



ANTELOPE VALLEY COLLEGE

**APPLICATION TO PARTICIPATE IN
CALIFORNIA COMMUNITY COLLEGES
BACCALAUREATE DEGREE PILOT PROGRAM**

Submitted December 17, 2014

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Need (Statement of Problem)

Description of the proposed baccalaureate program.

The proposed program is the baccalaureate degree in ***Airframe Manufacturing Technology***. The proposed 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. The program's curriculum addresses airframe manufacturing, aircraft fabrication (structures and composites), electronics, and welding.

Description of the college and district including demographics, regional characteristics, and enrollment data.

Antelope Valley Community College District, a single campus district, serves northern Los Angeles County and a small part of southwestern Kern County. The Antelope Valley contains two cities (Lancaster and Palmdale, each about 150,000 in population), smaller unincorporated residential towns and villages, and large expanses of open terrain. The college has a close relationship with local aerospace industries which have supplied part-time faculty, work-experience, donations of supplies, and advisory committee members to the college.

Antelope Valley College is located in a geographically isolated area of Los Angeles County. The nearest community colleges to Antelope Valley College are College of the Canyons (50 miles to the south), Victor Valley College (65 miles to the east), and Bakersfield College (90 miles to the north). There are several private colleges in the area that offer bachelor's degrees, but none of the private colleges offers a degree similar to the proposed degree in Airframe Manufacturing Technology. The nearest public universities to AVC are California State University Northridge (54 miles south) and California State University Bakersfield (91 miles to the north).

Antelope Valley College is part of the South Central Coast Regional Consortium. The region stretches from Lancaster to San Luis Obispo, over 185 miles.

Student enrollment in 2013-2014 was 18,771 (unduplicated headcount) or 35,046 (duplicated headcount). Enrollment is approaching peak enrollment of 2009-2010 (<http://www.avc.edu/administration/research/common/documents/AVCinNumbers.pdf>). According to the CCCCO's Data Mart, student enrollment consisted of 10,919 females, 7,674 males, and 178 unknown gender. The racial/ethnic composition of the student body was 3,093 African-American, 51 American Indian/Alaska Native, 252 Asian, 231 Filipino, 6,335 Hispanic, 669 multi-ethnic, 22 Pacific Islander, 3,402 White Non-Hispanic and 215 students whose ethnicity was unknown. Nearly two-thirds of students were of traditional college age. Over 11,000 students were under 25 years old, and another 2,485 students were 25-29 years old.

Evaluation of student interest, community support, and regional/statewide demand for the proposed program, including a statement supporting the necessity of a four-year degree for the program that is identified.

In 2013-2014, 493 Antelope Valley College students transferred to four year programs in the California State University System and 369 transferred to private in-state or out-of-state colleges and universities. The number of students who transferred to the University of California System was not reported. A total of 1349 degrees and 498 certificates were awarded by Antelope Valley College in that year (CCCCO's Data Mart).

Students who were enrolled in courses in aircraft fabrication and assembly, airframe and powerplant, and electronics were surveyed for their potential interest in a baccalaureate degree in Airframe Manufacturing Technology. Of 186 students who responded to the survey, 183 indicated that they would be interested in a bachelor's degree in this field. Student comments included that they would save time and money by not having to travel for baccalaureate education, they would be building on solid educational programs that already exist at Antelope Valley College, they would be able to advance their job opportunities in the aerospace industry, and they would prefer to stay closer to home to complete their bachelor's degrees.

The advisory committees for the aircraft fabrication and assembly program and the airframe and powerplant program met jointly on November 6, 2014. Representatives of Edwards Air Force Base, Lockheed Martin Corporation, Northrop Grumman Corporation, and The Spaceship Company were present. The representatives were unanimous in their support of the proposed program. All representatives stated that there was a need for the multi skilled airframe manufacturing technology graduate who could fulfill the roles of lead technician, shop foreman or manufacturing director. The Greater Antelope Valley Board of Trade expressed support for the proposal, as well. Letters of support for the program were received from Congressman Kevin McCarthy, State Senator Steve Knight, and Los Angeles County Supervisor Michael Antonovich all of whom expressed support for the program that would fulfill the local need for aerospace workers.

As the multi skilled airframe manufacturing worker is an emerging occupation, there is no regional data other than input from the advisory committee. There is no similar program in California. A program with some similarities to the AVC proposed program is being developed at Metropolitan State University in Denver, Colorado (www.denverpost.com/business/ci_26926338/metro-partners-aerospace-leaders-address-workforce-demands?source=email).

Summary of regional and/or statewide labor market and employer demand that documents the unmet workforce needs specifically related to the proposed baccalaureate degree pilot program.

According to data supplied by the Greater Antelope Valley Economic Alliance (<http://kedc.com/wp-content/uploads/2013/11/GAVEA-2014-Round-Table-Report.pdf>),

aerospace industries in the Antelope Valley represents a large sector of the employed population in the area. Edwards Air Force Base employs 10,647 and China Lake Naval Weapons Base employs 9,172. The private sector employs over 8,000 people in jobs that support both the military and civilian areas of aircraft manufacturing. Among the major private employers in aircraft manufacturing in the Antelope Valley are Northrop Grumman Corporation (2,772 employees), Lockheed Martin Corporation (2,712 employees), and Mojave Air and Spaceport (2,500 employees among all employers). Mojave Air and Spaceport is the home of the first spaceport in the nation and base of Virgin Galactic and The Spaceship Company, private ventures engaged in making commercial space travel feasible.

The data supplied by GAVEA is difficult to validate using the traditional methods of searching the California Economic Development Department website, the Bureau of Labor Statistics data, or data supplied by the Centers on Excellence. All three options were searched using the CIP Codes 49.0101 (Aeronautics/Aviation/Aerospace Science and Technology, General), 29.0401 (Aerospace Ground Equipment Technology), 49.0199 (Air Transportation, Other), 49.0104 (Aviation/Airway Management and Operations), the SOC Codes 17-3021 (Aerospace Engineering and Operations Technicians) and 11-3051 (Industrial Production Managers), and the NAICS Codes 336411 (Aircraft Manufacturing), 336413 (Other Aircraft Parts and Auxiliary Equipment Manufacturing), 336414 (Guided Missile and Space Vehicle Manufacturing), 336419 (Other Guided Missile and Space Parts and Auxiliary Equipment Manufacturing). None of the occupational descriptions associated with the CIP and SOC codes aligned with the interests expressed by the human resources and management representatives to the proposed program's advisory group. Depending on the source, employment opportunities in aerospace are either declining, holding steady, or slightly increasing in the Los Angeles-Glendale-Long Beach metropolitan area or in California. For example, for Industrial Production Managers, the EDD website shows that there could be 360 average annual openings in 2012-2022 in California with an hourly mean income of \$52.44. There are 295 Aerospace Product and Manufacturing employers for this occupation in the state. Demand for Aerospace Engineering and Operations Technicians is projected to be 450 employees between 2012-2022 in California (This occupation involves aircraft maintenance and repair, not aircraft production). Data supplied by the Centers of Excellence showed a projection of 940 jobs lost in the NAICS Codes that were explored.

Using information supplied by The Occupation Information Network (O*NET), the job responsibilities of Industrial Production Managers only matches about half of the local industry needs for a multi skilled airframe manufacturing technology worker.

Local advisory committee members had a different perspective than the usual employment data sources. The Spaceship Company representative said that the company has 80 to 100 employees who do not have bachelor's degrees who would benefit from the proposed degree. She estimated that 20% of the employees might take advantage of work schedule accommodations to enroll in the program. The Spaceship Company currently has about 25 positions that could directly be recruited from the

proposed bachelor's degree program at this time, and six to eight graduates would be needed annually to fill vacated positions and newly created positions. At Northrop Grumman Corporation engineers are being trained in manufacturing processes on the job so that they understand the practical nature of what they are supposed to design. The Northrop Grumman representative stated that 100 of the company's current employees could benefit from graduation from the proposed bachelor's degree.

Further evidence of need (quantitative and/or qualitative) drawn from experiences, statistics, authoritative sources, and/or research.

Recognizing that the Antelope Valley does not have the aerospace workforce that it needs, the Antelope Valley Union High School District established the Palmdale Aerospace Academy, a charter school with a Science-Technology-Engineering-Mathematics (STEM) focused curriculum and broad support from local aerospace industries. The vision of the Palmdale Aerospace Academy is to apply core academic concepts to aerospace and enrich students' educational experiences through partnerships with the local aerospace industries. The curriculum focuses on project-based learning including learning by inquiring, questioning, and thinking critically. The goal of the curriculum at Palmdale Aerospace Academy is to "grow our own" labor force for aerospace, as anecdotal information from local companies indicates that employees who are hired from outside the Antelope Valley tend to work at the local large manufacturers to get experience to list on their resumes. They also tend not to stay in the area if there are opportunities in areas that have a more desirable climate and more social and cultural opportunities than the semi-rural Antelope Valley.

Response to the Need

Description of the size, scope, and success of existing associate degree programs within the discipline of the proposed baccalaureate degree program at the college and within the region.

Antelope Valley College has offered an aircraft fabrication program since 2002-2003. The program focuses on composites and structures related to aircraft assembly (AFAB). In Spring 2014, there were 129 students enrolled in AFAB courses. Retention was 93.02% and success was 90.70%. Thirty eight associate degrees and 133 certificates were awarded in the discipline in the past five years.

The aviation airframe mechanics program has been offered at the college since the 1990s. In Spring 2014, twenty five students were enrolled. Retention was 96% and success was 96%. Seventy certificates and 17 associate in science degrees were awarded in this discipline in the past five years.

The Electronics Technology program had enrollment of 105 students in Spring 2014. Of those students, 95.24% were retained and 76.19% were successful. Antelope Valley College awarded 29 degrees and 42 certificates in Electronics Technology in the past five years.

How the proposed program will build upon existing programs and how it will include access for prospective students within the 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, Aviation Airframe, Electronics, and Welding. Entrance into the baccalaureate courses may require graduation from or substantial completion of one of those programs prior to admission to upper division courses. Industry representatives to the advisory committee stated that their current employees who are graduates of Antelope Valley College or who have substantial coursework in the disciplines that are included in the baccalaureate degree will be interested in this degree. Students who have completed the Aircraft Fabrication and Assembly program or who have substantial course work in that discipline are likely to have completed some of the prerequisites for upper division courses in the proposed baccalaureate degree.

Five-year enrollment projections for the proposed baccalaureate program and the number of anticipated graduates

Twenty students could be enrolled in the program annually during the first five years, assuming the program begins in 2016-2017. Considering the high success rate of the lower division courses, 80 to 90% of those students (16 to 18 students) could be projected to graduate prior to the end of the pilot program in 2023. Unless there is additional legislation that extends the pilot program beyond 2023, it would be prudent to stop enrolling new students in the program in 2021 so that students could graduate before the end of the pilot program.

Evidence of lack of program duplication with the UC or the CSU statewide

The websites of the 23 CSU and 10 UC campuses were reviewed. Six CSUs and five UCs offer bachelor's degrees in aviation related fields.

California State University, Long Beach--Mechanical and Aerospace Engineering
California State University, Los Angeles--Aviation Administration
California State Polytechnic University, Pomona--Aerospace Engineering
California State University, San Bernardino--Aerospace Studies (Air Force ROTC) Program
San Diego State University--Aerospace Engineering
San José State University--Aerospace Engineering; Aerospace Studies Program (This is for ROTC and Officer Training); Aviation Management; Aviation Maintenance Management; Aviation Operations
UC Berkeley--Aerospace Studies (ROTC)
UC Davis--Aerospace Science and Engineering
UC Irvine--Aerospace Engineering
UCLA--Aerospace Studies (ROTC; Mechanical and Aerospace Engineering)
UC San Diego--Mechanical and Aerospace Engineering

Analysis of the proposed curriculum for this degree including an example of the upper division discipline work that may be required

To fulfill the needs of industry for a multi skilled lead worker, the lower division courses will include courses in aircraft fabrication, aircraft structures, blueprint reading, electronics, vintage aircraft structures (to familiarize students with sheet metal work), composite fabrication, aerospace ethics, aircraft production systems, welding, computer aided design, and robotics. Upper division discipline work would include safety in aviation, foreign object elimination migration paths, lean manufacturing, testing and inspection, and airframe tooling. A capstone project that will take two semesters to design and complete will be used as verification of completion of the program learning outcomes. Northrop Grumman Corporation and The Spaceship Company industry representatives have volunteered to mentor students who will be completing the capstone projects.

Illustrations of the upper division general education course work that may be appropriate for the proposed degree

Upper division general education that would apply to this degree includes: Technical Writing for Aviation, a course meeting the requirement of CSU Area F, Introduction to Chemistry, Introduction to Physics (parts one and two), and Finite Math. The total number of units of upper division general education course work exceeds the nine unit minimum required by the CSUs.

Timeline for program planning, implementation, requisite accreditation approval, and degree completion

Program planning has already begun in anticipation of writing this proposal. Development and approval of the curriculum pattern, the upper division courses, the degree requirements, and curriculum approval could occur between January and December 2015 in anticipation of entering the first students in the upper division courses in fall 2016. The substantive change proposal for the Accrediting Commission for Community and Junior Colleges, Western Schools and Colleges (ACCJC) could be written by December 2015. The first degrees could be awarded at the end of spring 2018, depending on the qualifications of the first students to enroll in the program.

Program Management/Institutional Commitment

Summary of current and historical college/district accreditation status and accreditation for the proposed program

AVC has maintained full accreditation by ACCJC for more than 24 years. The college's accreditation was re-affirmed in 2011. Airframe and Powerplant course is FAA Part 147 program and is fully approved by the Federal Aviation Administration.

The proposed program will be submitted to ACCJC as a substantive change to the college's current degree inventory. The program is being developed so that it will meet the standards of ACCJC specifically related to education at the baccalaureate level. Although offering a baccalaureate at Antelope Valley College will require addressing all four accreditation standards, the college's potential response to standards related to

student learning program and support services were specifically considered when the proposal to offer the baccalaureate degree was discussed.

Verification of college and district long-term effective and stable fiscal management.

Antelope Valley Community College District has remained on sound fiscal footings. The board of trustees implemented a no less than 8% reserve requirement, which is being re-evaluated at a higher level. Reserves for the past seven years have been: 8.28% (2008-2009); 10.68% (2009-2010); 15.04% (2010-2011); 13.23% (2011-2012); 16.82% (2012-2013); 16.0% (2013-2014); and 15.8% (estimated for 2014-2015).

For annual verification, the college contracts with an independent auditor who reviews the District's financial status. Various compliance tests are conducted by the auditors to ensure adherence to the applicable laws and regulations. In 2009-2010, 2010-2011, 2011-2012 & 2012-2013 audit years there were no audit findings on the district financials or Proposition 39 financials.

Sources for verification:

Budgets: <http://www.avc.edu/administration/busserv/Budgets.html>

Audits: <http://www.avc.edu/administration/busserv/audits.html>

Identification of experienced and appropriate program administration and support staff with sufficient time allocated to ensure program success for the pilot baccalaureate program

Antelope Valley College's administration and staff is composed of committed individuals who have collaborated with baccalaureate-level administration, faculty and staff to provide upper division education to students in its community. The dean of career technical education has collaborated with CSU Bakersfield administration and faculty to bring a nursing baccalaureate degree to the Antelope Valley. The department chair for industrial technology is a faculty in the aircraft fabrication and assembly program. The counselor who staffs the college's Transfer Center has been the liaison between students at the college and four year educational institutions for 19 years. He has been a consultant for the proposed baccalaureate degree. If necessary, the college will add an administrator to direct the baccalaureate degree program. The college will commit a designated counselor to students pursuing the baccalaureate degree. Priority counseling will be given to those students to ensure they meet the commencement timeline. Student Services support staff are researching the preliminary steps in programs such as Financial Aid, CalWORKs, EOPS/CARE, Disabled Students Services, Student Development and the Career Center in order to serve students in the baccalaureate program effectively.

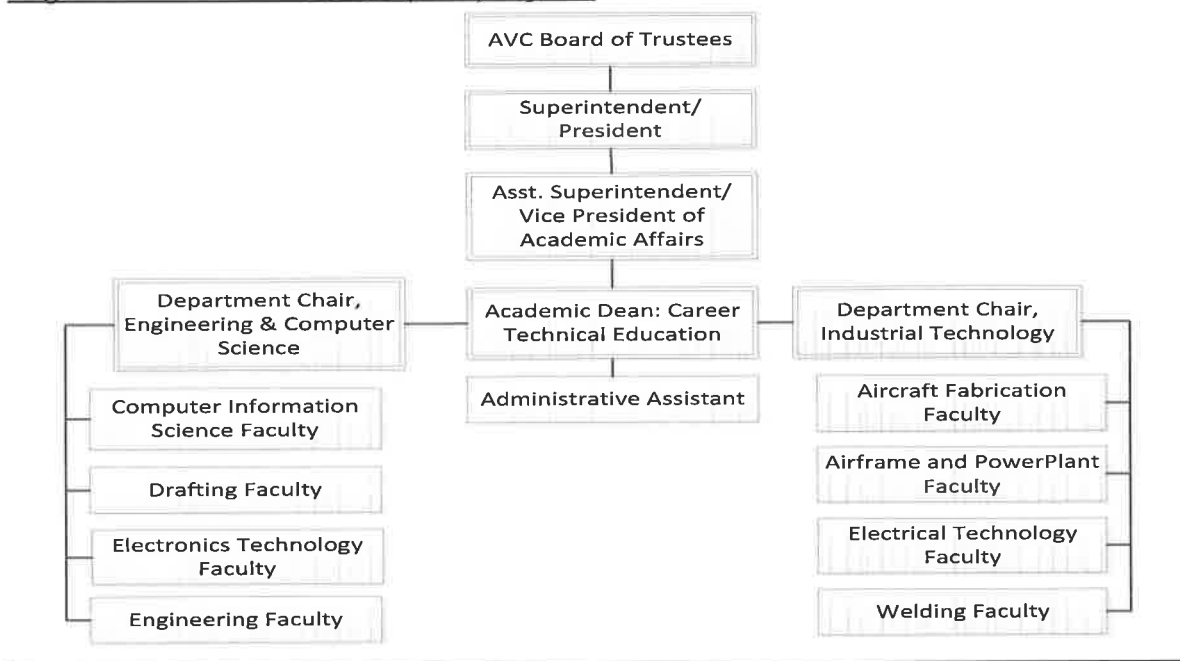
Examples of programs that the college and/or district have successfully implemented which are similar to the proposed baccalaureate degree program

Antelope Valley College has an established engineering degree program in collaboration with CSU Long Beach. Students complete the first two years of engineering, physics, calculus and drafting classes at the community college. Then they complete the upper division courses at the Lancaster University Center in the Antelope

Valley. The programs share faculty at times, and faculty and administrators from the programs collaborate to identify and fund equipment, laboratory space, and supplies. In addition, faculty from both programs serve on advisory committees for the engineering programs at both levels.

Antelope Valley College faculty and administration collaborate with the faculty and administration to offer baccalaureate completion programs on the CSU Bakersfield-Antelope Valley Regional Center in the disciplines of early child education, business, nursing, criminal justice, and master’s degrees in several disciplines (<http://www.csub.edu/AV/>). Degree alignment between the lower and upper division has resulted in seamless transfer opportunities in early child education and nursing.

Organizational chart for the pilot program



Identified Resources

Summary of funding and other resources, including professional development and curriculum development that will be provided to support the planning and implementation of the program

The Board of Trustees of the Antelope Valley Community College District approved a resolution to support the proposed program financially. The college will commit specific funding to the success of the baccalaureate degree, including building on existing faculty professional development offered at the college and participation in national conferences, seminars and workshops on the community college baccalaureate. If necessary, the college will augment the reassigned time of the industrial technology department chair to ensure that the program will be implemented in a timely manner with appropriate resources.

Evidence of the availability of discipline prepared instructional faculty and appropriate student support services and personnel

The following career technical education faculty are among those who have education preparation at or above the master's degree and currently teach in the disciplines that compose the proposed degree:

Maria Clinton, EdD, educational leadership; Aircraft Fabrication and Assembly faculty
Ronald Coleman, MBA; adjunct instructor in Aircraft Fabrication and Assembly
Tyrone Mettler, Master's in Aeronautical Science; Aviation Airframe faculty
Rick Motawakel, MBA; Electronics faculty
Michael Sauve, MBA; adjunct instructor in Drafting

All counseling faculty at Antelope Valley College have master's degrees or higher.

All faculty in the English, Physics, and Chemistry disciplines have master's degrees or higher and would be qualified to teach upper division general education courses.

A pool of potential faculty is available at Edwards Air Force Base, NASA, Northrop Grumman Corporation, and Lockheed Martin Corporation, all located within or near the college's Lancaster campus. As additional faculty are needed to teach and support students in the baccalaureate program, the college is committed to additional qualified faculty.

Description of facilities, instructional equipment, and supplies available for the program and/or plans for securing these essential resources

Antelope Valley College has existing facilities that will be used for the proposed program: composites lab, structures lab, welding shop, engineering lab, drafting computer lab. The college leases two hangars at General William J. Fox Field in Lancaster for its airframe course. The college owns two aircraft and a helicopter that are used in the airframe course and tools for the Aircraft Fabrication and Assembly program and aviation programs. The college receives generous donations of supplies from Lockheed Martin Corporation, Northrop Grumman Corporation and The Spaceship Company for the composites program. Additional resources can be purchased to support the proposed baccalaureate degree program when identified by faculty.

Analysis showing that the proposed baccalaureate degree can be successfully achieved with identified resources

Antelope Valley College has the faculty, facilities, community support, financial stability and industry partnerships to implement the baccalaureate program in airframe manufacturing technology. Faculty members have years of experience in the aviation industry and expertise to teach a multidisciplinary curriculum. The faculty participate in professional development and would be willing to engage in additional professional development to enhance their teaching skills. They developed a draft curriculum (not fully included in this proposal due to space constraints) with input from industry partners and with deep discussion regarding the time, effort and expense of the baccalaureate program.

The facilities for the program already exist. They do not need renovation or retrofitting to achieve the goals of the program. Industry partners have indicated that they will augment the generous donations that they already provide for the aerospace programs. The unique nature of the composites lab is also a desirable feature of this baccalaureate curriculum.

Antelope Valley College has demonstrated fiscal responsibility and has been managed soundly for years. The college can commit financial resources to instruction, supplies, student support to the baccalaureate from its reserve funds.

The program was developed with students' needs for advancement in the aerospace industry in mind. Employers stated their interest in having multi skilled workers who could move throughout the manufacturing floor to fill multiple roles. The curriculum in airframe manufacturing technology would provide the broad perspective that workers would need to fill industry requirements.

Evaluation and Reports

Antelope Valley College is willing to collect and report program data and progress reports requested by the Chancellor's Office in a manner prescribed by the Chancellor's Office. The college has been awarded numerous grants from the Chancellor's Office, private sources, and federal agencies, and it has complied with terms of the awards as required.

Dissemination and Coordination Plan

Various participants in the development of the proposed program have experience giving presentations at state and national conferences. Administrators have participated in statewide advisory committees to the Chancellor's Office. The college does not anticipate issues collaborating and sharing information with the pilot colleges and the Chancellor's Office or participating in program related statewide meetings.

APPENDIX A

By submission of their application, the District/College agrees to abide by the terms and conditions set forth in the Application to Participate in the California Community Colleges Baccalaureate Degree Pilot Program and the District/College application.

APPLICATION SIGNATURE PAGE

District: Antelope Valley Community College

College: Antelope Valley College

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District Superintendent/President (or authorized Designee)

Name: Edward T. Knudson Title: Superintendent/President

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College President

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Phone: (661)722-6300 ext 6062 Date: December 17, 2014

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Name: Diana Keelen Title: Executive Director, Business Services

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