

The completed and signed proposal should be submitted by the Dean’s Office to: curriculumplanning@asu.edu. Before academic units can advertise undergraduate concentrations or include them in their offerings as described in the university catalogs, they must be recommended for approval by the Senate Curriculum and Academic Programs Committee and approved by the University Provost.

Definition and minimum requirements:

A concentration is a formalized selection of courses within a major.

- A concentration requires a minimum of 15 semester hours of which at least 9 semester hours must be upper division. Specialized concentrations (e.g., BIS Concentrations) may have additional or different requirements.
- A concentration is offered by a single unit and is intended exclusively for students pursuing a particular major. If a concentration consists of courses from more than one college the approval of each college Dean is required.

College/School/Institute: Ira A. Fulton Schools of Engineering

Department/Division/School: The Polytechnic School

Proposing Faculty Group (if applicable): Aviation

If this is an official joint degree program? No, this is not a joint degree program

If “Yes” List all the additional college(s)/school(s)/institute(s) that will be involved in offering the degree program and providing the necessary resources. Note: All units offering this program must have collaborated in the proposal development and completed the appropriate unit and college/school approvals.

Existing Degree and Major under which this concentration will be established: BS in Aeronautical Management Technology

Proposed Concentration Name: Air Traffic Management

What is the first catalog year available for students to select on the undergraduate application for this program? 2016-2017

Delivery method: On-campus only (ground courses and/or iCourses)

Note: Once students elect a campus or On-line option, students will not be able to move back and forth between the on-campus and the ASU Online options. Approval from the Office of the University Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online.

Campus/Locations: indicate all locations where this program will be offered.

- Downtown Phoenix Polytechnic Tempe West Other:

Proposal Contact

Name: Mary Niemczyk **Title:** Chair

Phone number: 480-727-1595 **Email:** mary.niemczyk@asu.edu

DEAN APPROVAL(S)

This proposal has been approved by all necessary unit and College/School levels of review. I recommend implementation of the proposed organizational change.

College/School/Division Dean name: James S. Collofello

Signature  **Date:** 7/8/2015

College/School/Division Dean name:
(if more than one college involved)

Signature _____ **Date:** / /20

Note: An electronic signature, an email from the dean or dean’s designee, or a PDF of the signed signature page is acceptable.

1. OVERVIEW

- A. Provide a brief description of the new concentration (including the specific focus of the new concentration, relationship to other concentrations in this degree program, etc).

This concentration will consist of the same curriculum as the previous BS air traffic management, which is proposed to be disestablished.

- B. Explain the unit's need for the new concentration (e.g., market demand, research base, direction of the discipline, and interdisciplinary considerations). How will the new concentration complement the existing degree program?

Due to the changes in hiring for personnel in the Air Traffic Control segment of aviation, it will be more beneficial for students to have a BS in aeronautical management technology, with a concentration in air traffic management.

2. Support and Impact

- A. Provide a supporting letter from the chair of the academic unit verifying that the proposed concentration has received faculty approval through appropriate governance procedures in the unit and that the unit has the resources to support the concentration as presented in the proposal, without impacting core course resources.

The Air Traffic Management faculty suggested this change from a BS in air traffic management to a concentration in aeronautical management technology in order to assist students in securing other aviation work opportunities upon graduation.

- B. Identify other related ASU programs and outline how the new concentration will complement these existing ASU programs. (If applicable, statements of support from potentially-affected academic unit administrators need to be included with this proposal submission.)

This concentration is simply the establishment of the former BS in air traffic management as a concentration in aeronautical management technology.

- C. Provide a supporting letter from each college/school dean from which individual courses, or the entire concentration, are taken.

3. Academic Curriculum and Requirements

- A. List the knowledge, competencies, and skills (learning outcomes) students should have when they complete this proposed concentration. Examples of program learning outcomes can be found at (<http://www.asu.edu/oue/assessment.html>).

An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines

Demonstrate knowledge of the FAA and its organization.

Demonstrate knowledge of FAA Order 7110.65 requirements.

Demonstrate knowledge of the various FAA Orders pertaining to air traffic control.

Demonstrate knowledge of Letters of Agreement.

Demonstrate knowledge of aircraft recognition and performance characteristics as it pertains to an air traffic environment.

Demonstrate knowledge of meteorological conditions and effects on aircraft performance.

Demonstrate knowledge of the Tower, TRACON, and En Route options and their associated positions descriptions.

Demonstrate knowledge of equipment used in air traffic control.

Demonstrate knowledge of radar, its use, and limitations.

An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.

Demonstrate an ability to apply requirements contained in FAA Order 7110.65 in a air traffic control simulator environment.

- Demonstrate an ability to create solutions for varying air traffic scenarios and traffic volume.
- Demonstrate an ability to visualize and think in a 3-D environment.
- Demonstrate an ability to determine potential conflicts of aircraft flying specific courses, speeds, and altitudes using time/speed/distance method and appropriate equipment.
- An ability to conduct, analyze, and interpret experiments and apply experimental results to improve processes.
- Demonstrate an ability to analyze and modify operating techniques to improve the handling of traffic scenarios
- An ability to apply creativity in the design of systems, components, or processes appropriate to program objectives.
- Demonstrate an ability to create different solutions to handle given air traffic control scenarios.
- An ability to function effectively on teams.
- Demonstrate the skills necessary to work effectively on a team.
- Demonstrate the ability to properly coordinate with other controllers/facilities.
- Demonstrate the ability to scan the airport environment and recognize developing situations that affect other control positions.
- An ability to identify, analyze and solve technical problems.
- Demonstrate an ability to use heading, altitude, distance, and speed information to properly sequence aircraft in a radar environment.
- Demonstrate an ability to use speed and distance information to properly sequence arrival and departure aircraft.
- Demonstrate the proper techniques used in preventing runway incursions.
- Demonstrate an ability to transition to backup equipment in emergency situations.
- An ability to communicate effectively.
- Demonstrate an ability to properly use phraseology.
- Demonstrate an ability to properly coordinate with other controllers/facilities.
- Be able to write an On-the-Job (OJT) training report for another controller and effectively communicate the results.
- A recognition of the need for and ability to pursue lifelong learning
- Demonstrate an awareness of the critical necessity of maintaining a knowledge of the updates to the FAA Order 7110.65 facility orders, NOTAMS
- Demonstrate a knowledge of the various Computer Based Instruction (CBI) courses available.
- Demonstrate a knowledge of the career advancement opportunities available to controllers.
- Describe the elements necessary for a successful air traffic control career.
- An understanding of professional, ethical, and social responsibilities
- Describe the responsibilities of and what it means to be a professional air traffic controller.
- Develop a sense of ethical standards and integrity, flexibility, versatility, and openness to change.
- Demonstrate personal characteristics and attitudes of a successful air traffic controller.
- A recognition of contemporary professional, societal, and global issues and an awareness of and respect for diversity.
- Understand and adhere to a code of ethics and the traits identifiable as desirable for an air traffic controller.
- Demonstrate personal characteristics exemplifying a commitment to ethical standards, integrity, and values.
- A commitment to quality, timeliness, and continuous improvement.
- Demonstrate a commitment to quality, timeliness, and continuous improvement.

- B.** Provide the admissions criteria for the proposed concentration. If they are identical to the admission criteria for the existing major and degree program under which this concentration will be established, please note that here.
 Identical to the existing Aeronautical Management Technology degree program
- C.** Provide the curricular structure for this concentration. Be specific in listing required courses and specify the total minimum number of hours required for the concentration.

Required Core Courses for the Degree/Major				
Prefix	Number	Title	Is this a new Course?	Credit Hours
			(Select one)	
AMT	101	Introduction to Aeronautical Management Technology	No	1
AMT	182	Private Pilot Ground School	No	3
AMT	201	Air Traffic Control	No	3
AMT	214	Commercial Pilot Ground School	No	3
AMT	220	Aviation Meteorology	No	3
AMT	222	Instrument Pilot Ground School	No	3
AMT	280	Aerospace Structures, Materials and Systems	No	4
AMT	287	Aircraft Powerplants	No	4
AMT	308	Air Transportation	No	3
AMT	350	Aircraft Design and Logistics Management	No	3
AMT	360	Aircraft Dispatch Ground School	Yes	3
AMT	396	Aviation Professional	No	1
AMT	410	Aviation Safety and Human Factors	No	3
AMT	442	Aviation Law and Regulations	No	3
AMT	460	Aircraft Dispatch Capstone	Yes	3
ASU	101	The ASU Experience	No	1
ECN	211/212	Macroeconomics Principles or Microeconomics Principles	No	3
ENG	101	First-Year Composition	No	3
ENG	102	First-Year Composition	No	3
MAT	265	Calculus for Engineers I	No	3
PHY	111	General Physics	No	3
PHY	113	General Physics Laboratory	No	1
PHY	112	General Physics	No	3
PHY	114	General Physics Laboratory	No	1
PSY	101	Introduction to Psychology	No	3
PSY	230	Introcudtion to Statisticts	No	3
TWC	401 or 406	Fundamentals of Technical Communication or Technical and Scientific Reports	No	3

			<i>Section sub-total:</i>	73
Required Concentration Courses				
Prefix	Number		<i>Is this a new Course?</i>	Credit Hours
AMT	408	National Aviation Policy	No	3
AMT	444	Airport Management and Planning	No	3
ATC	230	Fundamentals of Air Traffic Management	No	3
ATC	331	Tower Operations	No	3
ATC	332	TRACON Operations	No	3
ATC	333	En Route Operations	No	3
ATC	431	Tower Operations and Procedures	No	3
ATC	432	TRACON Operations and Procedures	No	3
ATC	433	En Route Operations and Procedures	No	3
			<i>Section sub-total:</i>	27
Elective Concentration Courses				
Prefix	Number	<i>Title</i>	<i>Is this a new Course?</i>	<i>Credit Hours</i>
			(Select one)	
			(Select one)	
			(Select one)	
			(Select one)	
			(Select one)	
			<i>Section sub-total:</i>	
Other Concentration Requirements				Credit Hours
<i>E.g. – Capstone experience, internship, clinical requirements, field studies, foreign language skills as applicable</i>				
ATC 484 Internship				3
ATC 491 Air Traffic Management Capstone				3
Technical Electives				2
			<i>Section subtotal:</i>	8
Total minimum credit hours required for concentration				108

D. A minimum residency requirement: How many hours of the concentration must be ASU credit? 30

E. Provide a brief course description for each new course.

Note: All new required courses should be submitted in Curriculum Changemaker and ready for Provost's Office approval before this concentration is put on the CAPC agenda.

AMT 360: Aircraft Dispatch Ground School

Aeronautical knowledge areas required for Aircraft Dispatch certification, as well as preparation for the Aircraft Dispatch knowledge examination. Regulations, aerodynamics, emergencies, flight physiology, weight and balance, navigation, aircraft performance, meteorology, and flight operations. Lecture. Prerequisite(s): AMT 214, 220, 222

AMT 460: Aircraft Dispatch Capstone: Capstone for aircraft dispatch whereby students are engaged in practical applications of regulations, aerodynamics, emergencies, flight physiology, weight and balance, navigation, aircraft performance, meteorology and flight operations. Uses various scenarios in which students can employ the strategies and procedures necessary for safe flight. Lecture. Prerequisite(s): AMT 360

Administration and Resources

A. How will the proposed concentration be administered (including admissions, student advisement, retention, etc.)?

The same as the other Aeronautical Management Technology concentrations: Air Transportation Management, Professional Flight and Unmanned Aerial Systems.

B. What are enrollment projections for the next three years?

	1st Year	2nd Year (Yr 1 continuing + new entering)	3rd Year (Yr 1 & 2 continuing + new entering)
Number of Students (Headcount)	88	100	120

C. What are the resource implications for the proposed concentration, including any projected budget needs? Will new books, library holdings, equipment, laboratory space and/or personnel be required now or in the future? If multiple units/programs will collaborate in offering this concentration please discuss the resource contribution of each participating program. Letters of support must be included from all academic units that will commit resources to this concentration.

The resources currently used for the BS in air traffic management will be used for this concentration.

D. Please list the primary faculty participants regarding this proposed concentration. For interdisciplinary concentrations, please include the relevant names of faculty members from across the University.

Name	Title	Area(s) of Specialization as they relate to proposed concentration
Verne Latham	Lecturer	Air Traffic Tower
Joe Gridley	Lecturer	En Route, TRACON
John Gilding	Lecturer	En Route, TRACON

4. Additional Materials

- A. Prepare and attach a Major Map. Please use the "proposed map" function to create a Major Map in BAMM. This feature is explained in the training document available on help.asu.edu.
- B. *Complete and attach the Appendix document.*
- C. Attach other information that will be useful to the review committees and the Office of the University Provost.

**APPENDIX
OPERATIONAL INFORMATION FOR UNDERGRADUATE CONCENTRATIONS**

(This information is used to populate the Degree Search/catalog website.
Please consider the student audience in creating your text.)

Proposed Concentration Name: Aeronautical Management Technology (Air Traffic Management)

1. Program Description (150 words maximum)

The BS in aeronautical management technology with a concentration in air traffic management offers students exceptional training and state-of-the-art facilities in the field of aviation. Students learn air traffic control procedures and operations in tower, Terminal Radar Approach Control (TRACON) facilities and en route environments. Students learn the skills needed to be air traffic controllers with the Federal Aviation Administration, among other career possibilities.

2. Contact and Support Information

Office Location (Building & Room): SIM 213
 Campus Telephone Number: 480-727-1021
 Program email address: aerotech@asu.edu
 Program website address: <http://poly.engineering.asu.edu/aviation>

3. Additional Program Description Information

- A. Additional program fee required for this program? Yes No
 B. Does this program have a second language requirement? Yes No

4. Delivery/Campus Information

Delivery

- On-campus only** (ground courses and/or iCourses) (check campus(es)/locations below)
 ASU Online only (all courses online)*
 Both on-campus and ASU Online*

** Note: Academic units must obtain prior approval from the Office of the University Provost and Philip Regier (Executive Vice Provost and Dean) to offer programs through ASU Online.*

Campus(es) and/or Locations Check all locations where the program will be offered.

- Downtown - Polytechnic - Tempe - West
 - Other (please specify)

Operational information:

Once students select a campus or On-line option, students will not be able to move back and forth between the on-campus the ASU Online option.

5. Career Opportunities & Concentration(s)

Provide a brief description of career opportunities available for this degree program with the proposed concentration.

The number of controllers projected to be hired by the FAA through 2021 is 11,747. Increases in the volume of air traffic will require more air traffic controllers to handle the additional work. New computerized systems will assist controllers by automatically making many of the routine decisions. This will allow controllers to handle more traffic, thus increasing their productivity.

To prepare for this challenge, students receive training in the methodologies and technologies that are currently being developed for the next generation air traffic control systems. Despite the obvious demand for new controllers in the immediate future, competition to get into the FAA-approved training programs is expected to remain intense, as there generally are many more applicants than there are openings. Graduates who have met all of the FAA requirements will be considered for employment.

6. Additional Admission Requirements

If applicable list any admission requirements (freshman and/or transfer) that are higher than and/or in addition to the university minimum undergraduate admission requirements.)

N/A

7. Keywords

List all keywords used to search for this program. Keywords should be specific to the proposed program. air traffic control, air traffic management, aviation

8. Advising Committee Code

List the existing advising committee code associated with this degree. UGESPS

Note: If a new advising committee needs to be created, please complete the following form:
Proposal to create an undergraduate advising committee

9. Western Undergraduate Exchange (WUE) Eligible:

Has a request been submitted to the University Provost by the Dean to consider this degree program as eligible for [WUE](#)
Yes

Note: No action will be taken during the implementation process with regards to WUE until approval is received from the University Provost.

10. First Required Math Course List the first math course required in the major map. MAT 265

11. Math Intensity

- a. List the highest math required on the major map. (This will not appear on Degree Search.) MAT 265
- b. What is the math intensity as indicated by the highest math required on the major map? Math intensity categorization can be found here: <https://catalog.asu.edu/mathintensity> Substantial

12. CIP codes

- a. Identify CIP codes that should be displayed on Degree Search. CIP codes can be found at: <http://www.onetonline.org/crosswalk/CIP/>.

53-2021	Air Traffic Controller
53-2022 Airfield Operations Specialist

- b. Are any specific career codes (SOC/ONET codes) to be omitted from the CIP codes selected above? (i.e. “Omit 25-10312.00 Engineering Teachers, Postsecondary from CIP code 14.0501 Bioengineering and Biomedical Engineering.”)

13. Area(s) of Interest

A. Select one (1) primary Area of Interest from the list below that applies to this program.

- | | |
|---|--|
| <input type="checkbox"/> <u>Architecture & Construction</u> | <input type="checkbox"/> Health & Wellness |
| <input type="checkbox"/> Arts | <input type="checkbox"/> Humanities |
| <input type="checkbox"/> Business | <input type="checkbox"/> <u>Interdisciplinary Studies</u> |
| <input type="checkbox"/> <u>Communications & Media</u> | <input type="checkbox"/> <u>Law & Justice</u> |
| <input type="checkbox"/> Computing & Mathematics | <input checked="" type="checkbox"/> <u>STEM</u> |
| <input type="checkbox"/> Education & Teaching | <input type="checkbox"/> <u>Science</u> |
| <input type="checkbox"/> <u>Engineering & Technology</u> | <input type="checkbox"/> <u>Social and Behavioral Sciences</u> |
| <input type="checkbox"/> Entrepreneurship | <input type="checkbox"/> Sustainability |
| <input type="checkbox"/> <u>Exploratory</u> | |

B. Select any additional Areas of Interest that apply to this program from the list below.

















- | | |
|---|--|
| <input type="checkbox"/> <u>Architecture & Construction</u> | <input type="checkbox"/> Health & Wellness |
| <input type="checkbox"/> Arts | <input type="checkbox"/> Humanities |
| <input type="checkbox"/> Business | <input type="checkbox"/> <u>Interdisciplinary Studies</u> |
| <input type="checkbox"/> <u>Communications & Media</u> | <input type="checkbox"/> <u>Law & Justice</u> |
| <input type="checkbox"/> Computing & Mathematics | <input type="checkbox"/> <u>STEM</u> |
| <input type="checkbox"/> Education & Teaching | <input checked="" type="checkbox"/> <u>Science</u> |
| <input type="checkbox"/> <u>Engineering & Technology</u> | <input type="checkbox"/> <u>Social and Behavioral Sciences</u> |
| <input type="checkbox"/> Entrepreneurship | <input type="checkbox"/> Sustainability |
| <input type="checkbox"/> <u>Exploratory</u> | |

The following fields are to be completed by the Office of the University Provost.	
CIP Code:	
Plan Code:	

2015 - 2016 Major Map
Aeronautical Management Technology (Air Traffic Management), (Proposed)

OXBVEKA

Printer Friendly Major Map

Term 1 0 - 13 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 AMT 182: Private Pilot Ground School	3	C	<ul style="list-style-type: none"> • An SAT, ACT, Accuplacer, or TOEFL score determines placement into first-year composition courses • ASU Math Placement Exam score determines placement in Mathematics course • ASU 101 or College specific equivalent First Year Seminar required of all freshman students
 AMT 220: Aviation Meteorology	3	C	
 ASU 101: The ASU Experience	1		
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
MAT 265: Calculus for Engineers I (MA)	3	C	
Term hours subtotal:	13		
Term 2 14 - 27 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 AMT 101: Introduction to Aeronautical Management Technology	1	C	<ul style="list-style-type: none"> • Please note that both PHY 111 and PHY 113 must be taken to secure SQ General Studies credit.
 AMT 201: Air Traffic Control	3	C	
 PHY 111: General Physics (SQ)	3	C	
 PHY 113: General Physics Laboratory (SQ)	1		
ECN 211: Macroeconomic Principles (SB) OR ECN 212: Microeconomic Principles (SB)	3		
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Term hours subtotal:	14		
Term 3 28 - 44 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 AMT 214: Commercial Pilot Ground School	3	C	<ul style="list-style-type: none"> • Please note that both PHY 112 and PHY 114 must be taken to secure SQ General Studies credit.
 AMT 280: Aerospace Structures, Materials and Systems	4	C	
 ATC 230: Fundamentals of Air Traffic Management	3	C	
 PSY 101: Introduction to Psychology (SB)	3	C	
PHY 112: General Physics (SQ)	3		
PHY 114: General Physics Laboratory (SQ)	1		
 Complete Mathematics (MA) requirement.			

Term hours subtotal: 17

Term 4 45 - 60 Credit Hours Critical course signified by ⚠	Hours	Minimum Grade	Notes
⚠ AMT 222: Instrument Pilot Ground School	3	C	
⚠ AMT 287: Aircraft Powerplants	4	C	
PSY 230: Introduction to Statistics (CS)	3		
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Literacy and Critical Inquiry (L)	3		
Term hours subtotal:	16		

Term 5 61 - 75 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AMT 308: Air Transportation (G)	3	C	
★ AMT 350: Aircraft Design and Logistics Management	3	C	
★ ATC 331: Tower Operations	3	C	
AMT 360: Aircraft Dispatch Ground School	3	C	
Humanities, Arts and Design (HU) AND Historical Awareness (H)	3		
Term hours subtotal:	15		

Term 6 76 - 91 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AMT 396: Aviation Professional	1	C	
★ AMT 408: National Aviation Policy	3	C	
★ AMT 442: Aviation Law and Regulations	3	C	
★ ATC 332: TRACON Operations	3	C	
★ ATC 431: Tower Operations and Procedures	3	C	
AMT 460: Aircraft Dispatch Capstone	3	C	
Term hours subtotal:	16		

Term 7 92 - 106 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AMT 410: Aviation Safety and Human Factors	3	C	
★ ATC 333: En Route Operations	3	C	
★ ATC 432: TRACON Operations and Procedures	3	C	
ATC 484: Internship	3	C	
Upper Division Social-Behavioral Sciences (SB) OR Upper Division Humanities, Arts and Design (HU)	3		
Term hours subtotal:	15		

Term 8 107 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AMT 444: Airport Management and Planning	3	C	

★ ATC 433: En Route Operations and Procedures	3	C
★ ATC 491: Air Traffic Management Capstone	3	C
TWC 401: Fundamentals of Technical Communication (L) OR TWC 446: Technical and Scientific Reports (L)	3	
Technical Elective	2	
Term hours subtotal:		14

- Technical Elective: Please see subject list below. Consult with an academic advisor when selecting technical electives.

Technical Elective

- AES Elective
- AMT Elective
- ATC Elective
- MIS Elective
- NAV Elective
- OMT Elective
- TEM Elective
- TMC Elective

Total Hours: 120
Upper Division Hours: 45 minimum
Major GPA: 2.00 minimum
Cumulative GPA: 2.00 minimum
Total hrs at ASU: 30 minimum
Hrs Resident Credit for Academic Recognition: 56 minimum
Total Community College Hrs: 64 maximum

General University Requirements Legend

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2015 - 2016 academic year.