

## Subject Description Form

<b>Subject Code</b>	AAE4903
<b>Subject Title</b>	Human Factors in Aviation
<b>Credit Value</b>	3
<b>Level</b>	4
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	To provide students with fundamental human factors concepts and develop students' understanding of the applied multi-disciplinary approach mostly concerned on airline transport pilot perspective.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> <li>a. explain the basic concepts of human factors HF in the aviation industry;</li> <li>b. explain the application of ergonomics in flight deck design; and</li> <li>c. identify and explain the human errors in airport operations, air traffic control, and pilot operation.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Human Factors: Basic Concepts</b> - Human factors in aviation, Accident statistics, Flight safety concepts, Safety culture.</p> <p><b>Basic Aviation Physiology</b> - Basics of flight physiology, The atmosphere, Respiratory and circulatory system, High-altitude environment Central, peripheral and autonomic nervous systems, Vision, Hearing, Equilibrium, Integration of sensory inputs.</p> <p><b>Health Maintenance</b> - Health and hygiene, Personal hygiene, Body rhythm and sleep, Problem areas for pilots, Intoxication, Incapacitation in flight.</p> <p><b>Basic Aviation Psychology</b> - Human information processing, Attention and vigilance, Perception, Memory, Response selection, Human error and reliability, Reliability of human behavior, Mental models and situation awareness, Theory and model of human error, Error generation, Decision-making, Avoiding and managing errors: Safety awareness, Coordination (multi-crew concepts), Cooperation, Communication, cockpit management: Personality, attitude and behavior, Individual differences in personality and motivation, Identification of hazardous attitudes (error proneness), Human behavior: Arousal, Stress, Fatigue and stress management, Human overload and underload, Advanced cockpit automation: Advantages and disadvantages, Automation complacency, Working concepts.</p>

<p><b>Teaching/Learning Methodology</b></p>	<p>Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation systems (outcomes a to c).</p> <p>Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to c).</p> <p>Group mini-projects are used to help students to deepen their knowledge on a specific topic through search of information, analysis of data and report writing (outcomes a to c).</p> <p>Special seminar(s) delivered by invited industrial professionals may be used to relate the concepts learnt in class to engineering practices. Students are expected to achieve better understanding of human factors through this activity (outcomes a and c).</p> <table border="1"> <thead> <tr> <th rowspan="2">Teaching/Learning Methodology</th> <th colspan="3">Outcomes</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>Lecture</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Tutorial</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Mini-project</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Special seminar</td> <td>✓</td> <td></td> <td>✓</td> </tr> </tbody> </table>					Teaching/Learning Methodology	Outcomes			a	b	c	Lecture	✓	✓	✓	Tutorial	✓	✓	✓	Mini-project	✓	✓	✓	Special seminar	✓		✓										
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<b>Student Study Effort Expected</b>	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial	6 Hrs.
	Other student study effort:	
	▪ Course work	21 Hrs.
	▪ Self-study	45 Hrs.
	Total student study effort	105 Hrs.
<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Salas, Eduardo, Florian Jentsch, and Dan Maurino, eds. Human factors in aviation. Academic Press, 2010.</li> <li>2. Oxford ATPL Manual 8 - Human Performance &amp; Limitations - EASA, 1st Edition, Oxford Publishing.</li> <li>3. FAA (2007). Operator's manual: Human factors in airport Operations.</li> <li>4. Reason J.T. &amp; Hobbs, A.. Managing Maintenance Error: A Practical Guide. Ashgate, latest edition.</li> </ol>	

October 2017