

**BREVARD COMMUNITY COLLEGE  
AEROSPACE TECHNOLOGY PROGRAM**

**COURSE:** ETIC 1855 – STRUCTURAL FABRICATION I  
Credits – 3  
Contact Hours – 64  
Class Hours – 0800 - 1200  
Location – BCC Bldg 14 Aerospace Lab - Mondays

**PRE-REQUISITES:** Applied Mechanics; Materials and Processes I

**INSTRUCTOR:**

**CONTACT DATA:**

**TEXTS:** “Aircraft Sheet Metal”, Jeppesen Sanderson Training Products; by Nick Bonacci

**COURSE  
DESCRIPTION:**

This course provides an introduction to basic metalworking through use of blueprints (drawings), mathematics, standard metal shop tools and fabrication techniques for construction of an aerospace project.

**COURSE  
COMPETENCIES:**

Upon completion of the course the student will be able to:

1. Demonstrate a basic knowledge of applied trigonometry and machine tools.
2. Demonstrate the ability to interpret a basic drawing/blueprint
3. Produce a layout/template
4. Demonstrate a basic knowledge of metal working/machining characteristics including identification of incompatible material combinations and methods used to isolate incompatible combinations.
5. Demonstrate proper shop practices and safe use of equipment
6. Identify aerospace fasteners (rivets, HiLoks) by codes, markings.
7. Demonstrate the interpretation of prints as applied to the fabrication of the assigned project.
8. Demonstrate the ability to effect a sheet metal repair
9. Each student will complete their portion of the assigned project, which must meet the standards specified in the print.

10. Demonstrate teamwork in fabrication of the project.

**COURSE WORK:**

| <b>Week</b> | <b>Topic</b>                                                                                                                                                                                                                                                                                        |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b>    | <b>Introduction:</b> PowerPoint presentation on aerospace structural components, metalworking topics, laboratory safety, work area walkdown & student responsibilities (housekeeping, tool control, FOD, productive use of time); <u>Homework: Read textbook chapters I, II and III for week 2.</u> |
| <b>2</b>    | Review of assigned chapters; Layout of individual projects; <u>Homework: Read textbook chapters IV and V</u>                                                                                                                                                                                        |
| <b>3</b>    | Review of assigned chapters; In-Class Fabrication – Burnishing, drilling individual projects; <u>Homework: Read textbook chapter VI</u>                                                                                                                                                             |
| <b>4</b>    | Review of assigned chapters; In-Class Fabrication – Riveting; <u>Homework: Read chapter IX</u>                                                                                                                                                                                                      |
| <b>5</b>    | Review of assigned chapters; In-Class Fabrication – Start Group Project; Layout spars and ribs per drawing; Metalworking – use of shear, bandsaw, basic finishing (filing, burnishing)                                                                                                              |
| <b>6</b>    | In-Class Fabrication; In-Class Fabrication; Forming structural components - Spars                                                                                                                                                                                                                   |
| <b>7</b>    | In-Class Fabrication; Forming structural components - Ribs                                                                                                                                                                                                                                          |
| <b>8</b>    | In-Class Fabrication; Use of specialty Fasteners - HiLoks                                                                                                                                                                                                                                           |
| <b>9</b>    | <b>Midterm Examination</b> (Written); In-Class Fabrication – Joining structural components                                                                                                                                                                                                          |
| <b>10</b>   | In-Class Fabrication; Joining structural components                                                                                                                                                                                                                                                 |
| <b>11</b>   | In-Class Fabrication; Joining structural components                                                                                                                                                                                                                                                 |
| <b>12</b>   | In-Class Fabrication; Skins, Construction of leading edge                                                                                                                                                                                                                                           |
| <b>13</b>   | In-Class Fabrication; Install skins structural components                                                                                                                                                                                                                                           |
| <b>14</b>   | In-Class Fabrication; Install aileron piano hinge                                                                                                                                                                                                                                                   |
| <b>15</b>   | Final Project Submittal                                                                                                                                                                                                                                                                             |
| <b>16</b>   | <b>Final Exam</b> (Written)                                                                                                                                                                                                                                                                         |

**HANDS-ON PROJECT POLICY:**

Students are required to complete their assigned hands-on projects to receive credit for the class.

The layout procedure for a project may require the use of basic math. Proper layout practices will be discussed prior to beginning each project.

Students will practice with each tool on scrap prior to cutting, drilling, or fastening material components for their project.

**TEAM PROJECT:**

The project will be a 2-person team construction of a metal aerospace component from blueprints to specified requirements. The major goal of this project is to assess the individual student's ability to perform the necessary component fabrication using materials and manufacturing methods common to industry. The project deliverable will be the manufactured component. Project grading will be based on layout, proper use of tools, workmanship, and the component's compliance to the specification.

**GRADING****PROCEDURE:**

|                                                                                           |     |
|-------------------------------------------------------------------------------------------|-----|
| <b>Classroom Performance</b><br>(Participation, Attentiveness, Professionalism, Teamwork) | 10% |
| <b>Laboratory Performance</b><br>(Safely Perform Tasks; Tool Control; Housekeeping)       | 20% |
| <b>Mid-Term Exam</b><br>(Written Examination)                                             | 15% |
| <b>Project</b><br>(Team Score)                                                            | 40% |
| <b>Final Exam</b><br>(Written Examination)                                                | 15% |

**EXAMS:**

All exams will be held in class with distributed class handouts, and your personal notes.

**ATTENDANCE:**

Regular class attendance is expected. "Excessive absence" is defined as being absent more than 15% of class meetings without acceptable excuses.

|                |           |          |
|----------------|-----------|----------|
| <b>Grades:</b> | 90 to 100 | <b>A</b> |
|                | 80 to 89  | <b>B</b> |
|                | 70 to 79  | <b>C</b> |
|                | 60 to 69  | <b>D</b> |
|                | Below 60  | <b>F</b> |

**WITHDRAWAL  
POLICY:**

After the last established drop date, a student may withdraw from a class and receive a grade designation of "W". To withdraw, a student should submit the appropriate form to BCC Admissions and Record Office prior to deadline. No tuition is refunded. Withdrawals are counted as attempts.

**GRADING SCALE, ATTENDANCE POLICY AND WITHDRAWAL POLICY WILL BE IN ACCORDANCE WITH THE STUDENT HANDBOOK AND COLLEGE CATALOG.**