# Subject Description Form

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| **Subject Code** | AAE3103/IC381 |
| **Subject Title** | Appreciation of Aircraft Manufacturing Processes |
| **Credit Value** | 3 Training Credits |
| **Level** | 3 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | The subject provides opportunity for students to gain practical and hands-on training experiences in the following fundamental aircraft engineering and maintenance procedures and practices:<br>• Sheet metal fabrication,<br>• Composites fabrication,<br>• Machining,<br>• Material testing<br>This subject also equips students with basic workshop skills necessary for handling manufacturing project subjects. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a) Demonstrate a practical understanding on the working principle, capability and operation of major aircraft manufacturing processes;<br>b) Select and use appropriate materials and manufacturing processes for specific parts requirements;<br>c) Show a commitment to quality, timeliness, regulation conformance, and continuous improvement. |
| **Subject Synopsis/ Indicative Syllabus** | **1. Basic Machining**<br>Milling; Turning.<br>**2. Sheet-metal Trade Practices**<br>Drilling and Riveting; Removal and Installation of Hi-Lok; Removal, Inspection and Installation of Anchor Nut.<br>**3. Composites Trade Practices**<br>Composite Repair; Wet-layup process; Repair by wet-layup; Repair by Pre-preg with hot bonder.<br>**4. Material Testing**<br>Progression of tensile failure (metal); Progression of tensile failure (composites); Progression of compressive failure; Progression of fatigue crack; Progression of shear failure |

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<tr><td>Learning Methodology</td><td>Workshop-based hands-on activities will be used for students to appreciate the principles and operations of common aircraft manufacturing technologies, and to acquire essential practical skills for them to carry out project tasks.<br><br>Short lectures, demonstrations, and tutorials will be mixed with hands-on activities to deliver technical contents.<br><br>Technical handouts will be available on-line for students to familiarise with the technical contents before lesson.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><th rowspan="2">Specific Assessment Methods/Tasks</th><th rowspan="2">Weighting (%)</th><th colspan="3">Intended Subject Learning Outcomes to be Assessed</th></tr>
<tr><th>a</th><th>b</th><th>c</th></tr>
<tr><td>Workshop assignments</td><td>40</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>Quizzes</td><td>20</td><td>X</td><td>X</td><td></td></tr>
<tr><td>Training report</td><td>40</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>Total</td><td>100</td><td colspan="3"></td></tr>
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Workshop assignments in the form of small manufacturing tasks will be used to assess how well students understand the working principle, capabilities, and operation of the manufacturing processes. Students' skill-level will be evaluated by the artifacts they produced, while their practical knowledge and work attitude be evaluated by individual oral presentation.<br><br>Multiple-choice quizzes will be used to assess broadly the students' understanding of declarative knowledge covered by the subject, as well as their material and process selection judgement.<br><br>Individual training report will be used to assess holistically how well the students consolidate technical contents, reflect on their engineering decisions, and critically review their learning experience. The students also elaborate on their professional attitude and commitment in their writing.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class Contact</td><td></td></tr>
<tr><td>▪ Hands-on practices</td><td>90 Hrs.</td></tr>
<tr><td>Other Study Effort</td><td>0 Hrs.</td></tr>
<tr><td>▪ Total Study Effort</td><td>90 Hrs.</td></tr>
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</td></tr>
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| **Reading List and References** | 1. Forenz, T. (2018). Aviation Maintenance Technician Certification Series: Materials and hardware. Module 06. US, Aircraft Technical Book Company.<br>2. Fietz, K. (2019). Aviation Maintenance Technician Certification Series: Maintenance practices. Module 07A. US, Aircraft Technical Book Company. |