ALAGAPPA UNIVERSITY

(Accredited with A+ Grade by NAAC (CGPA: 3.64) in the Third Cycle, Graded as Category-I University and granted autonomy by MHRD-UGC)

DIRECTORATE OF COLLABORATIVE PROGRAMMES



B.Sc. (Aeronautical Science)

Regulations and Syllabus [For those who join the Course in July 2023 and after] CHOICE BASED CREDIT SYSTEM

GENERAL INSTRUCTIONS AND REGULATIONS

B.Sc Aeronautical Science conducted by Alagappa University, Karaikudi, Tamil Nadu through its Collaborative Institution **Nehru College of Aeronautics and Applied Sciences** at Kuniamuthur, Coimbatore.

Applicable to all the candidates admitted from the academic year **2023** onwards.

1. Eligibility:

A pass in the Higher Secondary Examination (HSC) or an examination accepted as equivalent thereto by the Syndicate. Candidate for admission to **B.Sc Aeronautical Science** shall be required to **have passed qualifying examination** with Physics, Chemistry and Mathematics (PCM).

2. For the Degree:

The candidates shall have subsequently undergone the prescribed programme of study in a institute for not less than three academic years, passed the examinations prescribed and fulfil such conditions as have been prescribed therefore.

3. Admission:

Admission is based on the marks in the qualifying examination.

4. Duration of the course:

The course shall extend over a period of **Three years** under semester pattern accounting to six semesters.

5. Standard of Passing and Award of Division:

- a. Students shall have a minimum of 40% of total marks of the University examinations in each subject. The overall passing minimum is 40% both in aggregate of Continuous Internal Assessment and external in each subject.
- b. The minimum marks for passing in each theory / Lab course shall be 40% of the marks prescribed for the paper/lab.
- **c.** A candidate who secures 40% or more marks but less than 50% of the aggregate marks prescribed for three years taken together, shall be awarded **THIRD CLASS**.
- **d.** A candidate who secures 40% or more marks but less than 60% of the aggregate marks prescribed for three years taken together, shall be awarded **SECOND CLASS**.
- **e.** A candidate who secures 60% or more of the aggregate marks prescribed for three years taken together, shall be awarded **FIRST CLASS**.
- f. Only Part-III subjects were considered for the ranking.
- g. The Practical/ Project shall be assessed by the two examiners, by an internal examiner and an external examiner.

6. Continuous internal Assessment:

- a. Continuous Internal Assessment for each paper shall be by means of Written Tests, Assignments, Class tests and Seminars
- b. **25 marks** allotted for the Continuous Internal assessment is distributed for Written Test, Assignment, Class test and Seminars.
- c. Two Internal Tests of 2 hours duration may be conducted during the semester for each course / subject and the best marks may be considered and one Model Examination will be conducted at the end of the semester prior to University examination. Students may be asked to submit at least five assignments in each subject. They should also participate in Seminars conducted for each subject and marks allocated accordingly.
- d. Conduct of the continuous internal assessment shall be the responsibility of the concerned faculty.
- e. The continuous internal assessment marks are to be submitted to the University at the end of every year.
- f. The valued answer papers /assignments should be given to the students after the valuation is over and they should be asked to check up and satisfy themselves about the marks they have scored.
- g. All mark lists and other records connected with the continuous internal assessments should be in the safe custody of the institution for at least one year after the assessment.

7. Attendance:

- a. Students must have earned 75% of attendance in each course for appearing for the examination.
- b. Students who have earned 74% to 70% of attendance to be applied for condonation in the prescribed form with the prescribed fee.
- c. Students who have earned 69% to 60% of attendance to be applied for condonation in the prescribed form with the prescribed fee along with the medical certificate.
- d. Students who have below 60% of attendance are not eligible to appear for the examination. They shall re-do the semester (s) after completion of the programme.

8. Examination:

Candidate must complete course duration to appear for the university examination. Examination will be conducted with concurrence of Controller of Examinations as per the Alagappa University regulations. **University may send the representatives as the observer during examinations.** University Examination will be held at the end of the each semester for duration of 3 hours for each subject. Certificate will be

issued as per the AU regulations. Hall ticket will be issued to the 1st year candidates and upon submission of the list of enrolled students along with the prescribed course fee subsequent 2nd and 3rd year hall tickets will be issued.

9. Question Paper pattern:

Theory – Maximum 75 marks

Section A	10 questions. All questions carry equal marks. (Objective- type questions)	10 x1= 10	10 questions – 2 each from every unit.
Section B	5 questions. Either/ or type like 1.a (or) b. All questions carry equal marks and each answer should not exceed one page or 250 words	5 x 5= 25	5 questions – 1 each from every unit.
Section C	Essay type questions. Either/ or type like 1.a (or) b. All questions carry equal marks and each answer should not exceed two page.	5 x 8= 40	Should cover all units.

10. Miscellaneous

- a. Each student posses the prescribed text books for the subject and the workshop tools as required for theory and practical classes.
- b. Each student is issued with an identity card by the University to identify his /her admission to the course
- c. Students are provided library and internet facilities for development of their studies.
- d. Students are to maintain the record of practical's conducted in the respective laboratory in a separate Practical Record Book and the same will have to be presented for review by the University examiner.
- e. Students who successful complete the course within the stipulated period will be awarded the degree by the University.

11. Fee structure

Course fee shall be as prescribed by the University and 50% of the course fee should be disbursed to University. Special fees and other fees shall be as prescribed by the Institution and the fees structure must intimated to the University. Course fees should be only by Demand draft / NEFT and A U has right to revise the fees accordingly.

12. Other Regulations:

Besides the above, the common regulation of the University shall also be applicable to this programme.

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Besides the above, the common regulation of the University shall also be applicabletothis programme.

Department of B.Sc. Aeronautical Science

VISION:

- To be the leader in aeronautical Science through quality education and Training in emerging areas with a high degree of interpersonal skills and ethical responsibilities.
- To provide Aeronautical Education with nationally and internationally accepted qualifications by considering contemporary educational culture and values,
- To attain excellence and a global reputation in Aeronautical Education and Training.

MISSION:

- Prepare the students to have very good fundamental knowledge to meet the present and future needs of industries.
- Improve the technical knowledge of the students in tune with the current requirements through collaboration with industries and Training organizations.
- Make the students gain enough knowledge in various aspects of system integration.
- Motivate the students to take up jobs in national laboratories, aircraft manufacturing industries, aerospace industries, airline industries, MRO, AMO, Technical publication companies, and all other Aviation related and allied industries of our country.

GRADUATE ATTRIBUTES:

- 1. Graduates will demonstrate a comprehensive understanding of aircraft systems, structures, and components, showcasing their ability to perform maintenance, repairs, and inspections with a high level of technical expertise.
- 2. Graduates will exhibit strong analytical skills, enabling them to identify, diagnose, and resolve complex issues within aircraft systems, fostering a safe and efficient operational environment.
- 3. Graduates will prioritize safety above all else, adhering to industry standards, regulations, and best practices to ensure the highest level of aviation safety for passengers, crew, and aircraft.
- 4. Graduates will effectively communicate with team members, engineers, and other stakeholders, both verbally and in writing, to relay technical information and collaborate on maintenance tasks.
- 5. Graduates will exhibit leadership qualities by taking initiative, mentoring junior colleagues, and leading by example, thereby contributing to the professional growth of the aircraft maintenance industry.

P.E.O- Programme Education Objectives.

- PEO 1 To acquire knowledge in Aeronautical Science and to work towards solving complex problems to excel in the professional career.
- PEO 2 To Work effectively as an individual and as a team member with professional ethics, social and environmental concerns.
- PEO 3 To provide exposure to the advancements in aeronautical science and Training and related fields.
- PEO 4 To gain competence and confidence to handle problems in theoretical and experimental aspects of various domains of aeronautical Science
- PEO 5 To continue their professional development by utilizing educational and careerbuilding opportunities through their employer, educational institutions, or professional bodies.

P.S.O-Programme Specific Objectives

- PSO 1 To cultivate a high level of technical competence in aircraft maintenance procedures, encompassing inspection, repair, and servicing protocols. Acquire hands-on skills in utilizing advanced tools, equipment, and software relevant to the field, fostering the ability to diagnose, rectify, and prevent mechanical issues.
- PSO 2 To demonstrate a meticulous understanding of aviation regulations and safety standards, including those outlined by aviation authorities such as FAA, EASA, and ICAO. Learn to apply these regulations rigorously in maintenance operations, ensuring a safe operating environment for aircraft and personnel.
- PSO 3 To enhance critical thinking abilities by systematically approaching complex maintenance challenges. Acquire the capability to analyze symptoms, identify root causes, and formulate effective solutions in real-time scenarios, considering safety, efficiency, and regulatory aspects.
- PSO 4 To foster the ability to collaborate effectively within maintenance teams, acknowledging diverse perspectives and harnessing collective strengths to achieve common goals. Additionally, develop leadership traits that can guide and inspire teams toward efficient and safe aircraft maintenance practices.
- PSO 5 To cultivate a comprehensive awareness of the broader aviation industry, including its stakeholders, emerging technologies, and market trends. Develop networking skills to establish meaningful connections within the aviation community, opening doors to potential career opportunities and collaborations.

Program Outcome (POs)

On successful completion of B.Sc. (Aeronautical Science) program:

- PO 1 Students will develop a deep understanding of aircraft systems, encompassing avionics, power plants, structures, and control systems, enabling students to comprehend the intricacies of aviation technology.
- PO 2 Students will Identify, formulate, review, and analyze complex engineering problems using the first principles of mathematics, and synthesis the information to provide valid conclusion.
- PO 3 Students will design solutions for complex aircraft problems related to diagnose complex aviation issues and make informed decisions quickly, minimizing downtime and ensuring flight safety that meet the specified needs with appropriate consideration for public health and safety and the cultural societal and environmental consideration.
- PO 4 Students will engage in investigations of complex problems including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
- PO 5 Students will be aware of the emerging technologies used in aircraft to Create, Select, and apply appropriate techniques, resources, and IT tools including prediction and modeling in the field of Aeronautical Science.
- PO 6 Students will apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional Aeronautical Science practice.
- PO 7 Students will understand the impact of Aeronautical solutions in societal and environmental contexts and demonstrate the knowledge in need for sustainable development.
- PO 8 Foster a strong sense of ethics, integrity, and professionalism, emphasizing the importance of responsible conduct and ethical decision-making within the aviation industry.
- PO 9 Cultivate the ability to work collaboratively within diverse teams of aviation professionals, promoting effective communication, leadership, and teamwork skills.
- PO 10 Students will communicate their thoughts and ideas in writing effective reports and design documentation, making effective presentations, and giving and receiving clear instructions.
- PO 11 Students will demonstrate knowledge and understanding of Aeronautical Science and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.
- PO 12 Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

P.S.O-Program Specific Outcome

After the successful completion of B.Sc. in Aeronautical Science programme, the students are expected to:

- PSO 1 Utilize the knowledge of Aeronautical Science in innovative, dynamic, and challenging environments for the design and development of new products.
- PSO 2 Use the software package in the design, manufacturing, testing, and maintenance of aeronautical-based components and systems.
- PSO 3 To work as a team member will be a main requirement in an industry or in any business enterprise. and also play a role in the success of the organization.
- PSO 4 To undertake research in the areas of aircraft maintenance, design requirements of aircraft, aero engine and demonstrate professional acumen in the development of aeronautical science.
- PSO 5 To exhibit professionalism in their chosen profession and adapt to current trends, technologies and industrial scenarios.

B.Sc. (Aeronautical Science) Programme Structure

Dant	Course	Nama	т/р	Cr	Hrs./	Marks		Total
rait	Code	Name	1/1	CI.	Week	Int.	Ext.	TUTAL
	1	SEMESTER-I				1		
	11811T/11H							
I	/11F/11M/T	Part I - Tamil / Other Languages-I	Т	3	3	25	75	100
	U/A/S							
Π	11812	Part –II – General English-I	Т	3	3	25	75	100
	11813	Workshop Practices	Т	5	5	25	75	100
	11814	Work Shop Practices, Engineering Graphics and Machine Drawing – Practical	Р	4	8	25	75	100
	11815	Aviation Mathematics	Т	3	3	25	75	100
III	11816	Computer Lab	Р	2	4	25	75	100
IV	11817	Value Education	T	2	2	<mark>25</mark>	<mark>75</mark>	<mark>100</mark>
		Library			2			
	1	Total		22	30	175	525	700
		SEMESTER-II						
	11821T/H/F/							
Ι	M/TU/A/S	Part I - Tamil / Other Languages-II	Т	3	3	25	75	100
Π	11822	Part –II – General English-II	Т	3	3	25	75	100
	11823	Aircraft Basics Electricity & Electronics	Т	5	5	25	75	100
Ш	11824	Aircraft Basics Electricity & Electronics Lab – Practical	Р	4	8	25	75	100
111	11825	Applied Mechanics	Т	3	3	25	75	100
	11826	Auto CAD Lab – Practical	Р	2	4	25	75	100
IV	<mark>11827</mark>	Environmental Studies	T	<mark>2</mark>	2	<mark>25</mark>	<mark>75</mark>	<mark>100</mark>
		Library			2			
		Total		22	30	175	525	700

		SEMESTER-						
I	11831T/H/F/ TU/M/A/S	Part I - Tamil / Other Languages-III	Т	3	3	25	75	100
II	11832	Part –II – General English-III	Т	3	3	25	75	100
	11833	Basic Aerodynamics	Т	3	4	25	75	100
	11834	Aircraft Construction & Systems	Т	3	3	25	75	100
III	11835	Aerodynamics and Aircraft Construction Lab – Practical	Р	3	6	25	75	100
	11836	Fluid Mechanics & Hydraulic Machines	Т	3	3	25	75	100
	11837	NDT Lab	Р	2	4	25	75	100
	<mark>11838</mark>	Entrepreneurship	T	<mark>2</mark>	<mark>2</mark>	<mark>25</mark>	<mark>75</mark>	<mark>100</mark>
	11920 4	Adipadai Tamil (for non tamil students	P					
	11639A	Advance Tamil	T	2	2	25	<mark>75</mark>	100
IV	11839B	IT Skill for Employment	T					
	11839C	1. Self learning course - MOOC'S	Т			 / 1	•,	
	optional	1. Self learning course - wrote S	1		EX	tra cred	It	
		Total		24	30	225	675	900
		Total SEMESTE-IV		24	30	225	675	900
I	 11841T/H/F/ M/TU/A/S	Total SEMESTE-IV Part I - Tamil / Other Languages-IV	T	24 3	30 3	225 25	675 75	900 100
I	11841T/H/F/ M/TU/A/S 11842	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV	T	24 3 3	30 3 3	225 25 25	675 75 75	900 100
I	11841T/H/F/ M/TU/A/S 11842 11843	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part -II - General English-IV Aircraft Instruments	T T T	24 3 3 4	30 3 3 4	225 25 25 25 25	675 75 75 75	900 100 100
I	11841T/H/F/ M/TU/A/S 11842 11843 11844	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations	T T T T	24 3 3 4 4	30 3 3 4 4	225 25 25 25 25 25	675 75 75 75 75	900 100 100 100
I	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations Aircraft Materials & Strength Of Material Lab– Practical	T T T T P	24 3 3 4 4 3	30 3 3 4 4 6	225 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75	900 100 100 100 100 100
I	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11845	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations Aircraft Materials & Strength Of Material Lab– Practical Aero Engineering Thermodynamics	T T T T P T	24 3 3 4 4 3 3	30 3 3 4 4 6 4	225 25 25 25 25 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100
I	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11846 11846 11847	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations Aircraft Materials &Strength Of Material Lab– Practical Aero Engineering Thermodynamics Software Multi-Sim Lab - Practical	T T T T P T P	24 3 3 4 4 3 3 2	30 3 3 4 4 6 4 4 4	225 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100 100
I	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11845 11846 11847 11848A	TotalSEMESTE-IVPart I - Tamil / Other Languages-IVPart – II – General English-IVAircraft InstrumentsAircraft Rules and Airworthiness RegulationsAircraft Rules and Airworthiness RegulationsAircraft Materials &Strength Of Material Lab–PracticalAero Engineering ThermodynamicsSoftware Multi-Sim Lab - PracticalAdipadai Tamil (for non tamil students compulsory)	T T T T P T P P	24 3 3 4 4 3 3 2 2 2	30 3 3 4 4 6 4 4 2	225 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100 100 100
I II III IV	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11845 11846 11847 11848A 11848B	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part –II – General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations Aircraft Materials &Strength Of Material Lab– Practical Aero Engineering Thermodynamics Software Multi-Sim Lab - Practical Adipadai Tamil (for non tamil students compulsory) Advance Tamil	T T T T P T P P P T P	24 3 3 4 4 3 3 2 2	30 3 3 4 4 6 4 4 2	225 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75 75 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100
I II III	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11846 11845 11846 11847 11848A 11848B 11848B	Total SEMESTE-IV Part I - Tamil / Other Languages-IV Part -II - General English-IV Aircraft Instruments Aircraft Rules and Airworthiness Regulations Aircraft Materials &Strength Of Material Lab- Practical Aero Engineering Thermodynamics Software Multi-Sim Lab - Practical Adipadai Tamil (for non tamil students compulsory) Advance Tamil Small Business Management	T T T T P P P P T T T T	24 3 3 4 4 3 3 2 2	30 3 3 4 4 6 4 4 2	225 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25	675 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100
I II III IV	11841T/H/F/ M/TU/A/S 11842 11843 11844 11845 11845 11846 11847 11848A 11848A 11848B 11848B 11848C Optional	TotalSEMESTE-IVPart I - Tamil / Other Languages-IVPart – II – General English-IVAircraft InstrumentsAircraft Rules and Airworthiness RegulationsAircraft Materials &Strength Of Material Lab–PracticalAero Engineering ThermodynamicsSoftware Multi-Sim Lab - PracticalAdipadai Tamil (for non tamil students compulsory)Advance Tamil Small Business ManagementSelf learning course - MOOC'S	T T T T P T P P T P P T T T	24 3 3 4 4 3 3 2 2 2	30 3 3 4 4 4 6 4 4 2 Extra	225 25	675 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75	900 100 100 100 100 100 100 100

		SEMESTER-V						
	11851	Piston Engine and Propeller	Т	4	4	25	75	100
-	11852	Gas Turbine Engine	Т	4	4	25	75	100
		Elective- I						
	11853A	i)Basics of Aviation Industry						
	11853B	ii)Aircraft Communication and Navigation	Т	4	4			100
		system						
	11050	iii)Additive Manufacturing				25	75	
	11853C	Elective II						
	11854.4	i) Airport and Air Traffic Service			4			
III	11854R	ii) Air Cargo Management	Т	1		25	75	100
	11854C	iii)Air Travel Management		4			13	100
	110510	Elective III						
	11855 4	i)Helicopter Theory						100
	11055A	ii) Avionics	Т	4	4	25	75	
	11855C	iii)Wind Tunnel Technique						
	118550	Aero Engine Laboratory	Р	4	8	25	75	100
		Career Development/ Employability Skill			2			
		Total		24	30	150	450	600
		SEMESTER-VI	1			1		
	11861	Aircraft Maintenance, Ground Handling and	Т	1	1	25	75	100
	11001	Support Equipment.	1	4	+	25	15	100
	11862	Aero Engine Maintenance	Т	4	4	25	75	100
	11863	Aircraft and Engine Maintenance Lab –	P	1	8	25	75	100
	11005	Practical	1	т	0		15	100
III		Elective III						
	11864A	i) Industrial Management						
	11864B	ii) Aircraft Maintenance Management	Т	4	4	25	75	100
	11864C	iii)Human Values and Ethics						
	11865A/	Project/	PR/	8	10	25	75	100
	11865B	Dissertation	D	0	10		,5	100
	Total				30	125	375	500
		Grand Total		140	180	1050	3150	4200

		I - Semester					
T/OL	Course code:	FRENCH	Т	Credits: 3	Hours: 3		
Course Objectives	 Recall and in a dialog Apply the understand Explain th aspects Demonstra emotions, o Communic 	remember the usage of gramm ue. learnt grammar rules in pract ling le nuances in the usage of var tte knowledge of various expres cause, effect, purpose, and hypo cate in French and summarize a	atical ice ex rious ssions thesis given	tenses in con cercises to in grammatical used to expre- s in French text	structingsentences prove their tenses and their ess opinions,		
Unit I	Salut ! Enchanté				(9) Hours		
Unit II	J'adore				(9) Hours		
Unit III	Tu veux bien?				(9) Hours		
Unit IV	On se voit quan	ıd ?			(9) Hours		
Unit V	Bonne idée (9) Hours						
					Total : (45) Hours		

References

Régine Mérieux & Yves Loiseau, Latitudes -1- (A1 /A2), méthode defrançais, Didier, 2017 (units 1-6 only)

	Course Outcomes	Knowledge level
CO-1	Identify the basic French sentence structure	K1
CO-2	Define and describe the various grammatical tenses and use them to communicate in French	К2
СО-3	Examine the various documents presented and discuss and reply to the questions asked on it	K2 and K3
CO-4	Analyze and interpret expressions used to convey thecause, the effect, the purpose, and the opposition in French	К4
CO-5	Evaluate the grammatical nature present in passages	K5

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	S	М	М	L	S	M	L	S	S	М	S	М
CO 2	S	М	М	L	М	М	L	S	S	S	S	М
CO 3	М	S	S	М	М	М	L	М	М	М	S	М
CO 4	S	М	М	L	S	М	L	S	S	М	S	М
CO 5	S	М	М	L	М	М	L	S	S	S	S	М
		1	1	S-Stro	ng	M-	Mediu	'n	L-Lov	v		

S-Strong

M-Medium

		I - Semester			
Ε	Course code: 11812	GENERAL ENGLISH-I	Т	Credits: 3	Hours: 3
Course Objectives	To enable learners life situations. To help them acqu To assist them in a To enable them to To assist them in a	to acquire self awareness and p nire the attribute of empathy. acquiring creative and critical the learn the basic grammar leveloping LSRW skills	ositive	e thinking requ abilities	ired in various
Unit I	SELF-AWAREN Life Story 1.1 Chapter 1 fron An Autobiography & 3) M.K.Gandhi Poem Where the Mind is Love Cycle – China	ESS(WHO)&POSITIVETHIN n MalalaYousafzai, I am Malala 7 or The Story of My Experimen Without Fear – Gitanjali 35 – Ra 14 Achebe	NKIN ts with	G(UNICEF) n Truth (Chapt anath Tagore	(9) Hours ers 1, 2
Unit II	EMPATHY Poem Nine Gold Medals - Alice Fell or povert Short Story The School for Sym Barn Burning –	– David Roth y – William Wordsworth pathy – E.V. Lucas William Faulkner			(9) Hours
Unit III	CRITICAL & CI Poem The Things That Ha Stopping by the Wo Readers Theatre The Magic Brocade Stories on Stage – LouisSachar)	REATIVE THINKING aven't Been Done Before –Edga oods on a Snowy Evening –Robe e – A Tale of China Aaron Shepard (Three Sideway	r Gues rt Fros Storie	st st es from Waysic	(9) Hours le School"by
Unit IV	Part of Speech Articles Noun Pronoun Verb Adverb Adjective Preposition				(9) Hours
Unit V	Paragraph and E Descriptive Expository Persuasive Narrative Reading Compre	ssay Writing(9) Hours hension			
				Tota	al : (45) Hou

References

MalalaYousafzai. I am Malala, Little, Brown and Company, 2013.

M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter – I), Rupa Publications, 2011.

Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose

Translations Made by the Author from the Original Bengali.

MacMillan, 1913.N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.

Aaron Shepard. Stories on Stage, Shepard Publications, 2017.

J.C. Nesfield. English Grammar Composition and Usage, Macmillan, 2019.

Course Ou	itcomes	Knowledge level
CO-1	Acquire self-awareness and positive thinking required in	PO1, PO7
	various life situations	
CO-2	Acquire the attribute of empathy.	PO1, PO2, PO10
СО-3	Acquire creative and critical thinking abilities.	PO4, PO6, PO9
CO-4	Learn basic grammar	PO4, PO5, PO6
CO-5	Development and integrate the use of four language skills	PO3, PO8
	i.e., listening, speaking, reading and writing.	

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
C01	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
C05	3	2	3	3	3	3	3	2	2	3

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
C05	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0
Course Contribution to				
POS				

Mapping with Programme Specific Outcomes:

3 – Strong, 2 – Medium, 1 - Low

		I - Semester								
Core	Course code: 11813	WORKSHOP PRACTICES	T Credits: 5	Hours: 5						
Course Objectives	1. To underst2. To identify3. To underst4. To evaluate5. To underst	 To understand the importance of safety Precautions To identify various types of Tools and Calibration of Equipment To understand Precision Instruments and its uses To evaluate the Fits Clearance for Drills To understand the functioning of Lathe and Welding Machines 								
Unit I	SAFETY PRECAUTIONS: (9) Hours Workshop location, Arrangement of tools, Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen oil and Chemicals. Also, instruction in the remedial action to be taken in the event of fire or another accident with one or more of these hazards including knowledge on extinguishing agents, Fire, types of Fires-Solid, Liquid, Electrical, Metal, Extinguishers for each									
Unit II	TOOLS: (9) Hours Common hand tools types; Hammer, Screw Driver, Pliers, Punches, Wrenches, Files, Taps and Dies. Common power tools types; Lubrication equipment and methods- operation, function and use of electrical general test equipment – care of tools, control of tools use of workshop materials; Dimensions, allowances, and tolerance, Standards of workmanship; Calibration of tools and equipment,									
Unit III	PRECISION INS Construction, Ope types, Internal m micrometers – Pur purpose, usage an Slip gauge – usag Test Indicator, Scr	TRUMENTS : ration, and use of precision instru- nicrometers, External micromete pose usage and calibration and error d calibration, Vernier bevel protr e. Combination sets, calipers insic ew pitch gauge	nents – Micrometer rs, Depth microm or correction, Verni actor, Dial gauge, le caliper, outside c	(9) Hours rs of various eters, Tube er calipers – Optical flat, caliper, Dial						
Unit IV	Test Indicator, Screw pitch gaugeFITS AND CLEARANCE :(9) HoursDefinition of clearance, Tolerance, Allowance, Limit, and bow. Types of drills, bolts, and their construction. Drill sizes for bolt holes. Classes of fits, a common system of fits and clearances. Loose fit, free fit, Medium fit, close fit. Class I A and Class I B threads, Class 2 A and Class 2 B threads, and Class 3 A and Class 3 B threads. Checking the thread size, ring thread gauge, plug thread gauge, go and not go gauge. Fits and allowance, interference, transition, clearance, and standard methods for checking shafts bearings and other parts									
Unit V	PRODUCTION M Description, funct Cutting mechanism Brazing, Soldering (application of all	MACHINES : ion, operation of Lathe parts, Typ n Types of welding; Gas welding g and Bronze welding Types of M machine)	bes of Lathe, Feed process - arc weld illing Machines, Ty Total	(9) Hours and Thread ing process, pes of gears : (45) Hours						

Text book

1. M Mahajan "A Textbook of Metrology ", Dhanpatrai and Co, 2nd Edition, 2013

References

- 1. Shop Theory by James Anderson Earl E. Tata McGraw Hill, 6th edition
- 2. Airframe & Power plant Mechanics (General Handbook EA-AC 65-9A) –byFederal Aviation Administration; Shroff publishers, Edition 2012
- 3. Workshop Technology by Hazra Chodhary (Volume I and II).
- 4. R. K. Jain, Engineering Metrology, Khanna Publishers, 1st Edition, 2013

5. R. S. Sirohi, H. C. Radha Krishna, "Mechanical Measurements", New Age Publishers, 3 rd Edition, 2011.

	Course Outcomes	Knowledge level
CO-1	Understand the importance of safety Precautions	K2
CO-2	Identify various types of Tools and Calibration of Equipment	K3
CO-3	Apply Precision Instruments and its uses	K3
CO-4	Evaluate the Fits Clearance for Drills and Threads	K5
CO-5	Illustrate the functioning of Lathe and Welding Machines	K2

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	3	2	2	2	2	2	3	3	3	3	2	3
CO2	2	2	2	2	2	2	2	2	2	2	2	2
CO3	2	2	2	2	2	2	2	2	2	2	2	2
CO4	2	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	2	2	2	2	2	2	2	3
W.AV	2.2	1.2	1.4	1.2	1.8	1.4	2.2	1.6	2.2	1.8	1.8	2.2

S-Strong (3), M-Medium2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	2
CO2	2	2	2	3	2
CO3	2	2	2	2	2
CO4	2	2	2	3	1
CO5	2	2	3	2	2
W.AV	2.2	2	2.2	2.4	1.8

S-Strong (3), M-Medium2, L-Low (1)

Core	Course code:11814	WORKSHOP PRACTICES , ENGINEERING GRAPHICS & MACHINE DRAWING- PRACTICAL	Credits: 4	: Hours: 8	
Course Objectives	 Underst practice Underst To underst 	anding a variety of tools and equipm anding what safety precautions are b erstand techniques of drawings in var	ent us eing ta ious f	ed for the w aken in the v ields of engi	vorkplace workshop ineering
	4. To unde machine 5. To unde compon	erstand and apply national and internate component. Perstand the concept of various toleran ent design	ational ces ar	l standards v 1d fits used f	vhile drawin Ìor
i. WORKS	HOP PRACTICE	ES			
1. Famili	iarization and use	of work shop equipment and Machin	ery an	d productio	n of job
related	l to these.				
a. Be	ench Vice				
b. 'V	Block				
c. Sc	ribing Block				
d. La	the				
e. Di f W	elding Apparatus				
2 Famili	arization and use	of Precision instruments and measuri	ng too	ols	
a. M	icrometer	or receision motiones and measure	ing tot	J15.	
b. D]	ΓΙ				
c. He	eight Gauge				
d. De	pth Gauge				
3. Famili	arization and use	of the following workshop tools as a	pprop	riate to the r	nature
of the	work performed				
a. Fil	es				
b. Ha	ick Saw				
c. Dr	ills				
d. Re	amers				
e. la	.ps				
I. W	renches	ICS			
II. ENGINE	LI ine types I e	ICS			
2. Plate	- 2 Ellipse – Cond	centric circle method. Rectangular of	olong	Method	
3. Plate	- 3 Cycloidal curv	ves- Involute of a circle. Cvcloid. Ep	icvclo	id and Hype	ocveloid.
4. Plate	-4 Conics section	n–Ellipse, Parabola, and Hyperbola	by Eco	centricity me	ethod.
5. Plate	- 5 Planes of proj	ection – 1 st and IIIrd Angle – Conver	sion c	of pictorial d	rawing
into (Orthographic view	rs (First angle method alone).		-	2
6. Plate	-6 Projection of	Points and lines.			
7. Plate	- 7 Projection of s	solids – cylinder, cone, truncated type	es.		
8. Plate	- 8 Isometric drav	wing of plane figures.			•••
9. Plate	- 9 Developments	s of surfaces –cylinders, pipe bends (Y.L. S	shapes pipe	joints).
10. Plate	- 10 Welded joint	ts and Riveted Joints –Representation	1.		
1ACHINE DR	AWING				
1. Plate	- I Dimensioning	types and Lettering.) a== 1	and ff i	
2. Plate	– ∠ Sectioning – F	un sectioning half broken Removal I	revolv	vea onset	

Sectioning with simple drawing examples.

- 3. Plate 3 Sleeve & cotter joint, socket & spoigot joint, knucle joint.
- 4.Plate 4 Flanged coupling Oldham's coupling Universal coupling Muff coupling, SplitMuff coupling.
- 5.Plate -5 Engine parts Connecting rod, stuffing box crank shaft.

		Total : 30 Hours
	Course Outcomes	Knowledge level
1	Ability to Produce Fitting jobs as per specified dimensions	K1
2	To know how to represents letters & numbers in drawing sheet	K3
3	To know about different types of projection	К5
4	Identify the national and international standards pertaining to machine drawing.	К3
` 5	Apply limits and tolerances to assemblies and choose appropriate fits.	K6

Mapping Course Outcome VS Programme Outcomes

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	P11	P12
CO1	2	2	2	2	2	2	1	2	2	2	2	2
CO2	1	3	3	2	1	1	2	1	2	2	2	2
CO3	2	2	2	2	2	1	2	2	3	2	1	2
CO4	2	3	2	1	2	2	1	1	2	2	2	2
CO5	2	2	2	2	1	2	2	2	2	2	2	2
.AV	1.8	2.4	2.2	1.	1.6	1.6	1.6	1.6	2.2	2	1.8	2

S-Strong (3), M-Medium2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	3	2	2
CO3	2	1	2	2	2
CO4	2	2	2	2	2
CO5	2	1	2	2	2
W.AV	2.2	1.6	2.2	1.8	2

S-Strong (3), M-Medium2, L-Low (1)

		I - Semester						
Allied	Course code: 11815	AVIATION MATHEMATICS	T Credits: 3 Hours: 3					
	1. To develop logical	understanding of the subjects						
	2. To visualize and co	onceptualize the problems						
~	3. To provide the stud	lents with sufficient knowledge in calcu	llus and matrix algebra					
Course	to model the proble	em mathematically	and alashania associance					
Objectives	4. To establish a corre	espondence between geometric curves a	and algebraic equations.					
	involved in networ	king activities and project planning	the cost and the time					
	MATDICES.	king denvines and project plaining.	(0) Hours					
	Rank of a matrix Cou	esistency of linear system of equations	() Hours					
	Figen values and eige	nvectors of a real matrix. Characteristic	- Engeni value problem -					
Unit I	eigen values and eigen	envectors – Cavley – Hamilton theor	em-inverse of a matrix-					
	Similarity transformat	ion -Basic concepts-Diagonalization 1	by similarity					
	transformation.							
	THREE DIMENSIO	NAL ANALYTICAL GEOMETRY :	(9) Hours					
	Direction cosines and	ratios, Angle between two lines- Equati	ions of a plane-					
Unit II	Equations of a straight	t line – Coplanar lines – Shortest distar	nce between skew lines –					
	Sphere – Tangent plan	e – Plane section of a sphere – Orthogo	onal spheres					
	GEOMETRICAL APP	LICATIONS OF DIFFERENTIAL CAI	LCULUS: (9) Hours					
TT *4 TTT	Curvature - Cartesian and polar co-ordinates - Centre and radius of curvature - Circle							
Unit III	of curvature – Involutes and evolutes – Envelopes – Properties of envelopes							
	evolutes -Evolutes as e	envelope of normal						
	FUNCTIONS OF SE	VERAL VARIABLES :	(9) Hours					
Unit IV	Functions of two va	riables – Partial derivatives – Total	differential – Taylor's					
	expansion – Maxima and minima – Constrained maxima and minima – Lagrange's							
	Multiplier method – Ja	cobinans						
	NETWORK ANALY	YSIS :	(9) Hours					
Unit V	Programme Evaluatio	n and Review Technique(PERT)-Criti	cal Path Method(CPM)-					
	Concepts-Application	problems-Computation of earliest time-	-Latest time-floats					
			Total : 45 Hours					
Text book								
1. Sandro	Salsa, " Partial differen	tial equations in action: From modelling	g to theory", Springer,					
Cham	, 2008	-						
References								
1. Veera	ajan, T., "Engineering N	Mathematics (for First Year)", Second	Edition, Tata McGraw -					
Hill Pı	ub. Co. Ltd. New Delhi,	2012.						
2. Venka	taraman, M.M. "Engine	eering Mathematics, Volume I, "Four	th Edition, the National					
Pub. C	Co., Chennai, 2003.							
3. Kreyszi	g, E, "Advanced Engine	ering Mathematics", Eight Edition, Joh	in Wiley and Sons (Asia)					
$1 \text{ C P } \mathbb{K}_{\infty}$	pore, 2001. thari "Quantitative Taal	niques(New Format)" Third Edition V	ikas Publishing 2012					
7. U.K.NO 5. Mathew	ulari, Qualititative recr v P. Coleman " An intro	duction to partial differential equations	with Matlah" CRC					
Press Sec	ond edition. Boca Raton	. 2013.						
11000, 000	Cours	e Outcomes	Knowledge level					
	Apply the knowledge	of matrices to solve the problem and	Knowledge level					
CO-1	understand the applica	tions of matrices	K2					
	A nolyco the share the	ation and momenting of three dimension						
CO-2	Analyse the characteri	sucs and properties of infee-dimensional	K3					
	geometric snapes and	Develop mainematical arguments about	L					

	geometric relationships. Specify locations and describe spatial relationships using coordinate geometry and other representational systems.	
СО-3	Fix the center of curvature, determines the direction of curvature of the curve at that specific point and to find the radius of curvature which determines the magnitude of that curvature	K4
CO-4	Find the rate of change of quantity with respect to other, find a function which is increasing or decreasing and to find the maximum and minimum value of a curve.	К2
CO-5	Get a clear idea about of how to manage and plan their project, concerning resources and time	К5

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	P11	P12
CO1	3	2	2	2	2	3	2	2	2	2	2	2
CO2	2	2	2	2	2	2	2	2	2	1	2	3
CO3	2	3	2	2	2	2	2	2	2	2	2	2
CO4	3	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	2	2	2	2	2	2	3	2
W.AV	2.4	2.2	2	1.	1.8	2.2	1.8	2	1.8	1.8	2.2	2.2

S-Strong (3), M-Mediu2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	2	1	3 2		2
CO3	2	2	2	2	2
CO4	3	2	2	2	2
CO5	2	2	2 2 2		1
W.AV	2.4	1.8	2.2	2.2	1.8

S-Strong (3), M-Mediu2, L-Low (1)

I - Semester										
Allied	Course code: 11816	COMPLITER I AB	Р	Credits: 2	Hours: 4					
		COMI UTER LAB								
1. To educate about creating professional documents using word.										
	2. To educate ab	out analyse, manage and present data using excel.								
Course	3. To educate ho	ow to create and manage presen	tatio	n using power	r point.					
Objectives	4. To study abou	4. To study about insert a table, picture and drawing into the documents.								
-	5. To educate ab	oout create a data base using acc	cess.							

List of Experiments

- 1. Create a document and apply different formatting options.
- 2. Design a Greeting Card using Word Art for different festivals.
- 3. Create your Bio-data and use page borders and shading.
- 4. Create a document and insert header and footer, page title etc.
- 5. To create a document, set the margins, orientation, size, column, water mark, page color and page borders.
- 6. Prepare a mark sheet of your class subjects.
- 7. Apply the creating, editing, saving, printing securing & protecting operations to an excel spreadsheets.
- 8. Prepare a bar chart & pie chart for analysis of five year results of your institute.
- 9. Work on the following exercise on a workbook:
 - a. Copy an existing sheet.
 - b. Rename the old sheet.
 - c. Insert a new sheet into an existing Workbook.
 - d. Delete the renamed sheet.
- 10. Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student & average of attendance.
- 11. Apply themes and layouts to power point slides and insert pictures, graphics, shapes, and tables into presentations.
- 12. In power point slide make use of adding transitions and animation & Working with mater slides.
- 13. Create a excel worksheet and perform computations using available data and using mathematical functions chosen from menus.
- 14. Create a database on students list of any 4 faculties and perform following database functions on it.
 - a. Sort data by Name
 - b. Filter data by Class
 - c. Subtotal of no. of students by Class
- 15. Create Database to maintain at least 10 addresses of your class mates with the following constraints
 - a. Roll no. should be the primary key.
 - b. Name should be not null

	Total : 30 Hours
Course Outcomes	Knowledge level
• To create and manage professional documents using word.	K6
• To analyse, manage and present data using excel.	K4
• To create and manage presentation using power point.	K6
• To insert a table, picture and drawing into the documents.	K6
• To create a data base using access.	K4

CO	PO1	PO 2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO1 0	P11	P12
CO1	2	2	2	2	2	2	1	2	2	2	2	2
CO2	1	2	3	1	1	1	2	1	2	2	2	2
CO3	2	2	2	2	2	1	2	2	2	2	1	2
CO4	2	2	2	1	1	2	2	1	2	2	2	2
C05	2	2	2	2	1	2	2	2	2	2	2	2
W _{.AV}	1.8	2	2.2	1. 6	1.4	1.6	1.8	1.6	2	2	1.8	2

S-Strong (3), M-Medium2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	2	2	2
CO3	1	1	2	2	2
CO4	2	2	2	2	3
CO5	2	1	2	1	2
W.AV	2	1.6	2	1.8	2.2

S-Strong (3), M-Medium2, L-Low (1)

	I - Semester									
Course code: 11817	VALUE EDUCATION	T Credits: 2	Hours: 2							
 To impart humanism v To make them awaren To familiarities the stu NSS and NCC and r teachvalues To impart skills by pression 	 To impart numanism values among the student under various rengious thoughts To make them awareness of ethics and civil rights To familiarities the students with basic features of extracurricular activities such NSS and NCC and relevance of Abdul Kalam and Mother Teresa efforts to teachvalues To impart skills by preparing project works such as writing poems and stories 									
Definition – Need for humanism and humanisti teaching of values under Jainism, Islam, etc. Ag Resource Centre for Valu	Definition – Need for value Education – How important human values are – humanism and humanistic movement in the world and in India – Literature on the teaching of values under various religions like Hinduism, Buddhism, Christianity, Jainism, Islam, etc. Agencies for teaching value education in India – National Resource Centre for Value Education – NCERT– IITs and IGNOU.									
Vedic Period Influence of Buddhism a invasion – British Rule – Swami Vivekananda – Ta	nd Jainism – Hindu Dynastic - culture clash – Bhakti cult - gore – their role in value educ	es – Islam Invasio - social Reformers cation.	(6) Hours on – Moghul 5 – Gandhi –							
Value Crisis (6) Hours Independence- After Independence – democracy – Equality – fundamental duties – Fall of standards in all fields – Social, Economic, Political, Religious and Environmental – corruption in society. Politics without principle – Commerce without ethics – Education without Character – Science without humanism – Wealth without work – Pleasure without conscience – Prayer without sacrifice – steps taken by the Governments – Central and State – to remove disparities on the basis of class, creed,										
Transition from school to mistaken for license – nec etiquettes – Extra- Curric of Dr. A.P.J. Abdual Kala	o college – problems – Contro ed for value education – ways sular activities – N.S.S., N.C. um's efforts to teach values – N	ol – free atmospher of inculcating it – C., Club activities Mother Teresa.	(6) Hours re – freedom Teaching of – Relevance							
 PROJECT WORK 1. Collecting details at magazines. 2. Writing poems, skits 3. Presenting personal 4. Suggesting solution 	bout value education from new s, stories centering around values experience in teaching values. s to value – based problems or	spapers, journals a ue-erosion in socie n the campus.	(6) Hours nd ty.							
		Tota	l : 30 Hours							
rishnan, S. "Religion and cu dananda. M.K. (1991), "Eth a publications. yathi. T.S. (ed) 1999. y, Research and Application taiah. N (ed) 1998, "Value E uborti, Mohit (1997) "Valu ka Publications.	ulture" (1968), Orient Paperba ics, Education, Indian unity a Culture", Socialisation and in India" – New Delhi Sage p Education" New Delhi Ph. Pub e Education: Changing Persp	cks, New Delhi. nd culture" – Delh l Human Develo publications. lishing Corporation pectives" New Del	i, opment: n. hi:							
	Course code: 11817 1. To impart humanism v 2. To make them awaren 3. To familiarities the stu NSS and NCC and r teachvalues 4. To impart skills by pro- Definition – Need for humanism and humanisti teaching of values under Jainism, Islam, etc. Ag Resource Centre for Valu Vedic Period Influence of Buddhism a invasion – British Rule – Swami Vivekananda – Ta Value Crisis Independence- After Ind- Fall of standards in a Environmental – corrupti- ethics – Education without Governments – Central a: gender. Transition from school to mistaken for license – new etiquettes – Extra- Curric of Dr. A.P.J. Abdual Kala PROJECT WORK 1. Collecting details at magazines. 2. Writing poems, skit 3. Presenting personal 4. Suggesting solution rishnan, S. "Religion and cu- lananda. M.K. (1991), "Eth a publications. athi. T.S. (ed) 1999. , Research and Application taih. N (ed) 1948, "Value F borti, Mohit (1997) "Valuk ka Publications.	Image: Course code: Image: Value Education 1. To impart humanism values among the student unde To make them awareness of ethics and civil rights 3. To familiarities the students with basic features of e NSS and NCC and relevance of Abdul Kalam ar teachvalues 4. To impart skills by preparing project works such as Definition – Need for value Education – How im humanism and humanistic movement in the world an teaching of values under various religions like Hind Jainism, Islam, etc. Agencies for teaching value e Resource Centre for Value Education – NCERT – IITs a Vedic Period Influence of Buddhism and Jainism – Hindu Dynastic invasion – British Rule – culture clash – Bhakti cult - Swami Vivekananda – Tagore – their role in value educ Value Crisis Independence – After Independence – democracy – Ed Fall of standards in all fields – Social, Econor Environmental – corruption in society. Politics without ethics – Education without Character – Science without Governments – Central and State – to remove dispariting gender. Transition from school to college – problems – Contromistaken for license – need for value education – ways etiquettes – Extra- Curricular activities – N.S.S., N.C.G of Dr. A.P.J. Abdual Kalam's efforts to teach values – M PROJECT WORK 1. Collecting details about value education from new magazines. 2. Writing poems, skits, stories centering around values a publications. 4. Suggesting solutions to value – based problems or or solutions. 4. Suggesting solutions to value – based problems or or solutions.	Image: Course code: VALUE EDUCATION T Credits: 2 1. To impart humanism values among the student under various religious 2. To make them awareness of ethics and civil rights 3. To familiarities the students with basic features of extracurricular activ NSS and NCC and relevance of Abdul Kalam and Mother Teresa teachvalues 4. To impart skills by preparing project works such as writing poems and Definition – Need for value Education – How important human valuanism and humanistic movement in the world and in India – Liter teaching of values under various religions like Hinduism, Buddhism, Jainism, Islam, etc. Agencies for teaching value education in India Resource Centre for Value Education – NCERT– IITs and IGNOU. Vedic Period Influence of Buddhism and Jainism – Hindu Dynasties – Islam Invasic invasion – British Rule – culture clash – Bhakti cult – social Reformers Swami Vivekananda – Tagore – their role in value education. Value Crisis Independence – democracy – Equality – fundame fall of standards in all fields – Social, Economic, Political, Re Environmental – corruption in society. Politics without principle – Commethics – Education without Character – Science without humanism – Wowrk – Pleasure without conscience – Prayer without sacrifice – steps Governments – Central and State – to remove disparities on the basis of ogender. Transition from school to college – problems – Control – free atmospher mistaken for license – need for value education from newspapers, journals a magazines. P. Writing poems, skits, stories centering around value-erosion in socie 3. Presenting personal experience in teaching values.							

- 5. "Value Education Need of the hour" Talk delivered in the HTED Seminar Govt. of Maharashtra, Mumbai on 1-11-2001 by N.Vittal, Central Vigilance Commissioner.
- 6. "Swami Vivekananda's Rousing call to Hindu Nation": EKnath Ranade (1991) Centenary Publication

Cours	e Outcomes	Knowledgelevel
CO-1	Knowledge about Humanism and Humanistic Movements in the World and in India	K2
CO-2	Understand the Social Reformers and Their Role in Value Education	K2
CO-3	Explore the theories of Fundamental Duties, Ethics, Extra-Curricular Activities –N.S.S., N.C.C	K3
CO-4	Know the concept of Value Education on College Campus	K5
CO-5	To Develop the Project Work regarding Writing Poems, Skits, Stories	K2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO1	3	2	2	2	1	3	2	2	2	2	1	2
CO2	2	2	1	1	1	2	1	1	2	1	2	2
CO3	2	3	2	2	2	2	2	2	1	1	2	2
CO4	2	2	1	1	2	2	2	2	2	2	2	1
CO5	2	2	3	2	2	2	1	2	1	1	3	2
w.AV	2.2	2.2	1.8	1.	1.6	2.2	1.6	1.8	1.6	1.4	2	1.8

S-Strong (3), M-Medium 2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2
CO2	2	1	1	2	2
CO3	2	1	2	3	2
CO4	1	2	1	2	1
CO5	2	2	2	3	2
W.AV	1.8	1.6	1.6	2.4	1.8

S-Strong (3), M-Medium 2, L-Low (1)

II-Semester										
T/OL	Course code: 11821F	FRENCH	Т	Credits:3	Hours:3					
Course Objectives	 Understand and sentences and pa Apply the rules a Practice exercise Explain and sur bulletins, info gr Demonstrate knopinion, emotion Build upon acqu 	Understand and apply the grammatical concepts in drafting sentences and paragraphs Apply the rules and regulations to effectively employ past tense Practice exercises and identify errors Explain and summarize a French document such as posters, bulletins, info graphics, etc. Demonstrate knowledge of various expressions used to convey opinion, emotions, cause, effect, purpose, and hypothesis in French Build upon acquired writing and communication skills to develop them								
Unit I	C'estoù?				(9) Hours					
Unit II	N'oubliez pas				(9) Hours					
Unit III	Belle vue sur la n	Belle vue sur la mer								
Unit IV	Quel beau voyage	Quel beau voyage								
Unit V	Oh joli Et après	Oh joli Et après								
				Tot	tal : 45 Hours					
References Régine Mérieu (units 7-12 onl	ıx & Yves Loiseau, <i>L</i> ly)	atitudes-1-(A1/A2),mét	hode	defrançais, l	Didier, 2017					
Course Outco	omes				Knowledge Level					
CO-1	Revise and recall	the French sentence str	uctur	e	K1					
CO-2	Enumerate the va Them to commun	rious grammatical tense nicate better in French	es and	d use	K2					
CO-3	Summarize and d After discussing i	evelop ideas from the d it in detail	ocun	nents	K2 and K3					
CO-4	Analyze and inter effect, purpose, a	rpret verbal expressions nd opposition in French	of ca	nuse,	K4					
CO-5	Evaluate and com	prehend text passages			K5					
	Mappi	ing with Programme C)utco	omes:						

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	М	L	М	М	L	S	M	M	M	M
CO2	S	М	М	L	М	М	L	S	M	S	M	М
CO3	М	S	S	М	S	М	M	M	S	M	S	S
CO4	S	S	М	L	S	М	L	S	S	M	S	S
CO5	S	S	S	L	М	М	L	S	S	М	S	S
			S-Str	ong]	M-Med	lium	L-Low				

			II-Semester			
	E	Course Code: 11822	GENERAL ENGLISH- II	Т	Credits:3	Hours:3
Сон	irse	To make students re	alize the importance of resili	ience	2	
Obiec	ctives	To enable them to b	e come good decisionmakers	5	-	
		To enable them to ir	nbibe problem-solving skills			
		To enable them to u	se tenses appropriately			
		To help them use Er	nglish effectively at the work	pla	ce.	
I	Unit I	RESILIENCE	<u> </u>	1		(9) Hours
		Poem				()) 110415
		Don't Ouit– Edga	r A. Guest			
		Still Here–Langst	on Hughes			
		Short Story				
		Engine Trouble –I	R.K. Narayan			
		Rip VanWinkle–V	Vashington Irving			
τ	J nit II	DECISIONMA	KING			(9)
		Short Story				
		The Scribe – Krist	in Hunter			
		The Lady or the T	iger-Frank Stockton			
		Poem				
		The Road not Tak	en – Robert Frost			
		Snake– D. H Law	rence			
U	nit III	PROBLEMSOI	LVING			(9)
		Prose life Story				
		3.1 How I taught	My Grandmother to Read -	Sud	ha Murthy	
		Autobiography				
		How frog Went to	Heaven–A Tale of Angolo			
		Wings of Fire (Ch	apters 1,2,3) by A. P. J Abdu	ul K	alam	(0) 77
U	nit IV	Tenses				(9) Hours
		Present				()) 110013
		Past				()) 110013
		Past Future				()) nours
		Past Future Concord				()) nours
U	J nit V	Past Future Concord English in the W	Vorkplace			(9) Hours
ι	J nit V	Past Future Concord English in the W E-mail – Invitation	V orkplace n, Enquiry, Seeking Clarifica	atior		(9) Hours
τ	J nit V	Past Future Concord English in the W E-mail – Invitation Circular	V orkplace n, Enquiry, Seeking Clarifica	atior		(9) Hours
τ	J nit V	Past Future Concord English in the W E-mail – Invitation Circular Memo	V orkplace n, Enquiry, Seeking Clarifica	atior		(9) Hours
ι	J nit V	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the	V orkplace n, Enquiry, Seeking Clarifica Meeting	atior		(9) Hours
τ	Jnit V	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the	V orkplace n, Enquiry, Seeking Clarifica Meeting	atior		(9) Hours (9) Hours Fotal : 45 Hours
Refer	Jnit V	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the	V orkplace n, Enquiry, Seeking Clarifica Meeting	atior	,	(9) Hours (9) Hours Fotal : 45 Hours
Refer	J nit V rences Martin H	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the	V orkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge	atior	versity Press	(9) Hours (9) Hours Fotal : 45 Hours , 2000
Refer 1 M 2 S	J nit V Tences Martin H SP Baksh	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the ewings. Advanced En i, Richa Sharma. Dese	V orkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge criptive English. Arihant Pub	atior	versity Press tions (India)	(9) Hours (9) Hours Total : 45 Hours , 2000 (Ltd.,2019.
Refer 1 M 2 S 3 S	J nit V T ences Martin H SP Baksh Sheena C	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the ewings. Advanced En i, Richa Sharma. Dese ameron, Louise Demj	Vorkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge criptive English. Arihant Pub psey. The Reading Book: A	univ Univ Dlica	versity Press tions (India) plete Guide	(9) Hours (9) Hours (9) Hours Total : 45 Hours , 2000 (Ltd.,2019. to Teaching
Refer 1 M 2 S 3 S F	J nit V Tences Martin H SP Baksh Sheena C Reading.	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the ewings. Advanced En i, Richa Sharma. Dese ameron, Louise Demj S& L. Publishing, 20	Vorkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge criptive English. Arihant Pub osey. The Reading Book: A 0 19.	univ Univ olica Com	versity Press tions (India) plete Guide	(9) Hours (9) Hours (9) Hours Total : 45 Hours , 2000 (Ltd., 2019. to Teaching
Refer 1 N 2 S 3 S F 4 E	J nit V Fences Martin H SP Baksh Sheena C Reading. Barbara S	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the ewings. Advanced En i, Richa Sharma. Dest ameron, Louise Demj S& L. Publishing, 20 Sherman. Skimming a	Vorkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge criptive English. Arihant Pub osey. The Reading Book: A 0 19. nd Scanning Techniques, Lil	ation Univ Dlica Com	versity Press tions (India) plete Guide v University	(9) Hours (9) Hours (9) Hours Total : 45 Hours , 2000 (Ltd.,2019. to Teaching Press, 2014.
Refer 1 M 2 S 3 S F 4 F	J nit V Tences Martin H SP Baksh Sheena C Reading. Barbara S	Past Future Concord English in the W E-mail – Invitation Circular Memo Minutes of the ewings. Advanced En i, Richa Sharma. Dese ameron, Louise Demj S& L. Publishing, 20 Sherman. Skimming a	Vorkplace n, Enquiry, Seeking Clarifica Meeting glish Grammar. Cambridge criptive English. Arihant Pub psey. The Reading Book: A 0 19. nd Scanning Techniques, Lil	univ Univ Dilica Com	versity Press tions (India) plete Guide y University	(9) Hours (9) Hours (9) Hours (9) Hours (1) Fotal : 45 Hours (1) Junctice (1) Ju

6 Communication Skills: Practical Approach Ed.ShaikhMoula

Course Outcome	28	Knowledge Level
CO-1	Realize the import rice of resilience	PO1, PO7
CO-2	Become good decision-makers	PO1, PO2, PO10
CO-3	Imbibe problem-solving skills	PO4, PO6, PO9
CO-4	Use tenses appropriately	PO4, PO5, PO6
CO-5	Use English effectively at the work place.	PO3, PO8

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 - Strong, 2 - Medium, 1 - Low

CO/PO	PSO1	PSO2	PSO3	PSO4
C01	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
C05	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0

Mapping with Programme Specific Outcomes:

		II-Semester								
Core	Course Code: 11823	AIRCRAFTBASICSELECTRICIT Y&ELECTRONICS	Т	Credits: 5	Hours: 5					
Course Objectives	 To farmain To s To e 	amiliarize about basic electricity and elec amiliarize about the batteries used in the a attenance. tudy the about the motors, generators and ducate about power distributions systems ducate about the various circuits used in t	trica aircr l its use	al devices. The and its controls. In the air	craft.					
Unit I	FUNDAME	NTALS :		(1	5) Hours					
	Basic laws Field effect switches, Re breakers. B voltmeter, an	of Electrical system, Resistors- Capacito transistor, Direction of current flow, elays and solenoids, Circuit protection d asic Electronic Measurement devices nmeter, CRO, Function Generator	ors-l Cir levic su	Inductors, 7 reuit contro ces, fuses a uch as Mu	Fransisto of device and circu ulti-meter					
Unit II	STORAGE Theory and Charging an Battery circu	STORAGEBATTERIES : (15) Hours Theory and constructional features of lead acid and Nickel cadmium batteries, Charging and capacity check of aircraft batteries. Maintenance of batteries; Battery circuits, Ground power circuit.								
Unit III	MOTORS A DC Motors Aircraft gen Voltage reg load balanci Principle of Ac generator	AND GENERATORANDRELATEDCO construction-Types-Principle of oper erator, principle of operation, characteris alators, reverse current cutout relay, cu ng; equalizing circuit; DC alternate or c alternator, Induction motor: Construction rs, High power brush less alternators. Inve	ON ratio stics urren ircu n, P erter	FROLS: (1 an, Constru- types of g at limiter; it. Starter g rinciple of rs.	5) Hour action of enerators Generator generator operation					
Unit IV	POWER SU Hours Half and f Voltage regulated load analys distribution parallel system	PPLIES AND POWER DISTRIBUT all wave rectifier –Bridge rectifier–R alator - SMPS and UPS Silicon Control is. Basic power distribution system; system, Spilt-power system, parallel em; Characteristics of aircraft electric wir	FIO ecti lled Larg elec re.	N SYSTE fication Ef Rectifier, 2 ge air cra strical syste	M: (15) ficiency- Electrical ft power em, spilt					
Unit V	ELECTRIC Starter circu gear actuatio auto ignition	CALCIRCUITS it-Navigation light circuit-landing and ta on and indicating circuit – Antiskid brake circuit.	axi 1 e sys	(15 light circui stem, turbir	b) Hours t-landing ne engine					
Tout hast				Total :	75 Hour					
1. Basic	Electricity- by	Dale Crane (2017)								
References 1. Aircra 2. Aircra 3. Electr	aft Electrical S aft Electrical an rical technolog	ystem by E.H.J. Pallet1996 ad Electronics by Thomas K Eismin 1994 y by B L Theraja	Ļ							

- Aircraft Electrical System --- E.H.J.Pallett
 Aviation Maint. Technician Hand Book-General -9A ----- FAA

Course O	utcomes	Knowledge Level
CO-1	To understand about basic electricity and electrical devices	K2
CO-2	To acquire the knowledge of batteries used in the aircraft and its maintenance	K3
CO-3	To understand the working principle and constructions of motor and generators	K2
CO-4	To analysis power distribution system used in the aircraft.	K4
CO-5	To understand various circuits used in the aircraft.	K2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	3	2	2	2	2	2	3	2	2	2	2	2
CO2	2	2	2	2	2	2	2	2	2	2	2	3
CO3	3	3	2	2	2	2	2	2	2	2	2	2
CO4	2	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	3	2	2	2	2	2	2	2	3	2
W.AV	2.4	2.2	1.8	1.8	2	2	2.2	1.6	1.8	1.8	2.2	2.2

S-Strong (3), M-Medium (2), L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2
CO2	2	2	2	1	2
CO3	3	2	2 2		2
CO4	2	2	3	2	2
CO5	3	1	2	1	2
W.AV	2.4	1.8	2.2	1.6	2

S-Strong (3), M-Medium (2), L-Low (1)

II-Semester									
Core	Course Code: 11824	AIRCRAFT BASICS ELECTRICITY & ELECTRONICSLAB – PRACTICAL	Р	Credits:	4 Hours:8				
Course Objectives	 To gain Thevini To mak To learn and Zen To mak To mak To mean 	hand on experience in Ohm's law, l n's Theorems e a circuit of RC phase shift oscillat n the characteristics of basic electron for diode. e different rectifier circuits. sure the load characteristics of moto	Kirchl or nic de ors.	hoff's law, vices such	and as BJT, FET				
 Verifi Verifi Verifi Verifi R.C. F Chara To con To con To con To con Zenor Chara To stut 	cation of Kirchho cation of Thevinir cation of Ohm's L Phase shift Oscilla cteristics of Trans nstruct a DC source nstruct a DC source diode as a voltage cteristics of FET idy the load charace	ff's Law. n Theorem. Law. tor istor–CE configuration be using single diode and transformer. be using two diode and transformer. be using four diode and transformer. the regulator. eteristics of DC shunt motor eteristics of Induction motor	er.						
<u> </u>				Tota	1:60 Hour				
Course Outco	omes				Knowledge Level				
 To ver To ana To ana diode. 	rifying Ohm's law alyze a circuit of F alyze a circuit to s	, Kirchhoff's law, and Thevinin's T C phase shift oscillator. tudy characteristic of Transistors, Fl	heore ET an	ms d Zenor	K6 K3 K3				
• To ana	alyze different rec	tifier circuits.			K3				
• Io me	easure the load cha	tracteristics of motors.			К5				

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	2	3	1	2	2	2	2	2	2	1	2
CO2	2	2	2	2	1	1	2	1	2	2	2	1
CO3	2	2	2	2	2	2	2	2	2	2	2	2
CO4	2	3	1	1	2	2	1	1	2	2	2	2
CO5	2	2	2	2	1	2	2	2	2	2	2	2
W.AV	2	2.2	2	1.6	1.6	1.8	1.8	1.6	2	2	1.6	1.8

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	1
CO2	2	2	3	2	2
CO3	1	2	2	2	2
CO4	2	2	2	2	1
CO5	2	1	3	3	2
W.AV	2	1.8	2.4	2.4	1.6

		II-Semester								
Allied	Course Code: 11825	APPLIEDMECHANICS	T Credits:3 Hours:3							
Course Objectives	1. To un 2. To id 3. To an 4. To ev 5. To de	nderstand the Fundamental co entify various types of force halyze the Friction on Simple valuate the Frame and Resolu evelop the Relationship betwo	oncept of mechanics and Projectile Motion Machine tion of force een stress and strain							
Unit I	MECHANICS		(9) Hours							
	Fundamental Co – Basic terms ar Concept of forc Concurrent, Nor forces, parallelog the principle of V	ncepts: Mechanics, Statics, I ad definitions and units – Re es, non-Coplanar- Coplanar a – Parallel, Forces – comp gram law of forces, Moment Virtual work	Dynamic, Kinetics, Kinematics solution of forces on a system, c, Concurrent, Parallel, Non – osition of forces. Resultant of of forces, couples lever arm –							
Unit II	DYNAMICS		(9) Hours							
	External and Internal Moment of coup Newton's law of work, energy of Momentum, Rot free and forced w	External and Internal forces, principle of transmissibility, Equivalent forces, Moment of couple, force Centroid and Center of gravity, Moment of Inertia- Newton's law of motion, D ' Alembert's principle, Momentum impulse, work, energy methods, curvilinear translation, motion of projectiles, Momentum, Rotation resultant, inertia force in rotation, rigid body motions, free and forced vibration simple harmonia motion of Vibratians								
Unit III	FRICTION		(9) Hours							
	Laws of Friction Screws, Journal inclined plane, s Efficiency	, Coefficient of Friction, Ang Bearing, Thrust Bearings, R simple Machines, Screw Jac	gle of Friction, Wedges, colling resistance, Belt friction k Velocity Ratio, Mechanical							
Unit IV	FRAMES		(9) Hours							
	Analysis of perf Introduction, Cl redundant frame sections and me with one end h horizontal and sh	ect trames by Analytical me assification of frames perf ass, Assumptions Resolution thod of joints – force table, inged and other freely sup- cew load	ethods: Sect, imperfect, deficient, and of forces using the method of Cantilever trusses – Structures ported on rollers subjected to							
Unit V	STRENGTH O	F MATERIALS	(9) Hours							
	Stress, strain de law- poisons rat Elastic constants circles – Thin a simple problems point load and U	io, a factor of safety, volum s, principal stress, and strair nd thick cylinders, shells su . Beams –types of beams, typ DL shear force, and bending	een stress and strain, Hooke's etric strain, simple problems – is – simpler problems, Mohr's ibjected to internal pressure – pes of load, beams subjected to moment diagram							
Text book 1. Rajaseka Dynam References	aran S and Sankara ics", Vikas Publis	asubramanian G, "Engineerin hing House Pvt. Ltd., New D	g Mechanics-Statics and elhi, 2006							
1. Enginee 2. A text b	ring Mechanics – ook of text strengt	A text book of Applied Mech h of Materials – R .K. Bansal	anics by S. Ramamurtham							

A text book of text strength of Materials 33

- 3. Beer F P and Johnson E R, "Vector Mechanics for Engineers, Statics and Dynamics", Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi, 2006.
- 4. Hibbeller, R.C., Engineering Mechanics: Statics, and Engineering Mechanics: Dynamics, 13th edition, Prentice Hall, 2013.

J.L. Meriam & L.G. Karige, Engineering Mechanics: Statics (Volume I) and Engineering Mechanics: Dynamics (Volume II), 7th edition, Wiley student edition, 2013

Course Outco	Course Outcomes					
CO-1	K2					
CO-2	Identify various types of force and Projectile Motion	K3				
CO-3	Analyze the Friction on Simple Machine	K4				
CO-4	Evaluate the Frame and Resolution of force	K5				
CO-5	Develop the Relationship between stress and strain	K6				

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	3	3	2	2	1	2	2	2	1	1	1	3
CO2	2	3	2	2	1	1	2	2	2	1	2	2
CO3	2	2	2	2	2	1	1	1	2	2	2	2
CO4	2	2	2	2	1	2	1	2	1	1	1	2
CO5	2	2	2	2	2	1	2	2	2	2	2	3
W.AV	2.2	2.4	2	2	1.4	1.4	1.8	1.8	1.6	1.4	1.6	2.4

S–Strong(3),M-Medium 2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	2	2
CO2	2	1	2	2	3
CO3	2	1	2	1	2
CO4	2	2	1	2	2
CO5	3	2	2	2	2
W.AV	2.4	1.4	1.8	1.8	2.2

S-Strong (3), M-Medium 2, L-Low (1)

II-Semester						
Allied	Course	AUTOCAD LAB-	P Credits:2		2 Hours:4	
	Code: 11826	PRACTICAL				
Course Objectives	 To apply basic concept to drawing, edit, dimension, hatching etc. to develop 2D Understand the AutoCAD environment by creating new drawings, opening existing drawings and saving drawings. Understand the basic building drawing fundamentals for creating and manipulate geometric models by CAD System To apply basic concept to drawing, edit, dimension, hatching etc. to develop 2D & 3D Modelling. To prepare surface modelling and sheet metal operations through various exercises 					
 List of Experiment : Introduction of cad software and its utilities in the engineering software. Study of the basic initial setting and viewing of drafting software interface. Study of various tool bar options and exercises to familiarize all the drawing tools. Study and implementation of co-ordinate systems and ucs. Use of basic entities in 2d. Use of various modify commands of drafting software. Dimensioning in 2d and 3d entities. Draw different types of 3d modelling entities using viewing commands, to view them (isometric projection). Sectioning of solid primitives and rendering in 3d. 						
Course Outcomes					Knowledge Level	
1. Able to use soft		K1				
 Comprehend the fundamentals of building drawings and understand CAD software for drafting. Develop Coometric Plan, Sections and Elevations for single and 					К2	
4. Able to prepare	 multi-storeyed building with suitable scale and dimensions. K3 Able to prepare surface modelling and sheet metal operations through 					
various exercises K1					K1	
5. Create and manage layouts, viewports and page setups K6						

Mapping Course Out	come VS Programme Outcomes
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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	2	2	1	1	2	1	2	2	1	1	2
CO2	2	2	1	2	2	1	2	1	2	2	2	3
CO3	2	2	2	2	3	1	2	2	2	1	2	2
CO4	2	2	2	2	2	2	1	2	3	2	2	2
CO5	2	2	3	2	2	2	2	2	2	2	2	3
W.AV	2	2	2	1.8	2	1.6	1.6	1.8	2.2	1.6	1.8	2.4

S-Strong (3), M-Medium(2), L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	1	3	2
CO2	2	2	2	2	2
CO3	2	3	2	3	1
CO4	3	2	2	2	2
CO5	2	3	2	2	2
W.AV	2.2	2.4	1.8	2.4	1.8

S-Strong (3), M-Medium (2), L-Low (1)
		II-Semester		1	1
SEC II	Course Code:	ENVIRONMENTAL STUDIES	T	Credits:2	Hours:2
Course Objective	1. To un as ford 2. To po 3. To im 4. To kn and bi	derstand the multidisciplinary nature est, water, mineral and energy and la rtray the eco system bio diversity an part the knowledge of environmenta ow the importance of field work to irds and visit local areas to documen	e of e and re d its l pol stud t env	nvironmental esources. conservation. lution. y common pla ironmental ass	studies suc
Unit I	The Multidiscipl	linary Nature of Environmental Studies			(3) Hours
	Definition, Scor	be and importance Need for public awareness	ss		
Unit II	Natural Resourc	ees:			(9) Hours
	 A). Forest Resc Extraction, Minin B). Water Resour Conflicts over Water C). Mineral Resource by Agriculture at Water Logging, S E). Energy Resc Sources, Use of A F). Land Resources Use of Resources 	burces: Use and Over-Exploitation, Defor ng, Dams and Their Effect on Forests and The urces: Use and Over-Utilization of Surface a ater, Dams- Benefits and Problems. sources: Use and Exploitation, Experimer es, Case Studies. D). Food Resources: Wo nd Overgrazing, Effects of Modern Agrice Salinity, Case Studies. sources: Growing Energy Needs, Renew Alternate Energy Resources, Case Studies. rces: Land as a Resource, Land Degradate ertification. Role of Individual in Conservate for Sustainable Lifestyle	estation ribal F and G ntal E orld Fo ulture wable tion, 1 tion o	on, Case Studies People. round Water, Flo ffects of Extract ood Problems, C , Fertilizer-Pestio and Non-Rene Main Induced La f Natural Resour	s, Timber pods, Drougl ing and Usi hanges Caus cide Probler wable Ener andsides, So ces -Equitab
Unit III	ECOSYSTEMS	, BIO-DIVERSITY AND ITS CONSERV neept of an Ecosystem. Structure and Function	ATIC)N 'an Ecosystem, F	(6) Hours Energy Flow
	The Ecosystem, I	Food Chains, Food Webs and Ecological Py	ramid	s.	lieigj i iew
	Biodiversity and Diversity, Bio-G Productive Use, and Local Level Biodiversity: Hab Endemic Species Biodiversity.	H Its Conservation: Introduction- Definiti- eographical Classification of India, Value Social Ethical, Aesthetic and Option Values, India as a Mega-Diversity Nation, Ho pitat Loss, Poaching of Wildlife, Man-Wild s of India, Conservation of Biodiversity: I	on: G of B ues. B ot Spo llife C n-Situ	enetic, Species a iodiversity: Con iodiversity at Gl ots of Biodiversi conflicts, Endang And Ex-Situ C	and Ecosysti sumptive U lobal, Natio ity, Threats ered and onservation
Unit IV	Environmental l	Pollution:			(6) Hours
• •	Causes, Effects A Pollution, D). Ma	And Control Measures of: A). Air Pollution, rrine Pollution, E). Noise Pollution, F). The	B). V rmal P	Vater Pollution, (Pollution, G). Nuc	C). Soil clear Hazard
Unit V	Field Work 1. Visit to a Local Mountain 2. Visit to a Local 3.Study of Comm 4 Study of Simple	Area to Document Environmental Assets– Polluted Site- Urban/Rural/Industrial/Agric non Plants, Insects, Birds	River/	Forest/ Grasslan l	(6) Hours ad/ Hill/
I	- T.Study Of Shinn	e Ecosystem-Pond, River, Hill Slopes, etc.			

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 Townsend, C.R., Begon, M., & Harper, J.L. (2008). Essentials of Ecology (3rd edition). Oxford: Blackwell Publishing.

3. Trivedi, R. K. (2010). Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards. Vol. I and II, Enviro Media.

Wanger, K.D. (1998). Environmental Management. Saunders Co. Philadelphia, USA

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Course Outcomes

Course O	acomes	eLevel
CO-1	Renewable and non-renewable resources.	K 2
CO-2	Species and Ecosystem Diversity, Bio-Geographical Classification of India, Value of Biodiversity	K 2
CO-3	Causes, Effects and Control Measures of environmental pollution	K 4
CO-4	Field work knowledge of studying eco system pond, river, hill andcommon plants, insects and birds	K 2
CO-5	Documentation of environmental assets	K 4

Mapping Course Outcome VS Programme Outcomes

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
C01	2	1	2	2	2	2	3	2	2	2	2	2
CO2	2	2	1	2	1	2	2	2	2	2	2	3
CO3	2	2	2	2	2	1	2	2	1	1	2	2
CO4	2	2	1	1	2	2	2	2	2	2	2	2
CO5	2	2	1	2	2	1	2	2	1	1	2	2
W.AV	2	1.8	1.4	1.8	1.8	1.6	2.2	2	1.8	1.6	2	2.2

S–Strong(3), M-Medium (2), L-Low(1)

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СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	3
CO2	2	1	1	2	2
CO3	2	1	2	1	2
CO4	1	2	1	2	1
CO5	2	2	2	2	2
W.AV	2	1.6	1.6	1.8	2

			III-Semester						
Τ/	OL	Course	FRENCH	Т	Credits:3	Hours:3			
		Code: 1831F							
Course 1. Identify and appreciate the construction and the structure of different tenses and sentences Objectives 2. Translate simple texts 3. Draft and summarize literary texts 4. Apply the grammatical rules to express one's ideas using different tenses 5. Analyze literary texts with respect to their structure and composition									
Unit	Les feui	illes mortesLe Vrai				(9) Hours			
Ι	Père Les pro	noms relatifs							
Unit	Nos étu	des				(9) Hours			
Π	Demain dès l'aube								
	Le passé composé								
Unit	Par une journée d'été (9)Hours								
III	L'imparfait								
T T •4	Le Plus	-que-partait	aiomotif						
Unit IV	Le cond	litionnel	bjoneth			(9) Hours			
Unit	L'hiver	Le libraire				(9) Hours			
V	La com	paraison							
					To	otal : 45 Hours			
Referen K. Mada Publishe	n ces anagobala er & Distr	ne & N.C. Mirakan ibutors Pvt Ltd,201	nal, <i>Le français par les textes</i> , C 7	hennai	i, Samhita Publi	cations – Goyal			
Cours	e Outco	mes				Knowledge Level			
CO-1	Underst gramma	and the structure ar aticaltenses	nd use of the different			K2			
CO-2	Transla	te texts and examin	e them			K2 and K4			
CO-3	Draft su	ummaries of literary	vtexts	-		K2 and K6			
CO-4	Identify	the requirement an	d employ the different grammat	ical ter	nses	К3			
CO-5	Analyze	e and critically asse	ss the literary texts			K4 and K5			

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	S	М	М	М	М	М	L	S	S	S	S	М
CO 2	М	М	S	S	S	S	М	М	М	S	М	S
CO 3	S	М	S	М	М	М	М	S	S	М	S	М
CO 4	S	S	М	М	S	М	L	S	S	S	S	М
CO 5	М	М	S	S	S	М	М	S	S	М	S	М
<u> </u>	S-Strong M-Medium L-Low											

III-Semester											
	Е	Course	GENERAL	Т	Credits:3	Hours:3					
		Code: 11832	ENGLISH-III								
	Course	To make them a	active listeners								
	Objectives	To enhance the	interpersonal relationsh	nip sk	ills						
		To embolden th	em to cope with stress								
		To master gram	mar skills								
		To help them to	use English effectively	/ 1n a	business enviro	onment					
	Unit I	ACTIVE LISTENIN	G								
		(9) Hours									
		Short Story									
		In a Grove – Akutagaw	a Ryunosuke Translate	d froi	n Japanese By	TakashiKojima					
		The Gift of the Ma	gi – O' Henry			J.					
		Prose									
		Listening – Robin	Sharma								
		Nobel Prize Accepta	nce Speech – Wangari	Maat	hai						
	Unit II	INTERPERSONAL	L RELATIONSHIPS								
		(9) Hours									
	Prose										
	Telephone Conversation – Wole Soyinka										
		Of Friendship – Francis	s Bacon								
		Song on (Motivatio	nal/ Narrative)								
		Still I Rise – Mava A	Angelou								
	Unit III	COPING WITH ST	TRESS								
		(9) Hours									
		Poem									
		Leisure – W.H. Davies									
		Anxiety Monster –	RhonaMcFerran								
		Readers Theatre									
		The Forty Fortunes	s: A Tale of Iran								
	IInit IV	Grammar	in mancon Dattaill								
		(9) Hours									
		Phrasal Verbs & Idioms	8								
		Modals and Auxiliaries									
		Verb Phrases – Ger	rund, Participle, Infiniti	ve							
	Unit V	Composition/Writi	ing Skills								
		Official Correspondence	e – Leave Letter , Lette	er of A	pplication,						
		Permission Letter									
	Drafting Invitations										
-		Brochures for Prog	grammes and Events								
Re	eferences				1 2 0 2 2						
	Wangari Maatha	1 – Nobel Lecture. Nobel	Prize Outreach AB 202	23. Ju	1 2023.						
2	Mahesh Dattani,	Where there is a Will. P	enguin, 2013.	·	D						
3	Martin Hewings	, Advanced English Gran	nmar, Cambridge Univ	ersity	Press, 2000						
4	Essential Englis	Essential English Grammar by Raymond Murphy									

Course Outcom	Knowledge Level	
CO-1	Listen actively	PO1, PO7
CO-2	Develop interpersonal relationship skills	PO1, PO2, PO10
CO-3	Acquire self-confidence to cope with stress	PO4, PO6, PO9
CO-4	Master grammar skills	PO4, PO5, PO6
CO-5	Carry out business communication effectively	PO3, PO8

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
C01	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
C05	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0

		111-Semester			I				
Core	Course Code: 11833	BASICAERODYNAMICS	T	Credits:3	Hours:4				
Course Objectives	 To familiarize the basic concepts and characteristics associate the atmosphere and the concepts of the application of the International Standard Atmosphere (ISA) to aerodynamics. To provide technical knowledge on airflow around a body it relationship between lift, weight, thrust and drag, methods o augmentation. To educate and provide an understanding in the flight controls flight conditions, operation and effect of controls. To learn and apply their knowledge on various design features provide aircraft stability about that axis. To educate the students to understand compressible subsonic a transonic flows and supersonic flows 								
Unit I	Physics of the A The characteris - Pressure – te humidity - tem Atmosphere (19	Physics of the Atmosphere(9) HoursThe characteristics associated with the atmosphere - such as Composition- Pressure – temperature - distribution effects of altitude - and effects ofhumidity - temperature and - Pressure on density - International StandardAtmosphere (ISA) - its application to aerodynamics							
Unit II	Aerodynamics(9) HoursAirflow around a body - Boundary layer - laminar and turbulent flow - freestream flow - relative airflow - up wash and Downwash - vortices -stagnation - The terms: camber - chord - mean aerodynamic chord - profile(parasite) drag - induced drag - center of pressure - angle of attack - wash irand wash out - fineness ratio - wing shape and aspect ratio - Thrust - Weight- Aerodynamic Resultant - Generation of Lift and Drag - Lift coefficientDrag coefficient - stall - High lift devices - slots - slats - flaps -								
Unit III	Theory of Flig Aero plane Ae Operation and elevators – stab – turning - glidi	ht erodynamics - Flight Control effect of roll control - ailerons illizers - yaw control – rudders ng.	s - I s and s – fin	Level fligh spoilers - j n – maneuv	(9) Hour t conditions pitch contro ers – climbin				
Unit IV	Flight Stability Static stability stability - spiral	 and Dynamics Dynamic stability – Longitud stability and Dutch roll stability 	linal ty.	- lateral - a	(9) Hour and direction				
Unit V	High Speed Th The speed of so the speed of so waves - shock subsonic - tran	neory ound - compressibility and in bund – shock waves and their drag - variation of speed of so asonic - supersonic speeds - b	comp obser ound - ehavi	pressibility rvation - et – critical N ior of aerop	(9) Hours - approachi fects of sho fach number plane at sho				

2. Aircraft Basic science by Michael J. Kroes; Michael S. Nolan; Publisher: The McGraw-

Hill Companies, Inc. Edition: Eighth Edition - 2013

References

- 1. Mechanics of Flight by A C Kermode, Pearson 11 edition
- 2. Aerodynamics By L J Clancy; Publisher: Shroff; Date 1 January 2006
- 3. Airframe & Power plant Mechanics (General Handbook EA-AC 65-15A) by Federal Aviation Administration, 2019

Course Outco	mes	Knowledge Level
CO-1	To have knowledge on the atmosphere and the concepts of the International Standard Atmosphere (ISA) to aerodynamics	K 1
CO-2	To understand and give a detailed description about the airflow around the body and aerofoil.	K 2
CO-3	The applicant will be able to apply his knowledge on generation of Lift, Drag Relationship between lift, weight, thrust and drag.	К 3
CO-4	The applicant will be able to analyze the equilibrium position in level flight, operation and effect of roll, pitch and yaw.	K 4
CO-5	The applicant will be able to evaluate the flight stability and dynamics; the speed of sound, compressibility, incompressibility and behavior of aeroplane at shock stalls	K 5

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	3	1	1	1	1	2	1	1	1	1	1	1
CO2	2	3	2	2	1	1	1	2	1	1	2	2
CO3	2	2	3	1	1	1	2	2	2	1	2	1
CO4	1	2	1	1	1	2	1	2	1	1	1	1
CO5	2	1	2	3	2	3	2	2	3	3	2	3
W.AV	2	1.8	1.8	1.6	1.2	1.8	1.4	1.8	1.6	1.4	1.6	1.6

S-Strong (3), M-Mediu2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3
CO1	3	2	2
CO2	2	2	2
CO3	1	2	2
CO4	1	1	2
CO5	2	3	3
W.AV	1.8	2	2.2

S-Strong (3), M-Mediu2, L-Low (1)

			III-Semester			
Core	;	Course Code: 11834	AIRCRAFTCONSTRUCTION&SY STEMS	Т	Credits: 3	Hours: 3
Course		1. To stud	dy the aircraft basic structure			-
Objective	es	2. To und	lerstand the different flight controls			
Ū		3. Acquir	e the knowledge of Landing gear system f	for s	afe aircraft	operation
		4. To imr	part knowledge of the hydraulic system co	mpc	onents	I
		5. To imr	part knowledge of the Aircraft fuel system	con	ponents	
Unit I	FR	AME WOR	KOFAIRCRAFT		- <u>T</u>	(9) Hours
Unit I	Bas	ic aircraft st	tructure station number Zoning nomenclatur	e an	d definition	forces
		ng on aircra	fail structure construction of different type (on It	ustion and l	Wings.
		h constructi	on	JIISU		lioney
	FI				((
Unit II			IKOLS		()	<i>y</i>) 11001 S
	Con and pow	Istructional f layout. Bal ver assisted o	features of primary and secondary controls, p ancing of control surfaces, inspection and p controls and fly by wire system. Rigging of	purp nain fligh	ose, mode o tenance. Des it control and	f operatio scription d symmetr
	che	CKS				
Unit III		CKS	AR SYSTEM		(9)) Hours
Unit III		cks NDING GE	AR SYSTEM	rino	(9)) Hours
Unit III	Cheo LA Typ syst	NDING GE e and parts o em, skid cor	AR SYSTEM of landing gear description of nose wheel stee ntrols wheel assembly, brake system and their	ering oper	(9) system, retr ation.) Hours
Unit III Unit IV	Chec LA Typ syst HY	NDING GE e and parts o em, skid cor DRAULIC	AR SYSTEM of landing gear description of nose wheel stee ntrols wheel assembly, brake system and their SYSTEM	ering oper	(9) system, retr ation. (9)) Hours raction Hours
Unit III Unit IV	Check Check Typ syst HY Prin fluid hyd Filtd Act class	NDING GE e and parts of em, skid cor DRAULIC aciple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications &	AR SYSTEM of landing gear description of nose wheel stee htrols wheel assembly, brake system and their SYSTEM scal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va b Fluid lines	ges, acter ajor lve.	(9) system, retr ation. (9) Properties o istics. Conta components egulator, Sel Purpose of s) Hours raction Hours f Hydraul mination –Reservoi ector valv seals and i
Unit III Unit IV Unit V	CheckLAITypsystHYPrirfluidhydFilteActclassAIF	NDING GE not and parts of em, skid cor DRAULIC notiple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications & RCRAFT FU	AR SYSTEM of landing gear description of nose wheel stee htrols wheel assembly, brake system and their SYSTEM scal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va & Fluid lines	ges, acter ajor lve.	(9) a system, retr ration. (9) Properties o istics. Conta components egulator, Sel Purpose of s (9)) Hours action Hours f Hydraul mination of -Reservois ector valv seals and i Hours
Unit III Unit IV Unit V	Class AIF Class cl	NDING GE NDING GE e and parts of em, skid cor DRAULIC aciple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications & RCRAFT FU ssification of ssification of ssificatio	AR SYSTEM of landing gear description of nose wheel stee atrols wheel assembly, brake system and their SYSTEM scal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va & Fluid lines UEL SYSTEM f fuel, Properties and Characteristics of aviat r installation. Gravity feed and Pressure feed a aircraft fuel system. Components and the d jettisoning system. Replenishment of fuel . Defueling operation, Fuel contamination and	ges, acter ajor lve. tion 1 sys eir fu tank l its o	(9) system, retr ation. (9) Properties o istics. Conta components egulator, Sel Purpose of s (9) fuels. Aircra item. Twin inction, Fue s- gravity fue checks.) Hours action Hours f Hydraul mination –Reservo ector valv seals and i Hours aft fuel engine l cross ueling,
Unit III Unit IV Unit V Unit V TEXT BOO 1. Airfra 2. Gener Reference I	Chee LA Typ syst HY Prin fluid hyd Filt Act clas Clas tank and feec pres DK: me Ha al Han Book:	NDING GE NDING GE e and parts of em, skid cor DRAULIC aciple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications & RCRAFT FU ssification of as and their multi engin system and ssure fueling and Book (AC of the constant of the constant state of the constant system and the constant state of the constant system and system and sys	AR SYSTEM of landing gear description of nose wheel stee htrols wheel assembly, brake system and their SYSTEM acal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va to Fluid lines UEL SYSTEM f fuel, Properties and Characteristics of avial r installation. Gravity feed and Pressure feed he aircraft fuel system. Components and the d jettisoning system. Replenishment of fuel . Defueling operation, Fuel contamination and the formation of the system of fuel (Chapter 1,2, &3) (55-9 A) – 1994 (Chapter 3)	ering oper ges, acter ajor Ire ro lve. tion 1 sys cir fi tank 1 its o	(9) system, retr ration. (9) Properties o istics. Conta components egulator, Sel Purpose of s (9) fuels. Aircra stem. Twin inction, Fue s- gravity fue checks.) Hours action Hours f Hydraul mination –Reservo ector valv seals and i Hours aft fuel engine l cross ueling,
Unit III Unit IV Unit V Unit V TEXT BOO 1. Airfra 2. Gener Reference I	Check LA Typ syst HY Prin fluid hyd Filtd Act clas Clas tank and feec pres DK: me Ha al Han Book:	NDING GE NDING GE e and parts of em, skid cor DRAULIC aciple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications & RCRAFT FU ssification of as and their multi engin system and ssure fueling and Book (AC of the Mainteners	AR SYSTEM of landing gear description of nose wheel stee atrols wheel assembly, brake system and their SYSTEM scal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va to Fluid lines UEL SYSTEM f fuel, Properties and Characteristics of aviat r installation. Gravity feed and Pressure feed are aircraft fuel system. Components and the d jettisoning system. Replenishment of fuel . Defueling operation, Fuel contamination and (65-15 A) – 1994 (Chapter 1,2, &3) (65-9 A) – 1994 (Chapter 3)	ering oper ges, acter ajor lve. tion 1 sys eir fu tank l its o	(9) system, retr ation. (9) Properties o istics. Conta components egulator, Sel Purpose of s (9) fuels. Aircra stem. Twin unction, Fue s- gravity fu checks.) Hours action Hours f Hydraul mination –Reservo ector valv seals and i Hours aft fuel engine l cross ueling,
Unit III Unit IV Unit IV Unit V TEXT BOO 1. Airfra 2. Gener Reference I 1. 4	Class AIF Class Cl	NDING GE NDING GE e and parts of em, skid cor DRAULIC aciple of Pas d. Types of raulic fluids, er, Accumul uator, Line of sifications & RCRAFT FU ssification of as and their multi engin d system and ssure fueling and Book (AC of the Maintenance tterton Aircret	AR SYSTEM of landing gear description of nose wheel stee introls wheel assembly, brake system and their SYSTEM scal's law, Aircraft hydraulic system advanta Hydraulic fluid used in aircraft and its chara , System layout, purpose and operation of Ma ator, Pressure regulator, Check Valve, Pressu disconnect valve, restrictors and sequence va to Fluid lines UEL SYSTEM f fuel, Properties and Characteristics of aviat r installation. Gravity feed and Pressure feed and aircraft fuel system. Components and the d jettisoning system. Replenishment of fuel . Defueling operation, Fuel contamination and the fost-15 A) – 1994 (Chapter 1,2, &3) 65-9 A) – 1994 (Chapter 3) e and Repair by Kores – 1993 aft Materials and Processes. Himalayan Books, New	ering oper ges, acter ajor lve. tion t sys eir fi tank lits o	(9) system, retr ation. (9) Properties o istics. Conta components egulator, Sel Purpose of s (9) fuels. Aircra tem. Twin inction, Fue s- gravity fu checks.) Hours raction Hours f Hydraul mination –Reservo ector valv seals and i Hours aft fuel engine l cross heling,

Course	Course Outcomes				
CO-1	CO-1 To understand the basic aircraft structure				
CO-2	Keep abreast knowledge on various flight control system and its recent advancements	K1			
СО-3	CO-3 Demonstrate the fundamental understanding of the Landing gear systems.				
CO-4	Demonstrate the ability to design a various system using hydraulic components	K2			
CO-5	To understand the Aircraft fuel system and its components.	K2			

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	1	2	2	2	1	3	2	3	2	2	2
CO2	2	2	1	3	1	2	2	2	2	2	3	3
CO3	2	2	2	2	2	1	2	1	2	2	2	2
CO4	1	1	1	1	1	2	1	2	2	2	2	2
CO5	2	3	2	2	2	1	2	2	2	3	3	2
W.AV	1.8	1.8	1.6	2	1.6	1.4	2	1.8	2.2	2.2	2.2	2.2

S-Strong (3), M-Mediu2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2
CO2	2	2	2	2	2
CO3	3	1	2	1	1
CO4	2	2	3	2	2
CO5	2	2	2	1	2
W.AV	2.4	1.8	2.4	2	1.8

S-Strong (3), M-Mediu2, L-Low (1)

		III-Semester		
Core	Course Code: 11835	AERO DYNAMICS AND AIRCRAFT CONSTRUCTION LAB– PRACTICAL	redits	Hours: 6
Course Objectives	 The o throug This I obser Stude time a 	bjective of this lab is to teach students, the importance of Aero gh involvement in experiments. lab helps to have knowledge of the world due to constant inter- vations and hypothesis, experiment and theory in this subject. ents will gain knowledge in various areas of Aerodynamics so applications in Aeronautical science.	odynam play be as to ha	tween twe real
1. Study of A	vircraft Symme	etry Check and its relevance to Aircraft flying Characteristics.		
2. Study of H	Ioney Comb st	tructure and its characteristics.		
3. Study of p	ower assisted	controls and their advantages over mechanically operated controls.		
4. Study on A	Aircraft Wheel	s		
5. Study on I	Landing Gear r	retraction Systems.		
6. Familiariz	ation of variou	us Hydraulic Components		
7. Calculatio	n of Aircraft e	mpty weight C.G during aircraft weighment and preparation of weig	ght schee	dule.
8. Study of v	vind tunnel and	d its components		
9. Pressure d	istribution ove	er an aerofoil.		
10. Lift and I	Drag Measurer	ment over a sphere and Hemisphere.		
			Total	: 30 Hou
Course Outc	omes		Kn Le	owledge vel
	ate the wind	tunnel for various motor speeds		K1 K3
 Calibi Analy Calcu cylind 	ze the results late and plot	s of smoke and tuft flow visualization techniques the pressure distribution around different airfoils and circular ot-static probes		KJ
 Calibi Analy Calcu cylind Estim method 	ze the results late and plot lers using pito ate the drag c d	s of smoke and tuff flow visualization techniques the pressure distribution around different airfoils and circular ot-static probes co-efficient for 2-D objects using pitot-static wake survey		K5 K3

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	2	2	2	2	2	1	2	2	2	2	2
CO2	1	2	2	2	1	1	2	1	3	3	2	2
CO3	2	1	2	2	2	1	2	2	2	2	1	2
CO4	2	2	2	1	2	2	1	1	3	2	2	2
CO5	2	2	2	2	1	2	2	2	2	2	2	2
W.AV	1.8	1.8	2	1.8	1.6	1.6	1.6	1.6	2.4	2.2	1.8	2

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	2
CO2	2	2	2	2	2
CO3	2	1	2	2	1
CO4	2	2	2	2	2
CO5	2	1	2	2	1
W.AV	2	1.6	2.2	1.8	1.6

S–Strong(3),M-Medium2,L-Low(1)

		III-Semester									
Allied	Course Code: 11836	FLUID MECHANICS & HYDRAULIC MACHINES	-	Т	Credits: 3	Hours: 3					
Course Objecti ves	1. Tou 2. Toi 3. Tou 4. Toe 5. Tou Pneu	understand the basic principles of fluid identify various types of flows understand Euler's equation of motion evaluate the Impact of jet on plate and I understand the functioning of Fluid Sys umatic circuits.	mech and f Hydra	hanics flow through pipes aulic Machines and Hydraulic,							
Unit I	INTRODU	CTION			()	9) Hours					
	Properties o pressure hea pressure, Ma	f fluids-Fluid characteristics-Terms and ad- gauge and absolute pressure - Pascal anometer, Mechanical gauges -Numerical p	defini 's Lav proble	tion w, N ms.	–pressure Measuremen	at a point at of fluid					
Unit II	STATICS C Forces actin center of p submerged a KINEMAT Types of flu equation –N function –Ec velocity pote	DF FLUIDS g on a submerged body-Forces on a curv ressure – Buoyancy, Metacenter, Metac and floating body-Numerical problems. ICS OF FLOW uids flow- Terms and definition –Rate of umerical problems – stream lines stream quipotential line Flownet Relationship be ential function –Numerical problems.	ved su centric of flow functi	irfac c he v or ion v	(ee - Total pr eight, Stabi e Discharge velocity pot eam functio	9) Hours ressure and lity of the continuity ential n and					
Unit III	DYNAMIC Equation o Assumptions equation, V equation and FLOW THI Losses in f parallel pipe nozzles, Wat	S OF FLUID FLOW of motion –Euler's equation from E is in deriving the equations allied proble enturimeter and Orifice meter, Pitot tub Allied problems. ROUGH PIPES: low, Flow through siphon, Pipes, Comp es, branched pipes, Power transmission ter hammers and related problems.	Bernou ems, A be alli pound thro	illi's App ied I pij ugh	(s equation lication of problems, problems, problems, problems, pipes, Flo	9) Hours –Various Bernoulli's Momentum lent pipes, w through					
Unit IV	IMPACT O Force exerte propulsion o HYDRAUL Turbines, H Reciprocatin	OF JET AND JET PROPULSION: ed by a jet, jet on hinged plate, moving of tank propulsion of Aircraft. IC MACHINES ydroelectric power plant, Classification of ng pumps	plate, of turb	jet j	propulsion. s. Centrifug	(9) Hours Jet gal pumps,					
Unit V	FLUID SYS Hydraulic I Hydraulic lif HYDRAUL Hydraulic, I operation tyj circuits.	STEMS Press, Hydraulic accumulator, Hydrauli ft, Hydraulic crane, Hydraulic coupling, To ICS & PNEUMATICS pneumatic circuit components, Hydraulio pes of valves and controls. Methods of jo	ic intorque of and of and of the second seco	tensi conv pn of hy	ifier, Hydra verter, Gear eumatic joi vdraulic and	(9) Hours aulic Ram, pump. nts, valves pneumatic					

Text book

1. Hydraulic Machines by Banga & Sharma, Khanna Publishers.

References

- 1. A text book of fluid mechanics and Hydraulic Machines –R.K. Bansal
- 2. Hydraulics, fluid mechanics and Hydraulic machinery MODI and SETH.
- 3. Fluid Mechanics and Hydraulic Machines by Rajput.
- 4. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar, Kotaria & Sons.
- 5. Fluid Mechanics and Machinery by D. Rama Durgaiah, New Age International.

Course Out	tcomes	Knowledg e Level
CO-1	Understand the fluid mechanics fundamentals,	K2
CO-2	Analyze the types of flow and Forces acting on a submerged body	K4
CO-3	Apply the Bernoulli equation to solve problems and Losses in pipes	K3
CO-4	Acquire knowledge of the Impact of jet and Hydraulic Machines	K1
CO-5	Understand the Function of Fluid Systems and Hydraulic, Pneumatic circuits	K2

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	3	1	1	1	1	2	1	1	1	1	1	1
CO2	2	3	2	2	1	1	1	2	1	1	2	2
CO3	2	2	3	1	1	1	2	2	2	1	2	1
CO4	1	2	1	1	1	2	1	2	1	1	1	1
CO5	2	1	2	3	2	3	2	2	3	3	2	3
W.AV	2	1.8	1.8	1.6	1.2	1.8	1.4	1.8	1.6	1.4	1.6	1.6

S–Strong(3),M-Medium 2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	2	2	3
CO3	1	2	2	2	2
CO4	1	1	2	2	2
CO5	2	3	3	2	2
W.AV	1.8	2	2.2	1.8	2.2

S-Strong(3),M-Medium 2,L-Low(1)

		III-Semester			
Allied	Course	NDT LAB	Р	Credits:	2 Hours:4
	Code: 11837				
Course	To learn	n more about the various NDT metl	nods		
Objectives	Explana	ation of the relevant techniques used	d for d	etecting dei	ects in
	Compon To imps	ents art knowledge on quantification and	d calibi	ration of eq	uinment
	To study	v about the process of Surface Test	ing Me	thods (LP)	C & MPT)
	To learn	about the Sub Surface Testing me	thods (Eddy curre	ent & UT)
1.	Inspection of we	lds using solvent removable visible	e dye p	enetrant.	
2.	Inspection of we	elds using solvent removable fluore	escent o	dye penetra	nt.
3. 4	Familiarization	and calibration of eddy current equ	addy	t. Turrent metl	nod
4. 5	Inspection of we	elds by Eddy current Testing	eutry c		100.
<i>5</i> . 6.	Inspection of we	elds by Magnetic Particle Testing -	Dry m	ethod.	
7.	Inspection of we	elds by Magnetic Particle Testing-	Wet m	ethod	
8.	Familiarization	of ultrasonic flaw detectors			
9.	Familiarization	and Calibration of reference blocks	s using	ultrasonic	flaw
10	detector.	much by normal and angle beam pr	ober		
10.	Inspection of we	elds in plates by ultrasonic angle be	eam tes	ting	
12.	Inspection of bu	itt welds in pipes by ultrasonic angl	le bean	n testing.	
				Tote	1 · 30 Hou
Course Outer	mag				Knowladaa
Course Outco	omes				Level
To determine	the defect, use dif	ferent NDT techniques			K5
For vario	ous defects, select	the appropriate NDT techniques			K4
The abilit	y to use scientific	and technological knowledge in the	ne field	l of	
Non-dest	ructive Testing	-			K3
Assess th	e instruments and	interpretation of techniques			V
Recogniti	on that it is nec	cessary to engage in lifelong lean	rning,	thinking	K0
processes	and development	t.	-	-	K2

CO	PO 1	PO2	PO 3	PO4	PO 5	PO6	PO7	PO8	PO 9	PO10	P11	P12
CO1	2	2	2	2	2	2	2	2	2	2	2	2
CO2	2	2	3	2	2	2	1	1	2	2	2	2
CO3	1	1	2	2	2	1	2	2	2	1	3	2
CO4	2	2	2	1	2	2	1	2	2	2	2	3
CO5	1	2	3	2	2	2	2	2	3	2	2	2
W.AV	1.6	1.8	2.4	1.8	2	1.8	1.6	1.8	2.2	1.8	2.2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2
CO2	2	2	2	2	2
CO3	3	3	2	2	2
CO4	2	2	3	3	2
CO5	2	2	3	2	2
W.AV	2.2	3.1	2.4	2.4	1.8

S-Strong(3), M-Medium2, L-Low(1)

SEC III				
	Course Code: 11838	ENTREPRENEURSHIP	T Credits:2	Hours:2
Course Objectives	1. To en to lea2. To id oppor3. To a oppor4. To pr entrep	able the students to understand t rn the professional behaviour ab lentify significant changes and tunities? analyse the institutional arra- tunities. rovide conceptual exposure on o preneurship	the concept of Ent out Entrepreneurs trends which cre angement for po converting ideas t	trepreneurship and hip. eate new business tential business to an women
Unit I	UNITI Entrepreneur–Mear Entrepreneur – Ent	ENTREPRENEURSHIP ning–Importance–Definition–Ty repreneurship as a career.	pes–Functions–Q	ualitiesofan
Unit II	UNIII Business Promotio land, building, wa infrastructural facil	BUSINESS on – Product selection – Form o ater and power, raw material, lities– Licensing, registration an	of ownership – Pla machinery, pow d local bye laws.	ant location – er and other
Unit III	UNITIII Institutional arrang NSIC, SISI – Insti banks – Incentives	BUSINESSPLAN PREPARA gements for entrepreneurship tutional finance to entrepreneur to small scale industries.	ATION development – I rs – TIIC, SIDBI,	DIC, SIDCO, , Commercial
Unit IV	UNITIV Project report – Me per requirements o – Technical feasib even analysis.	PROJECT eaning and importance – Project f financial institutions) – Projec ility – Financial feasibility and	report – Format o t appraisal – Marl economic feasib	of a report (as cet feasibility ility – Break
Unit V	UNITV Entrepreneurship Sickness in small	ENTREPRENEURSHIPDEV development in India – Wome scale industries and their remed	ELOPMENT PRO en entrepreneursh ial measures	GRAMME ip in India –

Text book

- 1. Ramachandran, Entrepreneurship Development, Mc Graw Hill
- 2. Katz, Entrepreneurship Small Business, Mc Graw Hill
- 3. Byrd Megginson, Small Business Management An Entrepreneur's Guidebook 7th ed,McGrawHill

References

- 1. Entrepreneurship and Management of Small business Centre for Entrepreneurship Development, Madurai
- 2. Joseph Paul, N. Ajit kumar and T.Mampilly. Entrepreneurship development. Himalayan Publishing House.
- 3. Khan, M.A. Entrepreneurship Development Programmes in India. Kanishka Publishing House, Delhi
- 4. Saravanavel, P. (1997). Entrepreneurial Development. Ess Pee kay Publishing House, Chennai.
- 5. Vasant Desai. Dynamics of Entrepreneur Development and Management. Himalayan Publishing House.

	Course Outcomes	Knowledge Level
CO-1	To understand the significance of entrepreneurship and entrepreneur qualities	K 2
CO-2	To know about the developing ideas and techniques of business.	K 2
CO-3	To understand about the procedures of startup.	K 2
CO-4	To identify the institutional support provided to entrepreneurs.	К 3
CO-5	To analyse the women entrepreneurship development	K 4

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	1	2	2	2	1	3	2	3	2	2	2
CO2	2	2	1	3	1	2	2	2	2	2	3	3
CO3	2	2	2	2	2	1	2	1	2	2	2	2
CO4	1	1	1	1	1	2	1	2	2	2	2	2
CO5	2	3	2	2	2	1	2	2	2	3	3	2
W.AV	1.8	1.8	1.6	2	1.6	1.4	2	1.8	2.2	2.2	2.2	2.2

S-Strong(3),M-Medium 2,L-Low(1)

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	2	2	2	2	2
CO3	3	1	2	1	2
CO4	2	2	3	2	3
CO5	2	2	2	2	2
W.AV	2.4	1.8	2.4	1.8	2.4

Mapping Course Outcome VS Programme Specific Outcomes

S-Strong(3),M-Medium 2,L-Low(1)

	இரண்டாம் ஆண்டு - மூன்றாம் பருவம்			
பாடக்குறியீட்டு எண்:	பள்ளியில் தமிழ் பயிலாத மாணாக்கர்களுக்கான அடிப்படைத் தமிழ்ப் பாடங்கள்	T/P	C	H/W
	தமிழ் மொழியின் அடிப்படைகள்	Р	2	2
நோக்கம் :	 இலக்கணம் அறிந்து கொள்ள வாய்ப்பினை ஏற்படுத்துதல். தமிழ் மொழியில் பிழையின்றி எழுத அறிந்துகொள்ள வாய்ப்பினை 	ஏற்படு	த்துத	<u>ல்</u> .
அலகு -1	எழுத்துக்கள் – உயிர் எழுத்துக்கள் – மெய்யெழுத்துக்கள் – உயிர்மெய்யெழு	ந்துக்கள்		
அலகு -2	சொற்களின் வகை அறிதல் – பெயர்ச்சொல் – வினைச்சொல் – இடைச்சொ	ii – enfla	ச்சொ	rii
அலகு-3	எழுத்துக்களின் வேறுபாடு அறிதல்: ணகர, னகர எழுத்துக்கள் சொற்களில் பயின்று வருதல் லகர, ழகர, ளகர வேறுபாடு அறிதல் ரகர, றகர வேறுபாடு அறிதல்.			
அலகு -4	எழுத்துக்களின் பிறப்பு – உச்சரிப்புப் பயிற்சி அளித்தல் – பிழையின்றிப் ப அளித்தல்.	டிப்பத <mark>ற்</mark>	குப்	ப <mark>யி</mark> ற்சி
அலகு -5	பிறமொழிச் சொற்களைக் கண்டறிதல் – தமிழ் மாதங்கள் – கிழமைகள் – எ உறவுப் பெயர்கள் ஆகியவற்றை அறிதல்	ண்கள் –	சுலை	ณ <mark>க</mark> ள் –
பயன்கள்:	 அடிப்படை இலக்கணச் சூழலியல் கற்றால் தமிழ் மொழி பிறமொழிகளோடு ஒப்பிடும் ஆற்றல் பெறுவர். அழகியல் உணர்ச்சிகளைப் புரிந்து கொள்ள ஏதுவாக இலக் என்பதை உணர்ந்து தனித்துவம் வாய்ந்தவர்களாக தன்னம்பிக்கை மாறலாம். 	இலக் கணம் கப் பெர்	கணர் இரு ற்றவர்	ங்கலை க்கிறது ர்களாக

	@rein_	ாம் ஆண்டு -	. மூன்ற	ாம் பருவம்			
பாடக்குறியீட்டு) என்: பள்ளியில் கல்த மானாச்) மேல்நிலை லூரியில் பகு கர்களுக்கால	ப் படிப்பு தி 1– இல் எ சிறப்பு	வரை தமிழ் பயின்று 9 தமிழ் பயிலாத த் தமிழ்ப் பாடங்கள்	T/P	С	H/W
		இக்கா	ல இலக்	கியம்	Р	2	2
நோக்கம்	≽ கவிதை, சிறுகதை	, புதினம், உ	ரைநடை	ஆகிய படைப்பியல் வன	ககளைப்	பற்றி	ш
	பரந்துபட்ட பு <mark>ல</mark> னை	மயைப் பெரு	நக்குதல்.				
	> இக்காலக் கமிம்	இலக்கியங்	களின்	டள்ளடக்கம். வெளியீட்(ட கெறி	പണ	டப்பி
	கொள்கை ஆகிய	 பற்றை அறிய	பச் செய்த	5ல்		n siven	
ക്രങ്ങ	கவிதை இலக்கியம்						
<u> </u> அல கு2	– 1. பாரதியார் – 'சுதந்திரப் பள்ளு'	சுதந்த என்ற பாடல்	ரிரப் பாட 1 வரை உ	ல்கள்: 'சுதந்திரப் பெருண .ன்ன 06 பாடல்கள்.	ம்' என்ற	பாடச்	0 முத
	2. பாரதிதாசன் – த 'தமிழ்க்கனவு' என்ற பாடல்	மிழ் (முதல் ெ வரை உள்ள	தாகுதி) எ 10 பா	்தமிழின் இனிமை' என் _ல்கள்.	ற பாடல்	முதல்	
	3. நாமக்கல் கவிஞர் − 'இணையிலர் காந்தி' என்ற	காந்தி) பாடல்வரை	மலர்: ர உள்ள	'காந்தி அஞ்சலி' என்ற 6 பாடல்கள்.	பாடல் மு	தல்	
	4. கவிமணி – பாடல் முதல் 'அருமை உட	உடல் .லின் நலமெ) நலம் (ல்லாம்' எ	'பணல் 'உடலின் உறுதி : ான்ற பாடல் வரை உள்ள	டடையவ 8 பாடல்	பரே' எ கள்	ன்ற
	5. பட்டுக் கோட்டை கல்ய	ாண சுந்தரம்	- காடு	வ <mark>ளையட்டும் பொண்</mark> சே	887		
	6. கண்ணதாசன்- ம	னிதரைப் பா	ட மாட்(டேன் (கவிதைகள்)			
	7. ஜீவா - ெ	பண் விடுதல	ກຄະ				
	8. அப்துல் ரகுமான் - வீட்(டிக்கொரு மர	ம் (கூடு	துறக்கும் பறவை)			
	9. சண்முகம் சரவணன் - இ	ியல்பாய் நட	_ந்தேறிய	ЭJ			
ച്ചഖക്ര	நாவல் இலக்கியம்						
	இறையன்பு - ஆத்தங்களை	ர ஓரம்,					
ଅର ଜ୍ୟ	சுறுகதை இலக்கியம்						
	1. வ.வே.சு.ஐயர்			குளத்தங்கரை அரசமரப்	D		
	2. அறிஞர் அண்ணா		(95)	செவ்வாழை			
	3. ஜெயகாந்தன்		முன் ந	லெவும் பின் பனியும்			
	4. கி. ராஜநாராயணன்.	10 0 07		கதவு			
	5. தனுஷ்கோடி ராமசாமி.	-	வாழ்ச்	கை நெருப்பூ			
	6. சே. செந்தமிழ்ப்பாவை.		வல்ல	மை தந்துவிட்டாய்			
	7. கரு. முருகன்.		அப்ப	ாவுக்கு காய்ச்சல்			
	8. சு.காந்திதுரை		துணி	க்காரச் சாமி			
	9. கெண்டக்கரை வேட்டி		பாண்	டுரங்கன்			

ചു ல ஞ்	இலக்கணம் முதல் எழுத்துக்கள் – சார்பெழுத்துக்கள் – மொழி முதல் எழுத்துக்கள் – மொழி இறுதி எழுக்துக்கள் – வல்லினம் மிகும் இடங்கள், மிகா இடங்கள்.
நியூ செஞ்சுரி பு	க் வரவுஸ் பிரைவேட் லிமிடெட்.சென்னை - 98.
பயன்கள்	 > இலக்கியங்கள் வாயிலாக மாணவர்கள் பல்வகைப்பட்ட சமூகப் போக்குகளையும் மக்களின் பண்பு நலன்களையும் அறிந்து கொள்ள இயலும். > பல வகையான இலக்கிய வாசிப்பின் வாயிலாக மாணவர்கள் கங்களின் படைப்பாற்றவ்

	Semester								
Course Coo	lii Ie NME	T/P	С	H/W					
11839B	IT Skills for Employment	Т	2	2					
	(Common to all UG programmes)								
Objectives:		1	1						
ັ> Un	derstand the components of computer								
> Un	derstand Internet and its terminology								
≻ Un	derstand basic cyber safety and security norms								
	IntroductiontoComputers-TypesofComputer-Hardware-Motherboard-Processo	r- RA	M—ł	ROM					
	- SMPS - Graphics Card- Storage Devices - Hard Disc - SSD - DVD - CD -	Pen d	rive	•					
	Input/Output Devices – Keyboard – Mouse – Mic- Monitor-Camera-Types of P	rinter	, 508	inner,					
Unit-1	Projector. Basic of Computer network-Modem, Hub, Switch, Bridge, Routers-Wi-Fi –								
	Introduction to Error and Open Source Software (EOSS) Need of Open Sources	۸đu	onto	7 05					
	of	- Auv	ama	ges					
	Open Sources Convrights-Software niracy								
	Basicsof Operating System Difference between various operating systems UserInt	arface	of						
	windows 10 OS - create. Conv. Move and delete files and folders. Use of pen c	lrive -							
	DVD Burning - Windows tools and features-Disk Space management-Disk Clea	n 11 n -	·CD-						
Unit-2	Managing Recycle								
	Bin-Disk defragmentation-Add/remove software' sand programs								
	Basic operating of word processing - Creating opening and closing documents-	Use	of						
	shortcuts-Creating and Editing of Text - Formatting the text - Find and replace -	· Drav	ving						
	Table-Page layout-Header / Footer - Setting page number-Creating simple applied	catio	ns lil	ke -					
	resume - letter writing ,job application ets- Printing document.								
	Basics of Excel worksheet & its importance-creating simple worksheets- formu	las-							
	conditional formatting-sort-filter- chart.								
Unit_3	Introduction to Down Doint we denote advaniance views of anonestation emission								
0111-5	introduction to PowerPoint-understand various views of presentation, animation	18,							
	transitions, neader, looter etc.	• • • •							
	Internet – ISP-word wide web (www)-web browser-search engine- creating& u	sing a	an ei	nail					
	License of CC & PCC. Understanding ID address Pandwidth Storing and ratio	g doc ina fi	ume	nts- rough					
	acogle drive	mg n	ic u	Tough					
	showing files and folders google door language translation, value to tout, tout	to vo							
	-sharing files and folders-google docs - language translation -voice to text, text	10 00	ice						
Unit-4	Optime dependence in the control of the second seco		7:1.						
	Unline educational websites (woocs- nptel - Swayam Central- spoken-tutorial.	org)-V	ideo)					
	Exercises (aservices to gov in) ato Job Dortals Online Dill normant Online for	und to	onof	or					
	usingUPIgateway.	una tr	ansf	-1					
	Internet Safety concerns: (Digital Footprints, Threats, Virus, Worm, Trojan Hor	se, Sr	oam,						
Unit-5	Malware, Adware, Spyware, Snooping)-SecurityMeasures: (Antivirus, Firewall)-C	yber							
	Crime:(Phishing,								

Pharming, Spoofing, Hacking, Cracking, IdentityTheft)CyberSafety(ITAct, CyberLaws).

ReferenceBooks:

VikasB. Agarwal Jyoti P. Mirani, *Computer Fundamentals* -Publisher: Nirali Prakashan (1 August 2019) LambertJoan, Lambert Steve, *Windows 10 Step By Step*, Publisher :PHI Learning PvtLtd

Mike Mc Grath and Michael, Office 2016 In Easy Steps, Price Publisher: BPB Publications

Adesh K. Pandey, Internet Fundamentals

JamesKL, TheInternet: AUsersGuide

Jaago Teens, Cyber Safety For Everyone - BPB Publications (October 12, 2019)

Refer website's and You tube tutorials .

Outcomes> Skillstoworkefficientlywithwindows,word,excel,powerpointpresentation.> Skills to use internet for various purpose with safe and secure.

		IV-Semester							
T/OL	Course	FRENCH	T	Credits:3	Hours:3				
	Code:								
Course	1. Apply of	connecting words (cause	e, but, o	concession, co	ondition, hypothèse,				
Objectives	conséquence) to improve the spoken as well as written communication skills								
	2. Differen unique usage	2. Differentiate the various past tenses in "Les Temps du Passé" and their unique usage							
	3. Summa	3. Summarize the literary texts							
	4. Identify passé" in sample	4. Identify and apply the different grammatical tenses of "les temps du passé" in sample exercises to practice							
	5. Critical narrative technic	ly assess the literary to ques, characters and its o	exts thr cultural	ough an anal significance	ysis of its themes,				
Unit I	Décadi et son grand-pè	reLe Petit chose			(9) Hours				
	Le passé simple								
Unit II	L'égoïste puniEstula				(9) Hours				
	Temps du passé – Emp simple, le plus-que-par	plois (le passé composé, l' fait)	'imparfai	it, le passé					
Unit III	Une Saison dans la vie	d'EmmanuelL'expression	de la cau	ise	(9) Hours				
	L'expression de la cons	séquence							
Unit IV	Une mauvaise nouvelle	L'expression du but			(9) Hours				
	L'expression de la conc	L'expression de la concession							
Unit V	La visite de la grand-m	èreLe Horla			(9) Hours				
L'expression de la condition et de l'hypothèse									
	L L	V L			Total : 45 Hours				
Defenences									
Xelerences 7 Madana gob	alane & N C Miraka	mal Lefrançaisparles	textes	Chennai Sa	mhita				
Publications –	Goval Publisher & D	istributors Pvt Ltd.20	17	Chemian, Dai					

Course Outco	mes	Knowledge Level
CO-1	Demonstrate the usage of connecting words in a giventext	K2
CO-2	Understand and differentiate the various types of past tenses in "Les Temps du Passé"	K2 and K4
CO-3	Summarize the literary texts after a thorough analysis	K2 and K4
CO-4	Identify and apply the different grammatical tenses of <i>'les</i> temps du passé"	K3
CO-5	Analyze and critically assess the literary texts with regard to the themes and literary techniques	K4 and K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PS O 1	PS O 2	PS 0 3	PS 0 4	PS O 5
CO1	М	s	M	L	S	М	L	S	S	М	S	L
CO2	S	М	M	L	М	М	L	S	S	S	М	L
CO3	М	S	S	М	М	М	М	S	М	М	S	L
CO4	S	М	М	L	М	М	L	S	S	S	М	L
CO5	М	S	S	М	М	М	М	S	М	М	S	L

S-Strong

M-Medium L-Low

		IV-Semester			
Ε	Course Code: 11842	GENERAL ENGLISH-IV	T	Credits:3	Hours:3
Course	1. To he	elp learners imbibe goal-settir	ng attit	ude.	•
Objectives	2. To er	nable them to understand the	value o	of integrity	
	3. To he	elp them deal with emotions.			
	4. To te	each the learners to frame sent	ences	using tenses.	
	5. To er	nhance reporting skills.		C	
Unit I	GOAL SETTIN	NG (UNICEF)			(9) Hou
	Life Story From Chinese Cir Why I Write - Geo Short Essay On Personal Mast On the Love o	nderella – Adeline Yen Mal orge Orwell ery – Robin Sharma of Life – William Hazlitt	1		
Unit II	INTEGRITY	(9) Hour			
	Short Story				
	The Taxi Driver – K	K.S. Duggal Jabindranath Tagore			
	A Retrieved Re	eformation – O Henry			
	Extract from a p	play			
	The Quality of	Mercy (Trial Scene from the l	Merch	ant of Venice -	Shakespeare)
Unit III	COPING WITH	I EMOTIONS			(9) Hours
	Poem	•• •. •			
	Pride – Dahlia Ravi Phenomenal Woma	ikovitch n – Maya Angelou			
	Reader's Theat	re			
	The Giant's Wife A	. Tall Tale of Ireland –William	n Carle	eton	
	The Princess ar	nd the God : A Tale of Ancien	tIndia		
Unit IV	Language Comp	petency Sentences			(9) Hours
	Simple Sentences				
	Compound Sentenc	es			
	Complex Sentences	3			
	Direct and Indir	rect Speech			
Unit V	Report Writing				(9) Hours
	Narrative Report				
	Drafting Sneech	168			
	Welcome Address				
	Vote of Thanks	3			
	1				

Cambridge Grammar of English , Ronald Carter and Michael McCarthy George Orwell Essays, Penguin Classics 3

Course Outcon	Course Outcomes		
CO-1	Determine their goals	PO1,PO7	
CO-2	Identify the value of integrity.	PO1,PO2,PO10	
CO-3	Deal with emotions.	PO4,PO6,PO9	
CO-4	Frame grammatically correct sentences	PO4,PO5,PO6	
CO-5	Write cohesive reports.	PO3,PO8	

	PO1	PO 2	PO3	PO 4	РО 5	PO 6	PO7	PO 8	PO 9	PO1 0
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3- Strong, 2 - Medium , 1 - Low

CO/PO	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3
CO5	3	3	3	3
Weightage	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0

Mapping with Programme Specific Outcomes:

		IV-Semester					
Core	Course Code: 11843	AIRCRAFTINSTRUMENTS	T	Credits:4	Hours:4		
Course Objectives	 It aims a used in a To study principle To learn Acquire Provide in mode 	at enabling the student to understan aircraft y various conventional types of Ins e of operation. a about direct reading and Remote no the knowledge of aircraft instrume students with an understanding of orn aerospace vehicle systems.	nd Di etrum readi ents the s	fferent type nents with it ng Compas scope and ex	of instruments s construction and s. ttent of avionics		
Unit I	BASIC AIRCRA	AFT INSTRUMENTS			(12) Hours		
	Instrument displa scales, and Digi displays. Descrip Description of In Barometers – Ad	ays, panels and layouts – Quantitative tal displays. Qualitative displays – ption of operational range marking ternational Standard Atmosphere and vantages and Disadvantages.	e disj Dire gs o its as	plays – Circe ector Display n instrumen ssumptions. I	ular scales, Straigh ys, LED and LCE t dial and colors Description of		
Unit II	FLIGHT INSTR	RUMENTS			(12) Hours		
Unit III	of operation of A Vertical Speed In GYROSCOPIC Gyroscopic theor driving force of 'Directional Gyro operation of 'Arti and Slip Indicator	Air Speed Indicator, Constructional features and padicator, Constructional features and p FLIGHT INSTRUMENTS ry, types of gyroscopes and their appl f gyroscopes. Constructional feature oscopes' / 'Direction Indicator'. Cor ificial Horizon' Constructional feature r'	lication res and res another	es and princ iple of opera on in instrum and principl ctional featur l principle of	iple of operation o tion of Machmeter. (12) Hours nents Description o e of operation o res and principle o operation of 'Turn		
Unit IV	ENGINE INSTR	RUMENTS			(12) Hours		
	Constructional features and principle of operation of 'Pressure Gauges' (Bourdon type) Manifold pressure gauge, Torque Pressure Indicator, Engine pressure Ratio Indi and Fuel Flow meters. Constructional features and principle of operation of 'Temper Indicating System' (Oil temperature gauge – Wheatstone Bridge type and Ratio type). Description of Thermocouple type thermometers (CHT and EGT gauges). Description						
Unit V	COMPASS			-	(12) Hours		
	Description of magnetic properties and laws of magnetism. Earth as a magnet and Form of earth. Compass Terminology (Magnetic Variation, Deviation and Magnetic DIP). Description of 'Terrestrial magnetism'. Types of Compasses – Direct Reading (DR) and Remote Reading (RR). Constructional features of DR Compass and their function. Constructional features of RR Compass and their function. Advantages of RR Compass. Calibration of DR compass						
	Calibration of DF	R compass					

Text book

1. Aircraft instrumentation and system, S Nagabhushana and L. K. Sudha, I. K. International Pvt Ltd,

References

- 1. Aircraft Instrument Second Edition EHJ Pallet.
- 2. Aircraft Instruments and Integrated System EHJ Pallet
- 3. Aircraft Instrument CA Williams
- 4. Auto flight Control EHJ Pallet & Shawn Coyle
- 5. Flight Instrument Sixth edition David Harries

Course Out	comes	Knowledge Level
CO-1	Acquire knowledge of various flight displays.	K2
CO-2	Have knowledge of the various aircraft's basic instruments.	K3
CO-3	Get an understanding of the different gyroscopic flight instruments.	K2
CO-4	Develop knowledge of the use of engine instruments.	K1
CO-5	Understanding about the various compass used in Aircraft.	K2

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
						PO6				0		
CO1	3	2	2	2	2	3	2	2	2	2	2	2
CO2	2	2	2	2	2	2	2	2	2	1	2	3
CO3	2	3	2	2	2	2	2	2	2	2	2	2
CO4	3	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	2	2	2	2	2	2	3	2
W.AV	2.4	2.2	2	1.8	1.8	2.2	1.8	2	1.8	1.8	2.2	2.2

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	2	2	3	2	2
CO3	2	2	2	3	1
CO4	3	2	2	2	2
CO5	2	2	2	2	2
W.AV	2.4	1.8	2.2	2.4	1.8

S-Strong(3), M-Medium2, L-Low(1)

		IV-Semester						
Сот	re Cours e Code: 11844	AIRCRAFT RULES AND AI WORTHINESS REGULATIONS	R	Т	Credits: 4	Hours: 4		
Cours Objectiv	e Introdu ves of aircr	ction to aircraft rules as far as they re aft	late to a	airwo	orthiness an	d safety		
	Knowle Proced Flight I Certific Aircraf	edge of mandatory documents like ce ure for development and test flights a release eate of Maintenance, Approved Certif t Manual, Flight Manual, Aircraft Scl	rtificate nd certi icates. 7 nedules	of H ficat Fech	Registration ion. Certific nical Public	cate of cations,		
Unit I	AIRCRAFT	ACTS & RULES, DGCA			(12) Hours		
	Indian Aircra (Aircraft Ma extent, Defin Introduction and Function	ft Act -1934: Introduction & Different nual (INDIA) Volume-1) - Aircraft nitions and Interpretation (Aircraft to the Directorate General of Civil s of DGCA	nt Powe t Rules t Manu Aviati	ers o -1 ual on (f Central G 937: Short (INDIA) V DGCA)-Or	overnment title and volume-1)- ganization		
	-Civil Aviatio	on Requirements (CAR),(CAR-Section Sections and Details of Series (Subjections)	on 1-Ge ects) in	nera a CA	l,Series-A, _j AR.	part-1)		
	23	Aeronautical Information Circular (Airworthiness Advisory Circulars (A	AIC) AC)	_				
	Aircraft Log Airworthines	books: recording and preservation s-Series 'x'-part-VI) -Units of Mea tions (CAR-Section 1-General-Series	of log sureme B-Part	g bo nts t T)	oks (CAR-) o be used	Section 2- in air and		
Unit II	REGISTRA	TION OF AIRCRAFT & APPROV	AL OI	-1) 7 OF	RGANISAT	TION		
					(12) Hours		
	Registration/ Registration Certificate: I Section-2-Air validation of Standards Modification (CAR-Section Categories, Airworthines	Deregistration of Aircraft (Procedure fees. (CAR-Section 2-Airworthine ssue, Validation and Suspension of tworthiness-Series F-part III)-Type Type Certificate of Aircraft and its p and Type Certification-Series s/Inspections (Section 2, Series-M- n 2-Airworthiness-Series F-part-VII Requirements, validity, Renewal s-Series E-part I)	, Validi ss-Serie Airwor Certi oroduct es Part I,I) -Appi of apj	ity, I es F thind ficat s (C. A-pa I)- S rova prov	Registration -part-I)-Air ess Certific e: Require AR-Section rt I,II)- Special Flig l of Organi al (CAR-S	markings, worthiness ate (CAR- ments for 6- Design Mandatory tht permit: isation: Section 2-		
Unit	AME LICE	NSING :			(1	12) Hours		
III	Categories, Eligibility, Continued Validity of AME License. (CAR-66 IS 4-SECTION-A-Technical Requirements-SUBPART-A) -Issue of Author Aircraft Maintenance Engineers-(CAR-Section 2-Training & -Airworthin L-Part IX)							
	-Cabin Crew Flight Dispat Licensing- Se	Training (CAR-Section 7-Training there Training Approval (CAR-Flig ection 7-Training & Licensing-Series	& Lic ght Cre M-Part	ensi w S II)	ng-Series M tandards, T	1-Part I) - Training &		

Unit	AIRCRAFT AIR WORTHINESS: (12) Hours
IV	-Flight testing of aircraft for which a C of A had been previously issued:
	Circumstance, Certification before Test flight, Procedure, Flight Test Report,
	Monitoring of Flight Performance, Evaluation, Certification (CAR-Section 2-
	Flight Testing of Aircraft-Series T-Part II) -Defect Recording, Reporting,
	Investigation, Rectification and Analysis (CAR-Section 2-Airworthiness-Series C-
	Part I) -Minimum Equipment List: (CAR-Section 2-Airworthiness-Series B-Part I)
	-Weight and Balance of Aircraft (CAR-Section 2-Airworthiness-Series X-Part 2) -
	Airworthings Series V Part VII) Requirements for Issue of Taxy Permit (CAP
	Section 2-Airworthiness-Series X-Part VIII) -Aircraft Fourinment and Instruments
	for different types of Aircraft operations e.g Day Flying, Night Flying, High
	altitude, Overwater, etc. (CAR-Section 2-Airworthiness-Series I-Part II) -Purpose
	and operation of Flight Data Recorder (FDR),(CAR-Section 2-Airworthiness-
	SeriesI -Part V) - Cockpit Voice Recorder (CVR),(CAR- Section 2-Airworthiness
	Series-I Part-VI) - Ground Proximity warning System (GPWS),(CAR-
	Airworthiness-Section 2-Series I-Part VII) -Traffic Collision Avoidance System
	(TCAS), Emergency Locater Transmitter (ELT) -Provision of Medical supplies in
	Aircraft: -First and Kit, Medical Kit, Universal Precaution Kit and its general Requirement (CAR-Section 2-Airworthiness-Series X-Part III)
Unit V	Airpurg trending Procedures (12) Hours
Unit	(12) Hours (CAR-Section 2-Airworthiness-Series H-Part II) -Special Precautions to be taken in
	the fuelling zonen -Safety precautions against Static Electricity discharge, bonding.
	earthing, Fire Hazard, Storm, Rain -Servicing and Maintenance of Aircraft during
	Fuelling -Fuelling with Passengers aboard
	Air Safety: Flight safety Awareness and accident / incident Prevention
	AIRCRAFT ACTS & RULES
	Indian Aircraft Act 1934
	• Aircraft Rules - 1937 related to Registration Airworthiness, Maintenance
	and operation (CARSeries F- part 3, 5)
	• Civil Aviation Requirements (CAR), (series A part - 1)
	2. Subjects, Procedure of issue and revision/ amendments, various circular issued by
	DGCA
	3. Aeronautical information circular (AIC)
	4. Air worthiness advisory circulars (AAC)
	 Aircraft log books, recording and preservation of logbooks (CAR series x part VI).
	······································
	Total : 60 Hours
l ext bo	OK Civil Aviation Dequinament M
1. (Daf	
Keieren	Aircraft Act 1034 & Aircraft rules 1037 by DCCA
2	Civil Aviation Requirement Section-2 by DGCA.
3.	Civil Aviation Requirement 21.
4.	Civil Aviation Requirement 145

Course	Knowledge Level	
CO-1	Introduction to aircraft rules as far as they relate to airworthiness and safety of aircraft	K1
CO-2	Knowledge of mandatory documents like certificate of Registration	K1
CO-3	Procedure for development and test flights and certification. Certificate of Flight release	K2
CO-4	Certificate of Maintenance, Approved Certificates. Technical	K4
CO-5	Publications, Aircraft Manual, Flight Manual, Aircraft Schedules	K5

CO	РО	PO	РО	PO	PO		PO	PO	PO	PO1	P11	P12
	1	2	3	4	5	PO6	7	8	9	0		
CO 1	3	2	2	2	1	2	2	2	2	2	2	2
CO 2	2	3	2	1	2	2	2	1	2	1	2	2
CO 3	2	3	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	1	2	2	2	2	2	2	2	2	2
CO 5	3	2	3	2	2	2	1	2	2	2	3	2
W.A V	2.4	2.4	2	1. 8	1.8	2	1.8	1.8	2	1.8	2.2	2

S-Strong (3), M-Mediu2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

C O	PSO 1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	2	2	2
CO3	2	1	2	3	2
CO4	2	2	2	2	3
CO5	2	2	2	2	3
W.AV	2.2	1. 8	2	3.1	2.4

S-Strong (3), M-Mediu2, L-Low (1)

		IV-Semester							
Core	Course Code: 11845	AIRCRAFT MATERIALS & STRENGTH OF MATERIAL LAB– PRACTICAL	Р	Credits:3	Hours:(
Course 1. To determine experimental data include universal testing machines a torsion equipment. Objectives 1. To determine experimental data for spring testing machine, compress testing machine, impact tester, hardness tester. 2. To determine stress analysis and design of beams subjected to bendi and shearing loads using several methods. 4. To determine Flexural strength of a beam. 5. To determine experimental stress with fatigue and compression Test									
1. Study (OF Ferrous metal	s and non- ferrous metals.							
2. Study o	of heat treatment	process and its effects.							
3. Study of	of Aircraft Hardw	vare							
4. Study o	of Plastic material	and its uses in Aircraft Industry.							
5. Study o	of Composite mat	erial and its uses in Aircraft Industr	у						
6. Tension	test								
7. Bending	g test on (Steel / W	ood) Cantilever beam.							
8. Bending	g test on simple sup	pport beam.							
9. Impact	test								
10. Spring t	test								
11. Torsion	test								
12. Hardnes	ss test								
				Tota	: 30 Hou				
Course Outcomes									
1. Analyse torsion, stress. st	and design struc bending and com rain and elastic b	etural members subjected to tension abined stresses using the fundament behaviour of materials.	, com tal cor	pression, neepts of	K5				
 Understa behaviou 	and the basic cor ar under different	ncepts of stress, strain, deformation t types of loading (axial, torsion, ber	, and nding)	material	K4				
 Perform stress analysis and design of beams subjected to bending and kashearing loads using several methods. Colculate the stresses and strains in avially loaded members subject to be an avial of the stresses and strains in avial beam beam beam beam beam beam beam beam									
4. Calculate the stresses and strains in axially-loaded members subject to K6 flexural loadings.									
5. Ability to conduct compression tests and Fatigue of cast iron and steel. K2									

CO	PO 1	PO2	PO 3	PO4	РО 5	PO6	PO7	PO8	PO 9	PO10	P11	P12
CO1	2	2	2	2	2	2	2	2	2	2	2	2
CO2	2	2	2	2	2	2	3	2	2	2	2	2
CO3	1	1	3	2	2	1	2	2	2	1	1	1
CO4	2	2	2	3	2	2	2	1	2	2	2	2
CO5	1	2	2	2	2	2	3	2	3	2	1	2
W.AV	1.6	1.8	2.2	2.2	2	1.8	2.4	1.8	2.2	1.8	1.6	1.8

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2
CO2	2	2	2	2	2
CO3	3	2	3	2	2
CO4	2	3	2	3	2
CO5	2	2	2	2	2
W.AV	2.2	2.4	3.1	2.4	1.8

S-Strong(3), M-Medium2, L-Low(1)
		IV-Semester								
Allied	Course	AEROENGINEERING	Т	Credits:3	Hours:4					
	Code:	THERMODYNAMICS								
	11846			C 1 F						
Course	1. 10 d	etermine the Mode of heat	tra	nster and Er	thalpy and law of					
Objectives		derstand the cycle of Refrig	erat	ion and Air S	Standard cycles					
	3. To de	fine the concept of ideal gas	es a	and the Theor	v of combustion					
	4. To un	derstand the working of Air	cor	npressor	5					
	5. To di	5. To discuss the aircraft propulsion system and Gas turbine								
Unit I	BASIC CONCE	PTS			(9) Hours					
	Introduction- s	ystems and surroundings	5 p	property an	d Thermodynamic					
	equilibrium, wor	k and form of work Heat	and	modes of h	eat transfer, internal					
	energy, zeroth la	w, first and second law of	ther	modynamics	. Enthalpy, Entropy,					
	law of conserva	tion of mass, law of conservences	erva	tion of mon	nentum, steady flow					
Unit II	IDEAL CASES	y equation and Amed proble								
	IDEAL GASES	vila's low Charle's low G	00 6	austion Uni	(9) Hours					
	Inuoduction- Bo	ic heats of gases Allied prol	as c blen	rquation Om	versar gas constant,					
	REFRIGERAT	ION CVCLES:		15.						
	Refrigeration pr	ocess Reversed heat engi	ine	vanour com	pression absorption					
	cycles, Gas cycl	e refrigeration- liquefaction	n of	gases, Proc	luction of solid ice					
	(Tonnage Problem	ms) Air Conditioning fundar	nen	tals, Types.						
	AIR STANDAR	D CYCLES								
	Introduction- Ef	ficiency of Air standard c	ycle	e and engine	e Carnot cycle, Otto					
	cycle, Diesel cyc	le, Dual cycle Brayton cycle	e and	d Allied prob	lems					
Unit III	PROPERTIES (OF GASES AND GAS MIX	ктu	IRES	(9) Hours					
	Avogadro's law,	ideal gases, Gas compress	ion,	Properties	of mixture of gases,					
	Dalton's law of j	partial pressures, internal er	herg	y, Enthalpy a	and specific heats of					
	gas mixtures.									
	FUELS AND CO	DMBUSTION	. 1							
	minimum air requ	uired for combustion Detern	nou: nina	stion of rues	s, and calculation of					
Unit IV					(0) Hours					
	Working of reci	inrocating air compressor	Ter	minology Is	othermal efficiency					
	Multistate comp	ression Intercooler power a	ind	efficiency of	f compressor. Allied					
	problems, Introdu	uction to rotary compressors	, ce	ntrifugal con	npressors, Axial flow					
	compressors, sim	ple problems								
Unit V	AIRCRAFT PR	OPULSION SYSTEM			(9) Hours					
	Piston Engine, Ga	as turbine Engine, Future pro	opul	sion systems						
	GAS TURBINE	S								
	Classification of	gas turbines constant press	sure	, closed cycl	e gas turbines, open					
	cycle gas turbin	turbing lat propulsion Dev	van	tages of clo	osed cycle, Thermal					
	enficiency of gas	turbines, jet propulsion, Roo	cket	propulsion.						

1. E.Rathakrishnan, Fundamentals of Engineering Thermodynamics, 2 nd Edition, Prentice – Hall of India Pvt. Ltd, 2006

References

- 1. Thermodynamics & Thermal Engineering Kothandaraman.
- 2. Engineering Thermodynamics Nag.
- 3. Fundamentals of Electric propulsion Ion & Hall Thrusters (Author DAN- M GOEBELL&IRACATZ)
- 4. Nag.P.K., "Engineering Thermodynamics", 4 th Edition, Tata McGraw-Hill, New Delhi, 2008.

Holman.J.P., Thermodynamics, 3rd Edition. McGraw-Hill, 1995.

Course Outco	mes	Knowledge Level				
CO-1	CO-1Determine the Mode of heat transfer and Enthalpy and law of conservation of mass					
CO-2	Understand the cycle of Refrigeration and Air Standard cycles	K2				
CO-3	Define the concept of ideal gases and the Theory of combustion	K1				
CO-4	Understand the working of Air compressor	K2				
CO-5	Discuss the aircraft propulsion system and Gas turbine	K5				

Mapping Course Outcome VS Programme Outcomes

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	P11	P12
CO1	2	2	2	2	2	1	3	2	2	2	1	1
CO2	2	2	1	2	1	2	2	1	1	1	2	2
CO3	2	2	2	2	1	1	2	1	2	2	2	1
CO4	2	1	2	2	1	2	2	2	2	2	2	2
CO5	2	3	2	2	2	1	2	2	1	3	2	2
W.AV	2	2	1.8	2	1.4	1.4	2.2	1.6	1.8	2	1.8	1.6

S–Strong(3),M-Medium 2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	2
CO2	2	2	2	2	2
CO3	1	1	2	1	2
CO4	2	2	1	2	3
CO5	1	2	2	2	3
W.AV	2	1.8	2	1.8	2.4

IV-Semester									
Allied	Course Code:11847	SOFTWAREMULTI- SIMLAB-PRACTICAL	Р	Credits:2	Hours:4				
Course Objectives	The student sho • To visu • To visu • To Imp • To visu	ould be made: nalize the effects Rectifier. nalize the effects Amplifier &O lement AM & FM modulation a nalize the effects communication	Dscill and o n sig	ator. lemodulation nal using filte	r circuit.				

List of Experiments

- 1. Study of Simulation software using simple circuits.
- 2. Rectifier circuits (Half wave, Full wave, Bridge rectifier with filters)
- 3. Power Supply design with regulators, LM7805, LM7812
- 4. Waveform generator using BC147 Transistors (Astable multivibrator)
- 5. Waveform generator using BC147 Transistors (Monostable Multivibrator)
- 6. Clipper and Clambers. (Positive edge and Negative edge)
- 7. Op-Amp application-I.
 - (Inverter Amplifier, Difference Amplifier)
- Op-Amp applications-II (RC Phase Shift Oscillator, Wein Bridge Oscillator)
- 9. AM Modulation and Demodulation
- 10. FM Modulation and Demodulation
- 11. Low Pass Filter, High Pass Filter And Band Pass Filter

Total: 30 Hours

Course Outcomes	Knowledge Level
 Simulate and analyze performance of Rectifier. Simulate and analyze Waveform generator 	K4 K3
 Simulate and analyze Amplifier &Oscillator circuits. 	K3 K4
• Simulate & validate the various modulation and band filters of a communication system	K4

CO	PO 1	PO 2	PO 3	PO 4	РО 5	PO6	PO 7	PO 8	PO 9	PO1 0	P11	P12
CO 1	2	2	2	2	2	2	1	2	2	2	2	2
CO 2	1	3	2	2	1	1	2	2	2	2	2	2
CO 3	2	2	2	2	2	1	2	2	3	1	1	2
CO 4	2	3	2	1	2	2	2	1	2	2	2	2
CO 5	2	2	2	2	1	2	2	2	2	2	2	2
W.A V	1.8	2.4	2	1. 8	1.6	1.6	1.8	1.8	2.2	1.8	1.8	2

S-Strong(3), M-Mediu2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	3	2	2
CO3	3	1	2	3	3
CO4	2	2	2	2	2
CO5	2	2	2	2	2
W.AV	2.4	1.8	2.2	2.2	3.1

		இரண்டாம் ஆண்டு	- práta	ாம் பருவம்	- contractor in			
பாடக்குறியீட்டு) crain:	பள்ளியில் தமிழ் பயிலாத மாணாக்கர்களுக்கான அடிப்படைத் தமிழ்ப் பாடங்கள்			T/P	C	H/W	
		இலக்கியமும்	மொழிப்	பயன்பாடும்	P	2	2	
நோக்கம்	> ш	<mark>ாணவர்கள் தமிழின்</mark> சிறப்புக	கள் அறித	శు.				
	ک ۲	ிழையின்றித் தமிழ் பேசுவத <u>ு</u>	ற்குப் பயி	ற்சி அளித்தல்				
ക്രങ്ങ	தமிழ் நீதி	இலக்கியக் கருத்துக்களை அ	அறிதல்					
	திருக்குறல	ir (அறன் வலியுறுத்தல்) –	10 கு	றட்பாக்கள்				
	ஆத்தி குடி	F	-	முதல் 20 பாடல்கள்				
	மூதுரை)	முதல் 15 பாடல்கள்				
ച്ചുഖങ്ങു	தமிழின் ச	ற்ப்புகளை அறிதல் – (வாய்	மொழித் 🤇	தேர்வு)				
	த	மிழ்மொழியின் தொன்மை -	- சிறப்பு 🗕	தமிழ் இலக்கியங்கள் –	சங்கப்புல	பர் கள்		
	தமிழ்க்கா	ப்பியங்கள் – புதுக்கவிஞர்கள	ள் – குறித்	த செய்திகளை அறிதல்				
ച്ചുഖക്ര	சொற்களி	ன் ப <mark>ம</mark> ன்பாடு.						
	3	ருஞ்சொற்பொருள் அறிதல்) – பிரித்த	து எழுதுதல் – சேர்த்து	எழுதுதல் -	- எதிர்	ச்சொவ்	
	அறிதல், ஒ	ஒரெழுத்து ஒரு மொழி அறித	ல்		en an	347.043		
அல சு	பிழையின்றித் தமிழ் பேசுவதற்குப் பயிற்சி அளித்தல் (வாய்மொழித் தேர்வு)							
		அறிந்து பேசும் திறன்கன	ரபுதக்தா. எ வளர்த்	தல்.	igi			
	2 0	ரவற்பரை கன்றியரை வ	ກໍາຫລາະກໍະ	கப் பயிற்கி வனிக்கல்				
	 வார் கலற்புலார் இலற்புலார் அறிறிலாறில்போ பாறிக் அவற்றல், 							
	3. в	தைசொல்லும் திறன்களை எ	வளர்த்த ல்	.(நீதிக் கதைகள் கூறல்)				
ച്ച லങ്ങ്	மொழிபெ	ա†ப்பு						
	ஆங்கிலத்	திலிருந்து தமிழில் மொழிடெ	யர்த்தல்					
	1	. ஆங்கிலச் சொற்களை மொ	ாழி பெயர்	க்கல்				
	2	. ஆங்கலத் தொடர்களைத் த	தமிழில் பெ	மாழிபெயாத்தல				
	نغېږي خ	சமின்றி தெளிவாக தங்களது	கருத்துக்	களை மா <mark>ணவர்</mark> கள் எடு	த்துரைக்க	வழி அ	றிதல்.	
1000801	> சொ	ற்களின் பயன்பாடு, தய	பக்கமின்ற	ி பேசக் கற்றுக்கொ	ாள்வதால்	மான	ாவர்கள்	
	தன்	னம்பிக்கை பெறுதல்						

பாடக்குறியீட்டு) तस्त्रेत:	பள்ளியில் மேல் கல்லூரிய மாணாக்கர்களு பயர்கமிம் இர	துகாரு றிலைப் ல் பகுதி நக்கான லக்கியங்	படிப்பு வலை 1 1-இல் தமிழ சிறப்புத் தம கணம் இலக்	பருமை ர தமிழ் பயின்று ழ் பயிலாத கிழ்ப்பாடங்கள் கிழலாலாலம்	T/P	C	H/W
நோக்கம்	> 1 > 4	ாணவர்கள் தமிழ் பெ மாழ்வியல் அறங்களு	ாழியினை க்கு வழி	னக் கற்பதா காட்டுதலாக	ல் அரிய இலக்கிய இ ருத்தல்	ங்களை ,	அறியச் (செய்தல்
୬ ର୍କ୍ଷ	சங்க இல 1. நற்றின 2. குறுந் (நெய்தல் 3. ஐங்குழ பாடல். (ம 4. அகநா 5. புறநாத முயலுநர்	க்கியம் ஹை – 'நய (குறிஞ்சி - 392)) தாகை– 'தெய்தல் இ) றநூறு – 'வானம் பா ழல்லை) ஹூறு – 'உண்டால் ! ப	னும், ந ருங் கழி ாடி வறப் _ன்ன' எ அம்ம (ரடியவர்:	ண்பும், நாணு ' எனத் தொ ம்' எனத் தொ னத் தொடா இவ்வுலகம்' கடலுள் மா	ர ்எனத் தொ டங்கும் நெய்தற் ப ரடங்கும் கிழவன் வகும் பாடல் (மருத எனத் தொடங்கும் யந்த இளம்பெரு எ	ாடங்கும்ப த்து பாடல பருவம் ம் - 176) பாடல் வழுதி.	ாடல் ல். பாராட்(182. பிர	டுப் பத்த றர்க்கென
.அல கு2	காப்பிய ரிலப்பகி	காப்பிய இலக்கியம்						
அலகு	நீதி இலை 1. த 2. ந 3. ந தொட 4. இ பாடல் எ 5. இ	கியம் நொலடியார் நான்மணிக்கடிகை ங்கும் பாடல் எண்: 27 இனியவை நாற்பது ண்: 3 இன்னா நாற்பது ண்: 07	-	அறிவுடை மேன்மக் 'அஞ்சாவ 'எவது 'ஆற்றல்	டமை – 10 குறட்ப கள் (முதல் பாடல்) மை அஞ்சுக' எனத் மாறாஇளக்கிளை இலாதான் பிடித்த	ாக்கள் மை' எஎ நபடை' எ	ளத் தெ எனத் தெ	ராடங்கும ராடங்கும
୬ ରାଜ୍ୟ	இலக்கிய 1. சங்க சு 2. காப்பி 3. சிற்றிவ 4. புதுக்க	வரலாறு ாலம் – எட்டுத்தொன ப இலக்கிய வரலாறு லக்கியங்கள் தோற்றமும் வ	க, பத்து – ஐம்பெ மம் வளர் ளர்ச்சியு	ப்பாட்டு. பருங் காப்பி ச்சியும் ம்.	யங்கள் – ஐஞ்சிறு	காப்பிய	ப்கள்	

அலகு 5	இலக்கணம்						
	1. சொல்வகை –	பெயர், வினை, இடை, உரி					
	2. அணி இலக்கணம் – நவிற்சி அணி.	உவமை அணி, உருவக அணி தற்குறிப்பேற்ற அணி, உயர்வு					
	3. புதுக்கவிதை இலக்கணம்–	படிமம் குறியீடு.					
பயன்கள்	 அரசுப் பணி பெறுவதற்க நடைமுறைத் தமிழ் இலக் 	ான வாய்ப்பினை நல்குதல். கியத்தை அறைய உதவுதல்					

		Semester-IV						
Course cod	e:	NME	T/P	С	H/W			
		Small Business Management	Т	2	2			
Objectives	 jectives To understand the policy initiatives and infrastructural support for establishing a small scale enterprises To analyze the opportunities for starting a small enterprise. 							
Unit-I	Unit-ISmall Scale enterprises—An Introduction and overview—Definition—Scopeunit-Iand importance – relative advantages of small scale enterprises vis - a – vis –Larg and medium scale industries – Efforts to development of SSE- Meaning and conce of entrepreneurship, the history of entrepreneurship development, role entrepreneurship in economic development, agencies in entrepreneurship management and future of entrepreneurship.							
Unit-II	•II Policy and institutional infrastructure for small enterprises – Development agencies for small enterprise–small enterprises growth and environmental factors in fluency-funding agencies and their role in Developing SSE Meaning of entrepreneur, the skillsrequiredtobeanentrepreneur, the entrepreneurial decision process, and role							
Unit-III	Establishi Market as then Ownershi Ideas ,and	Establishing the small scale enterprises–opportunities scanning–Choice of enterprise– Market assessment for SSE–Choice of technology and selection of site– Financing then ew/small enterprise– Preparation of business plan– Ownershipstructureandorganizationalframework-Businessideas,methodsofgenerating						
Unit-IV	Operating Operation Importanc typesofde And bank	the small-scale enterprise – Financial management issues in management issues in SSE – Marketing management issues of new venture financing, types of owner ship securities, v btsecurities, Determiningidealdebt-equitymix, and financial in s	n SSE s in S ventur stitut	E – ISE- re cap ions	vital,			
Unit-V	Performat andcontro family ent Successio	nce appraisal and growth strategies – Management performate I–Growthandstabilizationstrategiesforsmallenterprises–Man terprises–Related Cases-Exit strategies for entrepreneurs, bas n and harvesting strategy	nce a aging nkrup	ssessi g tcy, a	nent			
	Dynamic	Component for Continuous Internal Assessment only:						
Unit-VI	Conte	emporaryDevelopmentsRelatedtotheCourseduringtheSemesterc	oncer	ned.				
REFEREN	CES:							
MathurS.P.((1979)Econo	omics of small-scale industries.						
Siropolis.(19	986)Entrepre	neurship and small Business Management Vasant Desai.(1979))					
Organizatio	n and manag	gement of small scale industries.						
Outcomes	The stuThe s	ident should be able find out a suitable idea for starting a sma tudent should be able to visualize the importance of small sc	ll ent ale	erpris	e			

Enterprises in economic development.

		V-Semester					
Core	Course	PISTONENGINEAND	T Credits:4	Hours:4			
	Code:	PROPELLER					
	11851						
Course	1. Understa	nd the basic operating princ	ciples of reciproc	ating engines, which			
Objectives	are prima	rily used in aviation.					
	2. Know ho	w to read the performance	of an aircraft pist	on engine by taking			
	into acco	unt the factors that affect th	he shaft power th	at can be developed			
	by such a	n engine.		for IC on since and			
	5. To provid	te full information on the ty	pe of fuels used	for IC engines and			
	A Understa	ly systems.	d working princi	nle of ignition			
	Ondersta	nd the basic components an	id working princi	pie of ignition			
	5 Understa	nd the basic operating princ	ciples of the prop	eller including the			
	methods	used to calculate the thrust.	the power requir	red and the			
	efficiency	v.	the power requi				
Unit I) ON & CONSTRUCTION:		(12) Hours			
	Development, cla	assification and characteris	tics of piston en	gines. Constructional			
	features of Cran	k case, crank shaft, cylinde	er, piston, Conne	cting rod, cam shaft,			
	valve and valve	operating mechanism and	d their function.	Principles of valve			
	timing diagram a	nd engine firing order.					
	TERMS, DEFIN	NITION AND POWER CA	ALCULATION	:			
	Description of te	erms related to piston engi	ne, Operating pr	inciples - 2 stroke, 4			
	stroke, Otto and	Diesel cycle, Compressio	on ratio. Engine	efficiencies. Power			
	Calculation, and	factors affecting engine per	formance.				
Unit II	ENGINE ACCE	SSORY SECTION:		(12) Hours			
	Description of	accessory section and p	ropeller reduction	on gears. General			
	description of in	escription of induction and exhaust manifold. Supercharger and Turbo charger.					
	ENCINE LUDD	lescription of engine starter motor, Engine coolingsystems - air and liquid					
	Need for lubric	Classification and	d characteristics	of lubricating oil			
	Principal compor	ents of lubricating system	and their function	n nuoneaung on.			
Unit III	ENGINE FUEL	SVSTEM.		(12) Hours			
	Aviation fuels ar	d its characteristics. Alter	native fuels in av	viation. Fuel additives.			
	Principle of open	ration of Float type carbur	etor. carburetor	icing and prevention.			
	Maintenance of	float type carburetor. Princ	ciple of operation	and maintenance of			
	fuel injection sys	tem.					
Unit IV	IGNITION ANI	D STARTING SYSTEM:		(12) Hours			
	Principles of i	gnition. Magneto – Typ	pe, Characterist	ics and operation.			
	Description of i	gnition shielding, ignition	switch and wir	ing. Magneto timing			
	procedure. Magr	neto maintenance. Descript	tion of spark plu	ugs and its servicing			
	including pressur	e testing.					
Unit V	PROPELLER:			(12) Hours			
	Propeller theory	, terms and definition. F	orces acting on	propeller in flight.			
	General descript	ion of fixed and variable p	pitch propeller. P	ropeller controls and			
	operations of pit	ch changing mechanism. I	Description of we	ooden and composite			
	blade propellers.						

1. Fundamentals of Internal Combustion Engines by P.W. Gill, J.H. Smith & E.J. Ziurys

References

- 1. Airframe and power plant mechanics power plant hand FAA
- 2. Aircraft piston engines by Herschel smit
- 3. Heywood J.B., "Internal combustion Engine Fundamentals", McGraw Hill, 1988
- 4. Jet Engine Manual by E. Mangham and A Peace.

Course Outco	omes	Knowledge Level
CO-1	Competent to understand the basics of Piston engine operation.	K2
CO-2	Understanding the basic parts of a Piston engine.	K3
CO-3	For learning about the purpose of Carburetor's and fuel injection systems in a piston engine.	K2
CO-4	Understand engine starting, ignition systems and the requirements	K3
CO-5	To gain an understanding of the propeller system and its purpose.	K2

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CO1	2	2	2	2	2	2	2	2	2	2	2	2
CO2	2	2	2	2	2	2	2	2	2	2	2	3
CO3	3	2	2	2	2	2	2	2	2	2	2	2
CO4	2	2	2	2	2	2	2	2	2	2	2	3
CO5	2	2	3	2	2	2	2	2	2	2	2	2
W.AV	2.2	2	2.2	1.6	2	1.8	1.8	1.8	2	1.8	2	2.4

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	2	2	2
CO3	2	2	2	2	2
CO4	2	2	2	1	2
CO5	3	2	2	3	3
W.AV	2.4	1.6	2	2	2.2
	C Strong(2)	M Madium	DI Low	(1)	Į

		V-Semester			
Core	Course	GAS TURBINE ENGINE	Т	Credits:4	Hours:4
	Code: 11852				
Course	1. To expla	in the Gas Turbine with various o	perati	ng cycles.	
Objectives	2. Explain	different alternate fuels, gas turbin	nes an	d about jet prop	ulsion
	3. To under	stand the various classifications of in the different performance analy	of gas	turbine.	inos
	5. To be ab	le to analyze overall performance	of ga	s turbine power	plant
T T 1 / T			8		(10) 11
Unit I	INTRODUCI Principle of Is	ION t Propulsion Types of gos turbi	na an	ginas Dringinl	(12) Hours
	Ram Jet and s	cram Jetengines. Factors affectin	ng the	thrust and per	formance of gas
	turbine engine.	6	0	I	8
Unit II	TURBINE EN	IGINE		~	(12) Hours
	Construction	and working, Description of	Air Nor	intake, Comp	ressor Diffuser,
	Thrust Augn	internation devices. Noise sup	pressi	on system.	Thrust reversal
	mechanisms.	Thrust calculation procedure for	r a ti	urbojet engine	and fan engine
TT 1. TTT	problems				
Unit III	TURBOPRO	PENGINE	urbo r	ron engine Ec	(12) Hours
	propeller. Turk	propellersworking principle an	nd fun	ctions of prope	ller control unit.
	Propeller horse	e power calculations.		1 1	
TT 1/ TT 7					
Unit IV	FUEL SYSTE	MS	on of	fuel control un	(12) Hours
	operation. Elec	etronic engine controls and FADE	C syst	tems.	it and its
Unit V	ENGINE SYS	TEMS	5		(12) Hours
	Lubrication sy	stem : Types of lubricants , lubric	ation	system unit and	their functions .
	Starting system	m: Types of engine starts, we arters APU GPU Ignition system	orking	principle of	air turbine and
Text book	comoustion su		i unu i	is operation.	
1. Gas	Turbine Materia	ls by G, Lueas and J.F. Pollock			
References	raft navyar plant	c by Krooc wild 1004 (Chapter 1	1 1 7 4	(2, 1, 4, 1, 6)	
I. AIIC	rait power plant	s by kides wild – 1994 (Chapter 1	1,12,-	15,14,10)	
2. Gas	Turbine theory -	- Kohen & Rogers.			
3. Gas	turbines – V. Ga	neshan Modern Compressible flo	ws – J	ohn D	
4. Heat	t engines, by Va	sandan & Kumar Metropolitan	Book	Co Pvt Ltd – 200	00
5. Gas	Turbine for Airc	raft by A.W. Judge.			

Course O	utcomes	Knowledge
CO-1	Explain the basic principle of each cycle of the gas turbines.	K2
CO-2	Understanding the principles of the construction and operation of the gas turbines.	К3
CO-3	To understand how to build and operate a turbo propeller engine.	K1
CO-4	Understanding the impact of emission on conventional and unconventional fuels	K2
CO-5	Understand the engine start system of the gas turbines of the aircraft.	K2

CO	PO1	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
						PO6				0		
CO 1	3	2	2	2	2	2	3	2	2	2	2	2
CO 2	2	2	2	2	2	2	2	2	2	2	2	3
CO 3	3	3	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	2	2	2	2	2	2	2	2	2	2
CO 5	2	2	3	2	2	2	2	2	2	2	3	2
W.A V	2.4	2.2	1.8	1. 8	2	2	2.2	1.6	1.8	1.8	2.2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2
CO2	2	2	2	2	2
CO3	3	2	2	1	2
CO4	2	2	3	1	1
CO5	3	2	2	2	3
W.AV	2.4	1.8	2.2	1.8	2

		V-Semester						
Elective- I	Course Code: 11853A	BASICS OF AVIATION INDUSTRY	T Credits:	4 Hours:4				
Course Objectives1. Describe the airline industry today in its regulatory and busine 2. Explain how airlines, ANSPs and airports operate 3. Describe the duties and responsibilities of key airline personne 4. Explain safety and security issues affecting the aviation indust 5. Discuss challenges and opportunities affecting the aviation indust								
Unit I	The Evoluti Aviation Inc Structures -	on of Aviation - Growth Drivers - lustry- Aviation Industry in India - An Aircraft Manufacturers	Issues and Ch 1 Overview - A	(12) Hours allenges - Global arcraft Types and				
Unit II	Airports - C Terminals -	ivil, Military - Training - Domestic/Inte World Airlines - World's Major Airports	ernational - Pas	(12) Hours senger/Cargo				
Unit III	IATA / ICA Government	O - National Aviation Authorities & Rol s - Airports Authority of India.	e of State and C	(12) Hours Central				
Unit IV	Airport Serv Warehouse N	rices - Standard Operations - Ramp Set Management- airport operations- airport	rvices & Airsic management.	(12) Hours le Safety - Freight				
Unit V	Various Cris Response to Methods & Awareness.	is at Airport - SOP for Bomb Threat - M Acts of Unlawful Interference: Devel Procedures – Troubleshooting the issu	Iitigating Hijac oping Plans – ues – Handling	(12) Hours k Crisis Situation - Investigation g Situational				
	1			Total;60 Hours				
Text book 1. Airpor Educa References	t Planning and tion, 2011	Management – Seth Young, Alexander	T. Wells, McG	raw Hill				
 Flight: TI Aisle Be Aviation Tourison 	he Complete H Demand – Ris law – Philip H n : The Interna	Iistory of Aviation – Reg Grant, DK pub shi Piparaiya, Jaico Publishing House, 20 I tional Business – Mill R C	blisher, 2017. 013.					
Course Outc	omes			Knowledge Level				
CO-1	Desc busin	ribe the airline industry today in its reguless context	ne airline industry today in its regulatory and K2 ontext					
CO-2	Expla	ain how airlines, ANSPs and airports op	erate	K3				

	personnel	
CO-4	Explain safety and security issues affecting the aviation industry	K5
CO-5	Discuss challenges and opportUnit Ies affecting the aviation industry	K4

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO	PO	PO9	PO1	P11	P12
							7	8		0		
CO 1	2	1	2	2	2	1	3	2	3	2	2	2
CO 2	2	2	1	3	1	2	2	2	2	2	3	3
CO 3	2	2	2	2	2	1	2	1	2	2	2	2
CO 4	1	1	1	1	1	2	1	2	2	2	2	2
CO 5	2	3	2	2	2	1	2	2	2	3	3	2
W.A V	1.8	1.8	1.6	2	1.6	1.4	2	1.8	2.2	2.2	2.2	2.2

S –Strong (3), M-Mediu2, L- Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2
CO2	2	2	2	2	2
CO3	3	1	2	1	2
CO4	2	2	3	1	1
CO5	2	2	2	2	3
W.AV	2.4	1.8	2.4	1.8	2

S –Strong (3), M-Mediu2, L- Low (1)

		V-Semester								
Elective– I	Course Code: 11851B	AIRCRAFT COMMUNICATION AND NAVIGATIONSYSTEM	T	Credits:4	Hours:4					
Course Objectives• To familiarize about basic radio theory. • To familiarize communication systems used in the aircraft • To educate about various navigation systems used in the a • To educate about various radio air safety equipment's use aircraft • To educate basic radar and weather radar used in the aircraft										
Unit I	GENERAL: (1 Description of bands, Carrier characteristics. modulation and of radio transm of radio receive	GENERAL: (12) Hours Description of radio waves, terms like wave length and frequency, frequency bands, Carrier waves Groundwave, Sky wave and Space wave and their characteristics. Antenna, Amplifiers and types, microphones and its types, modulation and its various types, functions of a radio transmitter block diagram of radio transmitter and its function, functions of a radio receiver, block diagram								
Unit II	COMMUNIC Description, th communication system. Testin control systems	COMMUNICATION SYSTEMS: (12) Hours Description, theory of operation of Aircraft VHF (Very High Frequency) ommunication system, HF (High Frequency) and Satellite communication ystem. Testing of a communication radio, Aircraft Selcal systems, Audio ontrol systems								
Unit III	NAVIGATIO Description, th magnetic Indic system(ILS), D of operation o (GPS) and Dop advantages	N SYSTEMS: (12) Hours eory of operation of Automatic cator(RMI), Very High Omni I Distance Measuring Equipment, f Inertial Navigation system (I opler Navigation system, Micro	c Di Rang Mai INS) wav	rection Find ge(VOR), Ir rker beacon), Global Po ye landing sy	ler (ADF), Rad astrument landir system. Princip ositioning Syste ystem (MLS) ar					
Unit IV	RADIO EQUI Description and its operation Tr altimeter syster Locator transm Installation of I	ADIO EQUIPMENT (OPERATIONS): (12) Hours Description and operation of ATC transponder, various modes like A,C, S and ts operation Traffic alert and collision avoidance system(TCAS), Radio altimeter system, Ground proximity Warning system(GPWS), Emergency Locator transmitter(ELT) its types, Cockpit voice recorder(CVR) and								
Unit V	WEATHER R Radar, radar b Aircraft weather plate antenna radar system	ADAR SYSTEM: (12) Hours bands, description of principal er radar system, its units and , Radome, Safety precautions	l un its whi	its of analo operation , le handling	og radar syster wave guides, fl aircraft weath					

1. Aircraft instruments and avionics Max F. Henderson, Jeppesen

References

- 1. Aircraft Electricity & Electronics by Thomas K Eismin
- 2. Aircraft radio Systems by James Powell
- 3. Aircraft instruments and integrated system E H J Pallett, Pearson.
- 4. Aircraft instrumentation and system,
- 5. S Nagabhushana and L. K. Sudha, I. K. International Pvt Ltd,

	Course Outcomes	Knowledge Level
CO-1	To understand about basic radio theory.	K2
CO-2	To acquire the knowledge about communication systems used in aircraft.	K3
CO-3	To acquire knowledge on the various navigation systems.	K3
CO-4	To analysis on radio air safety equipment.	K4
CO-5	To acquire knowledge on basic radar and weather radar used in the aircraft	K3

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO	PO	PO9	PO1	P11	P12
							7	8		0		
CO1	3	3	2	2	1	2	2	2	1	1	1	3
CO2	2	3	2	2	1	1	2	2	2	1	2	2
CO3	2	2	2	2	2	1	1	1	2	2	2	2
CO4	2	2	2	2	1	2	1	2	1	1	1	2
CO5	2	2	2	2	2	1	2	2	2	2	2	3
W.AV	2.2	2.4	2	2	1.4	1.4	1.8	1.8	1.6	1.4	1.6	2.4

S –Strong (3), M-Mediu2, L- Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	2	2
CO2	2	1	2	1	1
CO3	2	1	2	1	2
CO4	2	2	1	2	1
CO5	3	2	2	2	2
W.AV	2.4	1.4	1.8	1.6	1.6

S –Strong (3), M-Mediu2, L-Low (1)

	V-Semester										
Elective- I	Course		T Credits:4	Hours:4							
	Code:	ADDITIVE									
	11853C	MANUFACTURING									
Course	1 To enco	urage the development of addit	ive monufacturi	a through a							
Objectives	1. To enco	of husiness opportunities applic	ations	ig unough a							
Objectives	2. To learn	about different software tools.	processes and te	echniques for							
	creating	physical objects that satisfy pro-	oduct developme	ent or prototype							
	requiren	nents using additive manufactur	ing.	1 71							
	3. To unde	rstand vat polymerization and d	lirect energy dep	osition							
	processe	processes.									
	4. Understand the fusion and material extrusion processes of powder beds.										
	5. To deve	lop an understanding of the app	olications of bind	lers, material							
IInit I	Jetting a	ION:(12) Hours									
	Overview - Nee	ed - Development of Additive M	lanufacturing (A	M) Technology							
	Rapid Prototypi	ing- Rapid Tooling - Rapid Mar	nufacturing - Ad	ditive							
	Manufacturing.	AM Process Chain- ASTM/ISO	O 52900 Classifi	cation - Benefits.							
	Applications: B	uilding Printing - Bio Printing -	Food Printing-	Electronics							
	Printing. Busine	ess OpportUnit Ies and Future I	Directions – Case	e studies:							
	Automobile, Ae	erospace, Healthcare.									
Unit II	DESIGN FOR	DESIGN FOR ADDITIVE MANUFACTURING (DfAM):(12) Hours									
	Topology Optir	Dispectives - ANI Unique Cap	adilities - Part	Consolidation –							
	Parts and Grad	opology Optimization- Generative design - Lattice Structures - Multi-Material									
	File formats:	STL-Problems with STL-	AMF Design t	for Part Ouality							
	Improvement: 1	Part Orientation - Support Stru	cture - Slicing	- Tool Path							
	Generation – D	esign rules for Extrusion based	AM.								
Unit III	VAT POL	YMERIZATION AND	DIRECTE	D ENERGY							
	DEPOSITION	:(12) Hours									
	Photo polymeri	zation: Stereo lithography App	aratus (SLA)- N	Applications							
	Digital Light	Processing (DLP) - Process	ages - Linnatio	- Applications							
	Continuous Lic	uid Interface Production (CL	IP)Technology.	Directed Energy							
	Deposition: Las	ser Engineered Net Shaping (LE	ENS)- Process -	Material Delivery							
	- Materials -Bei	nefits -Applications.	,	2							
Unit IV	POWDER BE	D FUSION AND MATERIAL	EXTRUSION	:(12) Hours							
	Powder Bed Fu	sion: Selective Laser Sintering	(SLS): Process -	Powder Fusion							
	Mechanism - M	laterials and Application. Select	tive Laser Meltin	ng (SLM),							
	Electron Beam	Melting (EBM): Materials - Pro	cess - Advantag	ges and							
	Applications. M	laterial Extrusion: Fused Depos	ition Modeling ((FDM)- Process-							
Unit V	OTHER ADDI	TIVE MANUFACTURING	PROCESSES	12) Hours							
	Binder Jetting:	Three-Dimensional Printing -	Materials - Pr	ocess - Benefits-							
	Limitations - A	Applications. Material Jetting:	Multi jet Mode	eling- Materials -							
	Process - Ber	nefits - Applications. Sheet	Lamination: L	aminated Object							
	Manufacturing	(LOM)- Basic Principle- M	lechanism: Glu	ing or Adhesive							
	Bonding - Ther	mal Bonding- Materials-Applic	ation and Limita	tion.							

1. Michael E. Mortenson, "Geometric Modeling", Wiley, NY, 1997

References

- Ian Gibson, David Rosen, Brent Stucker, Mahyar Khorasani "Additive manufacturing technologies". 3rd edition Springer Cham, Switzerland. (2021). ISBN: 978-3-030-56126-0
- Andreas Gebhardt and Jan-Steffen Hötter "Additive Manufacturing: 3D Printing for Prototyping and Manufacturing", Hanser publications, United States, 2015, ISBN: 978-1- 56990-582-1.
- 3. Milan Brandt, "Laser Additive Manufacturing: Materials, Design, Technologies, and Applications", Woodhead Publishing., United Kingdom, 2016, ISBN: 9780081004333.
- 4. Kevin N. Otto, Kristin L. Wood, "Product Design", Pearson Education, 2004.
- 5. David F. Rogers, J. A. Adams, "Mathematical Elements for Computer Graphics", TMH, 2008.

	Course Outcomes	Knowledge Level
CO-1	Identify the development of AM technologies and how they have spread over time. Different companies, and developing business opportunities.	K2
CO-2	Develop an understanding of the AM conversion process from concept to finished product technology.	К3
CO-3	Explain the vat polymerization and direct energy deposition processes and their applications.	K4
CO-4	Acquire knowledge on process and applications of powder bed fusion and material extrusion.	K2
CO-5	Perform an evaluation of the advantages, limitations and uses of binder jetting, material jetting and sheet lamination techniques.	К3

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
						PO6				0		
CO 1	3	2	2	2	2	2	2	2	2	2	2	2
1												
CO	2	3	2	2	2	2	2	2	2	2	2	2
2												
CO	2	3	2	2	2	2	2	2	2	2	2	2
3												
CO	2	2	2	2	2	2	2	2	2	2	2	2
4												
CO	3	2	3	2	2	2	2	2	2	2	3	2
5												
W.A	2.4	2.4	2	1.	1.8	2	1.8	1.8	2	1.8	2.2	2
V				8								

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome vis i rogramme speeme Outcomes											
CO	PSO1	PSO2	PSO3	PSO4	PSO5						
C01	3	2	2	3	2						
CO2	2	2	2	2	1						
CO3	2	2	2	2	1						
CO4	2	2	2	1	2						
CO5	2	2	2	2	2						
W.AV	2.2	1.8	2	2	1.6						
			T T (4)								

Mapping Course Outcome VS Programme Specific Outcomes

Elective II Course Code: AIRPORT AND AIRTRAFFIC SERVICE T Credits:4 Hours: 4 Course Objecti 1. Explain international procedures and practices governing the movement of air traffic 1. Explain international procedures and practices governing the movement of air traffic ves 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on aircraft lighting and support services. 5. To impart knowledge about ground handling operations. (12) Hours Airport Definition- History and Development of Airport, Principles of Airport Layout, Categories of Airport, Principles of Airport, Management, Functions o Airport, Aerodrome Reference Point ,Meaning of Green Field Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts , Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Stop way and Clearway, Load Classification Number. (12) Hours III AIRPORTIGENTIONS: (12) Hours III AIRPORTIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway L			V-Semester									
Elective II Code: 11854 SERVICE 4 A A 4 Course Objecti 1. Explain international procedures and practices governing the movement of air traffic 4 Ves 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 3. To gain more knowledge about ground handling operations. (12) Hours Airport Definition- History and Development of Airport, Principles of Airport Layout, Categories of Airport, Principles of Airport Management, Functions of Airport, Aerodrome Reference Point ,Meaning of Green Field Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts, Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Stop way and Clearway, Load Classification Number. (12) Hours III AIRPORTOPERATIONS: (12) Hours III AIRPORTLIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Readorme Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods		Course	AIRPORT AND AIRTRAFFIC	Т	Credits:4	Hours:						
11854 A Course 0bjecti of air traffic ves 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 4. To gain more knowledge about ground handling operations. Unit I AIPORTGENERAL: (12) Hours Airport Definition- History and Development of Airport, Frinciples of Airport, Aerodrome Reference Point , Meaning of Green Field Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts , Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Tariway Markings, Stop way and Clearway, Load Classification Number. Unit III RUNPORTOPERATIONS: (12) Hours Lay out of Apron, Holding Apron, Terminal Parse, Aircraft Parking Configuration, Terminal Configuration, Terminal Passenger Flows, Ramp Safety, Ramp Ground Support Equipments, Definition of Gate and Gate Capacity, Airport Congestion and Delay, Airport Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Hau and Short Haul Operations. IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Aerodrome Beacon, Airport Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airpor	Elective	II Code:	SERVICE			4						
A Image: Course Course Objecti 1. Explain international procedures and practices governing the movement of air traffic ves 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 4. To gain knowledge on aircraft lighting and support services. 5. To impart knowledge about ground handling operations. (12) Hours Airport Definition- History and Development of Airport, Principles of Airport Layout, Categories of Airport, Principles of Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts, Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Stop way and Clearway, Load Classification Number. (12) Hours III AIRPORTOPERATIONS: (12) Hours Lay out of Apron, Holding Apron, Terminal Apron, Aircraft Parking Configuration, Terminal Configuration, Terminal Configuration, Terminal Configuration, Runway Lighting System, Augnor Cound Support Equipments, Definition of Gate and Gate Capacity, Airport Congestion and Delay, Airport Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Haul and Short Haul Operations. Unit AIRPORTLIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Li		11854										
Course 1. Explain international procedures and practices governing the movement of air traffic Objecti 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 4. To gain knowledge on aircraft lighting and support services. 5. To impart knowledge about ground handling operations. (12) Hours Airport Definition- History and Development of Airport, Principles of Airport, Layout, Categories of Airport, Principles of Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit I RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts , Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Boy way and Clearway, Load Classification Number. Unit AIRPORTOPERATIONS: (12) Hours III Lay out of Apron, Holding Apron, Terminal Apron, Aircraft Parking Configuration, Terminal Configuration, Terminal Congestion and Delay, Airport Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Hau and Short Haul Operations. Unit AIRPORTLIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Ostruction Lighting System, Control Revence, Airport Recurse, Goods Prohibited fo Carriage by Air <t< th=""><th></th><th>Α</th><th></th><th></th><th></th><th></th></t<>		Α										
Objecti ves of air traffic 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 4. To gain more knowledge about ground handling operations. (12) Hours Airport Definition- History and Development of Airport, Principles of Airport Layout, Categories of Airport, Principles of Airport Management, Functions o Airport, Aerodrome Reference Point ,Meaning of Green Field Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts , Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Stop way and Clearway, Load Classification Number. (12) Hours III Lay out of Apron, Holding Apron, Terminal Apron, Aircraft Parking Configuration, Terminal Configuration, Terminal Passenger Flows, Ramp Safety, Ramp Ground Support Equipments, Definition of Gate and Gate Capacity, Airport Congestion and Delay, Airport Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Haul and Short Haul Operations. (12) Hours Iviat AIRPORTLICHTINGANDSUPPORTSERVICES: (12) Hours Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Runway Lighting Control Network, Air	Course	1. E	xplain international procedures and pract	ices g	overning the r	novement						
ves 2. To impart knowledge about air traffic systems. 3. To gain more knowledge on flight information systems. 4. To gain knowledge on aircraft lighting and support services. 5. To impart knowledge about ground handling operations. Unit I AIRPORTGENERAL: (12) Hours Airport Definition- History and Development of Airport, Principles of Airport Layout, Categories of Airport, Principles of Airport Management, Functions o Airport, Aerodrome Reference Point ,Meaning of Green Field Airport, Environmental Factors, Air Freedom Rights, Functions of - ICAO, IATA, DGCA AA Unit II RUNWAY&TAXIWAY: (12) Hours Runway Configuration, Runway Orientation, Runway Markings, Relationship between Aircraft and Airport, Aeroplane Parts , Aircraft Characteristics, Field Length Regulations, Weight Components, Taxiway Configuration, Taxiway Markings, Stop way and Clearway, Load Classification Number. Unit AIRPORTOPERATIONS: (12) Hours III Lay out of Apron, Holding Apron, Terminal Apron, Aircraft Parking Configuration, Terminal Configuration, Terminal Passenger Flows, Ramp Safety, Ramp Ground Support Equipments, Definition of Gate and Gate Capacity, Airport Congestion and Delay, Airport Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Haul and Short Haul Operations. IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport	Objecti	0	f air traffic									
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Slot, Sources of Airport Revenue, Airport Charges, Hub and Spoke Strategies, Long Haul and Short Haul Operations. Unit AIRPORTLIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS.		Equipments,	Definition of Gate and Gate Capacity, Airpo	ort Con	gestion and De	elay, Airport						
and Short Haul Operations. Unit AIRPORTLIGHTINGANDSUPPORTSERVICES: (12) Hours IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS.		Slot, Sources	s of Airport Revenue, Airport Charges, Hub	and Sp	oke Strategies	, Long Haul						
UnitAIRPORTLIGHTINGANDSUPPORTSERVICES:(12) HoursIVVisual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by AirUnit VAIRTRAFFICCONTROL&NAVIGATIONALAIDS: ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services- Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS.Total : 60 Hours		and Short Ha	ul Operations.									
 IV Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS. 	Unit	AIRPORT	LIGHTINGANDSUPPORTSERVICE	S:	(12) Hours						
 (PAPI), Approach Lighting System, Runway Lighting System, Taxiway Lighting System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS. 	IV	Visual App	proach Slope Indicator (VASI), Precis	ion A	pproach Pat	h Indicator						
System, Obstruction Lighting System, Aerodrome Beacon, Airport Lighting Airport Security System, Purpose of X-Ray Unit , Lounge Area Requirements Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB, VOR, DME , Marker Beacon and ILS.		(PAPI), Ap	proach Lighting System, Runway Light	ing Sy	/stem, Taxiwa	ay Lighting						
 Airport Security System, Purpose of X-Ray Unit, Lounge Area Requirements Precaution taken during Fuelling, Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services- Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation, Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. 		System, O	bstruction Lighting System, Aerodrom	ie Be	acon, Airpor	t Lighting,						
 Precaution taken during Fuelling , Airport Recue Services, Goods Prohibited for Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Ain Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS. 		Airport Sec	curity System, Purpose of X-Ray Unit	, Lou	nge Area Re	quirements,						
Carriage by Air Unit V AIRTRAFFICCONTROL&NAVIGATIONALAIDS: (12) Hours ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services- Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME , Marker Beacon and ILS. Total : 60 Hours		Precaution	taken during Fuelling, Airport Recue S	servic	es, Goods Pro	onibited for						
ATC- General, Need for Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services- Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation, Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours	11:4 X7	A IDTD A F	AII Elecontrol enavieational a	DC .	(1	1) Hanna						
 ATC- General, Need for All Hand Control, All Hand Control Network, All Traffic Control Aids, ATC and Surveillance Facilities, Air Traffic Services-Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation , Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB, VOR, DME , Marker Beacon and ILS. 	Unit v	AIRIKAF	FICCONTROL&NAVIGATIONALAT	DS: Troffi	() a Control Ne	12) Hours						
Objectives and its Features, Air Space Classes, ATS Routes, Controlled Airspace and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation, Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours		Traffic Con	atrol Aids ATC and Surveillance Eag	ilition	Air Troffic	Services						
and Uncontrolled Air Space, Terms Used in ATC Operations, Visual Flight Rules (VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation, Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours		Objectives	and its Features Air Space Classes AT	S Rou	tes Controlle	Airspace						
(VFR) and Instrument Flight Rules (IFR), Role of Meteorology in Aviation, Role of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours		and Uncont	rolled Air Space Terms Used in ATC O)nerati	ons Visual F	light Rules						
of Telecommunication in Aviation, Flight Plan and its Content, Briefing Centre and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours		(VFR) and	Instrument Flight Rules (IFR). Role of N	/eteor	ology in Avis	ation . Role						
and its functions, Brief Description and use of NDB,VOR,DME, Marker Beacon and ILS. Total : 60 Hours		of Telecom	munication in Aviation Flight Plan and	l its C	Content Brief	fing Centre						
and ILS. Total : 60 Hours		and its func	tions. Brief Description and use of NDP	S.VOR	DME . Marl	ker Beacon						
Total : 60 Hours		and ILS.	,	, . 51	, <u>, , , , , , , , , , , , , , , , , , </u>							
					Total	: 60 Hours						
					1.0001							

The Airport Business – Dogains R.
 Airport Operations – Ashford, Station & More. Cleared for takeoff behind the

scene of Air Travel – Barlay.

References

1. Airport Engineering- Norman Ashford & Paul H Wright.

2. Airport Planning & Management- Seth B Young & Alexander T.Wells

3. Airport Planning & Design – S.K.Khanna-M.G.Arora- S.S.Jain

4. AIP (India) Vol. I & II, "The English Book Store", 17-1, Connaught Place, New Delhi.

5. Michael S. Nolan., "Fundamentals of Air Traffic Control", Cengage Learning.

Course	Outcomes	Knowledge Level
CO-1	Describe the different components of airport and aircrafts.	K2
CO-2	Explain the airport runway and taxi way design.	K3
CO-3	The concepts of terminal services facilities are summarised.	K2
CO-4	Summarise the concepts of the airport lighting and support services.	K3
CO-5	Explain the inflight information systems and the rules of the air	K2
	traffic system.	

Mapping Course Outcome VS Programme Outcomes

CO	PO	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
	1					PO6				0		
CO1	2	2	2	2	2	3	2	2	2	2	2	2
CO2	2	2	2	2	2	2	2	1	2	2	2	2
CO3	2	2	2	2	2	2	2	2	2	2	3	2
CO4	2	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	3	2	2	2	2	2	2	2	3	2
W.AV	2. 2	2. 2	2	1. 8	2	2.2	2	1.6	2	1.8	2.4	2

S-Strong(3), M-Medium2, L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	1
CO2	3	2	2	2	2
CO3	2	2	2	3	2
CO4	3	2	2	2	2
CO5	2	2	2	3	2
W.AV	2.4	1.8	2.2	2.4	1.8

		V-Semester		-					
ElectiveII	Course	AIR CARGO	Т	Credits:4	Hours:4				
	Code:	MANAGEMENT							
	11854B	11854B							
Course	1. To ec	1. To equip the student with knowledge and skills used in Air Cargo							
Objectives	Mana	igement with systematic pr	oces	s involved ir	this process.				
	2. The a	um of this course is to fam	111ari	ze students v	with the				
	opera	itions and management of (differ	ent types of	cargo,				
	termi	nologies used in cargo ope	ratio	n, air cargo i	rates and				
	docui	mentations, packaging, IA	I A C	argo nandiin	g and				
Unit I	Introduction to	Lagistics:(12) Hours							
Umt I	Logistics- Meani	ng- Scope and Significanc	e- Fi	inctions of	Logistics System				
	– Transportation	Warehousing Order proc	vessir	ng Informat	ion handling and				
	procurement-	ogistics management	obied	tives- Cu	stomer service-				
	Expectation and	Fulfillment levels - Custo	mer	service for a	competitiveness -				
	Service phases a	und attributes - Value ad	ded	logistical se	rvices - Role of				
	Government in 1	ogistics - Warehousing, T	rans	portation an	d Packaging and				
	Inventory valuati	on.		L	00				
Unit II	Supply chain ma	nagement:(12) Hours							
	Supply chain m	anagement: Meaning –	Supp	ly chain lin	nkages- Role of				
	logistics in suppl	y chain -E business solution	on to	supply chain	n – Warehousing				
	:- Functions of	warehouse – Types - Site	e sele	ection – Lay	yout – Costing -				
	Material handling	g system - Material stora	ge sy	ystem - Vir	tual warehouse -				
	warehouse decis	tion models. Material han	aling	g systems:-	Role of material				
	storage storage	sucs - Material handling	g equ	npinent sys	orage methods				
	Inventory Mana	gement :- Meaning- Fu	- DC	ns - Reaso	ms for carrying				
	inventories - Inve	entory controls.			ins for carrying				
	Introduction to D	Ocumentary Credit, intern	ation	al sales con	tract, advantages				
	of documentary	credit, requirements of bu	iyer a	and seller, d	lifferent types of				
	documentary crea	lit	2		• 1				
Unit III	Transportation:								
	Transportation:-	Transportation infrastru	icture	e - Freigh	nt management,				
	Introduction and	functions of the freight for	ward	ers, Evolvin	g Role of Freight				
	Forwarder - Fac	tors influencing freight c	ost -	- Transporta	tion networks -				
	Route planning	- Containerization- Log	istica	I Packaging	g: Packaging as				
	utilization – Des	signs - Packaging materia	als -	Packaging	cost - Logistics				
	Information:- Ne	in distribution Channel	stics.	. Distributio	n and Logistics :				
	Channel member	Requirements of							
	sourcing – Third	Party Logistics (3PL) an	d Eo	urth Party L	original o				
	Services Contract		a 1'0	urur raity L					
Unit IV	Air Cargo Mana	 gement:(12) Hours							
	Introduction to C	argo, mode and means of	trans	portation. ai	r cargo operation				
	in India. Signific	ance of air transportation	in Lo	gistics: Util	ity created by air				
	transportation in	Logistics – Air Transpor	tatio	n as a mear	ns of conquering				

	time and space – Features and facilities offered by Air Cargo-ways- Factors influencing growth in Air Logistics- Air Suitability for different Cargo- Innovative schemes/facilities to popularize air cargo – Logistics in India- Share of airways in cargo movement in India and world wide conventions covering the movement of dangerous goods by air. Publication of air cargo tariffs, different types of air freight rates, types of other charges, Documentations: Custom clearing documents, accompany documents, shipper's letter of instruction, delivery order, transport documents, the airway bill of lading.
Unit V	Documentation for Air Cargo Transport:(12) Hours Shipper's Export Declaration, Certificate of Origin, Export license, Commercial Invoice, Certificate of origin, Bill of lading, Insurance certificate, Export Packing list, Import License, Consular invoice, Air way bills- format, boxes, contents, completion of Air waybill, mandatory information, Types of Air waybills (MAWB/HAWB), Inspection certification, dock receipt, warehouse receipt and destination control statement- Unit Load devices, types, aircraft loading procedure- Load Control, Air Cargo Loading Limitations, Cargo needing special attention in handling live animals. Introduction about Insurance Claim and Scope of Liability, principles and rules governing liability, the liability of freight forwarder, carriage of Goods by Sea, the Hague rules, Hamburg rules, Warsaw convention, Montreal convention

Total : 60 Hours

Text book

1. International Air Transport Association (IATA) – Cargo John G. Wensveen. (2007).

2. Air Transportation: a management Perspective, 6th Edition, Ashgate.

Clearwater Drive, 2000, Air Cargo Guide, Oak Brook, IL 60521

References

- 1. V.V.Sople Logistics Management Pearson.
- 2. Alan Rushton and John Oxley Hand book of Logistics and Distribution Kogen page.
- 3. Coyle etal The Management of Business Logistics, Thompson Learning.
- 4. Bowersox Logistical Management Mc Graw Hill, 2000.
- 5. Chi Chu,C.Leung, Van Hui & Cheung, 4th Party Cyber Logistics for Air Cargo, Spring,2004
- 6. (2014). Air Cargo Industry Master Operating Plan: A description of the air cargo industry transportation business process.

Course Out	comes	Knowledge Level
CO-1	Understand the basic concepts of Logistics Management	K1,K2
CO-2	Learn SCM, Warehouse functions and Inventory Management	K2,K2
CO-3	Understand the concept transportation	K1, K2
CO-4	Learn the importance of Air Cargo Transportation and the Functions	K1, K5
CO-5	Understand the different types of documentation for Air cargo transportation	K4,K5

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO	2	2	2	2	2	2	1	2	2	2	2	2
1												
CO	1	2	3	1	1	1	2	1	2	2	2	2
2												
CO	2	2	2	2	2	1	2	2	2	2	1	2
3												
CO	2	2	2	1	1	2	2	1	2	2	2	2
4												
CO	2	2	2	2	1	2	2	2	2	2	2	2
5												
W.A	1.8	2	2.2	1.	1.4	1.6	1.8	1.6	2	2	1.8	2
V				6								

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

С	PSO	PSO2	PSO3	PSO4	PSO5
0	1				
CO1	3	2	2	2	2
CO2	2	2	2	2	2
CO3	1	1	2	2	3
CO4	2	2	2	3	2
CO5	2	1	2	2	3
W.AV	2	1.	2	2.2	2.
		6			4

V-Semester											
ElectiveII	Course	AIRTRAVELMANAGEMENT	T	Credits:4	Hours:4						
	Code:										
	11854C										
Course	1. To enable	e the students to learn the modes of	tran	sportations							
Objectives	2. To learn	the different types of travel docume	ents r	required for a	air travel						
	3. To acquir	e knowledge in Travel information	mar	nual							
	4. To describe the development of Air transport and its planning										
.	5. To understand the concept of Air freight and distribution channel										
Unit I	TRANSPOR	TATION AND MARKET SEGM	ENI	ATION(12)) Hours						
	Air Transporta	tion Industry - Land Transportation	n Inc	ustry -Sea I	ransportation						
	Industry - Mu	In-modal Transportation - Market	ng a	nd Marketin	g mix -						
	Application of	Marketing Frinciples to Alfine	mana 7 An	agement-Air	The Busiliess						
Unit II		CUMENTS AND MADKETING	S AII	AIYSIS. DATECIES	(17) Hours						
	Passport – VI	SA's - Airlines Ticket or Author	izati	on - Health	Documents -						
	Michel Porter ³	s Five Factors and their Application	n to	Airline – Co	ost leadership						
	–Focus strateg	ies- Airline Business and Market S	Strate	egies – Com	mon Mistake-						
	Concept of P	roduct and Relation to Airline –	Flee	et and sche	dules Related						
	Product Featu	res-Customer Service and Con-	trolli	ng Product	Quality-Air						
	Freight Produc	t.		e							
Unit III	TRAVEL IN	FORMATION MANUAL(12) Ho	urs								
	Referring the	TIM - Passport Requirements:	Di	fferent Nati	ions - VISA						
	Requirements:	Different Nations - Tax, Curr	ency	v, Customs,	Immigration						
	requirements -	Referring the OAG - Aircraft Ty	pes a	and Codes -	World						
	Terminals -Ca	lculation of Flying time, Ground Ti	me a	ind Elapsed '	Time.						
Unit IV	DEVELOPM	ENT OF AIR TRANSPORT AN	D PL	ANNING(1	2) Hours						
	Introduction –	Growth of air transport, Airport	orga	nization and	associations,						
	Classification	of airports airfield components, A	ar tr	affic Zones	and approach						
	areas. Context	of Airport system planning – Dev	/elop	ment of Air	port Planning						
The 4 M	process – Ultin	nate consumers – Airline decision -	-01	CILANNEL	perations.						
	AIK FKEIGH	I MARKET AND DISTRIBUT	UN	CHANNEL Differentia	1.5(12) Hours						
	Structure of A	ir Freight Policy Distribution Cha	r anc nnol	Stratagies T	Travel Agency						
	Distribution S	vstem- Selling & Distribution Ch	anne	l in Air Fr	eight Market						
	Brand Buildir	g Strategies in Airline Industry-	Rel	lationshin M	Jarketing and						
	Components of	f Marketing Strategies	Rei		larketing and						
				Tot	al : 60 Hours						
				200							

- 1. Sethi, Praveen "Strategies for the Future of Travel and Tourism" Rajat Publication, 1999
- 2. Sethi, Praveen, "Handbook of Effective Travel and Tourism", Rajat Publication, 1999
- **3.** Bhatia, A.K., "International Tourism, Fundamentals and Practices", Sterlings Publishers, 1991 Krishan, K., Kamra, Chand Mohinder, "Basic of Tourism; Theroy Operation and Practice

References

- 1. 1. Airline Operations & Management Gerald N. Cook, Bruce Billig, Routledge, 2017
- 2. Airline Industry: The Official Guide to Airline Management Elnora Singleton Routledge, 2015.
- 3. Travel & Tourism Management Barkat A.M.A, Prentice Hall India Learning Pvt Ltd, 2015.
- 4. Kandari, O.P. Chandra Ashish, "Tourism Development; Principles and Practices", Shree Publishers, 2004
- 5. Gill, S. Pushpinder, "Tourism Planning and Management", Anmol Publications, 2003

Course Outc	omes	Knowledge
		Level
CO-1	Understand the modes of transportation	K 2
CO-2	Gain knowledge about maintenance documentations	K 2
CO-3	Apply the knowledge in production planning and control	K 3
CO-4	Make use of various maintenance control centres	K 3
CO-5	Analyse various Quality Assurance and Quality control	K 4

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO	2	2	2	2	2	1	3	2	2	2	1	1
1												
CO	2	2	1	2	1	2	2	1	1	1	2	2
2												
CO	2	2	2	2	1	1	2	1	2	2	2	1
3												
CO	2	1	2	2	1	2	2	2	2	2	2	2
4												
CO	2	3	2	2	2	1	2	2	1	3	2	2
5												
W.A	2	2	1.8	2	1.4	1.4	2.2	1.6	1.8	2	1.8	1.6
V												

S –Strong (3), M-Mediu2, L- Low (1) Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	2
CO2	2	2	2	1	2
CO3	1	1	2	1	2
CO4	2	2	1	2	1
CO5	1	2	2	2	2
W.AV	2	1.8	2	1.4	1.8

V-Semester										
ElectiveIII	Course	HELICOPTER THEORY	T	Credits:4	Hours:4					
	Code:									
	11855A									
Course	1. To fai	niliarize with the principals involved	d in	helicopters.						
Objectives	2. To Ur	iderstand aerodynamics of rotor blac	les.							
	3. To ed	ucate on controls in helicopter.	~ ~							
	4. To un	derstand the Transmission system o	fhe	licopter. 5.	Γο familiarize					
with the general concepts and fundamentals of the helicopter construction.										
Unit I	Helicopter Ae	erodynamics (12) Hours		(C1'O T	ol 1 (1 ·					
	Helicopter con	Disguration & its main parts, Dissyn	nme	try of lift, f	Blade flapping					
	and conning, Q	Corions effect, Translational III, Gr	oun	a effect and	auto rotation,					
	plich angle, 11	irust-conective pitch, Gyroscopic pr	eces		que.					
Unit II	Main Rotor S	vstem (12) Hours								
	Main rotor hea	ad and rotor blades, Blade alignment	t, tra	cking, static	c and dynamic					
	balancing, Bl	ade sweeping, Electronic balanci	ng,	Dampener	maintenance,					
	counterweight	adjustment, Autorotation adjustmen	nt.	1						
Unit III	Mast and Flig	ght Controls (12) Hours	4.0	Flight oon	tual arratanaa					
	Callective or	zer bar, Dampeners, Swasn pla	ie,	Flight con	Miyon boy					
	Gradient unit	Control boosts Maintenance and In	snec	Dell Crallks	, Mixer box,					
Unit IV	Tail rotor and	Transmission System (12) Hours	spec		n ngging					
Omerv	Tail rotor driv	ye shaft, tail gear box, rotor blades, r	nitch	n change me	chanism & its					
	operation. Eng	zine transmission couplings. Drive	shaf	t. Clutch m	echanism and					
	freewheeling	inits.								
Init V	Airframa and	Related Systems (17) Hours								
	Tubular consti	Liction Sheet metal construction Bo	ənde	ed construct	ion stress and					
	loads. Wheel	and skid gear. Visibility. Structura	al co	omponents a	and materials.					
	Fuselage main	tenance, Airframe systems, Special	purr	ose equipm	ent					
	U			T	tal · 60 Hours					
		Course Outcomes			Knowledge					
		Course Outcomes			Level					
CO-1	Understand the	e modes of transportation			K 2					
CO-2	Gain knowled	ge about maintenance documentation	ns		K 2					
CO-3	Apply the kno	wledge in production planning and c	cont	rol	K 3					
CO-4	Make use of v	arious maintenance control centres			K 3					
CO-5	Analyse variou	us Quality Assurance and Quality co	ntro	01	K 4					

CO	PO1	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
						PO6				0		
CO	3	2	2	2	2	2	3	2	2	2	2	2
CO	2	2	2	2	2	2	2	2	2	2	2	3
2												
CO 3	3	3	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	2	2	2	2	2	2	2	2	2	2
CO 5	2	2	3	2	2	2	2	2	2	2	3	2
W.A V	2.4	2.2	1.8	1. 8	2	2	2.2	1.6	1.8	1.8	2.2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	1
CO2	2	2	2	2	1
CO3	3	2	2	2	1
CO4	2	2	3	2	2
CO5	3	2	2	3	2
W.AV	2.4	1.8	2.2	2.4	1.4

		V-Semester								
Elective II	I Course		Τ	Credit	s:4	Hours:4				
	code:	AVIONICS								
	11855B									
Course	1. Introduct	ion of the basic avionics a	and th	ne need f	or c	ivil and military				
Objectives	aircraft									
	2. Provide i	nformation on the Avionic	cs Ai	chitectu	re ar	nd various				
	Database	S	1.0			1				
	3. lo get a	better understanding of the		terent av	ioni	es subsystems				
	4. Understa	how to oncept of navig	gatio	n system	s.					
IImit I	J. TO learn	1000000000000000000000000000000000000	ot sys							
Unit I	Need for avionic	INTRODUCTION TO AVIONICS:(12) Hours								
	avionics and w	weed for avionics in civil and military aircraft and space systems – integrated								
	technologies – In	troduction to digital com	nuter	and men	norie	absystems, design,				
Unit II	DIGITAL AVIC	NICS ARCHITECTUR	E:(1	2) Hour	s					
	Avionics system	architecture – data buses -	– MI	L-STD-1	553	B – ARINC – 420 –				
	ARINC – 629.									
Unit III	FLIGHT DECK	S AND COCKPITS: (12	2) Ho	ours						
	Control and disp	olay technologies: CRT,	LED	, LCD,	EL	and plasma panel -				
	Touch screen – I	Direct voice input (DVI) –	- Civ	il and M	ilita	ry Cockpits: MFDS,				
	HUD, MFK, HO	TAS.								
Unit IV	INTRODUCTIO	ON TO NAVIGATION S	SYST	EMS: (12)]	Hours				
	Radio navigation	– ADF, DME, VOR, LO	RAN	N, DECC	A, (DMEGA, ILS, MLS				
	– Inertial Naviga	ition Systems (INS) – In	iertia	l sensors	5, IP	S block diagram –				
	Satellite navigatio	on systems – GPS.								
Unit V	AIR DATA SYS	TEMS AND AUTO PIL	OT :	(12) Hou	IL					
	Air data quantitie	es – Altitude, Air speed,	Vert	ical spee	d, N	1ach Number, Total				
	air temperature,	Mach warning, Altitud	ach warning, Altitude warning – Auto pilot – Basic							
	principles, Longi	iudinai and lateral auto pl	101							
						Total : 60 Hours				

1. Aircraft instruments and avionics Max F. Henderson, Jeppesen

References

- 1. Albert Helfrick.D., "Principles of Avionics", Avionics Communications Inc., 2004
- 2. Collinson.R.P.G. "Introduction to Avionics", Chapman and Hall, 1996.
- 3. Middleton, D.H., Ed., "Avionics systems, Longman Scientific and Technical", Longman Group UK Ltd., England, 1989.

Pallet.E.H.J., "Aircraft Instruments and Integrated Systems", Pearsons, Indian edition 2011.

	Course Outcomes						
CO-1	Built Digital avionics architecture.	K2					
CO-2	Design Navigation system.	К3					
CO-3	Use data bus interfaces to integrate avionics systems.	K2					
CO-4	Develop an analysis of the performance of various cockpit display technologies.	K1					
CO-5	Design of autopilot for small aircraft	K2					

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO 1	2	2	2	2	2	2	2	2	3	2	2	3
CO 2	2	2	2	2	2	2	2	2	2	2	2	2
CO 3	3	2	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	2	2	2	2	2	2	2	2	2	2
CO 5	3	2	3	2	3	2	2	2	2	3	3	2
W.A V	2.2	2	2	1. 8	2.2	1.8	2	2	2.2	2.2	2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	2
CO2	3	3	2	2	3
CO3	2	2	2	2	2
CO4	2	2	2	2	2
CO5	2	3	2	1	3
W.AV	2.2	2.4	2.2	1.8	2.4

S-Strong(3),M-Medium2,L-Low(1)

	V-Semester										
Elective	III Course		Т	Credits:4	Hours:4						
	Code:	WIND TUNNEL									
	11855C	TECHNIQUE									
Course	1 To learn th	a Types of low speed Win	d turr	als and non	dimensional						
Objective	numbers wi	it its applications	a tum	iers and non	-unnensional						
Objective	2. To learn the	e Types of high-speed Wind	tunne	ls and with i	ts calibration						
	methods.	- The stringer shoes a ma									
	3. To Underst	and the Special Wind tunne	els and	with its cal	ibration						
	methods wi	th its design methods.									
	4. To describe	flow visualization technique	es and	data acquisit	ion methods.						
	5. To understa	and the functions of various i	Instrum	nents associa	ted with						
	wind tunne.										
Unit I	LOW SPEED WIN	D TUNNELS(12) Hours									
	Classification –nor	n-dimensional numbers-typ	es of	similarities	- Layout of						
	open circuit and cl	osed-circuit subsonic wind	l tunne	els – design	parameters-						
	energy ratio - HP c	alculations - Calibration me	ethods.								
Unit II	HIGH SPEED WI	ND TUNNELS(12) Hours			2						
	Blow down, in dra	ft and induction tunnel layo	outs ar	nd their desi	gn features -						
	and superational difficult	ies - sample design calculation	ieature	es of these	tunnels and						
Unit III	SPECIAL WIND	UNNEL TECHNIQUES (12) Ho		methods.						
	Types of Special W	ind Tunnels – Hypersonic, G	un and	l Shock Tuni	nels – Design						
	features and calibra	tion methods- Intake tests	– store	e carriage ai	nd separation						
	tests - wind tunnel n	nodel design for these tests.									
Unit IV	WIND TUNNEL I	NSTRUMENTATION(12)	Hours								
	Instrumentation ar	nd sensors required for	both	steady an	d unsteady						
	balances calibra	tion of measuring instrum	e comp	orror est	timation and						
	uncertainty analysis	aton of measuring mount	nems	- enor es	innation and						
Unit V	FLOW VISUALIZA	TION and NON-INTRUSIV	E FLO	W DIAGNOS	STICS						
	(12) Hours										
	Smoke and Tuft grid	techniques – Dye injection	specia	l techniques	– Oil flow						
	visualization and PS	P techniques - Optical metho	ods of	tlow visualiz	zation – PIV						
	and Laser Doppler t	ecnniques – Image processin	ig and	data deductio							
				101	al . ov nours						

Text Books:

- 1. NAL-UNI Lecture Series 12:" Experimental Aerodynamics", NAL SP 98 01 April 1998
- 2. Rae, W.H. and Pope, A., "Low Speed Wind Tunnel Testing", John Wiley Publication, 1984.

References

- 1. Bradsaw "Experimental Fluid Mechanics".
- 2. Lecture course on Advanced Flow diagnostic techniques 17-19 September 2008 NAL, Bangalore
- 3. Pope, A., and Goin, L., "High Speed Wind Tunnel Testing", John Wiley, 1985.
- 4. Rathakrishnan, E., "Instrumentation, Measurements, and Experiments in Fluids," CRC Press Taylor & Francis, 2007.
- 5. Short term course on Flow visualization techniques, NAL, 2009

Course O	utcomes	Knowledge Level
CO-1	Understand the uses of various types of tunnels and its losses	K 2
CO-2	Experiment with calibration of different types of high-speed tunnels	K 2
CO-3	Make use of various special tunnels and its applications	К 3
CO-4	Make use of various measurement techniques of instruments of wind tunnel	К 3
CO-5	Can use various techniques for aerodynamic data generation	K 4

Mapping Course Outcome VS Programme Outcomes

CO	PO1	PO2	PO3	PO4	PO5		PO	PO	PO9	PO1	P11	P12
						PO6	7	8		0		
CO 1	3	2	2	2	1	2	2	2	2	2	2	2
CO 2	2	3	2	1	2	2	2	1	2	1	2	2
CO 3	2	3	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	1	2	2	2	2	2	2	2	2	2
CO 5	3	2	3	2	2	2	1	2	2	2	3	2
W.A V	2.4	2.4	2	1. 8	1.8	2	1.8	1.8	2	1.8	2.2	2

S –Strong (3), M-Mediu2, L- Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	2	2	2	2	2
CO3	2	1	2	1	2
CO4	2	2	2	2	2
CO5	2	2	2	2	1
W.AV	2.2	1.8	2	2	1.8

V-Semester										
Core	Course	AERO ENGINE	Р	Credits:4	Hours:8					
	Code: 11856	LABORATORY								
Course	1. To describe various types of propulsion system with their merits and									
Objectives	challenges.									
-	2. To describe the performance and operating characteristics of Internal									
	Combu	stion Engines.								
	3. To des	cribe combustion process	phenomena	in IC engine	s.					
	4. To stud	dy testing on exhaust noz	zles and no	ise suppress	ors for a gas					
	turbine	e engine.			U					
	5. To be familiar with the working concept of inlets, nozzles and									
	combu	stion chamber with their a	pplications	in a propulsi	on system.					

PISTON ENGIEN LAB

- 1. Cylinder compression check.
- 2. Magneto installation and timing procedure.
- 3. Valve timing check for a four stroke engine.
- 4. Ground running of aero engine -procedure.

GAS TURBINE ENGINE LAB

- 1. General inspection procedure of turbine engine.
- 2. Turbine tip clearance adjustment procedure.
- 3. Removal and Fitment of burners.
- 4. Study on Thrust Augmentation devices for a gas turbine engine.
- 5. Study on exhaust nozzles and noise suppressors for a gas turbine engine.
- 6. Study of Thrust reversal mechanism of Turbojet engine and its effect on landing roll of an Aeroplane.
- 7. Study of Turbo prop engine configuration and its advantages / disadvantages over reciprocating engines.
- 8. Study of Jet engine efficiency at higher altitudes and its relative reduction in fuel consumption

	Total : 30 Hours
Course Outcomes	Knowledge
	Level
1. Establish the various types of internal combustion engines and their cycles of operation.	K3
2. Provide an understanding of the process of induction of air and fuel.	K4
3. Give an indication of the effect of different operating variables on engine performance.	K1
4. Able to acquire knowledge on fundamental concepts of low speed and high speed jets and experimental techniques pertains to measurements.	K1
5. Be able to describe the process of combustion and the parameters that affect combustion in jet engines.	K2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO 1	2	2	2	2	2	2	2	2	3	2	2	2
CO 2	2	3	3	2	2	1	2	3	2	2	1	2
CO 3	3	2	2	2	1	1	2	2	2	1	2	2
CO 4	2	2	2	2	2	2	1	2	3	2	1	3
CO 5	2	2	2	2	2	2	2	2	2	2	2	2
W.A V	2.2	2.2	2.2	2	1.8	1.6	1.8	2.2	2.4	1.8	1.6	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2
CO2	2	2	2	1	1
CO3	1	2	3	1	2
CO4	2	2	2	2	1
CO5	1	3	2	2	2
W.AV	1.6	2.2	2.2	1.6	1.6

		VI-Semester							
Core	Course	Г	1	Credits:	Hours				
	Code:	HANDLING AND SUPPORT EOUIPMENT			4	4			
	11861					1			
Course	1. To	understand the fundamentals of Aircraft Maintenance							
Objectiv	2. To	Acquire Knowledge on Landing Gear Maintenance							
es	3. To	Learn about the Aircraft Structural Repairs							
•5	4 To Understand the Ground Handling Procedures								
	5. To	Learn the Ground Equipments and functions	Ground Equipments and functions						
Unit I	GENERA				(12	2) Hours			
	Maintenan	e concept, inspection periodicity for types of aircraft	ike An	nι	ual Inspect	ion. 100			
	Hrs Inspe	tion. Inspection schedule and operational life of	comp	001	nents. Co	ntinuous			
	airworthing	ss maintenance Daily pre- flight and post flight insp	ection	ar	nd mainter	nance of			
	record								
Unit II	MAINTE	VANCEOFLANDINGGEARS			(12) Hours			
01111	Inspection	and maintenance of landing gear - struts wheel as	sembly	;	and brake	system			
	Landing g	ear retraction test and its procedure. Special inspec	tion af	, . te	r heavy h	andling			
	lightening	trike and turbulent weather	uon ui		i neuvy n	ianann <u>5</u> ,			
Unit III					(1)) Hours			
Unit III	AIKCKAI Dogio Drin	inles of sheet metal renair. Maintaining the original st	on oth	~ ~	12) datarmi) nours			
	rivet die	nd number of rivets for repair. Classification of structure	turol d	an		iation of			
	and dovice	a for sheet metal. Motel working mechines. Forming	a on or	an	liage, spec	t lovout			
	Divoting to	als Driving Divots Divot failure Domoving Divots S	g opera	D.	onoir Turc	i layoui,			
	Riveting it	ois, Driving Rivers, River landre, Removing Rivers, S			cpair Type	5 – SKIII h nonoin			
	Leading E	ge and Trailing edge renair	repair,	КI	io and we	o repair,			
II					(1)) 11			
Unit IV	GROUND	HANDLING	amant	۰f	(12) Aircraft) Hours			
	operation (- classification of file and extinguishing agents, wov	down	01	Alferant -	Towing			
		nu precautions taxing and taxing signals, Aliciali the		-	nomiai i	le uowii 1 aireanaft			
	procedure,	reacht Tie deur fer sterm condition presentions of	cis, se	a-	planes and	damaga			
		refait The down for storm condition -precautions ag	anist v	N II 2 2		damage.			
	Jacking air	rait & jacking precautions. Aircraft fueling operation a	ind pre	ca	utions.				
Unit V	CDUIND	FOUIPMENTS			(1)) Hours			
Unit V		EVUL IVIEN 13	atriaal		12) 12	Air stort			
	Description	and Maintenance of ground support equipments – Ele	ctrical	po	Swer unit,	Air start			
	unit, Hydra	incpowerunit, Preofingequipment, Airconditioningandr	leating	JU	n,Aircran	Jacks, 10			
	WDals.				Tatal	(0.11.0.m			
T (1 1					Total : C	by Hours			
1 D C C			TT.11 /	•••	02.2				
1. P.S.Seng	uttuvan – Fur	damentals of Airport Transport Management – McGra	W HIII 2	20	03 3.				
2. Aviation	n Maintenanc	e Management – Harry A. Kinnison – McGraw Hill							
ЪĆ									
References									
1	0.1 . 0	· K 0 D 1 1003							
I. Ai	rcraft basic S	cience – Kroes & Rardon – 1993							
2. Aircraft maintenance and repair – Kroes – Delp – 1993.									
3. Air	trame handb	ook – FAA –ACC 65 – 15A -1994							
4. Airtrame & Power plant mechanics – General Hand book AC 65-9A									
5. Air	port operatio	n by Noman J. Ashford-McGraw Hill 2003							

	Course Outcomes	Knowled ge Level
CO-1	Students understand the fundamentals of Aircraft Maintenance	K2
CO-2	Students Acquire Knowledge on Landing Gear Maintenance	K3
CO-3	Students Learn about the Aircraft Structural Repairs	K2
CO-4	Students Understand the Ground Handling Procedures.	K4
CO-5	Students Learn the Ground Equipments and functions	K2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO 1	3	3	2	2	1	2	2	2	1	1	1	3
CO 2	2	3	2	2	1	1	2	2	2	1	2	2
CO 3	2	2	2	2	2	1	1	1	2	2	2	2
CO 4	2	2	2	2	1	2	1	2	1	1	1	2
CO 5	2	2	2	2	2	1	2	2	2	2	2	3
W.A V	2.2	2.4	2	2	1.4	1.4	1.8	1.8	1.6	1.4	1.6	2.4

S –Strong (3), M-Medium 2, L- Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	1	2	2	2		
CO2	2	1	2	2	1		
CO3	2	1	2	2	1		
CO4	2	2	1	1	2		
CO5	3	2	2	2	2		
W.AV	2.4	1.4	1.8	1.8	1.6		
		VI Somostor					
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Com	C	v I-Semester	Т	Crediter	Hound		
Core	Course Code: 11862	AERO ENGINE MAINTENANCE	1	Credits:4	Hours:4		
Course Objectives	1. To make the procedure2. To acquire3. To learn the 4. To make set5. To beln the	he students to familiarize with the and practice. knowledge of basics of Aeronau concepts of Piston engines grou tudents aware of aircraft engine n e students to understand aircraft e	Airca tics and and ru nainte	raft engine m nd engine con in. mance and re	naintenance mponents. pair.		
Unit I	ENGINEANDCO	MPONENTS		o run up ene	(12) Hours		
	Concepts of mainted parts visual, magned common check on assembly and its sy	enance and overhaul- general ove etic, dimensional checks- things to parts like cylinder head, cylind ystem components.	rhaul becl ler ba	procedure- I hecked in a r urrel, piston,	nspection of engine eciprocating engine valves, crank case		
Unit II	PROPELLERS Inspection for pro only) Static and dy procedure for pro propellers.	peller mounts, blade damages a ynamic balancing of propellers- l opeller track and run out chec	nd oi Purpo ks. I	l leak. Varia se and proce Permissible	(12) Hours able pitch propeller adure – Purpose and repairs on wooden		
Unit III	RECIPROCATIN Importance of grou engine shut down a	GENGINEGROUNDRUN and run, ignition system check, accurd post stopping procedure	celera	tion and deco	(12) Hours eleration checks,		
Unit IV	GASTURBINATI Division of engine effects of foreign o repairs inspection an section	EENGINEMAINTENANCE cold section and hot section. Inspe bject damage, causes of blade dan d repair of turbine, turbine blades a	ction nage, nd its	of compresso combustion so replacement-	(12) Hours or section and blades, ection inspection and inspection of exhaust		
Unit V	ENGINERUNUP	CHECK- TURBINEENGINE			(12) Hours		
	Preparation of engin performance from va	ne run up, initial warm up and ful rious parameters viz, EPR, EGT, Fu	l thro el flov	ttle checks, a v RPM etc.	ssessment of engine		
					Total : 60 Hours		
	Course Outcomes						
CO-1	Use the maintenand	ce procedures for aircraft engines			K2		
CO-2	Identify the propell	er components and faults			K1		
CO-3	Configure reciproc	cating engine ground running and	shutti	ing down	К3		
CO-4	Use the maintenand	ce procedures for aircraft gas turb	ine er	ngines	K2		
CO-5	Configure gas turb	ine engine ground running and sh	utting	down	K2		

CO	PO1	PO2	PO3	PO4	PO5		PO7	PO8	PO9	PO1	P11	P12
						PO6				0		
CO 1	2	2	2	2	2	3	2	2	2	2	2	2
CO 2	2	2	2	2	2	2	2	2	2	2	2	2
CO 3	2	3	2	2	2	2	2	2	2	2	2	2
CO 4	2	2	2	2	2	2	2	2	2	2	2	2
CO 5	2	2	3	2	2	2	2	2	2	2	3	2
W.A V	2	2.2	2	1. 8	1.8	2.2	2	1.8	1.6	1.8	2.2	2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	2
CO2	2	2	2	2	2
CO3	2	2	2	1	2
CO4	3	2	2	2	2
CO5	2	2	3	1	2
W.AV	2.4	1.8	2.4	1.6	2

S–Strong(3),M-Medium2,L-Low(1)

	VI-Semester									
Core	Course	AIRCRAFT AND	P	Credits:4	Hours:8					
	Code: 11863	ENGINE		·						
		MAINTENANCE LAB-								
		PRACTICAL								
Course	1. To imp	art knowledge on basics of aircr	aft st	ructural desig	gn					
Objectives	2. Compu	te the buckling of plates, joints	and fi	ttings.						
	3. Unders	tanding the operation of instrum	nents t	that are empl	oyed in					
	aircraft	engines								
	4. Provide	e information on the maintenanc	e and	repair of bo	th piston and					
	jet engi	ne engines and procedures								
	5. Able to	perform reciprocating engine r	uns.							
AIRCRAFT LA	AB:									
1. Flaring and	l bending of alur	ninium pipe.								
2. Lap and Bu	itt Joint by riveti	ng.								
3. Simple airf	rame skin patch	repair.								
4. Sheet Meta	l forming.									
5. Under carri	iage wheel align	ment check.								
6. Study on C	omposite materi	al repair								
ENGINE LAB:										
1. Engine pro	peller track chec	k.								
2. Piston engi	ne Cleaning and	Visual Inspection								
3. Measureme	ent of piston ring	side clearance and end gap.								
4. Jet Engine	4. Jet Engine – Identification of components and defects									
5. Jet Engine	- Starting and G	round running procedure								

Total	:	30	Hours	5
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Course Outcomes	Knowledge Level
Learn the aircraft structures.	K1
For appropriate applications on the basis of characteristics, identify suitable materials.	K3
The safety rules and regulations should be incorporated.	
	K4
Do the quality control and calibration.	K5
Specify, interpret and evaluate data to make the best possible decision.	K5

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO	PO	PO9	PO1	P11	P12
							7	8		0		
CO 1	2	2	1	2	2	2	1	2	2	1	2	2
CO 2	2	2	2	1	2	2	2	1	2	2	2	3
CO 3	2	2	2	2	1	1	2	2	2	1	2	2
CO 4	2	2	2	1	2	2	1	1	2	2	2	2
CO 5	2	2	2	2	1	1	2	2	3	2	2	2
W.A V	2	2	1.8	2	1,6	1.6	1.6	1.6	2.2	1.6	2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2
CO2	2	2	3	2	2
CO3	2	2	2	1	1
CO4	3	2	2	2	2
CO5	2	1	3	2	1
W.AV	2.2	1.8	2.4	2	1.6
(1	

S–Strong(3),M-Medium2,L-Low(1)

		VI-Semester				
ElectiveIII	Course	INDUSTRIAL MANAGEMENT	T Credits:4	Hours:4		
	Code: 11864A					
Course Objectives1. Understanding the strategies to minimize operation cost while maintaining or improving quality2. Gaining skills in allocating resources effectively including labour, materi and equipment3. Develop the ability to set long term goals and demise plans to achieve the 						
Unit I	Intro du sti an t		mant Mint-han	(12) Hours		
	roles, manager planning, mod	nent by objectives, planning, strategiern trends in management.	c planning, ope	g management ration		
Unit II	II (12) Hours Principles, Characteristics and functions of organization, organizational structure. Authority and power. Co-ordination, manpower planning, recruitment and selection process. Training					
Unit III	Decision mak Supervision- r importance, pr	ing-principles and process. Motivat oles and duties of supervisor. Manag ocess, barriers to communication.	on importance erial communic	(12) Hours and methods. cation-		
Unit IV	Time manag correspondenc structure of pro	ement-techniques and ways, or e and planning. Management of reco oduction planning and control.	office manage ords. Productior	(12) Hours ement- office n management,		
Unit V	Inventory cor objectives, ma system. Work	ntrol, inventory management, inve n-machine system. Ergonomics prir study -purpose, techniques and procee	entory records, aciples in the d dures.	(12) Hours Ergonomics- lesign of work		
		Course Outcomes		Knowledge		
				Level		
CO-1	Improve the de issues	ecision-making skills to address comp	lex industrial	K2		
CO-2	Proficient in m quality	aintaining and improving product or	service	K3		
CO-3	Improve the at effective solution	oility to analyze complex industrial chors.	allenges and	K2		
CO-4	Develop the sk and organization	ills needed to lead and manage team,	department	K4		
CO-5	Improve contin staying update	nuous learning and to know the import s with evolving industrial trends and t	tance of echnologies.	K2		

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO	3	1	1	1	1	2	1	1	1	1	1	1
1												
CO	2	3	2	2	1	1	1	2	1	1	2	2
2												
CO	2	2	3	1	1	1	2	2	2	1	2	1
3												
CO	1	2	1	1	1	2	1	2	1	1	1	1
4												
CO	2	1	2	3	2	3	2	2	3	3	2	3
5												
W.A	2	1.8	1.8	1.	1.2	1.8	1.4	1.8	1.6	1.4	1.6	1.6
V				6								

S –Strong (3), M-Mediu2, L-Low (1)

Mapping Course Outcome VS Programme Specific Outcomes

СО	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	2	2	2	2	2
CO3	1	2	2	1	1
CO4	1	1	2	2	2
CO5	2	3	3	2	1
W.AV	1.8	2	2.2	2	1.6

S –Strong (3), M-Mediu2, L-Low (1)

		VI-Semester		
ElectiveIII	Course		T Credits:4	Hours:4
	Code:	AIRCRAFT MAINTENANCE		
	11864B	MANAGEMENT		
Course	1. To en	able the students to learn the importance of Aircraft I	Maintenance.	
Objectives	2. To lea	arn the different type of documents used during maint	enance.	
	3. To ac	quire knowledge in production planning and control		
	4. To de	scribe flow visualization techniques and data acquisit	tion methods.	
	5. To ur	derstand the functions of various instruments associa	ted with wind to	ınnel
Unit I	INTRODU	CTION(12) Hours		
	Goals and	Objectives of Maintenance -Types of Maintenance	e – Reliability,	Redesign
	Establishing	g Maintenance Programme- Introduction of Mair	tenance Steeri	ng Group -
	Process and	Task Oriented Maintenance - Maintenance Intervals	Defined.	
Unit II	Documenta	ition and Maintenance:(12) Hours	. 1.5	
	Types of L	ocumentation- Regulatory Documents - Airlines Ge	enerated Docum	ients - ATA
	Document S	Standards- Maintenance and Engineering Organizatio	n.	
Unit III	Production	Planning and Control (PPC):(12) Hours		
	Forecasting	- Production Planning & Control -Feedback for Plann	ing - Organizat	ion of PPC -
	Technical I	Publications- Functions of Technical Publication - Te	chnical Trainin	g – Training
T T •/ TT 7	tor Aviation	n Maintenance.		
Unit IV	MAINTEN	ANCE CONTROL CENTRE(12) Hours		. ,
	Kesponsibil	ittes- Line Maintenance Operations - Maintenance	Crew Skill Re	- quirement
II:4 V/	Hamper Ma	ASSUBANCE AND QUALITY CONTROL (12)	li aircrait).	
Unitv	QUALITY Dequirement	ASSURANCE AND QUALITY CONTROL(12) I	10Urs	Paliability
	Types of R	li foi Quanty Assurance - Quanty audit- 150 9000 Q	ent & Injury Re	norting
	Types of Ro	Safety - Maintenance Safety – Safety Rules- Acelu	Tota	1 • 60 Hours
			1014	
		Course Outcomes		Knowledge
<u>CO 1</u>	Indonator 1	Course Outcomes		Level
CO-1	Cain laws 1	ine importance of Aircraft Maintenance.		<u>K 2</u>
CO-2	Gain Know	eage about maintenance documentations		<u>K 2</u>
CO-3	Apply the k	nowledge in production planning and control		<u>K 3</u> <u>V 2</u>
CO-4	IVIAKE USE O	i various maintenance control centres		<u>K 3</u>
00-5	Analyse va	rious Quality Assurance and Quality control		K 4

CO	Р	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
	01									0		
CO1	3	1	1	1	1	2	1	1	1	1	1	1
CO2	2	3	2	2	1	1	1	2	1	1	2	2
CO3	2	2	3	1	1	1	2	2	2	1	2	1

CO4	1	2	1	1	1	2	1	2	1	1	1	1
CO5	2	1	2	3	2	3	2	2	3	3	2	3
W.AV	2	1.8	1.8	1. 6	1.2	1.8	1.4	1.8	1.6	1.4	1.6	1.6

S-Strong(3),M-Medium 2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	2	2	2	3
CO3	1	2	2	1	2
CO4	1	1	2	2	2
CO5	2	3	3	1	2
W.AV	1.8	2	2.2	1.6	2.2

S-Strong(3),M-Medium 2,L-Low(1)

		VI-Semester						
ElectiveIII	Course	HUMAN VALUES	Т	Credits:4	Hours:4			
	Code:	AND ETHICS						
6	<u>11864C</u>	· · · · · · · · · · · · · · · · · · ·			1 1 1 / 1			
Course	1. To help s	students distinguish betwee	n val	lues and skil	ls, and understand			
Objectives	the need,	basic guidelines, content an	a pro	cess of value	e education.			
	2. To help s	students initiate a process of (really want to be? in their	$\frac{1}{1}$	nd profession	iemserves to know			
	3 To help s	tudents understand the mea	ning	of happiness	and prosperity for			
	a human	being.	inng	or nuppiness	una prospenny for			
	4. To facilit	ate the students to understar	nd hai	rmony at all	the levels of			
	human liv	ving, and live accordingly		5				
	5. To facilit	ate the students in applyin	ig the	e understand	ing of harmony in			
	existence	in their profession and lead	an et	thical life				
Unit I	Course Introduct	tion - Need, Basic Guidelir	1es, C	Content and	Process for Value			
	Education							
	Understanding th	ne need, basic guidelines	s, co	ntent and p	process for Value			
	Education, Self-I	Exploration—what is it? -	its c	content and	process; 'Natural			
	Acceptance' and	Experiential Validation	n-a	s the mec	hanism for self-			
	exploration, Con	tinuous Happiness and Pi	rospe	rity- A lool	k at basic Human			
	Aspirations, Rigi	ts for fulfilment of aspir	nsnip	and Physic	cal Facilities- the			
	their correct price	rity Understanding Hanr	viness	s of every f	erity correctly A			
	critical appraisal	of the current scenario	Meth	od to fulfil	the above human			
	aspirations: under	standing and living in har	monv	at various l	evels.			
Unit II	Understanding H	armony in the Human Be	ing -	Harmony in	Myself			
	Understanding hu	man being as a co-existence	e of t	he sentient '	I' and the material			
	'Body', Understar	nding the needs of Self ('I	') an	d 'Body' - S	Sukh and Suvidha,			
	Understanding the	Body as an instrument of '	I' (I l	being the doe	er, seer and			
	enjoyer), Understa	inding the characteristics an	d acti	ivities of 'I' a	and harmony in 'I',			
	Understanding the	e harmony of I with the Bo	ody:	Sanyam and	Swasthya; correct			
	appraisal of Physi	cal needs, meaning of Pros	sperit	y in detail, F	Programs to ensure			
TT	Sanyam and Swas	tnya.	1.0	· · · · TT	• 11			
Unit III	Understanding F	larmony in the Family a	na s	ociety- Har	mony in Human-			
	Understanding ha	rmony in the Family- the	hasi	c unit of h	uman interaction			
	Understanding va	lues in human-human rel	lation	shin meani	ng of Nyaya and			
	program for its fi	nuerstanding values in numan-numan relationship; meaning of Nyaya and						
	(Samman) as the	Samman) as the foundational values of relationship Understanding the meaning						
	of Vishwas; Diff	erence between intention a	and c	competence,	Understanding the			
	meaning of Samn	eaning of Samman, Difference between respect and differentiation: the other						
	salient values in r	lient values in relationship, Understanding the harmony in the society (society						
	being an extension	on of family): Samadhan	, Sar	nridhi, Abh	ay, Sah-astitva as			
	comprehensive Hu	ıman Goals, Visualizing a u	niver	sal harmonic	ous order in society			
	Undivided Society	y (AkhandSamaj), Univers	al Or	der (Sarvabl	haumVyawastha)-			
	from family to wo	rld family!.						

Unit IV	Understanding Harmony in the Nature and Existence - Whole existence as
	Co-existence
	Understanding the harmony in the Nature, Interconnectedness and mutual
	fulfilment among the four orders of nature- recyclability and self-regulation in
	interacting units in all nervesive space. Helistic percention of hermony at all
	levels of existence
Init V	Implications of the above Holistic Understanding of Harmony on
	Professional Ethics
	Natural acceptance of human values. Definitiveness of Ethical Human Conduct.
	Basis for Humanistic Education, Humanistic Constitution and Humanistic
	Universal Order, Competence in Professional Ethics: a) Ability to utilize the
	professional competence for augmenting universal human order, b) Ability to
	identify the scope and characteristics of people-friendly and eco-friendly
	production systems, technologies and management models, Case studies of typical
	holistic technologies, management models and production systems, Strategy for
	transition from the present state to Universal Human Order: a) At the level of
	individual: as socially and ecologically responsible engineers, technologists and
	organizations
References	organizations.
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Values	s), Eastern Economy Edition, Prentice Hall of India Ltd.
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	Course Outcomes	Knowledge Level
CO-1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	K 2
CO-2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	K 2
CO-3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K 2
CO-4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	K 2
CO-5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	К 2

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	P11	P12
										0		
CO 1	3	2	2	2	2	3	2	2	2	2	2	2
	-		2	2	-	-	-	2	-	1		2
	2	2	2	2	2	2	2	2	2		2	3
2												
CO 3	2	3	2	2	2	2	2	2	2	2	2	2
CO	3	2	2	2	2	2	2	2	2	2	2	2
4	-			-	-	-	-		-	-	2	-
CO	2	2	2	2	2	2	2	2	2	2	3	2
5												
W.A V	2.4	2.2	2	1. 8	1.8	2.2	1.8	2	1.8	1.8	2.2	2.2

S-Strong(3),M-Medium2,L-Low(1)

Mapping Course Outcome VS Programme Specific Outcomes

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	2	2	3	2	2
CO3	2	2	2	2	1
CO4	3	2	2	2	2
CO5	2	2	2	2	1
W.AV	2.4	1.8	2.2	2.2	1.6

S-Strong(3),M-Medium2,L-Low(1)

VI Comostor			
vi-Semester			
11865A/11865B - Project/ Dissertation	PR/ D	Credits:8	Hours:10
Project/ Dissertation			

UG Programme

Passing minimum

A candidate shall be declared to have passed in each course if he/she secures not less than 40% marks in the End Semester Examinations and 40% marks in the Internal Assessment and not less than 40% in the aggregate, taking Continuous assessment and End Semester Examinations marks together.

The passing minimum for CIA shall be 40% out of 25 marks (i.e.10 marks) in Theory/ Practical Examinations.

The passing minimum for University Examinations shall be 40% out of 75 marks (i.e. 30 marks) for Theory /Practical papers.

The candidates not obtain 40% in the Internal Assessment are permitted to improve their Internal Assessment marks in the subsequent semesters (2 chances will be given) by writing the CIA tests or by submitting assignments.

 \triangleright Candidates, who have secured the pass marks in the End-Semester Examination and in the CIA but failed to secure the aggregate minimum pass mark (E.S.E + C I.A), are permitted to improve their Internal Assessment mark in the following semester and/or in University examinations.

A candidate shall be declared to have passed in the Dissertation/Project report/Internship report if he/she gets not less than 40% marks in the Internal Assessment and End Semester Examinations and not less than 40% in the aggregate, taking Continuous assessment and End Semester Examinations marks together.

A candidate who gets less than 40% in the Dissertation / Internship/ Project Report must resubmit the thesis. Such candidates need to take again the Viva-Voce on the resubmitted report/thesis.

18.2 Grading of the Courses

The following table gives the marks, Grade points, Letter Grades, and classifications meant to indicate the overall academic performance of the candidate.

ANGE OF MARKS	GRADE POINTS	LETTER GRADE	SCRIPTION
- 100	9.0 - 10.0	0	tstanding
- 89	8.0 - 8.9	D+	cellent
- 79	7.5 – 7.9	D	tinction
- 74	7.0 - 7.4	A+	y Good
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Conversion of Marks to Grade Points and Letter Grade (Performance in Course / Paper)

- 69	6.0 - 6.9	Α	od
- 59	5.0 - 5.9	В	erage
- 49	4.0 - 4.9	С	isfactory
- 39	0.0	U	appear
SENT	0.0	AAA	SENT

- a) Successful candidates passing the examinations and earning a GPA between 9.0 and 10.0 and marks from 90 100 shall be declared to have Outstanding (O).
- b) Successful candidates passing the examinations and earning GPA between 8.0 and
 8.9 and marks from 80 89 shall be declared to have Excellent (D+).
- c) Successful candidates passing the examinations and earning GPA between 7.5 7.9 and marks from 75 79 shall be declared to have Distinction (D).
- d) Successful candidates passing the examinations and earning GPA between 7.0 7.4 and marks from 70 74 shall be declared to have Very Good (A+).
- e) Successful candidates passing the examinations and earning GPA between 6.0 6.9 and marks from 60 69 shall be declared to have Good (A).
- f) Successful candidates passing the examinations and earning GPA between 5.0 5.9 and marks from 50 59 shall be declared to have Average (B).
- g) Successful candidates passing the examinations and earning GPA between 4.0 4.9 and marks from 40 49 shall be declared to have Satisfactory (C).
- h) Candidates earning GPA between 0.0 and marks from 00 39 shall be declared to have Re-appear (U).

i) Absence from an examination shall not be taken as an attempt.

From the second semester onwards the total performance within a semester and

continuous performance starting from the first semester are indicated respectively

by Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA).

These two are calculated by the following formulate

GRADE POINT AVERAGE (GPA) = $\Sigma_i C_i G_i / \Sigma_i C_i$

GPA = Sum of the multiplication of grade points by the credits of the courses

Sum of the credits of the courses in a Semester

18.3 Classification of the final result

The final result of the candidate shall be based only on the CGPA earned by the candidate.

a) Successful candidates passing the examinations and earning CGPA between 9.5 and 10.0 shall be given Letter Grade (O+) and those who earned CGPA between 9.0 and 9.4 shall be given Letter Grade (O) and declared to have First Class –Exemplary*.

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- b) Successful candidates passing the examinations and earning CGPA between 7.5 and 7.9 shall be given Letter Grade (D), those who earned CGPA between 8.0 and 8.4 shall be given Letter Grade (D+) and those who earned CGPA between 8.5 and 8.9 shall be given Letter Grade (D++) and declared to have First Class with Distinction*.
- c) Successful candidates passing the examinations and earning CGPA between 6.0 and 6.4 shall be given Letter Grade (A), those who earned CGPA between 6.5 and 6.9 shall be given Letter Grade (A+), and those who earned CGPA between 7.0 and 7.4 shall be given Letter Grade (A++) and declared to have First Class.
- d) Successful candidates passing the examinations and earning CGPA between 5.0 and 5.4 shall be given Letter Grade (B) and those who earned CGPA between 5.5 and 5.9 shall be given Letter Grade (B+) and declared to have passed in the Second Class.
- e) Successful candidates passing the examinations and earning CGPA between 4.0 and 4.4 shall be given Letter Grade (C) and those who earned CGPA between 4.5 and 4.9 shall be given Letter Grade (C+) and declared to have passed in the Third Class.
 - f) Absence from an examination shall not be taken as an attempt.

CGPA	Grade	Classification of Final Result
9.5 – 10.0 9.0 and above but below 9.5	0+ 0	First Class – Exemplary*
 8.5 and above but below 9.0 8.0 and above but below 8.5 7.5 and above but below 8.0 	D++ D+ D	First Class with Distinction*
 7.0 and above but below 7.5 6.5 and above but below 7.0 6.0 and above but below 6.5 	A++ A+ A	First Class
5.5 and above but below 6.0 5.0 and above but below 5.5	B+ B	Second Class
4.5 and above but below 5.04.0 and above but below 4.5	C+ C	Third Class
0.0 and above but below 4.0	U	Re-appear

Final Result

CUMULATIVE GRADE POINT AVERAGE (CGPA) = $\Sigma_n \Sigma_i C_{ni}$ $G_{ni} / \Sigma_n \Sigma_i C_{ni}$

CGPA = <u>Sum of the multiplication of grade points by the credits of the entire programme</u> Sum of the credits of the course for the entire Programme

Where '**Ci**' is the Credit earned for Course i in any semester; '**Gi**' is the Grade Point obtained by the student for Course <u>i and 'n' refers to the semester</u> in which such courses were credited.

CGPA (Cumulative Grade Point Average) = Average Grade Point of all the Courses passed starting from the first semester to the current semester.

Note: * The candidates who have passed in the first appearance and within the prescribed Semesters of the UG Programme (Major, Allied, and Elective courses alone) are eligible for this classification.