

Course Title	Aircraft General Knowledge - Instrumentation				
Course Code	AVM210				
Course Type	Compulsory				
Level	Bachelor (1 st cycle)				
Year / Semester	2 nd Year / 1 st Semester				
Instructor's name	TBA				
ECTS	6	Lectures / week	3 Hours /14 Weeks	Laboratories / week	None
Course Purpose and Objectives	<p>The purpose of the Aeroplane General Knowledge (Instrumentation) course is to provide the student with the knowledge required in order to be able to understand and potentially efficiently use all the aeroplane's monitoring and navigational instruments and systems. The course aims to cover subjects like sensors, gyroscopic and magnetic instruments, navigation systems, automated control systems, communication systems, flight management and monitoring systems and alerting systems. It will also provide information on integrated systems and electronic displays as well as the fundamental principles of general purpose computers.</p>				
Learning Outcomes	<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Describe the measuring sensors and the related instruments on an aeroplane. • Explain the theory and usage of the main magnetic and gyroscopic instruments. • Demonstrate knowledge of different navigation systems and their operations. • Demonstrate understanding of the operation and application of the aeroplanes automated control, flight management systems and navigational systems. • Demonstrate knowledge regarding communication principles and systems. • Explain the usage of the aeroplane's alerting and proximity systems. • Demonstrate knowledge of operating integrated instruments and electronic displays. • Explain the usage of the aeroplane's maintenance, monitoring and recording systems. 				

	<ul style="list-style-type: none"> • Demonstrate knowledge of digital circuits and general computer fundamentals theory. 		
Prerequisites	AVM111	Co-requisites	None
Course Content	<p>The Material Included In this Course Covers the Following Subjects:</p> <ul style="list-style-type: none"> • Sensors And Instruments: Pressure Gauge, Temperature Sensing, Fuel Gauge, Fuel Flowmeters, Tachometer, Thrust Measurement, Engine Torquemeter, Synchroscope, Engine Vibration Monitoring, Time Measurement. • Measurement Of Air Data Parameters: Pressure Measurement (Definitions, Pitot/Static System - Design, And Errors), Temperature Measurement (Definitions, Design And Operation), Angle Of Attack Measurement, Altimeter, Vertical Speed Indicator (VSI), Airspeed Indicator (ASI), Machmeter, Air Data Computer. • Magnetism – Direct Reading Compass And Flux Valve: Earth’s Magnetic Field, Aircraft Magnetic Field, Direct Reading Magnetic Compass, Flux Valve. • Gyroscopic Instruments: Gyroscope Basic Principles, Rate Of Turn Indicator / Balance (Slip) Indicator, Attitude Indicator (Artificial Horizon), Directional Gyroscope, Remote Reading Compass Systems • Inertial Navigation And Reference Systems (INS And IRS): INS - Inertial Navigation Systems (Stabilised Inertial Platform) (Basic Principles, Design, Errors/Accuracy, Operation), IRS - Inertial Reference Systems (Strapped-Down)) (Basic Principles, Design, Errors/Accuracy, Operation). • Aeroplane Automatic Flight Control Systems: General: Definitions And Control Loops, Autopilot System: Design And Operation, Flight Director (Design And Operation), Aeroplane Flight Mode Annunciator (FMA), Autoland Design And Operation. • Trims – Yaw Damper – Flight Envelope Protection: Trim Systems (Design And Operation), Yaw Damper (Design And Operation), Flight Envelope Protection (FEP). • Autothrottle – Automatic Thrust Control System • Communication Systems: Voice Communication, Datalink Transmission (Definitions And Transmission Modes, Systems: Architecture, Design And Operation), Future Air Navigation Systems (FANS). • Flight Management System (F.M.S.): Design, Navigation Data Base, Aircraft Data Base, Operations, Limitations, Man Machine Interface (Multi-Function Control Display Unit - MCDU). 		

	<ul style="list-style-type: none"> • Alerting Systems, Proximity Systems: General, Flight Warning Systems, Stall Warning Systems (SWS), Stall Protection, Over-Speed Warning, Take-Off Warning, Altitude Alert System, Radio-Altimeter, Ground Proximity Warning Systems - GPWS (GPWS Design, Operation, Indications, Terrain Avoidance Warning System - TAWS), Runway Awareness And Advisory System), ACAS/TCAS Principles And Operations, Engine Over-Speed Alert System (Design, Operation, Displays, Alarms). • Integrated Instruments – Electronic Displays: Electronic display units (Design, limitations), Mechanical Integrated instruments : ADI/HIS, Electronic Flight Instrument Systems - EFIS (Design, operation), Primary Flight Display (PFD), Electronic Attitude Director Indicator (EADI), Navigation Display (ND), Electronic Horizontal Situation Indicator (EHSI), Engine parameters, Crew warnings, Aircraft systems, Procedure and Mission display systems, Engine First Limit Indicator. • Maintenance, Monitoring And Recording Systems: Cockpit voice recorder (CVR), Flight data recorders (FDR), Maintenance and Monitoring systems (Integrated Health & Usage Monitoring System (IHUMS) : Design, operation, performance, Aeroplane Condition Monitoring System (ACMS): General, design, operation),. • Digital circuits and computers: Digital circuits and computers (General, definitions and design), Software (General, definitions and certification specifications). 						
Teaching Methodology	Face-to-face						
Bibliography	<ul style="list-style-type: none"> • Bristol ATPL (A) Groundschool Manual & CBT Software 						
Assessment	<table border="1"> <tr> <td data-bbox="472 1346 1011 1423">Examinations</td> <td data-bbox="1011 1346 1487 1423">90%</td> </tr> <tr> <td data-bbox="472 1423 1011 1501">Participation</td> <td data-bbox="1011 1423 1487 1501">10%</td> </tr> <tr> <td data-bbox="472 1501 1011 1528"></td> <td data-bbox="1011 1501 1487 1528">100%</td> </tr> </table>	Examinations	90%	Participation	10%		100%
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Language	English						