

Program Description

The program meets the need in the aerospace industry for multi skilled individuals who understand, perform, and serve as first-line leads in the major processes of manufacturing the structural components of an aircraft for civilian and military specifications. This program is designed to prepare students for careers in aviation manufacturing engineering.

Staff

Please dial (661) 722-6300, then the 4 digit extension.

Division:

Greg Bormann, Dean	x.6327
Rosie Heasley, Project Supervisor	x.6882
Mari-Ali Baiza, Administrative Assistant	x.6327
Leyla Recinos, Clerical Assistant III	x.6327
Dr. Maria Clinton, Department Chair	x.6577

Faculty:

Alfred Brubaker	x.6098
Dr. Maria Clinton	x.6577
Jack B. Halliday	x.6289

Instructional Assistant:

Susanna Otis	x.6872
Tiffani Zinner	x.6049

Adjunct Faculty:

Elaine Clinton	V.M. 2475
----------------	--------------

Career Options

Aircraft Assembler	Industrial Engineer
Airframe/Systems Technician	Manufacturing Engineer
Composite Fabricator	Multi-skilled Composite
General Mechanic	Low Observable Technician
Electrical Technician	

Program Learning Outcomes

- Analyze and evaluate critical aspects of the aerospace manufacturing industries related to the planning design of plant facilities, which ensures both production efficiency and safe work practices/environment that ensure quality of production work.
- Assess and evaluate composite tooling requirements to ensure quality and efficiently for manufactured parts.
- Recognize engineering requirements in order to set-up and prepare facilities and workflow from the perspective of engineering needs and requirements as well as the needs and requirements of the technicians.
- Produce an actual or simulated improvement plan to eliminate waste, production inefficiencies, and poor facility design using pertinent and statistical process control data.

Bachelor Degree

Baccalaureate in Science in Airframe Manufacturing Technology

The Airframe Manufacturing Technology baccalaureate degree builds off of two existing high quality, successful programs that have provided well trained employees to meet the needs in our communities for many years. By expanding these programs to include the opportunity to earn a baccalaureate degree, Antelope Valley College will now fill the need of local employers for a highly skilled lead worker in the same field and will provide a valuable opportunity for both our students and our community. The Airframe Manufacturing Technology program will include courses in disciplines in which Antelope Valley College already offers degrees and certificates: Aircraft Fabrication and Assembly and Aviation Airframe. Entrance into the baccalaureate courses will require graduation from or substantial completion of one of those programs prior to admission to upper division courses.

Students must receive a minimum grade of "C" or better in all required core courses and the specific courses listed as program electives in order to qualify for the degree or certificate.

Minimum Eligibility Requirements for Applicants:

- Completion of the Aircraft Fabrication & Assembly Technician (AFAB) associate degree/course sequence or noted equivalent Aeronautical and Aviation Technology courses and AFAB 130 and AFAB 210.
- Completion of the general education requirements for the CSU system, including:

CHEM 101, Introductory Chemistry	5
COMM 101, Introduction to Public Speaking <i>or</i>	3
ENGL 101, College Composition	3
ENGL 115, Introduction to Technical Communication	3
PSY 101, General Psychology	3
PHYS 101, Introductory Physics	4
MATH 135, Plane Trigonometry	3

NOTE: Above courses fulfill both the major and the general education requirements. For assistance, contact the counseling department.

- Students must have a 2.8 minimum GPA in all AFAB/AERO courses and a 2.5 minimum GPA in all college classes taken for credit (overall GPA).

NOTE: The aerospace industries generally require employment applicants to pass a background check and drug screening. Employment is often subject to the applicant's ability to receive a security clearance from the Department of Defense (DoD).

Enrollment Procedures:

Refer to announcements on the AVC website for updated enrollment information. All items in the enrollment process are extremely important. Students who omit any part of the required information or miss the deadline will be dropped from consideration for the Airframe Manufacturing Technology Program. Only official documents will be accepted. Faxed documents are not official and are not accepted.

- Submit the completed Application for Enrollment packet by mail or walk-in by the deadline. **NOTE:** You are responsible for notifying the Career Technical Education Division office when you change your address or telephone number. Please call 661-722-6300, extension 6327, to do this.

2. Attach unopened official college transcripts (including Antelope Valley College) that show completion of the prerequisite courses. One set of college transcripts must also be on file in the Admissions and Records Office. **NOTE:** "Official" college transcripts must be submitted in sealed envelopes that have not been opened by the student.
3. Attach a copy of the Educational Planning and Evaluation Form completed by an AVC counselor. Call 661-722-6300, extension 6338, to schedule an appointment with the appropriate BS degree counselor. Be sure you inform the information desk that you are requesting an appointment regarding the BS Degree. The form should be completed no more than one semester prior to submitting the application packet. All students must see an AVC counselor before they submit an admission packet. Counselors complete Educational Planning and Evaluation Forms by appointment only.
4. Submit the items listed in numbers 1 through 3 to the Career Technical Education Division office (EL-129, Enterprise Lab). Please call the division office at (661) 722-6300 x.6327 for drop off hours. Application packets may also be mailed.

Screening Procedures:

Application packets are accepted during the designated application period only. Students who meet the minimum requirements of the program will be randomly selected for enrollment. Students who have not completed 2-3 baccalaureate prerequisite courses or are currently in the process of completing them are encouraged to apply for admission. Students will be advised of acceptance or non-acceptance by mail. **INCOMPLETE PACKETS WILL NOT BE CONSIDERED.**

Program Prerequisites:

	units
AFAB 110, Introduction to Aircraft Structures, Blueprint and Manufacturing Documentation <i>or</i>	
AERO 121, Aircraft General II	3-7.5
AFAB 115, Aircraft Structures <i>and</i>	
AFAB 120, Composite Fabrication and Repair <i>or</i>	
AERO 230, Airframe I	15
AFAB 130, Aerospace Ethics and Issues (CSU GE Area C2)	4
AFAB 210, Aircraft Production Systems	4
CHEM 101, Introductory Chemistry	5
COMM 101, Introduction to Public Speaking (CSU GE Area A1)	3
ENGL 101, College Composition (CSU GE Area A2)	3
ENGL 115, Introduction to Technical Communication (CSU GE Area A3)	3
MATH 135, Plane Trigonometry (CSU GE Area B4)	3
PHYS 101, Introductory Physics	4
PSY 101, General Psychology (CSU GE Area D)	3
Total	50-54.5

Required Courses:

	units
AFMT 310, Safety in Aviation	3
AFMT 320, Lean Management (Six Sigma & 5S)	3
AFMT 330, Airframe Manufacturing Producibility	3
AFMT 340, Theory of Low Observables	3
AFMT 341, Manufacturing Testing & Inspection	6
AFMT 345, Airframe Composite Manufacturing I	6
AFMT 350, Airframe Manufacturing Capstone I	2
AFMT 442, Foreign Object Elimination (FOE) and Migration Paths	3
AFMT 446, Airframe Composite Manufacturing II	6
AFMT 451, Airframe Manufacturing Capstone II	4
BIOL 304, A Survey of Emerging and Re-emerging Infectious Diseases (CSU GE Area B2)	3
ELTE 105, Introduction to Robotics	3
ENGL 315, Applied Technical Writing (Upper Division GE)	3
ENGR 140, Engineering 3-D Graphics	3
HIST 107, US History, 1607-1877 <i>or</i>	
HIST 108, US History, 1607-1877 <i>or</i>	
HIST 110, African American History, 1450-1877 <i>or</i>	
HIST 111, African American History, 1877-Present (CSU GE Area D)	3
POLS 101, American Political Institutions (CSU GE Area D)	3
PSCI 302, Introduction to Quantitative Atmospheric Dynamics and Thermodynamics (Upper Division GE)	3
PSY 301, Organizational Behavioral Psychology (Upper Division GE)	3
CSU GE Area C1	3
CSU GE Area E	6

Total Units 72**Degree Total 122-126.5**

Except in cases of a prerequisite requirement, it is not required to take courses in exactly this sequence; they are recommended in this order to facilitate success.

Recommended Pathway

First Semester	units
AFAB 110, Introduction to Aircraft Structures, Blueprint and Manufacturing Documentation <i>or</i> AERO 121, Aircraft General II	3-7.5
AFAB 130, Aerospace Workplace Issues and Ethics	4
COMM 101, Introduction to Public Speaking	3
ENGL 101, College Composition (CSU GE Area A2)	3
POLS 101, American Political Institutions (CSU GE Area D)	3
Total	16-20.5

Second Semester	
AFAB 115, Aircraft Structures <i>and</i> AFAB 120, Composite Fabrication and Repair <i>or</i> AERO 230, Airframe I	15
PSY 101, General Psychology (CSU GE Area D)	3
CSU GE Area C1 or C2	3
Total	21

Third Semester	
AFAB 210, Aircraft Production Systems	4
MATH 135, Plane Trigonometry (CSU GE Area B4)	3
PHYS 101, Introductory Physics (CSU GE Area B1/B3)	4
CSU GE Area C1	3
Total	14

Fourth Semester	
CHEM 101, Introductory Chemistry	5
ENGL 115, Introduction to Technical Writing (GE Area A3)	3
HIST 107, US History, 1607-1877 <i>or</i> HIST 108, US History From 1865 <i>or</i> HIST 110, African American History, 1450-1877 <i>or</i> HIST 111, African American History, 1877-Present (CSU GE Area D)	3
CSU GE Area E	3
Total	14

Fifth Semester	
BIOL 304, A Survey of Emerging and Re-emerging Infectious Diseases (CSU GE Area B2)	3
ENGL 315, Applied Technical Writing (Upper Division GE)	3
PSCI 302, Introduction to Quantitative Atmospheric Dynamics and Thermodynamics (Upper Division GE)	3
PSY 301, Organizational Behavioral Psychology (Upper Division GE)	3
Total	12

Sixth Semester	
AFMT 310, Safety in Aviation	3
AFMT 320, Lean Management (Six Sigma & 5S)	3
AFMT 330, Airframe Manufacturing Producibility	3
ELTE 105, Introduction to Robotics	3
ENGR 140, Engineering 3-D Graphics	3
Total	15

Seventh Semester	
AFMT 340, Theory of Low Observables	3
AFMT 341, Manufacturing Testing & Inspection	6
AFMT 345, Airframe Composite Manufacturing I	6
AFMT 350, Airframe Manufacturing Capstone I	2
Total	17

Eighth Semester

AFMT 442, Foreign Object Elimination (FOE) and Migration Paths	3
AFMT 446, Airframe Composite Manufacturing II	6
AFMT 451, Airframe Manufacturing Capstone II	4

Total 13
Degree Total 122-126.5

Prerequisite Completion

All prerequisite courses must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of "A," "B," "C" or "P". Classes in which the Pass/No Pass option is available are indicated with an asterisk (*) before the course title. See "Pass/No Pass Option" in the catalog for full explanation.

Airframe Manufacturing Technology Courses

AFMT 310 SAFETY IN AVIATION

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFAB 130, AFAB 210, ENGL 315, & PSY 301.

This course provides supervisors/leads/technicians with the aviation safety principles and practices needed to manage the problems associated with aircraft manufacturing/maintenance operations, aviation safety program development, safety management systems, aviation human factors issues, and case studies relevant to aviation safety. This includes the identification and analysis of major problem areas and the impact of accidents on the aviation industry. Students are prepared to assume safety responsibilities in their areas of operation. (AVC)

AFMT 320 LEAN MANAGEMENT (SIX SIGMA & 5S)

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFAB 210, ENGL 315, and PSY 301.

Corequisite: Concurrent enrollment in AFMT 330.

This course focuses on gaining an understanding of Lean principles, practices, and techniques from both technical and individual perspectives needed to effect the change and sustain improvement within the aviation industry. Emphasis will be placed on developing the individual skills needed to become a Lean thinker and champion building a roadmap for transitioning an organization from its current state to one of being a Lean operation. Six Sigma and the 5's systems will be covered. Classroom sessions will include exercises designed to simulate real world applications to clarify concepts and techniques. (AVC)

AFMT 330 AIRFRAME MANUFACTURING PRODUCIBILITY

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFAB 210, ENGL 315, and PSY 301.

Corequisite: Concurrent enrollment in AFMT 320.

This course addresses the evaluation of product producibility and the impact of changes in the properties and characteristics of the manufacturing process in the context of "Return on Investment." Students will evaluate whether or not changes incorporated into the manufacturing process not only fix the problem/issue, but also reduce costs for the company. Note: This course is a prerequisite for Capstone I and Capstone II classes. (AVC)

AFMT 340 THEORY OF LOW OBSERVABLES

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFAB 120, CHEM 101, and PHYS 101.

This course provides an understanding of the history and development of low observable technology, the reduction of radar, optical and acoustic signatures which provide stealth. A focus on the importance of proper coating application processes that ensure stealth capabilities, along with facilities, equipment, and Personal Protective Equipment (PPE) requirements for applying coatings will also be covered. (AVC)

AFMT 341 MANUFACTURING TESTING & INSPECTION

6 units

8 hours weekly [5 lecture, 3 lab]

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFMT 310.

This course provides an understanding and familiarization with the various inspection and testing methods for the materials and processes associated with aircraft structures. Non-Destructive Inspections (NDI) and Non-Destructive Testing (NDT) are other methods employed by the aviation industry to detect defects. This course includes hands-on familiarization with testing equipment related to rigging, high pressure lines and fittings, seals, gases, fluids, and curing. (AVC)

AFMT 345 AIRFRAME COMPOSITE MANUFACTURING I

6 units

8 hours weekly [5 lecture, 3 lab]

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFAB 120 and AFMT 310.

This course is designed and intended for advancing knowledge and skills of composite manufacturing. Students will develop an advanced understanding of the practical skills involved in producing quality composite structures. The student will have an intermediate level of understanding of composite layup and vacuum bagging techniques for complex shapes, fabrication of potted honeycomb core assemblies, manufacturing composite component parts using production type tooling, and a fundamental understanding of the documentation and record keeping required to support composite manufacturing. (AVC)

AFMT 350 AIRFRAME MANUFACTURING CAPSTONE I

2 units

2 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFMT 310, AFMT 320, and AFMT 330.

This course is the initial phase of the Lean Management/Project Management proposal process that will consist of an actual unclassified or generic project that student teams would compete for. Possible 'real world' unclassified projects may come from aerospace corporations. The capstone course encompasses the assigning of teams, distribution of project proposals, assigning of faculty and/or industry mentors. These projects will focus on workflow analysis and project management. (AVC)

AFMT 442 FOREIGN OBJECT ELIMINATION (FOE) AND MIGRATION PATHS

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.

Prerequisite: Completion of AFMT 330.

This course provides supervisors/leads/technicians with aviation safety principles and practices needed to manage the problems associated with aircraft manufacturing/maintenance operations. In addition, it prepares students to assume safety responsibilities in their areas of operation. The Foreign Object Elimination (FOE) elements of basic awareness addresses twelve industry identified basic knowledge areas, activities and functions designed to prevent foreign objects from entering aerospace products. The standards are derived from NAS 412 - Foreign Object Damage / Foreign Object Debris (FOD) Prevention. Possible field trip opportunities to Northrop Grumman and other industry partners. (AVC)

AFMT 446 AIRFRAME COMPOSITE MANUFACTURING II

6 units

8 hours weekly [5 lecture, 3 lab]

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of AFMT 345.

This course is designed and intended for advancing knowledge and skills of composite manufacturing. Students will develop an advanced understanding of the practical skills involved in producing quality composite structures. The student will have an intermediate level knowledge of machining, trimming and drilling composite components using fixtures, surface preparation methods/secondary bonding of structures, component assembly methods and techniques, as well as acquire a fundamental knowledge of the resin vacuum infusion manufacturing process. (AVC)

AFMT 451 AIRFRAME MANUFACTURING CAPSTONE II

4 units

4 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of AFMT 350.

This course is the design and submission phase of the Lean Management/Project Management proposal process that will consist of an actual unclassified or generic project that student teams would compete for. Possible 'real world' unclassified projects may come from aerospace corporations. The capstone course encompasses the completion and submission of project proposals. (AVC)

Biology Course**BIOL 304 A SURVEY OF EMERGING AND RE-EMERGING INFECTIOUS DISEASES**

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of ENGL 101.

This is an upper division General Education course, covering a survey of selected emerging and re-emerging infectious diseases, addressing the Biological, Historical, Sociological, Geographical, and Epidemiological factors that have had an impact on the human populations worldwide throughout history. The content will cover the basic concepts of infectious disease agents (Viruses, Prions, Bacteria, Protozoa, and Helminths), human biology, and the Public Health measures used to identify, treat, and prevent these diseases. Also covered are the various human factors that have influenced the trends of these diseases, including historical events, geopolitics, and cultural and sociological changes affecting human populations. (AVC)

English Course**ENGL 315 APPLIED TECHNICAL WRITING**

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of ENGL 115.

Building on skills learned in the lower division technical writing course, this course provides extended, guided practice and instruction in understanding and writing for multiple audiences and multiple purposes in a technical environment. Students will develop skills in language choice as an aid to clarity, and students will learn principles of document design in both digital and conventional communication situations. Students will learn advanced research techniques and strategies while working on extended writing projects. Learning to work on multi-staged, collaborative projects will be central to this course. (AVC)

Physical Science Course**PSCI 302 INTRODUCTION TO QUANTITATIVE ATMOSPHERIC DYNAMICS AND THERMODYNAMICS**

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of MATH 135 and PHYS 101.

This course provides a quantitative understanding of general meteorology. It introduces the physics and thermodynamics of the atmosphere to understand the horizontal and vertical transport of atmospheric heat and momentum which are directly related to the cyclones, anticyclones, hurricanes, weather fronts, mesoscale disturbances, severe storms, tornadoes, sea and land breezes, atmospheric boundary layer and turbulence. Insight into these mechanism will be gained through the use of spread sheet based calculations by allowing relationships to be studied by plotting the data graphically and then explaining the meaning of those relationship using the graphs. Atmospheric thermodynamic processes will be quantified using various thermodynamic calculations and in some cases, computational diagrams such as the Skew-T and Stüve diagrams. (AVC)

Psychology Course**PSY 301 ORGANIZATIONAL BEHAVIORAL PSYCHOLOGY**

3 units

3 hours weekly

Limitation on Enrollment: Must be selected as part of the AFMT BS Degree cohort to take this course.**Prerequisite:** Completion of PSY 101.

This course offers an introduction and broad overview of the psychology of individual and group dynamics in the workplace. This course will examine topics such as organizational culture and structure, teamwork, group dynamics, managing change, conflict theory, motivation, and leadership. Emphasis is placed on applying course concepts to current workplace issues. (AVC)