

Tel.No.: 2419700/2419567
Fax: 0821-2419363/2419301

Email: registrar@uni-mysore.ac.in
www.uni-mysore.ac.in



Vishwavidyanilaya Karyasoudha
Crawford Hall, Mysore 570 005

_____ (Re-accredited by NAAC at "A" Grade with a CGPA of 3.47) _____
_____ (NIRF-2020 Ranked 27 in University Category & 47 in Overall Category) _____

No.: PMEB/AC10/759/2019-20 | 8

Date: 04-08-2020.

NOTIFICATION

Sub: Introduction of **B.Sc.(Aviation)** course under Specialized programme from the academic year 2019-20- Reg.

Ref: 1. Decision of the BOS Meeting held on 21-11-2019.

2. Decision of the Academic Council meeting held on 18-06-2020.

The Board of Studies in **B.Sc. Aviation and BBA Aviation, Hospitality and Tourism(UG)** at its meeting held on 21.11.2019 has recommended to introduce **B.Sc.(Aviation)** course in University of Mysore under specialized/specified program. The Regulations, Syllabus and Scheme of Examination was approved from the academic year 2019-20.

The Academic Council has also approved the above said proposals at its meeting held on 18-06-2020 and the same is hereby notified.

The Regulations, Syllabus of **B.Sc.(Aviation)** course is uploaded in University website. The contents may be downloaded from the University website www.uni-mysore.ac.in.

MSSB
5/8/2020
REGISTRAR
University of Mysore
MYSURU - 570 005

To:

1. The Registrar(Evaluation), University of Mysore, Mysuru.
2. The Dean, Faculty of Science & Technology, DOS in Psychology, MGM.
3. Prof. D. Anand , Chairperson, BOS in B.Sc. Aviation and BBA Aviation, Hospitality and Tourism(UG), DoS in Business Administration, MGM.
4. The President, Maharaja Aviation Academy, K.R.Mills, Belavadi, Srirangapatna Tq. Mandya Dist.
5. The Deputy Registrar/ Asst. Registrar/ Superintendent, Examination Branch, UOM, Mysuru.
6. The Special Officer to Hon'ble Vice-Chancellor, University of Mysore, Mysuru.
7. The PA to Vice-Chancellor/Registrar/Registrar(Evaluation), University of Mysore, Mysuru.
8. Office Copy.

UNIVERSITY OF MYSORE



Proposed Regulation for Six Semester
Programme of B.Sc (Aviation)
Regulations – 2019

1.0 NAME OF THE PROGRAMME AND DURATION OF THE COURSE:

B.Sc (Aviation) (Six Semesters)

NOTE :

1. These regulations are applicable to students taking admission to First semester and Lateral Entry to Third Semester B.Sc (Aviation) from Academic Year 2019 –20
2. Each semester shall extend over a minimum period of SIXTEEN weeks teaching duration.

2.0 ELIGIBILITY FOR ADMISSION

A candidate who has passed the two year pre-university examination conducted by the pre- university board of education in the State of Karnataka or any other examination considered equivalent thereto by the University of Mysore, Mysore with Physics & Maths and Pursuing CPL/CHPL, Flight Dispatcher, AME from Director General of Civil Aviation (DGCA) Govt. of India or any International Civil Aviation Organisation approved Country is eligible for admission to the First Semester of the Programme.

Lateral Entry: Third Semester

A candidate who has passed the two year pre-university examination conducted by the pre- university board of education in the State of Karnataka or any other examination considered equivalent thereto by the University of Mysore, Mysore and completed his/her CPL/CHPL, Flight Dispatcher, AME from Director General of Civil Aviation (DGCA) Govt. of India or any International Civil Aviation Organisation approved Country is eligible for admission to the Third Semester of the Programme.

Credit Transfer

In case of a Student having been enrolled in a BSc. Program at any other Program or University as recognized by the Dept. of Higher Education, Karnataka, (in case of Universities in Karnataka) or the University Grants Commission (in case of other Universities), prior to joining the University of Mysore, he / she may choose to transfer

upto a maximum of 35% of the required credits, and shall be exempted from the requirement equaling the same number of credits in this Program.

1. Notification for admission into B.Sc(Aviation) programme shall be advertised about three months prior to the commencement of the programme.
2. Candidates seeking for admission shall have to submit all documents for verification at the time of admission.
3. The list of the admitted candidates, including foreign nationals shall be submitted by the approved centres to the UOM, Mysore, for approval with the roll number allotted to them for their enrollment in B.Sc(Aviation) programme.

3.0 ADMISSIONPROCEDURE

3.1 At the time of admission all documents in original in support of the claims made in the application have to be reproduced.

3.2 All decisions taken by the University of Mysore, Mysore with regard to the course and any other matter not mentioned here are final and the candidates are bound to abide by them.

4.0 SCHEME OFINSTRUCTIONS:

4.1 Every course offered may have three components: Lecture (L), Tutorial (T) and Practical (P). Tutorial session consists of participatory discussion / self study / desk work / brief seminar presentations by students and such other novelmethods.

4.2 One hour of lecture is equal to one credit and two hours of tutorials / practicals is equal to one credit.

5.0 SCHEME OF EXAMINATION ANDEVALUATION:

There shall be University Examination at the end of each semester for maximum marks of 80 marks for Theory examination and the Continues Assessment will be for 20 marks.

In case of courses less than 3 credits, C3 (Semester End Examination) will be for 40 marks and Continues Assessment is for 10 marks.

All courses of this program except courses that are common to all other graduate programme of the University of Mysore shall be set/valued/reviewed by BoE of B.Sc (Aviation), for a maximum of 80 marks. The pattern of question paper will be as follows:

Part- A: Answer any two out offour questions.	2*15=30
Part- B : Answer any three out offive questions.	3*10=30
Part- C : Answer any four out ofsixquestions.	4*05= <u>20</u>
TOTAL	<u>80</u>

Evaluation of each course is divided into Continuous Assessment (CA) and C3, (Semester End Examination) with marks allocated as shown in the table.

Scheme of Assessment:

Course Type	C1	C2 (Including ABFR)	C3		Total
	Marks	Marks	Marks	Duration (Hrs)	
DSC	10	10	80	3	100
DSE	10	10	80	3	100
SEC	10	10	80	3	100
Project Work	30	30	40	3	100
AECC	10	10	80	3	100

Continues Assessment will be carried out in two stages: One, after eight weeks of instructions designated as C1, C2 is the preparation of Activity Based Field Report. In each semester, students shall carry out field/factory visits and collect data (primary/secondary) on an activity pertaining to the subject in consultation with the concerned teacher called Activity Based Field Report (ABFR). The ABFR shall be submitted before the sixteenth week of the semester to the concerned teacher, who in turn will evaluate and submit the marks list along with C1 and C2 marks. The end of term examination designated as C3.

Continuous assessment may be through Activity Based Field Report, announced and surprise tests, term papers / seminars / quizzes / case discussions, viva, and practical.

The breakup of marks will be as follows:

- a. C1(Covering the first half of the syllabus) - 10Marks
- b. C2(Covering the Second half of the syllabus&ABFR) - 10Marks
- c. C3 (Covering Entire Syllabus) - 80Marks

Total

=100Mark

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In case of Lateral Entry of the programme students will not be exempted from credits requirement of Ist & IInd semester, so students will be required to appear for the exams along with the third semester.

Evaluation of Project Report

Evaluation of Project Report is for 100 marks divided into three components.

- | | |
|--|-----------|
| a) C1 (Finalization & Preparation of Synopsis) | -30 Marks |
| b) C2 (Submission of detailed work diary) | -30 Marks |
| c) C3 (Final Project Report) | -40 Marks |

6.0 ATTENDANCE:

6.1 Only those Students, who have at least 75% attendance in a course, shall be permitted to take C3 examination for that course.

6.2 A candidate who fails to satisfy the requirement of attendance in a course shall re-join the same course by obtaining prior permission from University.

7.0 MEDIUM OF INSTRUCTION:

The medium of instruction shall be English. However, a candidate may write examination in Kannada.

8.0 BOARD OF EXAMINERS:

8.1 There shall be a Board of Examiners for scrutinizing and approving the question papers and scheme of valuation constituted by the University.

8.2 There will be single valuation for all the papers.

8.3 Question paper pattern will be

- | | |
|---|----------|
| Part- A: Answer any two out of four questions. | 2*15= 30 |
| Part- B : Answer any three out of five questions. | 3*10= 30 |
| Part- C : Answer any four out of six questions. | 4*05=20 |

Total

80

9.0 PASSING CRITERIA:

9.1 A student is considered to have passed the course, only on securing a minimum of 40% from C1, C2 and C3 put together.

9.2 A student can take C3 exam irrespective of the marks secured in C1 and C2 of a particular course.

9.3 In case a student secures less than 30% in C3 or absents for C3, the student is said to have not completed the course. The student shall complete the course by re-appearing only for C3 component of that course when University conducts the examination. The student carries the marks already awarded in C1 and C2.

9.4 On successful completion of UG program, a final grade card consisting of grades of all courses successfully completed by the student will be issued by the University.

10.0 ANY OTHER ISSUE NOT ENVISAGED ABOVE SHALL BE RESOLVED BY THE VICE CHANCELLOR IN CONSULTATION WITH THE APPROPRIATE BODIES OF THE UNIVERSITY WHICH SHALL BE FINAL AND BINDING.

11.0 WHEREVER THE REGULATION IS SILENT, THE PROVISIONS OF UNIVERSITY REGULATIONS SHALL BE APPLICABLE.

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B.Sc (AVIATION) COURSE STRUCTURE

DETAILS OF B.Sc (AVIATION) SUBJECTS AND SYLLABUS:

Sl.No.	Course Code	Subject	Credits	L:T:P
I SEMESTER				
1	AECC	Kannada/MIL – 1	3	2:1: 0
2	AECC	English – 1	3	2:1: 0
3	DSC – 1	Mechanics	5	4:1: 0
4	DSC – 2	Applied Mathematics	4	3:1: 0
5	DSC – 3	Fundamental of Computer Application	5	3:0: 2
6	AECC	Environmental Studies	3	2:1: 0
TOTAL			23	23
II SEMESTER				
1	AECC	Kannada/MIL – 2	3	2:1: 0
2	AECC	English – 2	3	2:1: 0
3	DSC – 4	Fundamental of Aviation	4	3:1: 0
4	DSC – 5	Basics Of Electronics	4	3:1: 0
5	DSC – 6	Financial Accounting	5	4:1: 0
6	AECC	Constitution of India	3	2:1: 0
TOTAL			22	22
III SEMESTER				
1	AECC	Kannada/MIL – 3	3	2:1: 0
2	AECC	English – 3	3	1:2: 0
3	DSC – 7	Quantitative Aptitude	5	4:1: 0
4	DSC – 8	Introduction To Aviation Industry	5	4:1: 0
5	DSC – 9	Airport Operations	5	4:1: 0
6	AECC	Disaster Management	2	2:0: 0
TOTAL			23	23

IV SEMESTER				
1	AECC	Kannada/MIL - 4	3	2:1:0
2	AECC	English- 4	3	1:2:0
3	DSC - 10	Radio Navigational Science-I	5	3:1:1
4	DSC - 11	Aircraft System & Electricity	5	4:1:0
5	DSC - 12	Air Navigational Science-I	5	3:1:1
6	DSE - 1	AirCraftSimulator Training	5	2:0:3
TOTAL			26	26
V SEMESTER				
1	DSC - 13	Radio Navigational Science-II	5	3:1:1
2	DSC - 14	Air Navigational Science-II	5	3:1:1
3	DSC - 15	Instrument Flying	5	3:1:1
4	DSC - 16	Air Regulation	5	3:1:1
5	DSC - 17	Basics Of Technical Flight	5	4:1:0
TOTAL			25	25
VI SEMESTER				
1	DSC - 18	Air Metrological Science	5	4:1:0
2	DSE-2	Project Work & Logs of Simmulator/Actual Flying.		

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I- SEMESTER

DSC – I Mechanics

L: T: P 4:1:0

6 Hours per week

Unit I: BASICS & STATICS OF PARTICLES:

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

Unit II: EQUILIBRIUM OF RIGID BODIES

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

Unit III: PROPERTIES OF SURFACES AND SOLIDS

Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, - Angle section, Hollow section by using standard formula – second and product moments of plan area – Rectangle, triangle, circle from integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Derivation of mass moment of inertia for rectangular section, prism, sphere from first principle – Relation to area moments of inertia.

Unit IV: DYNAMICS OF PARTICLES

Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion – Newton's law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies

Unit V: FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS

Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt friction. Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion.

I- SEMESTER

DSC-2 Applied Mathematics

L: T: P 3:1:0

5 Hours per week

Unit I: Mathematical Logic:

Open sentences—compound open sentences—quantifiers—Truth sets—connective involving quantifiers— methods of proof—methods of disproof.

Unit-II. Relations and Functions:

Relations on a set—equivalence relations—equivalence classes—partition of a set. Functions (mappings)— set theoretic properties of functions—existence of inverse of a function and properties of inverse functions— composition of functions—associativity— inverse of composition.

Unit-III. Differential Calculus:

Successive differentiation—nth derivatives of the functions: $(ax + b)^m$, $\log(ax + b)$, e^{ax} , $\sin(ax + b)$, $\cos(ax + b)$, $e^{ax} \sin(bx + c)$, $e^{ax} \cos(bx + c)$ —Leibnitz theorem and its applications.

Partial differentiation—first and higher derivatives—Differentiation of homogeneous functions—Euler's theorem—Total derivative and total differential—Differentiation of implicit functions and composite functions— Jacobians.

Unit-IV. Integral Calculus:

Reduction formulas for $\int \sin x \, dx$, $\int \cos x \, dx$, $\int \tan x \, dx$, $\int \cot x \, dx$, $\int \sec x \, dx$, $\int \operatorname{cosec} x \, dx$, $\int \sin x \cos x \, dx$.

Differentiation under the integral sign.

Unit-V. Analytic Geometry of Three-Dimensions:

Relation between Cartesian coordinates and position vectors—Distance and Division formulas—Direction cosines of a line (as components of unit vector)—Direction ratios— Angle between two lines—area of a triangle and volume of a tetrahedron with given vertices.
Equation of a line in different forms—Perpendicular from a point onto a line. Equation of a plane in different forms—Perpendicular from a point onto a plane. Angle between two planes—Line of intersection of two planes—Plane coaxial with given planes—Planes bisecting the angle between two planes—Angle between a line and a plane— Coplanarity of two lines— Shortest distance between two lines. Equation of the sphere in general and standard forms—equation of a sphere with given ends of a diameter.

I- SEMESTER

DSC-3 Fundamental of Computer Application

L: T: P 3:0:2

5 Hours per week

Unit 1: Introduction to Computer – Uses of Computers in Business – Overview of Technology and organisation – Computer Hardware Types, Parts and their functions – software : System Software Application Software.

Unit 2: Office productivity Tools Word Processing – Electronics Spreadsheets - Business Project Management and Presentation Tools.

Unit 3: Data Processing – Techniques of data processing: Online, Batch mode real time Processing Software tools and applicability to organisation setup.

Unit 4: Database Structure – Types and Comparison – Data access control software – Methods and structure of Data Base Management – Data storage and retrieval current and most frequently used Reporting systems, Management Systems and Languages.

Unit 5: Telecommunications and Networking – Network Design LAN / WAN / SAN – Networking structure needed for a Business Organisation – Data Transmission methods – Internet Email, Chatting and video conferencing Web browsers, Search engines.

II- SEMESTER

DSC-4Fundamental of Aviation

L: T: P 3:1:0

5 Hours per week

UNIT 1: Introduction:

Airline Industry – Scope – Types – Scheduled and Non Scheduled Flights – Air Cargo Transport – Economic and Social impact – Regulatory Bodies – Key Performance indicators

UNIT 2: Characteristics:

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Airline Profitability – Main Industry - Characteristics of Passenger airlines – Service Industry – Characteristics

UNIT 3: Organisational Structure:

Airline Alliances – Development of commercial airlines – Deregulation – Impact of Deregulated Airline industry – Organizational Structure – Types of Airline Personnel – Flight crew and Cabin Crew – Training – OrganizationalCulture

UNIT 4: Airports and its services:

Airports – Personnel – Processing Passengers and Freight – Airport Security – Air Navigation Services – Air Traffic Control – Airplanes – Manufacturers – Types of Aircraft

UNIT 5: Safety and security:

Air Safety and Security – Role of Regulatory Agencies – Airside Safety – Culture of Safety – Issues in Air safety – Accident and Incident Investigation – Future of Airline Industry

II- SEMESTER

DSC-5 Basics of Electronics

L: T: P 3:1:0

5 Hours per week

UNIT 1: Brief history of the development of electronics i.e., vacuum tube and solid state devices

UNIT 2: Voltage and current sources Concept of voltage and current sources, constant voltage and current sources and their graphical representation. Conversion of voltage source into current source and viceversa.

UNIT 3: Semi-Conductor Physics Atomic structure, crystalline structure, covalent bonds, generation and recombination, semi-conductor materials, intrinsic semiconductors, effect of temperature on conductivity in germanium and silicon. Extrinsic semi-conductors, doping, P & N type semi-conductors, majority and minority carriers, effect of temperature. P-N junction, drift and diffusion currents, depletion layer, potential barrier, effect of forward and reverse biasing of a P-N junction. Energy band diagrams, Breakdown mechanisms.

UNIT 4: Semi-Conductor Diodes Crystal diode, its working, characteristics, static and dynamic resistance Use of diode as half wave and full wave (center, static and dynamic resistance) Between DC output and AC input voltage Concept of ripples, filter circuits: shunt capacitor, series inductor and LC filters and their application to reduce ripples Diode rating/ specifications Zener diode and its V-I characteristics.

UNIT 5: Transistors Construction of a bi-polar junction transistor with respect to: Doping, width and area, working principle of transistors, forward and reversed biasing Transistor configurations: Common Base (CB), Common Emitter (CE) and Common Collector (CC) Comparison between CB, CE and CC Configurations Current relationships, input and output characteristics in CB and CE configurations Applications of transistor amplifier in CE configurations

II- SEMESTER

DSC - 6 FINANCIAL ACCOUNTING

L: T: P 4:1:0

6 Hours per week

Unit 1: Meaning of Accounting – Accounting Principles – Concepts and Conversations – Accounting Standards – Meaning – objectives – Indian Accounting Standards – IFRS. Systems of Book – Keeping – Rules of double – entry – preparation of Journal and Ledger.

Unit 2: Subsidiary Books - Purchase, Purchase Returns, Sales, Sales Returns, Cash Book, Petty Cash Book. Journal proper, Bills payable Book (Format and Theory only). Problems on Three Column Cash Book.

Unit 3: Preparation of Trail Balance – Preparation of Final Accounts of sole- Trading Concern, Trading Accounts, Profit and Loss Account and Balance sheet.

Unit 4: Depreciation – Meaning, causes, Methods of Depreciation, Problems on straight – line method. Written down value method and sinking fund method.

Unit 5: Consignment – Meaning – Differences between sales and consignment – proforma invoice – Account sales, Problems on consignment (at cost and Invoice price)- Normal loss and Abnormal loss.

Unit 6: Bills of Exchange – meaning, features- parties to Bill of Exchange – Noting and protest- discounting – Endorsement – Renewals of Bills – Dishonor of Bills, Simple problems on Trade Bills

**III SEMESTER
DSC – 7 QUANTITATIVE APTITUDE**

L: T:P4:1:0

6 Hours PerWeek

UNIT 1-Set theory: meaning-types and operations on sets; application of venn diagram to represent problems on sets.

UNIT 2- Progression: Meaning of sequence, progression; types of progressions; arithmetic progression and geometric progression-general terms and sum of 'n' term of Arithmetic progression and Geometric progression-Application problems on Arithmetic progression and geometric progression.

UNIT 3-Permutations and combinations: fundamental principles of counting, Factorial(n), permutation-linear and circular permutation; Combination-Application problems using permutation and combination formula.

UNIT 4: Simple interest and compound interest-Bills discounting- Meaning-concepts; Bankers discount, true discount, bankers' gain and present worth of bill.

UNIT 5: Matrices and determinants: meaning and types of matrices, matrix operation - addition, subtraction and multiplication . Determinants of a matrix and its evaluation; solutions of linear equations by using cramer's rule.

III SEMESTER

**DSC – 8
INTRODUCTION TO AVIATION INDUSTRY**

L: T:P4:1:0

6 Hours PerWeek

UNIT 1: Introduction:

Airline Industry – Scope – Types – Scheduled and Non Scheduled Flights – Air Cargo Transport – Economic and Social impact – Regulatory Bodies – Key Performance indicators

UNIT 2: Characteristics:

Airline Profitability – Main Industry - Characteristics of Passenger airlines – Service Industry – Characteristics

UNIT 3: Organisational Structure:

Airline Alliances – Development of commercial airlines – Deregulation – Impact of Deregulated Airline industry – Organizational Structure – Types of Airline Personnel – Flight crew and Cabin Crew – Training – Organizational Culture

UNIT 4: Airports and its services:

Airports – Personnel – Processing Passengers and Freight – Airport Security – Air Navigation Services – Air Traffic Control – Airplanes – Manufacturers – Types of Aircraft

UNIT 5: Safety and security:

Air Safety and Security – Role of Regulatory Agencies – Airside Safety – Culture of Safety – Issues in Air safety – Accident and Incident Investigation – Future of Airline Industry

**III SEMESTER
DSC – 9 AIRPORT OPERATIONS**

L: T:P4:1:0

6 Hours PerWeek

UNIT 1: Green Field Airport, Airport Terminal, Passenger Terminal, Airport Charges, Air certification, Airport facilities for passenger. Hub & Spoke system noise Management.

UNIT 2: Passenger service and principles of handling, Passenger handling procedure passport, P.O.E. Clearance, Police Clearance – Departure, Arrivals, Transit / Connection, over flow and denied boarding, Embarkation & Disembarkation procedures, No show, go show cancellation, After delays.

UNIT 3: Baggage Handling – Checked baggage, Free baggage allowance – weight & piece concept, Excess baggage charges, Baggage tracing – type of mishandled baggage Systems for tracing mishandled baggage, Found & unclaimed baggage, property irregularity report.

UNIT 4: Air Navigation service, Airspace and Air traffic, Service, Navigational aids and communication.

UNIT 5: Emergency Procedures in Airport, Types of Emergency, Fully Emergency, Hi – Jack – Bomb threat – Aircraft accident - Airport securities safety Measures

**IV SEMESTER
DSC – 10 Radio Navigational Science-I**

L: T:P3:1:1
PerWeek

5 Hours

UNIT 1: NAVIGATION SYSTEM- Radio Navigation : Introduction - Revision - Essential Knowledge

UNIT 2: Doppler Navigation System - Introduction - Doppler Principle – Airborne , Doppler - Janus Array System Calculations .

UNIT 3: Aeronautical Mobile Service : Introduction - Principle of Operation - Service Provided - Use of Service - Classification of Bearings - Range of VDF - Factors Affecting Accuracy - VHF Emergency Service - VHF let down service .

UNIT 4 : Automatic Direction Finding : Introduction - Non Directional Beacon(NDB) Principle of Operation - Frequencies and Types of NDB - Aircraft Equipment – Emission Characteristics and beat frequency oscillator (BFO) - Presentation of information – Uses of the non- directional beacon - Plotting ADF Bearings - Track Maintenance using the RBI Inbound Tracking - Maintaining an inbound track in a crosswind - Outbound Tracking – Drift Assessment and regaining inbound track - Drift Assessment and outbound track maintenance - Holding- Runway Instrument approach procedures - Factors Affecting ADF Accuracy - Factors Affecting ADF Range - Accuracy – ADF.

UNIT 5: RADIO SYSTEM - The VHF Omni – Directional Range (VOR) : Introduction - The Principle of Operation - Terminology - Transmission Details - Identification - Monitoring- Types of VOR - The Factors Affecting Operational Range of VOR - Designated Operational Coverage (DOC) - Factors Affecting VOR Beacon Accuracy - The Cone of Ambiguity - Doppler VORs(DVOR) - VOR Airborne Equipment - VOR / ILS Deviation Indicator – Radio Magnetic Indicator (RMI) - In – Flight Procedures - (a) Radial Interceptions -(b) bound Track Keeping (c) Station Passage (d) Outbound Flight (e) Airfield Approach VOR .

IV SEMESTER
DSC – 11 Aircraft System & Electricity

L: T:P4:1:0
PerWeek

6 Hours

UNIT 1: Introduction-Air Temperature Measurement - Types of Thermometer - Ram Air Temperature - Corrected outside air temperature -Errors (Instrument Errors) - Position Error - Lag -The gyroscopeTypes of GYRO -Free Gyro - Tied Gyro -Earth Gyro - Rate Gyro -Gyroscopic Theory -RigidityPrecession -Secondary precession -Real wander - Apparent wander-Earth rate-Transportwander -Power sources -Ring laser gyros -Traffic alert and collision avoidance system(TCAS) -Global positioning system (GPS) - GPS Overview-Performance Definition -Benefits of GPS for commercial aviation.

UNIT 2: ELECTRONIC INSTRUMENT DISPLAY SYSTEMS-
Introduction- Cathode ray tube (CRT) - Colour CRT Displays- Alpha – numeric displays Flight deck displays -The CRT Display units -The EICAS System - The EFIS System -Performance management

UNIT 3: COMMUNICATION & NAVIGATION SYSTEM-
Introduction -Communication-HF Communication - VHF Communication - Selcal Decoder Satellite communication - Navigation Systems - Automatic Direction finder (ADF) – Radio Magnetic Indicator (RMI) - VHF Omrange (VOR)

UNIT 4: EMERGENCY EXITS/EMERGENCY EQUIPMENT-
Emergency Equipment - Portable Oxygen Bottles- Fire Extinguishers - Escape devices Instrument Landing System (ILS) - Marker Beacons - Distance Measuring Equipment

UNIT 5: AUTOMATIC PILOT-
Introduction - Automatic Flight and Landing - The auto pilot - Auto Pilot Requirements- Fly- By – Wire System - Servo – mechanisms and Automatic control fundamentals - Servo –Mechanisms - Automatic control fundamentals - Classification of systems - Outer – loop control -Manometric or Air data - Altitude Hold- Airspeed hold- Match hold- Vertical speed selection and hold - Heading hold - Turbulence penetration- Control wheel steering – Touch control steering - Central air data computer (CADC) - Automatic Landing - Automatic landing sequence

IV SEMESTER

DSC – 12 Air Navigational Science-I

L: T:P3:1:1
PerWeek

6 Hours

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UNIT 1: AIR SPACE AND GENERAL RULES-
Airspace Organisation,Air Traffic Service,Flight Information Service and Alerting Service,Rules of the Air – General Rules,Rules of the Air – Flight Rules

UNIT 2: SIGNAL CONTROL AND FLIGHT PLANNING-
Signals,Aerodromecontrol,Visual Separation in the Vicinity of Aerodromes,Separation Methods and Minima,Flight Plans

Unit 3: AERODROMES-
Aeronautical Information service,Clearances and Reports,Emergencies, Communication Failure and contingencies Aerodrome Reference

Unit – 4:
RUNWAY AND LIGHTING SYSTEM-
Physical Characteristics,Visual Aids for Navigation,Visual Aids for Denoting Obstacles

Unit – 5:
OPERATING SUPERVISION-
Operational control and Aerodrome Operating minima,Altimeter Setting Procedures,Search and Rescue, Miscellaneous Topics,Human Performance and Limitations.

V SEMESTER
DSC – 14 Radio Navigational Science-II

L: T:P3:1:1
PerWeek

6 Hours

UNIT 1: The Instrument Landing System(ILS) : Introduction - ILS Components ILS Frequencies - DME Paired with ILS Channels - ILS Identification - Marker Beacon Ground Monitoring of ILS transmissions - ILS Coverage - ILS Principle of Operation – ILS Presentation and Interpretation - ILS Categories - Errors and Accuracy - Factors Affecting Range and Accuracy - ILS Approach Chart - ILS Calculations .

UNIT 2: The Microwave Landing System (MLS) : Introduction - ILS - isadvantages - The MLS System - Principle of Operation - Airborne Equipment

UNIT 3 :RADAR(Radio Detection And Ranging) : Introduction - Types of Pulsed Radars - Radar Applications - Radar Frequencies - Pulse Technique – Distance Measurement – Echo Principle - Theoretical Maximum Range- Primary Radars - The Range of Primary RADAR - RADAR Measurements - RADAR Resolution - Moving Target Indication (MTI) - RADAR Antennae

UNIT 4:

RADARS- Ground Radars : Introduction - En – Route Surveillance Radars (RSR) -Aerodrome Surveillance Approach RADARS - RADAR Vectoring to ILS – Surveillance RADAR Approach (SRA) - High Resolution Surveillance Radar - Precision Approach RADAR - Use of QFE / QNH approach and landing - Airport Surveillance Detection Equipment (ASDE) - Characteristics of Contemporary RADARS.

UNIT 5:

Airborne Weather Radar (AWR) : Introduction - Component Parts – AWR Functions - Principles of operation - Weather Depiction - Monochrome control unit - Mapping operation - Plotting a navigation fix - Weather operation - Colour AWR controls Appendix 10A:Calculating approximate cloud height .

V SEMESTER

DSC – 15 Air Navigational Science –II

L: T:P3:1:1
PerWeek

6 Hours

UNIT I: The Instrument Landing System(ILS) : Introduction - ILS Components,ILS Frequencies - DME Paired with ILS Channels - ILS Identification - Marker Beacons,Ground Monitoring of ILS transmissions - ILS Coverage - ILS Principle of Operation –ILS,Presentation and Interpretation - ILS Categories - Errors and Accuracy - Factors Affecting Range and Accuracy - ILS Approach Chart - ILS Calculations .

UNIT 2: The Microwave Landing System (MLS) : Introduction - ILS -Disadvantages - The MLS System - Principle of Operation - Airborne Equipment (xi)

UNIT 3:RADAR(Radio Detection And Ranging) : Introduction - Types of Pulsed,Radars - Radar Applications - Radar Frequencies - Pulse Technique - DistanceMeasurement – Echo Principle - Theoretical Maximum Range- Primary Radars - The Range,of Primary RADAR - RADAR Measurements - RADAR Resolution - Moving TargetIndication (MTI) - RADAR Antennae .

UNIT 4: Ground Radars : Introduction - En – Route Surveillance Radars (RSR) -Aerodrome Surveillance Approach RADARS - RADAR Vectoring to ILS – SurveillanceRADAR Approach (SRA) - High Resolution Surveillance Radar - Precision ApproachRADAR - Use of QFE / QNH approach and landing - Airport Surveillance Detection Equipment (ASDE) - Characteristics of Contemporary RADARS.

UNIT 5:Airborne Weather Radar (AWR) : Introduction - Component Parts –AWR,Functions - Principles of operation - Weather Depiction - Monochrome control unit -Mapping operation - Plotting a navigation fix - Weather operation - Colour AWR controls,Calculating approximate cloud height , Secondary Surveillance radars(SSR) : Introduction - Advantages of SSR,SSR Display - SSR Frequencies and transmission - Modes - Reply process - Mode C,SSR Operating procedure - Special codes - Disadvantages of SSR - Mode S Benefits of mode ,Distance Measuring Equipment(DME) : Introduction - Equencies -Uses ofDME -Principle of operation - Twin pulses - Range search - Beacon saturation - Station identification - VOR/DME Frequency pairing - DME Range measurement for ILS - Range and coverage - Accuracy

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SEMESTER

DSC – 16 Instrument Flying

L: T:P3:1:1
PerWeek

5 Hours

UNIT 1: An Area Navigation (RNAV) : Introduction - Benefits of RNAV - Types and levels of RNAV - A Simple 2D RNAV System - Operation of a Simple 2D RNAV System Principle of Operation of a Simple 2D RNAV System - Limitations and Accuracy of simple RNAV Systems - Levels 4 RNAV Systems - Overview of 737 – 800 FMS Operation - Control Display Unit (CDU) - CLIMB - CRUISE - Descent - Principle of Operation – Twin IRS , Twin FMC - Principle of Operation - Triple IRS , Twin FMC - KALMAN Filtering, Electronic Horizontal Situation Indicator (EHSI).

UNIT 2: Introduction - ESHI Controller - Expanded navigation mode - Full navigation mode - Expanded VOR mode - Full rose VOR mode - Expanded ILS mode - Full rose ILS mode - Map mode - Centre map mode - Plan mode ESHI Colour coding - ESHI Symbology .

UNIT 3: Global Navigation Satellite Systems (GNSS) : Introduction – Satellite orbits - Position reference system - The GPS Segments - The space segment – The control segment - The user segment - Principle of operation - GPS Errors - System accuracy Integrity monitoring - Differential GPS (DGPS) - Combined GPS and glonass systems

UNIT 4: Long Range Navigation : Introduction - Hyperbolae - Loran Coverage - Loran Equipment Principle of Operation - Chain Identification - Slave Station – Time delays - Differential Range By Timing- Ranges and Factors Affecting Range – Phase Coding - Fix Accuracy

UNIT 5: OPERATIONAL PROCEDURE - Introduction , The Director Unit, Detector Unit, Gyro Unit, Amplifier unit, Corrector control box, Manual synchronization, Repeater system, Advantages of remote indicating compass , Corrections of coefficients (Sperry clia compass), Principles of operations.

V SEMESTER

DSC – 17 Air Regulations

L: T:P3:1:1
PerWeek

6 Hours

UNIT 1: Introduction - Basic 1:60 Rule - 1:60 Rule mathematical approach - Tracking problems using 1:60 Rule

Option 1 Alter Heading (A/H) Direct to Turning Point - Option 1 Double Track error method, Other Application of the 1: 60 Rule- Use of the CRP5 for 1: 60 Rule problems - The closing, Angle Method - Revision of estimated time of Arrival

Unit – 2: Wind Components & Convergency and Conversion Angler, Introduction - Cross wind components - Determining the crosswind value by drawing to scale, Simple computer solutions - Finding the Wind Velocity, Pilot navigation/ wind components – examples - Introduction to convergency & conversion, Angle - Convergency- Conversion angle

Unit – 3: (Pilot navigation – 1: 60 Rule), Introduction - Objective - Definition - Scale Problems - Navigation General Scale Number One

Unit-4: Charts , Introduction - Objectives - Maps / Charts - Chart Projection General - Type of Projection – General - Azimuthal Plane Projection - Cylindrical Projections - Conical Projections, Orthomorphism / Conformality - ICAO Request

Unit- 5: Cylindrical Projections 1 / Mercator Charts, Introduction - Objectives - Mercators projection- general - Mercators chart scale, Mercators chart plotting - Consolidation Questions – Mercator general - Consolidation, Questions – Mercator scale - Consolidation – Mercator plotting

V SEMESTER

DSC –18 Basics Of Technical Flight

L: T:P4:1:0

6 Hours Per Week

UNIT 1: FLIGHT & CONTROL.-

Basic Aerodynamics - Introduction - Basic Aerodynamics - Temperature - Pressure - Pressure Altitude - Density- Viscosity - Equation of State-Continuity Equation - Bernoulli's Principle - Atmosphere -The international standard atmosphere – Speeds

UNIT - 2 : AEROFOIL THEORY –

Introduction - Flow over an Aerofoil–Lift,Generation(flow over circular cylinder -Joukowsky Transformation - Aerofoil Definitions-Pressure and Velocity(Distribution around the aerofoil) - Lift Drag and Pitching moment of an Aerofoil -Lift -Drag -Pitching Moment - Centre of Pressure - The Boundary Layer -Type of Boundary Layer -Laminar boundary layer -Turbulent Boundary Layer –FlowSeparation -Vortex Generators -Variation of CL,CD and their combined effect –Maximum,lift coefficient.

UNIT - 3 : WING THEORY - Introduction - Effect of finite span : Tip vortices –Spanwise,flow variation - Induced Drag - Various planform areas of the wing - Aspect Ratio –Sweep,Angle - Taper Ratio - Area rule - Angle of Incidence

UNIT - 4 : STABILITY- Introduction - Static Stability -Directional Stability -Design of the fin and rudder -Moment arm- Longitudinal Stability - Design of the Tailplane -Position of the CG -Neutral Point -CG Margin -Lateral stability - Dihedral Effect -Sweepback – Variation with speed - Wing Location -High wing -Low wing -Fuselage / Fin Contributions -Dynamic Stability -Periodic Time - Damping -Dynamic Stability of aircraft -Longitudinal Dynamic Stability -Phugoid - Lateral Dynamic Stability - Spiral Stability

UNIT - 5 : AIRCRAFT STRUCTURES- Introduction - Classification of Airplanes –By engine - By Propeller - Landing Gear - By Wings - Principle Structural Units - The Fuselage Types of Construction - Pressurized Area- Doors and Exits - The wing - Wood and Cloth wing - Stressed skin wing - Fairing - Fixed Tail Surfaces - Flight Controls Surfaces – Engine Mounts - Landing Gear - Station Numbering

UNIT - 6 : FLIGHT CONTROL- Introduction - Principle of operation - Hinge moment Control Balancing - Mass Balance - Aerodynamic Balancing - Set – Back Hinge – Horn Balance - Internal Balance - Control Balancing using tabs - Balance Tab (Geared Tab) - Servo Tab - Spring Tab -Trimming the aircraft using Tabs-Trim Tab - High Lift Devices- Types of Flap - Plain Flap - Split Flap- Slotted Flap - Fowler Flap - Krueger Flap –Leading edge droop - Leading edge slots - Slats -Slat Control - Spoilers

VI SEMESTER

DSC –19 Air Metrological Science

L: T:P3:1:1
PerWeek

6 Hours

UNIT -1 :Introduction -Whether charts and information - Surface Weather Chart -Upper wind chart Constant Pressure Charts -Auxillary Charts-Functions of met Section -Met codes for Surface and upperAir reports -Met codes for current Weather and forecasts-Synoptic Meteorology -Surface weather charts -Upper Wind charts -Tephigram-Constant pressure Chart,Thickness charts & other Auxillary Charts -Interpretation and plotting of various symbols Obtaining of weather forecast -Types of forecasts -Met briefing.

Unit -2: METEOROLOGICAL OBSERVATION & ELEMENTS-Introduction, Visual & Instrumental observation,Atmospheric pressure - Temperature- Air density- Humidity- Wind –Clouds,Visibility - Runway Visual Range - Rain Fall - Weather phenomena

Unit -3: SURFACE WEATHER CHARTS-Introduction - Objectives Base maps for surface charts - SYNOP Code - Plotting of surface,charts -Wind direction -Visibility -Present weather -Past weather -Sea level pressure -Temperature - Dew point temperature - Pressure change in 24 hours -Rainfall

Unit -4: STRUCTURE OF THE ATMOSPHERE-Introduction -Objective - Composition of layer - Layers in the atmosphere- Troposphere,Propopause - Stratosphere - Ozone - Higher layers

Unit-5: ATMOSPHERIC PRESSURE-Introduction - Objectives - Variation of pressure - Altimeter - International Standard Atmosphere - Altimeter Settings - Pressure Altitude - Sea levels pressure patterns – Static and moving pressure system - Calculation of Alitico

Unit-6:WIND-Pressure and Wind - Geostrophic wind - Cyclostrophic Force - Gradient Wind and Cyclostrophic wind - Effect of Friction - Veering and Backing - Cross Wind -Buys Ballot's law -Winds at higher Levels - Local Winds - Sea and Land Breezes- Katabati and Anabatic Winds - Fohn Wind - Valley Winds - Some important local winds,Introduction - Objective - Importance of visibility in aviation - Shortcoming of visibility,Runway Visual Range - Vertical and Slant Visibility - In- Flight Visibility - Cause of poor,Ground Visibility - Causes of fog formation - Radiation fog -Local Influences on Radiation,fog.

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