

Differentiation Rules and Techniques – Maxima and Minima of a function with single variable - Calculation of Speed in relation to Speed, Distance and Time - Calculating Estimated Time of Arrival (ETA), Estimated Time of Departure (ETD), Estimated Elapsed Time (EET) - Calculation of Endurance and Still Air Range (SAR), Rate of Climb (ROC), Rate of Descent (ROD) - Selection of Altitude according to the flight path, Top of Climb (TOC), Top of Descent (TOD) and its understanding and Implementation.

MODULE IV VECTOR CALCULUS 12

Vector Operations: Addition, Subtraction, Dot and Cross Products - Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields.

MODULE V DESCRIPTIVE STATISTICS 12

Mean, Median, Mode, Variance, Standard Deviation – Correlation, Regression, Skewness and Kurtosis – Data Representation.

L – 45; T – 15; TOTAL HOURS – 60

TEXT BOOKS:

1. Elliott Mendelson and Frank Ayres, “Schaums Easy Outline of Calculus”, McGraw Hill, 2nd Edition (8 January 2020).
2. Shanti Narayan, “Differential Calculus”, S Chand; Fifteenth edition (1 January 1942).
3. S.C.Gupta and V.K.Kapoor, “Fundamentals of Mathematical Statistics”, Sultan Chand and Sons, New Delhi, 2012.

REFERENCES:

1. Ram Krishna Ghosh, “An Introduction to Analysis Integral Calculus”, New Central Book Agency;12th Revised edition (1 January 2013).
2. A. Singaravelu , “Allied Mathematics”, ARS Publication,

COURSE OUTCOMES:

After the course the students are expected to be able to:

CO1: Understand the basic units and how to convert the units, algebraic expressions and simplify algebraic expressions involving exponents and radicals.

CO2: Identify trigonometric functions and their features.

CO3: Understand basic rules of derivative and the Calculations of Estimated Time for different phases of Flight.

CO4: Understand algebraic and geometric representations of vectors in R^n and their operations, including addition, scalar multiplication and dot product.

CO5: Understand the basic knowledge on data representation and various statistical elementary tools.

Board of Studies (BoS):

16th BOS of Mathematics & AS held on 18.10.2024

Academic Council:

22nd ACM held on 04.09.2024

	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	M	L	-	-	-	-	-	-	-	-	-	-	-	-	-

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Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG 9 - Industry, Innovation, and Infrastructure

Statement: Mathematics is essential in the design and engineering of aircraft, ensuring safety, efficiency, and innovation. Advanced calculations and simulations help in the development of new technologies, such as more fuel-efficient aircraft and sustainable aviation solutions, contributing to resilient infrastructure and industrial innovation.

AVD 1201	AIRCRAFT STRUCTURES	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the fundamental concepts of structural engineering

COB2: To gain the basics knowledge in stress and strains, familiarize in the materials properties

COB3: To learn the structural components in the aircraft and various types of loads acting on it.

COB4: To gain knowledge in analysis of aircraft structures and airframe loads.

COB5: To study and have a clear idea about the sheet metal and inspection of components.

MODULE I MECHANICS OF MATERIALS - FUNDAMENTALS 9

Loads and loading members, Types of beams, Types of supports, statically determinate structures, Indeterminate structures, moment of inertia.

MODULE II BASICS OF STRENGTH OF MATERIALS 9

Basic concepts: Stress, strain, types of stresses and strains, Poisson's ratio, typical stress - strain plot of various materials, Hooke's law. Elastic constants-Young's modulus, rigidity modulus and bulk modulus. Tensile properties- yield strength, allowable strength and factor of safety. Material properties: toughness, hardness, brittleness, elasticity and plasticity - ductile and brittle materials.

MODULE III AIRCRAFT STRUCTURES - INTRODUCTION 9

Principles of stressed skin structure constructions - Materials Such as Aluminum alloys, Steel, Titanium, Plastics, Glass Composites. Structural components of Aircraft - Loads on structural components, functions of structural components and fabrication of structural components.

MODULE IV AIRFRAME LOADS 8

Factors of safety, flight envelopes, loads factor determination. Airframe loads- Aircraft inertia loads, symmetric maneuvers load, normal accelerations associated with various types of maneuvers and Gust envelope. Fatigue - safe life, fail safe structures, fatigue strength of components, Prediction of aircraft fatigue life, crack propagation.

MODULE V INSPECTION OF AIRCRAFT COMPONENTS 10

Marking out and calculation of bend allowance; Sheet metal working, including

bending and forming; Inspection of sheet metal work. Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes. Inspection and testing of springs. Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes. Transmissions, Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.

L – 45; TOTAL HOURS – 60

TEXT BOOKS:

1. R.K. Bansal, —Strength of Materials, Sixth Edition, Laxmi Publications, 2020.
2. Hibbeller, R.C., Engineering Mechanics, Pearson Education Asia Pvt. Ltd., 2000.
3. T. H. G. Megson Aircraft structures for engineering students, Butterworth Heinemann, 2011.
4. Federal Aviation Administration (FAA)/Aviation Supplies & Academics (ASA)Aviation Maintenance Technician Handbook General: FAA-H-8083-30 (FAA Handbooks) Aviation Supplies & Academics Inc; 2013th edition (21 March 2013).

REFERENCES:

1. Aircraft handbook FAA (AC 65-15 A).
2. Aircraft structure Ch. 01 (FAA).
3. AC 43.13-1B - Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair.
4. EASA-part-66-module-13, Aircraft tech book co.

COURSE OUTCOMES:

Students will be able to

CO1: Proficiently analyze loads and their effects on structural members.

CO2: Describe the fundamental concepts in material mechanics.

CO3: Demonstrate a comprehensive understanding of the principles of aircraft structure constructions and focusing on materials.

CO4: Comprehensively analyze and apply the principles of aircraft structural integrity.

CO5: Examine the sheet metal and perform the inspection of aircraft components.

Board of Studies (BoS):	**Academic Council:**
19th BOS of Department of Aerospace Engg held on 17.5.2024	22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	L	H	M	H	H	L	M	L	H
CO2	H	L	M	M	M	M	L	L	M	H
CO3	H	L	H	M	H	H	L	M	M	H
CO4	H	L	H	H	H	H	L	H	M	H
CO5	H	L	M	H	H	H	L	H	H	H

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Statement: Focus on the full life-cycle of aircraft structures, from production using sustainable materials to recycling at the end of service life. Design for disassembly and recycling to minimize waste and reduce environmental impact.

AVD 1202	AIR REGULATION	L	T	P	C
SDG: 4		3	0	0	3

COURSE OBJECTIVES:

COB1: To ensure that students have a comprehensive understanding of the international legal framework governing aircraft registration and airworthiness.
COB2: To impart comprehensive knowledge to students on personal licensing, air regulations, and aircraft operations.
COB3: To provide students with adequate knowledge about aeronautical information services, air traffic services, and air traffic management.
COB4: To provide a comprehensive understanding of the detailed policies and procedures that govern operations within the Aerodrome, as well as the protocols for search and rescue operations.
COB5: To facilitate the students' comprehension of the Civil Air Regulations governing aviation security and aircraft accident investigation.

MODULE I INTERNATIONAL LAW AND AIRWOTHINESS OF AIRCRAFT, AIRCRAFT NATIONALITY & REGISTRATION MARKS 9

International Law: Conventions, agreements & organizations Convention of International Civil Aviation Air Navigation Other conventions and agreement World and European Organizations. Airworthiness of Aircraft, aircraft nationality & registration marks Certificate of Airworthiness (CofA) Aircraft Nationality and Registration Marks (Definitions) Nationality marks, common marks and registration marks.

MODULE II PERSONNEL LICENSING, RULES OR THE AIR & AIRCRAFT OPERATIONS 9

Personnel Licensing Aircrew Regulation — Annex 1 (ICAO), Aircrew Regulation — Annex I (EASA Part-FCL), Aircrew Regulation — Annex IV (EASA Part-MED). Rules of the Air General rules, Visual flight rules (VFR), Instrument flight rules (IFR), Interception of civil aircraft ICAO (Annex 2) Aircraft Operations Definitions & abbreviations Departure procedures Approach procedures Holding procedures Parallel or near-parallel instrument RWYs SSR (transponder) operating procedures on Air Operations

MODULE III ATS & ATM, AIS 9

Air Traffic Services (ATS) & Air Traffic Management (ATM) Air Traffic Services. Altimeter-setting procedure. Air Traffic Management. Aeronautical Information Service (AIS). Introduction. Definitions of ICAO Annex 15. General. Aeronautical information publication (AIP). ATM Services providers

MODULE IV AERODROMES, FACILITATION, SEARCH & RESCUE (SAR) 9

Aerodromes- General Aerodrome (AD) data Physical characteristics Visual aids for navigation Visual aids for denoting obstacles Visual aids for denoting restricted use of areas Aerodrome (AD) operational services, equipment and installations Attachment A to ICAO Annex 14, Volume 1 — Supplementary Guidance Material Facilitation Entry and departure of aircraft Search & Rescue (SAR) Essential SAR definitions SAR –Organization Operating procedures for non-SAR crews Search and rescue signals.

MODULE V SECURITY, AIRCRAFT ACCIDENT INVESTIGATION 9

Security- Essential definitions of ICAO Annex 17 General principles Preventive security measures Management of response to acts of unlawful interference Operators' security programme. Security procedures in other documents Aircraft Accident & Incident Investigation Essential definitions of ICAO Annex 13 Accident and incident investigation in ICAO Annex 13 Accident and incident investigation.

L – 45; TOTAL HOURS – 60

TEXT BOOKS:

1. ICAO Annex – 8 to the convention on international civil aviation International standards and recommended practices.
2. RK Bali, "Air Regulations", Sterling Book House (1 January 2019).
3. OXFORD ATPL GRN TRAINI SERIES AIR LAW 1.
4. Nordian, Air Law & ATC Procedures, Edition 7.2 (2018).
5. V. Krishnan & S.R. Iyer, "A Handbook on Air Regulations for Pilots", The English Book Store (The Aviation People) (1 January 2014).

REFERENCES:

1. Nordian, Air Law & ATC Procedures, Edition 7.2 (2018).
2. V. Krishnan & S.R. Iyer, "A Handbook on Air Regulations for Pilots", The English Book Store (The Aviation People) (1 January 2014).

COURSE OUTCOMES:

CO1: Discuss the international agreements and organization.

CO2: Explain the Aircraft Nationality and Registration Marks.

CO3: Investigate the procedure for air navigation.

CO4: Explain the operating regulation for aerodrome.

CO5: Illustrate the Indian aircraft rules.

Board of Studies (BoS)
19th BOS of Department of Aerospace Engg held on 17.5.2024

Academic Council:
22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	H	M	M	L	-	M	-	-	L	H
CO2	H	M	L	L	-	L	-	-	M	H
CO3	H	L	H	L	-	H	-	-	M	H
CO4	H	M	M	L	-	M	-	-	M	H
CO5	H	M	L	L	-	M	-	-	H	H

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No.: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Statement: Effective air regulation policies can help achieve these SDGs by reducing harmful emissions, promoting clean energy, and improving public health and environmental quality

GED 1207	ENVIRONMENTAL STUDIES	L	T	P	C
SDG: All		2	0	0	2

COURSE OBJECTIVES:

To make the student conversant with the

COB1: Various natural resources, availability, utilisation and its current scenario.

COB2: Diverse ecosystems and its function, importance of biodiversity, its values, threats and conservation.

COB3: Types of pollutants and its impacts on the environment and the effects of natural disasters.

COB4: Impacts of human population, human health, diseases and immunisation for a sustainable lifestyle.

MODULE I MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES AND NATURAL RESOURCES **8**

Definition, scope and importance, Need for public awareness.

Natural resources and associated problems(a) Land resources: Land as a resource, land degradation, soil erosion and desertification -(b) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forest and tribal people -(c) Water resources: Use and over-utilization of surface and ground water, conflicts over water, dams-benefits and problems, Water conservation: rain water harvesting, watershed management -(d) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, mining -(e) Food resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture - (f) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

MODULE II ECOSYSTEMS AND BIODIVERSITY **8**

Ecosystems: Concept of an ecosystem; Structure and function of an ecosystem; Producers, consumers and decomposers; Energy flow in the ecosystem; Ecological succession; Food chains, food webs and ecological pyramids; Introduction, types, characteristic features, structure and function of the following ecosystem(a)Terrestrial Ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem (b) Aquatic fresh water ecosystems: Ponds and lakes, rivers and streams (c) Aquatic salt water ecosystems: oceans and estuaries.

Biodiversity: Classification: genetic, species and ecosystem diversity; Bio-geographical classification of India and India as a mega-diversity nation; Invasive, endangered, endemic and extinct species; Hot sports of biodiversity and Red

data book; Values of biodiversity, Threats to biodiversity; Conservation of biodiversity.

MODULE III ENVIRONMENTAL POLLUTION AND ITS CONTROL 8

Definition, Cause, effects and control measures of (a) Air pollution, (b) Water pollution, (c) Soil pollution, (d) Marine pollution, (e) Noise pollution, (f) Thermal pollution, (g) Nuclear hazards, (h) ill-effects of fireworks and upkeep of clean environment - El Nino and La Nina.

Solid waste Management - Causes, effects and control measures of urban, industrial wastes and e-waste -Disaster management: flood, drought, cyclone, landslide, avalanche, volcanic eruptions, earthquake and tsunami.

MODULE IV HUMAN POPULATION, SOCIAL ISSUES AND HEALTH 6

Population, population growth, variation among nations; population explosion; Family Welfare Programme - Unsustainable to sustainable development - Resettlement and rehabilitation of people - Environment Protection Act - Public awareness -Human Rights - Value Education - Women and Child Welfare - HIV/AIDS - Environment and human health: air-borne, water borne, infectious diseases, contagious diseases and immunization (all types of vaccines from birth), risks due to chemicals in food and water, endocrine disrupting chemicals, cancer and environment.

Case studies related to current situation.

L – 30; TOTAL HOURS – 30

TEXT BOOKS:

1. ErachBharucha, “Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education for University Grants Commission”, Orient BlackswanPvt.Ltd., Hyderabad, India, 2013.
2. Benny Joseph, “Environmental Studies”, Tata McGraw-Hill Education, India, 2009.
3. Ravikrishnan A, “Environmental Science and Engineering”, Sri Krishna Publications, Tamil Nadu, India, 2018.
4. Raman Sivakumar, “Introduction to Environmental Science and Engineering”, McGraw Hill Education, India, 2009.
5. Venugopala Rao P, “Principles of Environmental Science and Engineering”, Prentice Hall India Learning Private Limited; India, 2006.
6. Anubha Kaushik and Kaushik C.P., “Environmental Science and Engineering”, New Age International Pvt. Ltd., New Delhi, India, 2009.

REFERENCES:

1. Masters G.M., “Introduction to Environmental Engineering and Science”, Prentice Hall, New Delhi, 1997.
2. Henry J.G. and Heike G.W., “Environmental Science and Engineering”, Prentice Hall International Inc., New Jersey, 1996.

3. Miller T.G. Jr., “Environmental Science”, Wadsworth Publishing Co. Boston, USA, 2016.
4. “Waste to Resources: A Waste Management Handbook”, the Energy and Resources Institute, 2014
5. https://www.teriin.org/article/e-waste-management-india-challenges-and-opportunities.
6. https://green.harvard.edu/tools-resources/how/6-ways-minimize-your-e- waste.
7. https://www.aiims.edu/en/departments-and-centers/central-facilities/265-biomedical/7346-bio-medical-waste-management.html.
8. https://tspcb.cgg.gov.in/Shared%20Documents/Guidelines%20for%20Management%20of%20Healthcare%20Waste%20Waste%20Management%20Rules,%202016%20by%20Health%20Care%20Facilities.pdf.

COURSE OUTCOMES:

The student will be able to:

CO1: analyse the current scenario of various natural resources and their depletion and suggest remedies to curb the exploitation.

CO2: identify food chains and web and its function in the environment, assess the impacts on the biodiversity and propose solutions to conserve it.

CO3: analyse the types and impacts of pollutants in the environment and propose suitable methods to alleviate the pollutants and the natural disasters.

CO4: assess on the impact of human population and the health related issues and immunization practices and sustainable developments for a healthy life

Board of Studies (BoS) :
11thBoS of Chem held on 17.06.2021

Academic Council:
22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		L	M			L	M							
CO2				M	H									
CO3							M	M			L		M	
CO4						M	M	M				L		
CO5														

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No. All: Poverty, Zero Hunger, Good Health and Well-Being, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable & Clean Energy, Decent Work and Economic Growth, Industry, Innovation & Infrastructure, Reduced Inequalities, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land,

Peace, Justice and Strong Institutions, Partnerships for the Goals.

Statement: This course discuss about the environment, all the natural resources available, sharing of resources, effective utilization, effects of over utilisation, health and environmental issues pertained to that, global warming and related issues, climates, disasters, impact assessments, population, human rights, societal welfare, laws to conserve the environment and sustainability

AVD 1203	TECHNICAL DRAWING LABORATORY	L	T	P	C
SDG: 9		0	0	4	2

COURSE OBJECTIVES:

COB1: To make students familiarize with design and drafting of aircraft components using software tools like AUTOCADD, CATIA.

COB2: To prepare assembly drawings both manually and using standard CAD packages

PRACTICALS:

List of Experiments:

1. Introduction about technical drawing and software.
2. Modelling of Riveted Lab & Butt Joint.
3. Modelling of Welded Joints.
4. Modelling of Control Components - CAM.
5. Modelling of Control Components Push-pull Rod.
6. Modelling of symmetrical and cambered airfoil.
7. Layout of control System used in aircraft.
8. Layout of Typical Wing Structure
9. Layout of Typical Fuselage Structure
10. Three view diagrams of a typical Aircraft.

P– 60; TOTAL HOURS – 60

TEXT BOOKS:

1. Gopalakrishna K.R., “Machine Drawing”, 22nd Edition, Subhas Stores Books Corner, Bangalore, 2013.
2. Junnarkar, N.D., “Machine Drawing”, 1st Edition, Pearson Education, 2004

REFERENCES:

1. N.D.Bhatt and V.M. Panchal, “Machine Drawing”, 48th Edition, Charotar Publishers,2013

COURSE OUTCOMES:

Upon the completion of this course the students will be able to:

CO1: Understand and interpret machine manufacturing drawings.

CO2: Develop 2D and 3D models using high end modeling software.

CO3: Apply engineering drawing standards.

CO4: Understand the layout of Aircraft wing and fuselage.

CO5: Prepare layout of various Aircraft components.

Board of Studies (BoS):	Academic Council:
19th BOS of Department of Aerospace Engg held on 17.5.2024	22nd ACM held on 04.09.2024

SDG 9 - Industry, Innovation, and Infrastructure

Statement: Technical drawings are crucial in designing sustainable infrastructure and innovative solutions.

COD 3103	NATIONAL SERVICE SCHEME	L	T	P	C
SDG: 10		1	1	0	2

COURSE OBJECTIVES:

COB1: To make the students understand the basic concepts of NSS.

COB2: To familiarise the students about the needs and problems of the community and involve them in problem-solving

COB3: To familiarise the youth development programmes under the Government of India.

COB4: To develop the student"s capacity to meet emergencies and natural disasters.

COB5: To make awareness to the students about the importance of health and hygienic in day to day life

MODULE I INTRODUCTION AND BASIC CONCEPTS OF NSS 6

Introduction, History, aims and objectives of NSS, Emblem, Flag, Motto, Song, Organizational structure, Roles and responsibilities of NSS functionaries.

MODULE II NSS PROGRAMMES AND ACTIVITIES 6

Concept of regular activities, special camping, Basis of adoption of village/slums, Methodology of conducting survey, Financial pattern of the scheme, Coordination with different agencies, Maintenance of dairy.

MODULE III YOUTH DEVELOPMENT PROGRAMME IN INDIA 6

National Youth Policy, Youth Development Programme at the National level, State level and voluntary sector, Youth-focused and Youth–lead organizations.

MODULE IV DISASTER MANAGEMENT 6

Introduction to Disaster Management, classification of disaster, Role of youth in Disaster Management, National Disaster Response Force and Civil Defense, organization and functions.

MODULE V HEALTH, HYGIENE AND SANITATION 6

Definition, need and scope of health education, Food and nutrition, Safe drinking water, water borne diseases and sanitation (Swatch Bharat Abhiyan), National Health Programme.

L – 15; T- 15; TOTAL HOURS – 30

TEXT BOOKS:

1. J.D.S.Panwar, Amit Kumar Jain &Brijesh Kumar, “National Service Scheme,

A Youth Volunteers Programme", Daya Publishing House, New Delhi, 2020

REFERENCES:

1. National Service Scheme Manual, Government of India
2. Training Programme on National Programme scheme, TISS.
3. Orientation Courses for N.S.S. Programme officers, TISS.
4. Social service opportunities in Hospitals, Kapil K. Krishan, TISS.

COURSE OUTCOMES:

On successful completion of this course students are able to:

CO1: Explain the basic concepts of NSS

CO2: Demonstrate the clear picture on NSS activities and the organization structure of NSS.

CO3: Practically show the social responsibility by doing the campus activities.

CO4: Describe the disaster management and rescue operations of the country.

CO5: Illustrate the importance of health education and hygienic in our community

Board of Studies (BoS) :
16th BoS of Department of Commerce held on 11.12.2021 & 13.12.2021

Academic Council:
22nd ACM held on 04.09.2024

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				H		H	H	H	H			H		
CO2				H		H	H	H	H			H		
CO3				H		H	H	H	H			H		
CO4				H		H	H	H	H			H		
CO5				H		H	H	H	H			H		

Note: L - Low Correlation M - Medium Correlation H - High Correlation

SDG No. 10: Reduce inequality within and among countries

Statement: This course enable the learners to understand what are the social and emotional causes of poverty and it helps to end the inequalities, and create awareness that social welfare programs are the best support through activism, votes, time and talent that can help make a difference in the society.

SEMESTER III

AVD 2101	**GENERAL NAVIGATION**	**L**	**T**	**P**	**C**
SDG: 9		**3**	**1**	**0**	**4**

COURSE OBJECTIVES:

COB1: To understand the basic concept of earth and its position.

COB2: To understand the earth magnetism and its variation.

COB3: To acquire the knowledge of topographical maps

COB4: To understand the polar stereographic projection and its properties.

COB5: To understand the solar system and its time.

MODULE I THE EARTH, POSITION & DISTANCE L: 8 T: 4 P:

Direction: The form of the Earth, Basic Direction; -Lines on the Surface of the Earth: Great Circle, Small circle, Rhumb Line. - Position: Latitude, Longitude, Chlat, Chlong, - Units of distance: NM, kM, SM -Measurement of distance: GC, RL distance determination.

MODULE II TOPOGRAPHICAL MAPS & NORMAL MERCATOR L: 8 T: 4 P:

Scale: Scale and Calculation; Topographical Maps: Features, Map Reading and Navigation Techniques, Symbology. Chart Overview: Types of projections, Conformality; Normal Mercator: Mercator - Intro and Overview of Projections, Mercator - Principle of Construction, Mercator Properties

MODULE III DIRECTION, TRIANGULAR VELOCITIES, CP & PNR AND CONVERGENCY L: 8 T: 4 P:

Earth Magnetism: Variation, Magnetic Dip and Deviation. 1 in 60 Rule: Rule and geometry, Application in Basic Navigation. CP or PET: Introduction, Calculations; PNR or PSR: Introduction, Calculations. Convergence: Convergency, Conversion Angle

MODULE IV LAMBERT'S, TRANSVERSE & OBLIQUE MERCATOR L: 8 T: 4 P:

Lambert's Conformal: Conical projection, Parallel of origin, cone of constant, standard parallels, scale, chart convergence and properties Polar Stereographic: Polar Projection and properties Transverse Mercator: Introduction and properties Oblique Mercator: Introduction and properties

MODULE V TIME **L: 8 T: 4 P:**

Time: Solar system and Kepler's law, Seasonal Variation, Twilight period, Sunrise and Sunset, Declination and Hour Angle, Numerical: UTC/GMT, LMT, ST, ZT.

L – 40; T – 20; Total Hours: 60

TEXT BOOKS:

1. R K Bali, "AIR NAVIGATION".
2. K.S. Ramakrishnan, "Air Navigation", Integrity Media; First edition (1 January2009).
3. CAE Oxford Aviation Academy – General Navigation.

REFERENCES:

1. Trevor Thom, "Air Navigation", Air life Pub Ltd (1 July 2002).
2. Keith Williams, "1000 Questions Answers & Explanations for JAR ATPL (A) & CPL (A) - General Navigation", The English Book Store (The Aviation People); 2016th edition (1 January 2016).

COURSE OUTCOMES:

At the end of the course students will able to

COB1: Describe the geometric properties of the Earth's surface and their relevance to navigation.

COB2: Apply appropriate methods for measuring distances and understanding Earth's magnetic properties.

COB3: Interpret and utilize topographical maps for effective navigation and terrain analysis.

COB4: Employ normal, transverse, and oblique Mercator projections for accurate geospatial navigation.

COB5: Evaluate modern navigation systems, their operational principles, and the processes involved in their development.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO2
CO1	2	3	3	2	2	2	1	2	2	3	3
CO2	1	2	2	2	2		1	2	2	1	1
CO3	2	2	2	2	1	1	2	2	2	2	2
CO4	1	2	2	2	1	1	2	2	2	2	2
CO5	2	2	2	1	2	1	2	3	2	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9 - Industry, Innovation, and Infrastructure

Statement: By integrating traditional navigation techniques with emerging technologies such as satellite-based systems and digital mapping, the course prepares students to support innovation and operational efficiency in aviation, contributing to the development of reliable, resilient, and sustainable transportation infrastructure.

AVD 2102	AIRCRAFT SYSTEMS	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the basic operation and principles of aircraft air-conditioning systems.

COB2: To gain knowledge of hydraulic system components and their applications in aircraft.

COB3: To comprehend the fundamental operation of aircraft fuel systems.

COB4: To understand various flight control systems and their functional operations.

COB5: To become familiar with the different communication equipment used in aircraft.

MODULE I HYDRAULIC AND LANDING GEAR SYSTEM L: 9 T: P:

System lay-out; Hydraulic fluids; Hydraulic system components; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters Pressure Control; Power distribution; Indication and warning systems; Interface with other systems.

Landing Gear Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, anti-skid and auto-braking; Tyres; Steering.

MODULE II FLIGHT CONTROL SYSTEM L: 9 T: P:

Flight Controls, Primary controls: aileron, elevator, rudder, spoiler; Trim control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire; Artificial feel, Stall protection/warning system

MODULE III FUELSYSTEM L: 9 T: P:

Fuel Systems, types of fuel, System lay-out; Fuel tanks; Supply systems - Fuel sub-systems Indications and warnings

MODULE IV AIR CONDITIONING AND PRESSURISATION SYSTEM L: 9 T: P:

Air supply-Sources of air supply including engine bleed, APU and ground cart. Air-Conditioning, Air-conditioning systems- Air cycle and vapor cycle machines,

Distribution systems; - control system. Pressurization systems; Control and indication including control and safety valves; Cabin pressure controllers. Safety and warning devices.

MODULE V COMMUNICATION AND NAVIGATION SYSTEM L: 9 T: P:

Communication: Fundamentals of radio wave propagation, basic components; Working principles of following systems: — Very High Frequency (VHF) communication, — High Frequency (HF) communication, — Audio, — Emergency Locator Transmitters, — Cockpit Voice Recorder, — Very High Frequency omnidirectional range (VOR).

Navigation: — Instrument Landing System (ILS), — Microwave Landing System (MLS**)**

L – 45; Total Hours: 45

TEXT BOOKS:

1. Handbooks of Airframe and Power plant Mechanics, Airframe Handbook 15 A US dept. of Transportation, Federal, Aviation Administration, the English Book Store, New Delhi, 1995
2. McKinley, J.L. and Bent R.D. Aircraft Maintenance & Repair, McGraw Hill, 1993.

REFERENCES:

1. Handbooks of Airframe and Power plant Mechanics, US dept. of Transportation, Federal, Aviation Administration, the English Book, Store, New Delhi, 1995
2. McKinley, J.L. and Bent R.D. Aircraft Maintenance & Repair, McGraw Hill, 1993
3. Treager, S, “Aircraft Gas Turbine Technology, McGraw Hill 1997.

COURSE OUTCOMES:

At the end of the course students will able to

COB1: Explain the principles and operation of hydraulic systems used in aircraft.

COB2: Compare the features and functionalities of different flight control systems.

COB3: Analyze the performance and operation of various aircraft fuel systems.

COB4: Describe the functioning of aircraft air-conditioning and pressurization systems.

COB5: Acquire, interpret, and apply data from various aircraft communication and navigation systems.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	3	2		3					1	1	2
CO2	3	3	3	2				1	2		2
CO3	3	2	1	3	2	1		2	3	3	2
CO4	2	2	1	2		1	1	2	2	2	2
CO5	3	2	2	1	3	3	2	3	3	3	3

Note: 1 - Low Correlation 2- Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: Through hands-on understanding of modern aerospace technologies and infrastructure, students are prepared to contribute to the advancement of sustainable, safe, and efficient aviation systems, thereby promoting resilient industry practices and innovation in the aviation sector.

AVD 2103 **AIRLINE AND AIRPORT OPERATIONS** **L T P C**

SDG: 9 **3 0 0 3**

COURSE OBJECTIVES:

COB1: To understand the market potential and economic dynamics of the airline industry.

COB2: To gain knowledge of airport planning principles and infrastructure design.

COB3: To develop a comprehensive understanding of airport and airline ground operations and related services.

COB4: To become familiar with key aviation regulatory bodies and their respective functions.

COB5: To understand the critical importance of safety and security in ground operations.

MODULE I HISTORY OF AVIATION AND DEVELOPMENT L: 9 T: P:

History of Aviation- Development of Air transportation in India-Major players in Airline Industry-Swot (SWOT)analysis in Airline Industry-Market potential of Indian Airline Industry - PPP [Public Private Participation] in Indian Airports-Current challenges in Airline Industry.

MODULE II AIRPORT PLANNING AND OPERATION L: 9 T: P:

Introduction to Greenfield Airport - Airport planning- Operational area and Terminal planning, design, and operation-Airport Operations-Organization structure and Airport functions – PPP model airports in India – AAI - role, functions and services - Global and Indian scenario of Airport management**.**

MODULE III AIRLINE OPERATION L: 9 T: P:

Turn around activity – activities prior to arrival – Aircraft Guiding and docking Procedures – safety precautions – GSE – non powered and powered and functions - Baggage/Cargo offloading and loading – Catering uplift procedure - Refueling – Walk around inspection - departure activities / procedure

MODULE IV REGULATORY BODIES L: 9 T: P:

ICAO – Formation, Functions, Annexures – Freedom of Air – Other International conventions

DGCA introduction, Functions and guidelines - Act and Rules, sections of CAR

BCAS – Formation, Functions – Acts and Rules, various restricted articles and items –

IATA – Formation, functions, codes for airport and airline,

AAIB – Purpose, Role and functions

MODULE V SAFETY PROCEDURES IN GROUND OPERATION L: 9 T: P:

Ramp Safety – Types of Accidents at Ramp, Personnel – Damage to Aircraft, Ground Equipment and Vehicle – (Beacon – Cones) – Foreign Object Debris (FOD) - Personnel Protection on the Ramp –Driving on the RAMP–Service Roads –Equipment Parking Areas – Safety DO's and DON'T's – Securing the Aircraft

L – 45, Total Hours: 45

TEXT BOOKS:

1. Managing Airport an International Perspective – Graham - Butterworth Heinemann, Oxford- 2001
2. Airport Planning and Management - Wells.A, 4th Edition-McGraw-Hill, London-2000
3. Doganis.R.-The Airport Business - Routledge, London-1992
4. Fundamentals of Airport Transport Management – P.S.Senguttuvan – McGraw Hill 2003.

REFERENCES:

1. Airport Systems: Planning, Design, and Management - Richard De Neufville – McGraw-Hill, London- 2007
2. DGCA – Civil Aviation Requirements (CAR)- Section 4.

COURSE OUTCOMES:

At the end of the course students will able to

COB1: Demonstrate broad knowledge of aviation history, key developments in the aviation industry, and current challenges along with the strategies used to address them.

COB2: Understand the functional significance, design, and development of various airport areas and facilities.

COB3: Explain the procedures and best practices involved in managing ramp operations effectively.

COB4: Identify major aviation regulatory bodies and describe their roles and responsibilities.

COB5: Understand and apply the principles of safety culture in ground and ramp operations.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1		2	2	1	1					1	2
CO2	3	2	3	2	3	2	2	3	3	2	3
CO3	3	2	3	3	2	2	2	2	3	2	3
CO4			3		3	1	2	2	2	1	1
CO5	1	3	2	3	2	2	2	3	3	3	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: By covering topics such as ground handling, airport infrastructure, regulatory compliance, and safety management, the course prepares students to contribute to the development of resilient, technologically advanced, and sustainable aviation systems that are essential to modern transportation infrastructure.

AVD 2104	RADIO NAVIGATION	L	T	P	C
SDG: 9		4	0	0	4

COURSE OBJECTIVES:

COB1: To understand the basic principles of radio wave propagation.

COB2: To learn the classification and interpretation of ground bearings.

COB3: To understand the working principles of VOR and Doppler navigation systems.

COB4: To gain knowledge of altimeter and radar components used in aviation.

COB5: To understand the fundamentals of satellite-assisted navigation.

MODULE I PROPAGATION THEORY, ANTENNA AND IONOSPHERE **L:12 T: P:**

Basic radio propagation theory - Basic principles - Electromagnetic waves - Wave length, amplitude, phase angle, frequency - Frequency bands - Carrier, modulation, - Oscillation circuit - Antennas - Characteristics - Polarization - Types of antennas - Wave propagation - Properties of Radio Waves, Ground wave - Space wave - Propagation with the frequency bands - Frequency prognosis (MUF) - fading - Factors affecting propagation (reflection, absorption, interference, twilight, shoreline, mountain, static), The Ionospheric Layers – Skip distance – dead space – Angle of Incidence – Critical Angle; Relationship between frequency & Atmospheric Condition.

MODULE II GROUND D/F, ADF/NDB AND TYPES OF BEARING **L: 12 T: P:**

Ground D/F (including classification of bearings) - principles - presentation and interpretation - - factors affecting range and accuracy; ADF (including associated beacons and use of the radio magnetic indicator) - ADF Control Panel- Function switch- BFO circuit diagram - principles - presentation and interpretation –--- factors affecting range and accuracy; Types of Bearing; True, Magnetic & Relative Bearing;

MODULE III VOR & DOPPLER, TRACK & DRIFT, HOLDING PATTERN **L: 12 T: P:**

VOR and Doppler – VOR (including the use of the radio magnetic indicator) - principles - presentation and interpretation - - factors affecting range and accuracy; Track & Drift Calculation; VOR/RMI/ADF – Calculation; Holding, Radial Intercept, Bearing to plot.

MODULE IV RADIO ALTIMETER, RADAR & INSTRUMENTS: DME, ILS **L: 12 T: P:**

Radio Altimeter - components - frequency band - principle of operation - displays - errors; Radar: Primary & Secondary; DME (distance measuring equipment) ILS (Instrument Landing System) principles - presentation and interpretation - - factors affecting range and accuracy.

MODULE V RADAR, DME, ILS L: 12 T: P:

SSR secondary surveillance radar and transponder: principles - presentation and interpretation - modes and codes, including mode S; Self-contained and External-Referenced Navigation Systems - Satellite assisted navigation: GPS / GLONASS - principle of operation - advantages and disadvantages

L – 60; T – 00; P – 00; Total Hours: 60

TEXT BOOKS:

1. R K Bali, “AIR NAVIGATION”, 2nd Edition, 1 January 2017.
2. CAE Oxford, “Radio Navigation”
3. R. B. Underdown, David Cockburn, “Ground Studies for Pilots: Radio Aids”, Wiley-Blackwell; 6th edition (20 April 2001).
4. Trevor Thom, “Radio Navigation and Instrument Flying: Air Pilot's Manual”, Airlife Pub Ltd (1 July 2002).

REFERENCES:

1. Keith Williams, “Radio Navigation 1000 questions and answers with explanation”, The English Book Store (The Aviation People) (1 January 2013)
2. Alan E. Bramson, Neville Birch and Alan Branson, “Radio Navigation for Pilots”, Gardners Books; 3rd edition (June 30, 1996).
3.

COURSE OUTCOMES: After the course the students are able to

COB1: Explain the operating principles of radio navigation instruments.

COB2: Understand the concepts of magnetic and relative bearings and their applications in navigation.

COB3: Analyze the functionality and advantages of Area Navigation (RNAV) systems.

COB4: Summarize the basic operating principles of radar systems used in aviation.

COB5: Explain the working of Inertial Navigation Systems (INS) and Inertial Reference Systems (IRS).

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	2	2	3	2			2	2	2	2	1
CO2	2	2	3	2	2	2	2	2	2	3	3
CO3	2	2	3	2	2	1	2	2	2	2	3
CO4	2	2	3	3	3	2	2	3	2	2	3
CO5	2	3	2	2	3	1	2	3	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure)

Statement: Through the study of technologies such as VOR, Doppler, radar, and in innovation, supports the advancement of reliable navigation infrastructure, and prepa modernization and resilience of the global aviation industry.

AVD2105	FLIGHT INSTRUMENTS	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To provide students with foundational knowledge of various aircraft systems, instruments, and their practical applications.

COB2: To impart understanding of the principles and applications of gyro instruments.

COB3: To explain the basic concepts of magnetism and its relevance in aviation systems.

COB4: To introduce the basic structure and function of aircraft power plants and their sub-assemblies.

COB5: To educate students on safety precautions and standard procedures for handling aircraft systems effectively.

MODULE I PRESSURE INSTRUMENTS L: 9 T: P:

Air data instruments - pitot and static system - pitot tube, construction, and principles of operation - static source - malfunction – heating - alternate static source Altimeter - construction and principles of operation - display and setting – errors - correction tables – tolerances. Airspeed indicator - construction and principles of operation - speed indications (IAS) - meaning of colored sectors - maximum speed indicator, VMO, MMO pointer – errors Mach Meter- construction and principles of operation errors Vertical Speed Indicator (VSI) - aneroid and instantaneous VSI (IVSI) - construction and principles of operation – display

MODULE II GYRO FUNDAMENTALS & GYROSCOPIC INSTRUMENTS L: 9

Gyro fundamentals - theory of gyroscopic forces (stability, precession) - types, and principles of operation: - vertical gyro - directional gyro - rate gyro - rate integrating gyro - single degree-of-freedom gyro - ring laser gyro - apparent drift - random drift – mountings - drive types, monitoring Directional gyro - construction and principles of operation - Slaved gyro compass- construction and principles of operation – components - mounting and modes of operation - turn and acceleration errors - application, uses of output data. Attitude indicator (vertical gyro) - construction and principles of operation- display types - turn and acceleration errors - application, uses

of output data Turn and bank indicator (rate gyro) - construction and principles of operation - display types - application, uses of output data, Turn coordinator

MODULE III AIRCRAFT MAGNETISM: DRC, RIC L: 9

Aircraft magnetism - Hard iron and vertical soft iron - the resulting magnetic fields - the variation in directive force - Change of deviation with change of latitude and with change in aircraft's heading - keeping magnetic materials clear of the compass; Magnetic Compass - construction and principles of operation, - errors (deviation, effect of inclination) Remote reading compasses (Gyro-Magnetic Compass): Principle of Construction, Flux Valve, Compass Components and Remote Transmission- - serviceability tests - advantages and disadvantages of the remote indicating compasses

MODULE IV POWER PLANT AND SYSTEM MONITIRING INSTRUMENTS L: 9 T: P:

Pressure Gauge – sensors - pressure indicators -Temperature Gauge - ram rise, recovery factor. RPM Indicator - piston and turbine engines - high pressure line fuel flowmeter (function, indications, failure warnings). Fuel Gauge - measurement of volume/mass, units - measuring sensors - content, quantity indicators - Torque Meter - indicators, units - Basics of Electronic Displays- EFIS- EICAS – ECAM – FMS

MODULE V WARNING DEVICES L: 9 T: P:

Flight Warning System - Aerodynamic Warnings, Ground Proximity Warning System (GPWS), Airborne Collision and Avoidance System (ACAS), Flight Data Recorder, Cockpit voice recorder

L – 45, Total Hours: 45

TEXT BOOKS:

1. Pallet, E.H.J., "Aircraft Instruments & Principles", Pitman & Co., 1993.
2. Nordian, "Airframe and Systems", KLM flight academy, 2018.
3. CAE Oxford, "Instrumentation"
4. CAA, "CAP 459 Part-I & II Civil Aircraft Inspection Procedures", Sterling Book House, 2006.
5. Jeppesen, "A &P Technician Airframe", Jeppesen Sanderson; Illustrated edition (30 May 2003).

REFERENCES:

1. Dale Ph.D. De Remer, “Aircraft Systems for Pilots”, Aviation Supplies & Academics Inc, 4th Edition, (30 January 2018).
2. Chris Binns, “Aircraft Systems”, Wiley-IEEE Press; 1st edition (28 December 2018).
3. David Harris, “Ground Studies for Pilots - Flight Instruments and Automatic Flight Control Systems”, Wiley India Pvt Ltd; Sixth edition (7 July 2008).

COURSE OUTCOMES:

Students will able to

COB1: Explain the working principles and functions of pressure instruments used in aircraft.

COB2: Describe the operation and significance of gyroscopic instruments in flight operations.

COB3: Illustrate the principles and applications of advanced magnetic instruments in aviation.

COB4: Discuss the basic engine instruments and their operational characteristics.

COB5: Explain the technical features and working principles of aircraft warning and alerting systems.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	1	3	3	3	2	1	1	2	1	3	3
CO2	1	2	2	3			1	2	1	1	1
CO3	1	2	1	1	1		1	1	2	2	1
CO4	2	3	2	3	2	1	2	2	3	3	2
CO5	2	2	3	2	2	2	2	3	3	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: Through the study of pressure, gyroscopic, magnetic, and electronic instruments, the course fosters innovation and supports the advancement of reliable aviation technologies, thereby contributing to the development of resilient and modern aerospace infrastructure.

AVD 2106	FLIGHT SIMULATOR LABORATORY	L	T	P	C
		0	0	4	2

SDG: 9

COURSE OBJECTIVES:

- This course is designed not to replace actual flight training, but to thoroughly familiarize students with the aircraft and its systems, ensuring they are well-prepared and confident before undertaking real-world flight training, which can be both costly and high-risk.

Exp. No	EXPERIMENTS	Number of Hours
1	Introductory Flight	2
2	Four Fundamentals of the flight	3
3	Integrated Flight Instruction	2
4	Slow Flight and Stall Recovery	3
5	Emergency procedures	2
6	Steep Turns and Ground Reference Maneuvers	3
7	Traffic Pattern Review	2
8	Pre solo Review	3
9	First Solo check	3
10	Performance Take offs and Landings	2
11	Solo Practice	2
12	Navigation	3
		TOTAL= 30 HOURS

COURSE OUTCOMES:

Upon the completion of this course the students will be able to

CO1: Identify and explain the four fundamental forces of flight and their effects on aircraft performance.

CO2: Describe the principles and application of integrated flight instruction techniques.

CO3: Demonstrate proficiency in performing steep turns and ground reference maneuvers.

CO4: Execute standard procedures for takeoffs and landings under varying conditions.

CO5: Successfully perform solo flight checks in accordance with training standards and safety protocols.

REFERENCES:

1. https://www.youtube.com/watch?v=Nl8fw6N_Uyo
2. https://www.youtube.com/watch?v=9DM_8OW9Z3E
3. https://www.youtube.com/watch?v=YzNSBTxH_Cs
4. https://www.youtube.com/watch?v=UvKeDcga9zo
5. https://www.youtube.com/watch?v=5Miei8UHiYg

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	3	2	2	2	1	3	2	1	1	3	2
CO2	2	2	2	3	3	2	3	3	2	2	3
CO3	3	2	1	3	1	3	2	2	1	2	2
CO4	3	2	3	3	2	3	3	3	2	3	3
CO5	3	2	2	3	2	3	2	3	2	2	3

SDG 9: Industry, Innovation, and Infrastructure

Statement: By providing a safe, cost-effective, and high-fidelity simulation environment, the lab enables students to develop essential flying skills and operational awareness. This contributes to building resilient aviation infrastructure and supports the development of skilled professionals who are prepared to meet the evolving demands of the aerospace industry.

SEMESTER - IV

AVD 2201	PISTON ENGINES & PROPELLERS	L	T	P	C
SDG: 7 & 9		4	0	0	4

COURSE OBJECTIVES:

COB1:	Understand the fundamentals and operating principles of piston engines.
COB2:	Analyze the functions and components of various piston engine sub-systems.
COB3:	Interpret and evaluate engine indication and monitoring systems.
COB4:	Examine the detailed construction, types, and working of aircraft propellers.
COB5:	Understand the procedures and best practices for the maintenance and servicing of propellers.

MODULE I FUNDAMENTALS & CONSTRUCTION OF PISTON ENGINE **L: 15 T: P:**

Fundamentals- Mechanical, thermal and volumetric efficiencies; Operating principles — 2 strokes, 4 stroke, Otto and Diesel; Engine configuration and firing order. Engine Performance, Power calculation and measurement; Factors affecting engine power. Engine Construction-Crank case, crank shaft, cam shafts, Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.

MODULE II ENGINE FUEL SYSTEMS, STARTING AND IGNITION SYSTEMS **L: 15 T: P:**

Carburetors- Types -construction and principles of operation; Icing and heating. Fuel injection systems- Types, construction and principles of operation. Electronic engine control, Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components. Starting and Ignition Systems, pre-heat systems; Magneto types- construction and principles of operation.

MODULE III ENGINE INDICATION SYSTEMS **L: 15 T: P:**

Engine Indication Systems - Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust Gas Temperature; Fuel pressure and flow; Manifold pressure. Engine Monitoring and Ground Operation, Procedures for starting and ground run-up; Interpretation of engine power output and parameters**.**

MODULE IV PROPELLER CONSTRUCTION L: 15 T: P:

Propeller Construction- Construction methods and materials used in wooden, composite and metal propellers; and hub assembly; types of propellers-; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Vibration and resonance.

Propeller Pitch Control, Speed control, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection. Propeller Synchronizing and synchrophasing equipment. Propeller Ice Protection -Fluid and electrical de-icing equipment.

MODULE V PROPELLER MAINTENANCE. L: T: P:

Propeller Maintenance- Various inspections, Static and dynamic balancing; Blade tracking; Assessment of blade damage, Propeller treatment/repair schemes; Propeller engine running. Blade tracking, repair of pitch control mechanism- re-assembly and testing**.**

L – 60; Total Hours: 60

TEXT BOOKS:

1. Herschel Smith, “Aircraft Piston Engines”, McGraw Hill Higher Education (1 July 1981).
2. Ralph D Bent and Mckinley James L, “Aircraft Power Plants”, McGraw-Hill; Revised Ed. edition (January 1, 1955).
3. Airframe and Power plant Mechanics (EA-AC 65- 12A) -Power Plant Hand FAA..

REFERENCES:

1. Aircraft Piston Engines: For Professional and Private Pilots by Oxford Aviation Academy Limited, 2005.
2. Graham White, “Allied Aircraft Piston Engines of World War II”, SAE, 1995.

COURSE OUTCOMES:

Upon completion of the course the students are able to

COB1: Explain the working principles of piston engines.

COB2: Analyze the components and operation of various piston engine sub-systems.

COB3: Interpret the functions and significance of engine indication systems.

COB4: Describe the constructional features and design procedures of aircraft propellers.

COB5: Evaluate the procedures and practices involved in propeller maintenance.

Board of Studies (BoS):

20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:

24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1		2	2	2			2	2	2	2	
CO2		2	2	2			2	2	2	2	
CO3		2	2	2			2	2	2	2	
CO4		2	2	2			2	2	2	2	
CO5	1	2	2	2		1	2	2	2	2	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation, and Infrastructure).

Statement: By equipping students with technical knowledge of efficient engine and propeller systems, it supports SDG 7 & 9. The course encourages responsible maintenance practices and fosters awareness of fuel-efficient technologies, contributing to reduced environmental impact and a more sustainable aviation industry.

AVD 2202	OPERATIONAL PROCEDURES	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: Understand the fundamental operational procedures in aviation.

COB2: Interpret weather requirements and apply relevant operational procedures.

COB3: Understand the basic concepts and functions of aviation communication equipment.

COB4: Explain the special operating procedures in various flight scenarios.

COB5: Identify and assess various natural hazards affecting aviation operations.

MODULE I OPERATIONAL PROCEDURES – SPECIAL & EMERGENCY PROCEDURES GENERAL **L: 9 T: P:**

ICAO Annex 6, Parts I, II and III (as applicable) – definitions – applicability - general framework and contents CAR-OPS – Requirements: General requirements about - quality system - additional crew members - methods of carriage of persons - admission to flight deck - information retained on ground - power to inspect - production of documentation and records - preservation of documentation – leasing Operator certification and supervision requirements - general rules for Air Operator Certification - issue - variation and continued validity of an AOC - administrative requirements Operational Procedures requirements - operational control and supervision - use of Air Traffic Services - instrument departure and approach procedures - carriage of person with reduced mobility - - stowage of baggage and cargo - passengers seating - - smoking on board - take-off conditions - application of take-off minima's

MODULE II ALL-WEATHER OPERATIONS, INSTRUMENT & SAFETY EQUIPMENT REQUIREMENTS **L: 9 T: P:**

All-weather Operations requirements: Aerodrome Operating Minima's – General: Low Visibility Operations – General operating rules – Aerodrome considerations – Training and qualifications – Operating procedures – Minimum equipment; VFR Operating Minima Instrument and safety equipment requirements: general introduction - circuit protection devices - windshield wipers - airborne weather radar equipment - flight crew interphone system - public address system - internal doors and curtains - first aid kits - emergency medical kit - first aid oxygen - supplemental oxygen – pressurized aero planes - supplemental oxygen – non-pressurized aero planes - crew protective breathing equipment - hand fire extinguishers - crash axes and crowbars - marking of break-in points - means for emergency evacuation – megaphones - emergency lightings, -

automatic emergency locator transmitter - ELTs for extended over-water flights - survival equipment.

MODULE III COMMUNICATION & NAVIGATION EQUIPMENT REQUIREMENTS & FDTL L: 9 T: P:

Communication and navigation equipment requirements: radio equipment - audio selector panel - radio equipment VFR - communication and navigation IFR and VFR - cabin crew. Knowledge of basic navigation equipment, operational and regulatory, requirements for long-range flights in MNPS, Trans-oceanic and polar airspace.

MODULE IV SPECIAL OPERATIONAL PROCEDURES L: 9 T: P:

Special Operational Procedures: Minimum equipment list – AFM. Ground de-icing: icing conditions-, on ground/in-flight -, types of de-icing fluids - performance deterioration, on ground/in-flight. Bird strike risk and avoidance. Noise abatement: influence by the pilot (power setting, low drag, low power. Fire/smoke: actions in case of overheated brakes after aborted take-off and landing. Decompression of pressurized cabin: slow decompression - rapid or explosive decompression - dangers and action taken.

MODULE V HAZARDS (GENERAL ASPECTS) L: 9 T: P:

Wind shear, microburst: definition and description - effects and recognition during departure and approach - actions to avoid and actions taken during encounter. Wake turbulence: cause - influence of speed and mass, wind - actions taken when crossing traffic, during take-off and landing. Security - unlawful events. Emergency and precautionary landings operations in various terrain –definition - cause - factors to be considered - passenger information - evacuation - action after landing. Fuel jettisoning: safety aspects. Transport of dangerous goods: Annex 18 - practical aspects. Contaminated runways: kinds of contamination - braking action, - performance correction and calculations.

L – 45; Total Hours: 45

TEXT BOOKS:

1. Nordian," Operational Procedures".
2. CAE Oxford, "Operational procedures".
3. Wing Commander R.K. Bali, "Air Regulations"
4. ICAO Annexures.

REFERENCES:

1. Keith Williams, "Radio Navigation 1000 questions and answers with explanation", The English BookStore (The Aviation People) (1 January 2013).
2. Alan E. Bramson, Neville Birch and Alan Branson, "Radio Navigation for Pilots",

Gardners Books; 3rd edition (June 30, 1996).

COURSE OUTCOMES: After the course the students are expected to be able to

COB1: Analyze and apply standard aviation operational procedures.

COB2: Interpret various weather conditions and implement appropriate safety measures.

COB3: Demonstrate the use and functions of communication equipment during flight operations.

COB4: Evaluate and apply special procedures in emergency situations.

COB5: Analyze the appropriate actions to be taken during natural and operational hazards.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	2	2	3	1	3	2	2	2	3	3	3
CO2	2	2	3	2	2	2	2	2	3	3	3
CO3	1	2	3	2	2	1	2	2	2	2	3
CO4	1	2	3	1	2	1	2	2	3	2	3
CO5	2	1	3	2	2	3	2	2	3	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: The course “Operational Procedures” supports the United Nations Sustainable Development Goals by fostering safe, efficient, and sustainable practices in aircraft and airport maintenance. It contributes to SDG 9 by enhancing technical proficiency and procedural compliance in aviation operations.

AVD2203 MASS AND BALANCE - AEROPLANES **L T P C**

SDG: 9 **3 0 0 3**

COURSE OBJECTIVES:

COB1: Understand the basic concepts of aircraft mass and balance.

COB2: Identify and explain the factors that determine aircraft limitations related to mass and center of gravity.

COB3: Understand the procedures and considerations involved in aircraft loading.

COB4: Learn the fundamental methods for calculating the center of gravity (C.G.) position.

COB5: Understand the procedures involved in preparing the aircraft trim sheet.

MODULE I INTRODUCTION TO MASS AND BALANCE L: 9 T: P:

Centre of gravity (cg): Definition, importance About aircraft stability (Airplane), Mass and balance, consult Airplane flight manual for: cg limits for take-off, landing, cruise configurations - maximum floor load - maximum ramp and taxi mass.

MODULE II FACTORS DETERMINING MAXIMUM PERMISSIBLE MASS AND CG LIMITS L: 9 T: P:

factors determining maximum permissible mass: structural limitations, performance limitations such as – runway available for take-off and landing, weather conditions - rate-of-climb and altitude requirements for obstacle clearance; engine-out performance requirements. Factors determining cg limits: aircraft stability, ability of flight controls and surfaces to overcome mass and lift pitching moments under all flight conditions, changes in cg location during flight due to consumption of fuel, raising and lowering of undercarriage, and intentional relocation of passengers or cargo, transfer of fuel, movement of Centre of lift because of changes in position of wing flaps

MODULE III LOADING L: 9 T: P:

Terminology: empty mass, dry operating zero fuel mass, standard mass – crew, passengers and baggage, fuel, oil water (volume/mass conversion factors), carry-on luggage, useful load (traffic load + usable fuel) Effects of overloading: high take-off and safety speeds, longer take-off and landing distances, lower rate-of-climb, influence on range and endurance, decreased engine-out performance, possible structural damage in extreme cases

MODULE IV CENTRE OF GRAVITY (CG) L: 9 T: P:

Basic of CG calculations (load and balance documentation) - Datum – explanation of term, location, use in cg calculation - Moment arm – explanation of term, determination of algebraic signs, use - Moment –- Expression in percentage of mean aerodynamic chord (% MAC) Effect of load-shift - movement of C.G. Possible out of limits - possible damage due to inertia of a moving load- effect of acceleration of the aircraft load.

MODULE V LOAD SHEET L: 9 T: P:

Aircraft weighing procedure, Aircraft weight and balance report preparation

L – 45; T – 00; P – 00; Total Hours: 45

TEXT BOOKS:

1. Nordian, “Mass & Balance: Flight Performance & Planning”, sterling book house, 2017
2. Jeppesen, “EASA ATPL Training Mass & Balance”, Jeppesen Gmbh (1 January 2014).

REFERENCES:

1. Oxford Aviation Academy, ATPL Book- Mass and Balance, Performance, 2014.
2. U. S. Department of Transportation, Federal Aviation Administration, “Aircraft Weight and BalanceHandbook”, Createspace Independent Pub (11 June 2013).
3. Keith Williams, “1000 Questions Answers & Explanations for JAR ATPL (A) & CPL (A) Mass & Balance”, 1 January 2011.

COURSE OUTCOMES:

COB1: Understand the fundamental concepts of aircraft mass and balance.

COB2: Discuss the factors influencing maximum permissible mass and center of gravity (CG) limits.

COB3: Analyze aircraft loading procedures prior to take-off.

COB4: Calculate the center of gravity and assess the effect of different loading conditions.

COB5: Perform weight and balance calculations for the preparation of the aircraft trim sheet.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on

Academic Council:
24th ACM held on 26.08.2025

07.07.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	1	2	3	2	1	1	2	2	2		
CO2	1	2	3	2	2		2	2	2	1	
CO3	2	2	3	2	1	2	2	2	2	2	
CO4	1	2	2	2			2	2	2	1	
CO5	1	2	3	2	2	2	2	2	2	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9 (Industry, Innovation, and Infrastructure)

Statement: It contributes to SDG 9 (Industry, Innovation, and Infrastructure) through the development of professional skills in load management and flight safety.

AVD 2204	COMPOSITE MATERIALS & STRUCTURES	L	T	P	C
SDG: 9 & 12		4	0	0	4

COURSE OBJECTIVES:

COB1: Understand the fundamental concepts and properties of composite materials.

COB2: Learn various manufacturing processes used for composite materials.

COB3: Understand the design principles of sandwich constructions in composites.

COB4: Explore the testing methods and quality assurance procedures for composites.

COB5: Examine the applications of composite materials in the aviation industry.

MODULE I INTRODUCTION L: 12 T: P:

Introduction: Definitions, Composites, Reinforcements and matrices, Types of reinforcements, Types of matrices, Types of composites, Carbon Fibre composites, Properties of composites in comparison with standard materials, Applications of metal, ceramic and polymer matrix composites. Advantages and disadvantages of composite materials - Uses and limitations of various FRP - Applications of composite in Aviation and Aerospace industries

MODULE II MANUFACTURING METHODS L: 12 T: P:

Hand and spray lay - up, injection molding, resin injection, filament winding, pultrusion, centrifugal casting and prepregs. Fibre/Matrix Interface, mechanical. Measurement of interface strength. Characterization of systems; carbon fibre/epoxy, glass fibre/polyester, etc.

MODULE III SANDWICH CONSTRUCTIONS L: 12 T: P:

Basic design concepts of sandwich construction -Materials used for sandwich construction - Failure modes of sandwich panels

MODULE IV MECHANICAL PROPERTIES AND TESTING L: 12 T: P:

Mechanism of plastic deformation, slip and twinning – Types of fracture – Testing of materials under tension, compression and shear loads – Fatigue and Creep test

MODULE V MAINTENANCE **L: 12** T: P:

Recognizing different types of damage, visual inspection and NDT methods, various repair techniques, curing and post-repair procedures. advanced techniques, preventive maintenance techniques. Environmental effect and their impact on maintenance.

L – 60; T – 00; P – 00; Total Hours: 60

TEXT BOOKS:

1. Autar K Kaw, 'Mechanics of Composite Materials', CRC Press, 2nd edition, 2005.
2. Isaac M. Daniel & Ori Ishai, "Mechanics of Composite Materials," OUP USA publishers,2nd edition, 2005
3. Madhujit Mukhopadhyay, Mechanics of Composite Materials and Structures, UniversityPress, 2004.

REFERENCES:

1. Agarwal, B.D., and Broutman, L.J., "Analysis and Performance of Fibre Composites," JohnWiley & Sons, 3rd edition, July 2006.
2. Allen Baker, Composite Materials for Aircraft Structures, AIAA Series, 2nd Edition, 2004
3. Calcote, L R. "The Analysis of laminated Composite Structures", Von — Nostrand ReinholdCompany, New York 1998
4. Lubing, Handbook on Advanced Plastics and Fibre Glass, Von Nostran Reinhold Co., NewYork, 1989
5. Michael F. Ashley, "Material Selection in Mechanical Design", 5th edition, Butterworth-Heiner,2016.

COURSE OUTCOMES:

COB1: Explain the mechanics and behavior of composite materials.

COB2: Analyze various manufacturing processes used for composites.

COB3: Apply knowledge to the design and fabrication of sandwich constructions.

COB4: Evaluate different testing procedures for composite materials.

COB5: Demonstrate understanding of maintenance practices for composite structures in aviation.

Board of Studies (BoS):

20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:

24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1		2	2	2			2	2	2	2	1
CO2		2	2	2			2	2	2	2	1
CO3		2	2	2			2	2	2	2	1
CO4		2	2	2			2	2	2	2	1
CO5		2	2	2			2	2	2	2	1

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9 (Industry, Innovation, and Infrastructure) & SDG 12 (Responsible Consumption and Production)

Statement: It supports SDG 9 by equipping students with advanced knowledge in lightweight, high-performance materials that enhance aircraft efficiency. Additionally, the use of composites contributes to fuel savings and reduced emissions, supporting SDG 12.

AVD 2205	AERO ENGINE LABORATORY	L	T	P	C
		0	0	4	2

SDG:

COURSE OBJECTIVES:

- To impart knowledge of maintenance and repair procedures involved in the overhaul of aero engines.

Exp No	EXPERIMENTS	Number of Hours
1	Dismantling of aircraft piston engine	3
2	Study of Carburetor and its components	3
3	Carry out dimensional inspection of Piston	3
4	Carry out dimensional inspection of connecting rod	3
5	Study of Magneto and firing order of ignition system	3
6	Study of reduction gear unit	3
7	Visual inspection of aircraft propeller	3
8	Visual inspection of Gas turbine engine	3
9	Study of axial flow and centrifugal flow compressor	3
10	Study of Combustion chamber	3
		TOTAL= 30 HOURS

COURSE OUTCOMES:

Students will able to

- Maintain and repair the aero engines.

REFERENCES:

1. Aircraft Piston Engines: For Professional and Private Pilots by Oxford Aviation Academy Limited, 2005.
2. Graham White, “Allied Aircraft Piston Engines of World War II”, SAE, 1995

Board of Studies (BoS):	Academic Council:
20th BoS of Aerospace Engg held on 07.07.2025	24th ACM held on 26.08.2025

Detailed Syllabus for Professional Elective Courses

AVDX01	NON DESTRUCTIVE TESTING	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the basic principles and significance of Non-Destructive Testing (NDT).

COB2: To earn the concepts and applications of surface NDT methods.

COB3: To understand the principles and techniques of thermographic testing.

COB4: To explore the fundamentals of ultrasonic and acoustic emission testing.

COB5: To gain knowledge of radiographic testing methods and their practical applications.

MODULE I OVERVIEW OF NDT L: 9 T: P:

NDT Versus Mechanical testing, Overview of the Non-Destructive Testing Methods for the detection of manufacturing defects as well as material characterization. Relative merits and limitations, Various physical characteristics of materials and their applications in NDT. Visual inspection - Unaided and aided.

MODULE II SURFACE NDT METHODS L: 9 T: P:

Liquid Penetrant Testing - Principles, types and properties of liquid penetrants, developers, advantages and limitations of various methods, Testing Procedure, Interpretation of results. Magnetic Particle Testing- Theory of magnetism, inspection materials Magnetization methods, Interpretation and evaluation of test indications, Principles and methods of demagnetization, Residual magnetism.

MODULE III THERMOGRAPHY AND EDDY CURRENT TESTING (ET) L: 9 T: P:

Thermography- Principles, Contact and non-contact inspection methods, Techniques for applying liquid crystals, Advantages and limitation - infrared radiation and infrared detectors, Instrumentations and methods, applications. Eddy Current Testing-Generation of eddy currents, Properties of eddy currents, Eddy current sensing elements, Probes, Instrumentation, Types of arrangement, Applications, advantages, Limitations, Interpretation/Evaluation.

MODULE IV ULTRASONIC TESTING (UT) AND ACOUSTIC EMISSION (AE) **L: 9 T: P:**

Ultrasonic Testing-Principle, Transducers, transmission and pulse-echo method, straight beam and angle beam, instrumentation, data representation, A-Scan, B-scan, C-scan. Phased Array Ultrasound, Time of Flight Diffraction. Acoustic Emission Technique Principle, AE parameters, Applications.

MODULE V RADIOGRAPHY (RT) **L: 9 T: P:**

Principle, interaction of X-Ray with matter, imaging, film and film less techniques, types and use of filters and screens, geometric factors, Inverse square, law, characteristics of films - graininess, density, speed, contrast, characteristic curves, Penetrometers, Exposure charts, Radiographic equivalence. Fluoroscopy-Xeroradiography - Computed Radiography, Computed Tomography

L – 45; Total Hours: 45

TEXT BOOKS:

1. Baldev Raj, M. Thavasimuthu, and T. Jayakumar," Practical Non-Destructive Testing ", Narosa Publishing House 2014.
2. Ravi Prakash, "Non-Destructive testing techniques", 1st Revised edition, New Age international publishers, 2010.

REFERENCES:

1. ASM metal handbook," Non-Destructive Evaluation and Quality Control "American society Metals, Metals Park, Ohio, USA, 200, Volume-17
2. ASNT, American Society for Non-Destructive Testing, Columbus, Ohio, NDT Handbook, Vol. 1, Leak Testing, Vol. 2, Liquid Penetrant Testing, Vol. 3, Infrared and Thermal Testing Vol. 4, Radiographic Testing, Vol. 5, Electromagnetic Testing, Vol. 6, Acoustic Emission Testing, Vol. Ultrasonic Testing
3. Paul E mix "Introduction to Non-destructive testing", IInd Edition New M Jersey, 2005.

COURSE OUTCOMES:

Students will be able to

COB1: Explain the fundamental concepts and significance of Non-Destructive Testing (NDT).

COB2: Discuss various methods and techniques used in Non-Destructive

Evaluation (NDE).

COB3: Describe the principles and applications of Thermography and Eddy Current Testing.

COB4: Explain the working principles of Ultrasonic Testing and Acoustic Emission techniques.

COB5: Understand the basic concept and procedure of Radiographic Testing.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1		2		2	1		2	2	2	1	
CO2		2		3	1		2	2	2	2	1
CO3		2		3	1		2	2	2	2	1
CO4		2		3	1		2	2	2	2	1
CO5		3		3	1		2	2	2	2	1

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: By focusing on innovative, non-invasive testing methods such as ultrasonic, radiographic, and thermographic techniques, the course promotes sustainable industrial practices, minimizes material waste, and contributes to the development of resilient and high-performance aviation systems.

AVDX 02	AIRCRAFT DESIGN	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the fundamentals of aircraft design layouts and configuration.

COB2: To gain knowledge of power plant characteristics and their influence on aircraft design.

COB3: To learn the preliminary design concepts involved in aircraft development.

COB4: To understand the principles and applications of the design optimization process.

COB5: To acquire a foundational understanding of structural design concepts in aircraft engineering.

MODULE I TYPES OF AIRCRAFT DESIGN LAYOUTS L: 9

Review of developments in aviation categories and types of aircraft specifications various configurations- layouts and their relative merits-strength, stiffness, fail safe and fatigue requirements maneuvering load factors-gust and maneuverability envelopes balancing and maneuvering loads on tail planes.

MODULE II POWER PLANT TYPES AND CHARACTERISTICS L: 9

Characteristics of different types of power plants - and selection-relative merits of location of power plant.

MODULE III PRELIMINARY DESIGN L: 9

Preliminary design selection of geometric and aerodynamic parameters-weight estimation and balance diagram- drag estimation of complete aircraft-level flight, Climb, Take- Off and landing calculations- range and endurance- static and dynamic stability estimates-control requirements**.**

MODULE IV OPTIMIZATION L: 9

Special problems layout peculiarities of subsonic and supersonic aircraft-optimizationof wing loading to achieve desired performance-loads on undercarriages and design requirements

MODULE V STRUCTURAL DESIGN L: 9

Estimation of loads on complete aircraft and components-structural design of fuselage, wings and undercarriages, control, connections and joints. materials for

modern aircraft-methods of analysis, testing and fabrication.

L – 45; Total Hours: 45

TEXT BOOKS:

1. G. Corning, "Supersonic & Subsonic Airplane Design", ii Edition, Edwards Brothers Inc., Michigan, 1953.
2. H.E.F. Bruhn, "Analysis and Design of Flight Vehicle Structures", Tristate Offset., U.S.A., 1980
3. A.A. Lebedenski, "Notes on airplane design", Part-I, IISc., Bangalore, 1971.

REFERENCES:

1. E. Torenbeek, "Synthesis of Subsonic Airplane Design", Delft University Press, London, 1976
2. D.P.Raymer," Aircraft conceptual design". AIAA Series, 1988.
3. H.N.Kota, "Integrated design approach to Design fly by wire" Lecture Notes Interline Pub. Bangalore, 1992.
4. S.C. Keshu & K.K. Ganapathi "Aircraft Production Techniques and Management", 1995.

COURSE OUTCOMES:

COB1: Describe various types of aircraft specifications and their relevance to design requirements.

COB2: Discuss different types of power plants and their performance characteristics.

COB3: Examine the steps involved in preliminary aircraft design and configuration.

COB4: Analyse special design challenges and constraints encountered in aircraft development.

COB5: Develop a conceptual aircraft design based on given performance and mission requirements.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	3	2	1			3		1	1	3	2
CO2	2	1	1			2		1	2	2	2
CO3	3	2	1			3		2	1	2	2
CO4	1	2				3		1	2	3	3
CO5	2	2				3		1	2	3	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: Through the study of aircraft configuration, power plant integration, structural design, and optimization techniques, students are equipped to contribute to the creation of efficient, resilient, and advanced aerospace systems—supporting the growth of a modern and sustainable aviation infrastructure.

AVDX 03	AIRFRAME CONSTRUCTION AND MAINTENANCE PROCEDURES	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: To understand the airworthiness requirements related to airframe structures.

COB2: To learn about the basic structural components of an aircraft airframe.

COB3: To understand the construction and design of aircraft windows and emergency exits.

COB4: To explore the construction and integration of engine attachments and associated accessories.

COB5: To understand general repair methods for various types of airframe structures.

MODULE I AIRFRAME STRUCTURES - GENERAL CONCEPTS L: 9

Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision., Aircraft bonding

MODULE II AIRFRAME CONSTRUCTIONS L: 9

Construction methods of - stressed skin fuselage, various structural components- floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding Methods of surface protection,; Surface cleaning. Airframe symmetry: methods of alignment and symmetry checks.

MODULE III AIRFRAME STRUCTURES - Components attachment L: 9

Aero plane Fuselage (ATA 52/53/56) Construction and pressurization sealing; Wing, stabilizer, pylon and undercarriage attachments; Seat installation and cargo loading system; Doors and emergency exits- construction, mechanisms, operation and safety devices; Windows and windscreen-construction and mechanisms. Wings (ATA 57) Construction of wings, Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments**.**

MODULE IV AIRFRAME STRUCTURES -STABILISERS, NACELLES/PYLONS, FLIGHT CONTROL SURFACES **L: 9**

Stabilisers (ATA 55)-Construction; Control surface attachment. Nacelles/Pylons (ATA 54) -Construction; Firewalls; Engine mounts, Flight Control Surfaces (ATA 55/57) Construction and attachment; Balancing — mass and aerodynamic

MODULE V AIRFRAME STRUCTURES- MAINTENANCE PROCEDURES **L: 9**

Types of defects and visual inspection techniques. General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes; Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection/Quality Control/Quality Assurance; Additional maintenance procedures. Control of life limited components. Special Inspections – bird strike, lightning strike, forced landing and turbulence

L – 45; Total Hours: 45

TEXT BOOKS:

1. Kroes, Watkins, Delp, "Aircraft Maintenance and Repair", McGraw Hill, New York, 1992.
2. Handbooks of Airframe and Power plant Mechanics, Airframe Handbook 15 A US dept. of Transportation, Federal, Aviation Administration, the English Book Store, New Delhi, 1995.

REFERENCES:

1. Brimm D.J. Bogges H.E., "Aircraft Maintenance", Pitman Publishing corp., New York, 1940.
2. Delp. Bent and Mckinely “Aircraft Maintenance Repair”, McGraw Hill, New York, 1987.
3. 3.Larry Reithmeir, "Aircraft Repair Manual", Palamar Books, Marquette, 1992.

COURSE OUTCOMES:

Upon completion of this course, students will able to

COB1: Understand general Airframe structural repairs, the structural repair manual and structural control programme

COB2: Understand the nature of Airframe structural component construction

COB3: Understand the construction and maintenance related aspects of main body.

COB4: Know about aircraft control surfaces operations and its attachment

COB5: Understand the procedure to inspect the airframe components after Abnormal events.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1		2	2	3	1		2	2	2	2	
CO2		2	2	3	1		2	2	3	2	
CO3		2	2	3	1		2	2	2	2	
CO4		2	2	3	1		2	2	2	2	
CO5	1	2	2	2	2		2	3	2	2	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: It contributes to SDG 9 (Industry, Innovation, and Infrastructure) by fostering technical expertise in modern airframe technologies and repair methods.

AVDX04	FLIGHT PLANNING AND MONITORING	L	T	P	C
SDG: 9		3	0	0	3

COURSE OBJECTIVES:

COB1: Understand the procedures involved in obtaining flight dispatcher approval.

COB2: Learn and interpret key meteorological terms relevant to flight dispatch.

COB3: Understand the steps involved in preparing an accurate and compliant flight plan.

COB4: Gain insights into the structure and use of the flight dispatch manual.

COB5: Understand the procedures for handling, reporting, and communication during flight operations.

MODULE I INTRODUCTION TO FLIGHT DISPATCH L: 9

Abbreviations and definitions pertaining to Flight Dispatch, insights of flight operation, need for qualified (by state regulator) dispatcher, Flight dispatcher approval – DGCA process & foreign license, validity of approval, period & acceptance in other countries.

MODULE II DECODING AND UNDERSTANDING L: 9

NOTAM, SNOWTAM, Volcanic Ash Advisory, METAR / SPECI (real time weather information at aerodromes) Terminal Aerodrome Forecast, Enroute Inflight weather Chart, Sat Picture / Doppler In-flight Weather Radar, Plotting Of Danger/Restricted Zone, Build Direct Route, MEL/ Course Deviation List, Understanding AIRAC (Aeronautical Information Regulation and Control) Cycle And Updates, Understanding Aeronautical information publications Its Amendment, Suspected unapproved parts.

MODULE III OPERATIONAL FLIGHT PLAN OR COMPUTERISED FLIGHT PLAN L: 9

Need for Operational flight plan, Various parameters considered in planning – Weather, notam, MEL/CDL, Performance limitation, its implications & penalties (if any) – Cost Index, W/S factor, fuel policy, fuel calculation, fuel tinkering, company advisory and Dispatch advisory for additional fuel uplift, Re-dispatch concept, flight following**.**

MODULE IV INSIGHTS TO FLIGHT DISPATCH MANUAL L: 9

Dispatch Minimums, Insight to FDM and OM. Organization- Duties and responsibilities of dispatch personnel, Qualification and training of flight dispatch personnel, daily functions of flight dispatch – Flight and wx monitoring,

Observation flight, Introduction to Crew rostering, Introduction to Flight documentation & EFB, Maintain Dispatch library**.**

MODULE V DEVIATION FROM NORMAL OPERATION [INCLUDING BCP] **L: 9**

Different scenario's, handling and reporting procedure, maintain check list, need for revised operational flight plan, contingency flight plan or Historic Flight Plan (HFP), low visibility operation, challenges in Aviation Safety, Alcohol or Psychoactive Substances**.**

L – 45; Total Hours: 45

TEXT BOOKS:

1. Massoud Bazargan, "Airline Operations and Scheduling", Routledge, 2nd Edition, 28 August,2010.
2. 2. Aeronautical Information Publication - AIP
3. Peter J. Bruce, "Understanding Decision-making Processes in Airline Operations Control", Routledge; 1st edition (September 8, 2016).

REFERENCES:

1. JAA ATPL Theoretical Training Manual: Flight Performance and Planning, Transair (UK) Ltd; 7th Revised edition (1 June 2004).
2. David Cockburn, "Flight Performance and Planning", Air Pilot Publisher Ltd (1 January 2006).
3. Aircraft Dispatcher: Book of Knowledge (Aviation) - Patrick s. Flannery - Createspace Independent Pub (20 July 2014).

COURSE OUTCOMES:

Upon completion of this course, students will able to

COB1: Explain the role, necessity, and regulatory framework of flight dispatch operations.

COB2: Interpret and apply various technical terminologies used in flight dispatch and operations.

COB3: Demonstrate knowledge of procedures and practices involved in flight planning and understanding performance limitations.

COB4: Analyze the contents and applications of the Flight Dispatch Manual and related operational documents.

COB5: Evaluate the impact of non-normal operations and describe continuity planning measures in flight dispatch.

Board of Studies (BoS):
20th BoS of Aerospace Engg held on 07.07.2025

Academic Council:
24th ACM held on 26.08.2025

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO1	1	2	2	2	1	1	2	2	3	2	3
CO2	2	1	2	2	2	1	2	2	3	2	3
CO3	2	3	2	2	2	2	2	2	3	2	3
CO4	2	2	3	2	2	2	2	2	2	2	3
CO5	2	2	3	1	2	2	2	2	2	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

SDG 9: Industry, Innovation, and Infrastructure

Statement: It supports SDG 9 by equipping students with skills in optimized route planning, fuel efficiency, and regulatory compliance. This course enables future aviation professionals to contribute a safer and more sustainable air transport system.