

## **Proposal to Create an AAE Course Designator for Aerospace Engineering Courses**

***Submitted by Brady J. Gibbons, Associate School Head for Undergraduate Programs and Nancy Squires, Senior Instructor, School of Mechanical, Industrial, and Manufacturing Engineering***

### **Justification:**

*The school of Mechanical, Industrial, and Manufacturing Engineering (MIME) currently has four undergraduate Bachelor of Science programs. They include Mechanical Engineering, Industrial Engineering, Manufacturing Engineering, and Energy Systems Engineering. Given the diversity within this school, several Minor programs have been (or are planning to be) proposed, including Humanitarian Engineering, Materials Science, Robotics, and Aerospace Engineering. Currently each of those areas aside from Aerospace Engineering has a course designator (HEST, MATS, and ROB). This proposal is to add an AAE course designator. At the present time, there are no opportunities for students in Oregon to obtain any type of degree in Aerospace Engineering. This has been a concern among STEM programs across the state, as many talented students are going to other states for this degree. Importantly, there have been a number of our OSU students now employed in the aeronautics and astronautics industries since the first aerospace-related course at OSU was offered in 2013. In addition, many of these students have been engaged in rocketry and aviation-based Senior Capstone projects. With the many opportunities in aerospace engineering, both in post-graduate programs and industry, students from a wide variety of disciplines within MIME, including Robotics, Materials Science, Design, Dynamics and Controls and Thermal-Fluid Sciences have participated in aerospace-related courses and Senior Design projects. There has also been significant interest in an Aerospace Minor among students in engineering schools outside of MIME, including Electrical and Computer Engineering and Computer Science (EECS) and Nuclear Science and Engineering (NSE). To reflect the collaborative nature of the courses offered for an aerospace minor, we propose to create an AAE course designator.*

**Purpose: The proposed course designator should have an identified purpose within the curricular structure of Oregon State University.**

- **What academic programs, including majors, certificates, options and minors will be served by courses within the designator?**

*All four of the undergraduate academic programs in MIME will be served by courses within this designator. It is expected that students from EECS, NSE and other Schools in the College of Engineering will be interested in these courses, as well. Courses with the AAE designator will be listed not only as required/optional for the Minor, but open as Senior Restricted Electives for all Mechanical Engineering students, as well.*

- **In what ways do the general area and scope of the content constitute a coherent body of knowledge?**

*All engineering disciplines are reflected in aeronautics and astronautics. Many colleges and universities do not offer a specific degree in Aerospace Engineering, including here at Oregon State University. A professional working in the aerospace industry can expect to see all fields of engineering in the multidisciplinary design, manufacture, integration, testing, and certification of aero vehicles. Creating an AAE designator will emphasize the unity of all engineering disciplines in the aerospace field. It will also help identify courses that will be required/optional to our soon-to-be proposed Aerospace Engineering Minor.*

- **Is the proposed usage of the designator consistent with practice at OSU and other institutions? Give examples.**

*There are many examples of academic programs that offer courses under the AAE designator. For example, Texas A&M offers a Mechanical Engineering degree with a minor in Aerospace Engineering, which includes courses such as AAE 301 Aerodynamics, AAE 303 High Speed Aerodynamics, and 310 Aerospace Dynamics.*

**Accountability: Responsibility for the integrity and oversight of the proposed course designator should be clearly identified.**

- **What is the academic College of the designator?**

*MIME and other Schools that will be associated with the AAE designator are in the College of Engineering.*

- **Who is responsible for administering courses in the designator, e.g. scheduling and catalog updates. Who are the faculty contact persons?**

*The School of MIME Undergraduate Programs leadership and scheduling will be responsible for the administration of courses with an AAE designator. They would include the Interim School Head Prof. David Cann, the Associate School Head for Undergraduate Programs, Prof. Brady Gibbons, the MIME scheduler, Prof. Kenneth Funk, and the Aerospace Engineering Minor coordinator, Sr. Instructor Nancy Squires (along with Associate School Head Brady Gibbons). These will also be the faculty contacts regarding the designator.*

- **Who is responsible for consistency and outcome assessment for courses in the designator?**

*The School of MIME Undergraduate Programs leadership will be responsible for the consistency and outcome assessment for courses in the designator. This includes the Interim School Head, Prof. David Cann and Associate School Head for Undergraduate Programs, Prof. Brady Gibbons. MIME has a rigorous assessment and evaluation process in place for all courses, as required by both the MIME Undergraduate Program Committees (UPCs) and by our external accreditation entity, ABET.*

- **Which units get credit for the SCH generated by courses in the subject code?**

*The School of MIME will continue to get credit for the SCH generated by any courses with this designator.*

- **Who is responsible for communicating information about the new designator to stakeholders, including advisors, Admissions, and students?**

*The School of MIME Undergraduate Programs leadership will be responsible for communicating information about the new designator to stakeholders, including academic advisors throughout the college, Admissions, and students. The idea of creating this designator has the full support of the Interim School Head, Prof. David Cann, the Associate School Head for Undergraduate Programs, Prof. Brady Gibbons, the Mechanical Engineering Undergraduate Program Committee chair, Prof. Bob Paasch, numerous MIME faculty, and the MIME professional advising staff.*

### **Impacts: Who will benefit from the new designator and what changes will result from its implementation?**

- **Will courses in the new designator duplicate or compete with existing ones?**

*Upon implementation, current Aero-related ME 499 special topic courses that are now in the CAT 2 process will be given the AAE designator. These courses include: Aerospace Applications in Mechanical Engineering, UAV Engineering, Space Systems Engineering, and the Aerospace Design Lab. These are all new courses developed in the last three years that are not duplicates of any others on campus. They have been developed with the AAE designator (and hopeful Minor program) in mind.*

- **Are there expected cross-listings or curricular equivalencies?**

*No cross-listings are expected.*

- **How will the new designator affect transfer credits?**

*The new designator will not affect transfer credits.*

- **Will any previous existing designators expire as the new one appears?**

*No designators will expire as the new one appears.*

- **How will the new designator benefit students?**

*This new designator will be very beneficial to students. Our goal is to identify a segment of the OSU engineering program that is affiliated with Aerospace Engineering. At the present time, there are no university programs in Oregon in the Aerospace Engineering field. This designator would uniquely, and easily, convey to students both here at OSU and in STEM programs across the state that there is an opportunity to engage in aerospace-related higher education in Oregon.*