Program Outcome Specific Guidance (ASCI 490, AMNT 490, SCTY 490, & Tran 490 only)

General Education POs (Apply to ASCI, AMNT, SCTY, and Tran Capstone Degree Programs only)

1. ***Critical Thinking.*** *The student will show evidence of knowledge at a synthesis level to define and solve problems within professional and personal environments.*

Critical thinking is the key to a successful Capstone effort. Critical Thinking goes beyond a reciting of information researched. It involves the application of knowledge gained through research that develops a defined project in order to meet a specific outcome.

As an integral component of problem solving and decision-making, this combination of skills allows one to form contentions, conclusions, and recommendations. This skill combines analysis, evaluation, conceptualizing, application, solutions, recommendations, synthesis, decision-making, and problem solving through critical research.

The proposal should clearly identify how the Critical Thinking PO will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Analyzing valid and reliable information and data with a specific purpose that results in the forming of conclusion or recommendations.
- Evaluating information and data as part of a decision making process (problem solving).

- Recommending courses of action (through research) to meet a specific objective.
- Evaluating potential solutions to a project.
- Comparing and contrasting critical variables of a project.
- Identifying and establishing priorities in project.

The result of Critical Thinking is the analysis of information and the development of conclusions and recommendations related to a project and is supported by valid and reliable referenced material.

2. ***Quantitative Reasoning.*** *The student will show evidence of the use of digitally-enabled technology & analysis techniques to interpret data for the purpose of drawing valid conclusions and solving associated problems.*

Quantitative Reasoning is the utilization and application of quantitative concepts and methods in solving real world problems. These concepts (which vary greatly) include basic math, algebra, statistics, geometry, and associated techniques and tools like spreadsheets, graphing, charting and the technology to construct them.

Quantitative Reasoning is the application of quantitative concepts that support and develop a defined project in order to meet a specific outcome. It is the quantitative version of Critical Thinking.

The proposal should clearly identify how the Quantitative Reasoning PO will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research object, such as:

- Analyzing data that supports a project. (This does not necessarily mean "statistical analysis").
- Applying quantitative data, such as descriptive statistics, charts, graphs, linear representations, tables, figures, databases, and spreadsheets to support a specific objective or outcome.
- Interpret and apply quantitative calculations in support of decision making and problem solving processes.
- Using quantitative concepts to "measure" variables in projects.

The result of Quantitative Reasoning is the application of quantitative concepts in the analysis of information and the development of conclusions and recommendations related to a project and supported by valid and reliable referenced material.

3. ***Information Literacy.*** *The student will show evidence of meaningful research, including gathering information from primary and secondary sources and incorporating and documenting source material in their writing.*

There must be a valid and reliable relationship established between any topic of discussion and the material used to support that discussion. This material is comprised of identifiable 'primary' sources, and supported 'secondary' sources in order to logically, effectively, and concisely qualify a position on the topic.

Key to the Information Literacy PO is the conduct and reporting of meaningful research that specifically supports the fundamental purpose of the project.

The proposal should clearly identify how the Information Literacy PO will be met by identifying how research will be conducted and reported in support of the development of the Capstone and include key words, phrases, and concepts to the research objective, such as:

- Use of peer reviewed research that is specific to an objective or outcome
- Conducting research that differentiates between primary and secondary sources.
- Information that is reliable and valid to the project.
- Reporting of research that conforms to APA guidelines.
- Information Literacy employs correct research processes that support the development of the project, including analysis and evaluation of the information gathered, not simply randomly gathering data.
- Using research that is properly cited and referenced and can be verified.
- The result of Information Literacy is the conduct of valid and reliable research that supports the analysis, conclusions, and recommendations related to a project.

4. ***Communication.*** *The student will show evidence of communicating concepts in written, digital and oral forms to present technical and non-technical information.*

In this context, communication is the application of thought into cogent written and oral presentation. Communication is the requisite expression of thought that successfully supports positions on a selected project using the standards identified in the appropriate documents (Publication manual of the

American Psychological Association [APA] and Capstone Policy Guide), and that successfully conveys those positions to the intended audience.

Key to the Communication PO is the effective and efficient communication of the Capstone as a whole, utilizing a logical flow and organization that successfully communicates the outcomes of the project to the intended audience. The student must remember that the Capstone paper and presentation are created for the audience.

Effective communication is not necessarily a singular process or tool (such as MS Word or PowerPoint), but an integration of multiple processes and tools. The proposal must be clear in explaining exactly how the project will be communicated. Communication can take on many forms, including:

- The Capstone itself, which encompasses other components:
    - Correct use of APA guidelines
    - Grammatically correct
    - In-text citations
    - Referenced
    - Logical sequence, flow, transitions

The project presentation. This can take on many forms, including:

- Development of the supporting Power Point presentation
- In-class verbal presentation
- Verbal presentation through Eagle Vision or Skype
- Verbal presentation through teleconferencing
- Individual presentations between instructor and student

Participation in the Discussion Board

- Communication between instructor and student in the development of the proposal and Capstone
- Communication between students
- Weekly status checks

The results of Communication are the presentation of valid and reliable research that supports the analysis, conclusions, and recommendations related to a project and the understanding of that information by the intended audience.

5. ***Scientific Literacy.*** *The student will show evidence of analyzing scientific evidence as it relates to the physical world and its interrelationship with human values and interests.*

Scientific Literacy is the application of critical thinking to the general scientific evidence (general physics, mechanics, weather, chemistry, biology, physiology, etc.) that is used to support a project.

The proposal should clearly identify how Scientific Literacy will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Applying physics or physical laws to a project.
- Identifying and apply factors in aeronautical science as they relate to a project.
- Analyzing weather as a factor in developing a project.

- Evaluating operating characteristics of a system, component, or part as part of an overall project.
- Analyzing mechanical or electrical properties related to a project.
- Assessing physiological factors in human performance.

The result of Scientific Literacy is the analysis of information and the development of conclusions and recommendations related to the scientific aspects of a project and supported by valid and reliable referenced material.

6. ***Cultural Literacy.*** *The student will show evidence of the analysis of historical events, cultural artifacts, and philosophical concepts.*

Cultural Literacy is the knowledge, understanding, and application of history, contributions, and perspectives of differing cultural groups to a specific project or the impact on those cultural groups of the topic of a specific project.

Cultural Literacy is the ability to associate an individual's knowledge, understanding, and application of history, contribution, perspectives, and impacts of their own and other cultural groups. These groups are not limited to ethnic, religious or social groups, but include groups associated with industry, professional, and other work or recreationally related entities. Examples of cultures can include:

- Social cultures
- Organizational cultures
- Aviation cultures (or non-aviation cultures)
- Safety cultures
- Religious cultures

- Ethnic cultures

The proposal should clearly identify how Cultural Literacy will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Analyzing historical events as they impact/influence a project.
- Comparing and contrasting social norms as they impact a specific objective or outcome.
- Examining the evolution of an organization as cultures change.
- Evaluating challenges in managing multi-cultures change.
- Evaluating past and current cultures for trends in aviation safety.

The result of Cultural Literacy is the application and analysis of information in the development of conclusions and recommendations related to the cultural aspects of a project and supported by valid and reliable referenced material.

7. ***Life Long Personal Growth.*** *The student will show evidence of the skills needed to enrich the quality of life through activities, which enhance and promote lifetime learning.*

Life Long Personal Growth is not about the student's personal experience, but broadly with an industry perspective how an individuals' (not the students) personal experience can be demonstrated through the project.

Life Long Personal Growth relates to a compilation of knowledge, skills, and actions taken by individuals in an industry over time to advance one's position and abilities to their benefit. The acquisition of knowledge and skill is followed by an application or action in order to change something.

A demonstration of Life Long Personal Growth skills necessitates an understanding of the Gen Ed POs themselves. These skills are an integral part of an action and planned professional development (both specific to aviation and generalized outside of aviation). The proposal should clearly identify how Life Long Personal Growth is demonstrated through the project. Examples of Life Long Personal Growth can include:

- Evaluating how diversity in professional responsibility supports a specific project.
- Critiquing increase experience through the involvement in a specific project.
- Assessing how education and training impacts performance as it applies to a specific project.
- Evaluating the value of professional development as it applies to a specific project.
- Assessing how professional development (or lack of progression) of career advancement as it applies to a specific project.

The result of Life Long Personal Growth is application of knowledge and skills through professional development that supports the analysis, conclusions, and recommendations related to the life long personal growth aspects of a project and supported by valid and reliable referenced material.

Bachelor of Science in Aeronautics (BSA)(ASCI 490) – Core Program Outcomes

***8.* Aviation/Aerospace/Aeronautical Science.** *The student will show evidence of advanced concepts of aviation, aerospace, and aeronautics to solve problems commonly found in their respective industries.*

The Aeronautical Science PO is the application of critical thinking to the specific aeronautical scientific evidence (the physics of flight, flight operations, human factors, flight physiology, aircraft simulation, aviation safety and security, air traffic control, UAS, etc.) that is used to support a project.

Aeronautical Science includes concepts that can be explained by any of the aeronautical sciences and the associated concepts and properties as they relate to the project.

The proposal should clearly identify how Aeronautical Science will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Applying aeronautical sciences and associated concepts to a project.
- Identifying and applying factors in aeronautical science as they relate to a project.
- Analyzing human factors or flight physiology as factors in developing a project.
- Evaluating flight operations principles and concepts as characteristics of an overall project.
- Analyzing flight simulation systems and procedures as they relate to a project.

- Assessing air traffic control systems, technologies, and procedures as they impact aviation safety and security.

The result of Aeronautical Science is the analysis of information and the development of conclusions and recommendations related to the aeronautical science aspects of a project and supported by valid and reliable referenced material.

9. Aviation Legislation and Law. *The student will show evidence of the basic concepts in national and international legislation and law as they pertain to the aviation, aerospace, and aeronautics industries.*

The Aviation Legislation and Law PO is the application of critical thinking to the past, present, and future local, state, federal, and international laws and regulations that are used to support a project.

Aviation Legislation and Law includes an analysis and evaluation of any and all regulatory requirement (safety, security, flight and maintenance operation, liability, local, state, federal, and international aviation regulations, environmental, aviation facility development, etc.) as they impact and relate to the project.

The proposal should clearly identify how the Aviation Legislation and Law PO will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Analyzing and applying the impact of all laws and regulations that impact any aspects of the project.
- Capstone topic and associated concepts to a project.

- Recommending changes to or elimination of existing laws and regulations or the addition of new laws and regulations as they relate to a project.
- Analyzing and evaluating proposed or soon to be implemented laws and regulations for the impact on a project.

The results of Aviation Legislation and law is the analysis of information and the development of conclusions and recommendations related to the aviation legislation and law aspects of a project and supported by valid and reliable referenced material.

10. Aviation Safety. *The student will show evidence of basic concepts in aviation safety as they pertain to the aviation, aerospace, and aeronautics industry.*

The Aviation Safety PO is the application of critical thinking to the specific topics of aviation safety and security that are used to support a project.

Aviation Safety includes an analysis and evaluation of any and all safety and security concepts, techniques, and procedures (SMS, airfield and other aviation facility security, accident investigation, operation safety, Federal Air Marshal Program, terrorism prevention, etc.) as they impact and relate to the project.

The proposal should clearly identify how the Aviation Safety PO will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objective, such as:

- Applying aviation safety and security programs, agencies, and concepts to a project.

- Identifying the role accident investigation techniques and procedures as they relate to a project.
- Analyzing the impacts of human factors and human error on aviation safety and security as factors in developing a project.
- Evaluating and analyzing prior aviation accidents for use in developing new regulations and methodologies for improving aviation safety and security.
- Assessing the roles private industry and federal regulators and academic research play in improving aviation safety and security.
- Developing safety and security recommendations based upon valid researched evidence from numerous sources.

The result of Aeronautical Safety PO is the analysis of information and the development of conclusions and recommendations related to the aviation safety and security aspects of a project and supported by valid and reliable referenced material.

11. Aviation Management and Operations. *The student will show evidence of sound, ethical, management principles within standard aviation, aerospace, and aeronautics operations.*

The Aviation Management and Operations PO is the application of critical thinking to the specific topics of management of aviation operations that are used to support a project.

Aviation Management and Operations includes an analysis and evaluation of any and all management concepts, techniques, and procedures (personnel, flight

operations, maintenance operations, engineering development and test, airfield, airline, etc.) as they impact and relate to the project.

The proposal should clearly identify how the Aviation Management and Operations PO will be met through the development of the Capstone and include key words, phrases, and concepts applicable to the research objectives, such as:

- Applying established aviation management techniques to the personnel and programs associated with all aviation operations to a project.
- Evaluating the impacts of failures in management on aviation operations as they relate to a project.
- Developing and recommending improvements to existing management techniques and theories or new techniques, based upon valid research, as needed to support a project.

The result of Aviation Management and Operation PO is the analysis of information and the development of conclusions and recommendations related to aviation operations management aspects of a project and supported by valid and reliable referenced material.

Bachelor of Science in Aviation Maintenance (AMNT 490 only) – Core POs

8. Aviation Maintenance. *The student will be able to demonstrate an understanding and application of the fundamentals of aviation maintenance, commonly accepted maintenance practices and global regulations applicable to the aviation maintenance industry.*

The Aviation Maintenance PO includes the study of physical mathematics, weight and balance, FAA regulations, common and special tools and measuring