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### *Human Factors and Systems (MSHFS)*

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Master of Science

Department Chair - **Albert Boquet**  
Program Coordinator - **Shawn Doherty**

#### **Introduction**

The Department of Human Factors and Systems offers graduate instruction leading to the Master of Science degree in Human Factors and Systems with two distinct tracks in Human Factors and in Systems. These programs are designed to meet the highest academic standards, fully preparing students for doctoral-level studies while at the same time preparing students for immediate employment in the real world of cost-sensitive and operationally driven aviation/aerospace environments.

The Human Factors track will develop a graduate with the capacity to design, conduct, and apply human factors research in support of the design of simple and complex systems. It will develop a student's ability to work as a human factors professional in aviation and aerospace environments based on their academic preparation and to actively participate in human factors projects at the graduate level. A variety of research, consulting, and internship arrangements are included in the program.

This track is based on the scientist-practitioner model of the American Psychological Association (APA) and adheres to guidelines established by the committee for Education and Training of APA's Division 21 (Applied Experimental and Engineering Psychology). The program has been designed to meet the accreditation requirements of

the Education Committee of the Human Factors and Ergonomics Society, as well as the International Ergonomics Association.

Students receive education in the content and techniques of human factors, including statistical and quantitative procedures, experimental design, survey methods, computer techniques, and other research methodologies.

The Systems track provides a systemic focus to the transformation of an operational need into a defined system configuration through the iterative process of functional analysis, synthesis, optimization, and design integration.

History indicates that a properly coordinated and functioning system that has a minimum of undesirable side effects cannot be achieved unless the system designer is sensitive to operational feasibility during the early stages of system development and assumes the responsibility for a user-centered life cycle. Therefore, a major focus of the Systems Track is an appreciation of the total life cycle of the system, including design, development, testing, production, operations, sustaining support, and disposal.

The track addresses considerations of human factors, reliability, maintainability, logistic support, safety, producibility, economic, and related factors as they apply to system design, integration, and evaluation. The goal of the track is to produce graduates who understand the proper balance between

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operational, behavioral, economic, and logistic factors.

Finally, the Systems track produces graduates who can move easily across disciplines. The graduates will understand the relative capabilities and limitations of each and thus know where trade-offs can effectively be made. This interdisciplinary prerequisite also requires that the graduate be able to use the tools and techniques of the various disciplines in both traditional and nontraditional applications.

\* A five-year Human Factors and Systems program is available. Please see the undergraduate section of this catalog for details.

## Degree Requirements

### HUMAN FACTORS TRACK

Core Courses	Credits
HFS 500 Systems Concepts, Theory, and Tools . . . . .	3
HFS 510 Research Design and Analysis I . . . . .	3
HFS 600 Human Factors in Systems . . . . .	3
HFS 610 Research Design and Analysis II . . . . .	3
HFS 615 Sensation and Perception . . . . .	3
HFS 620 Memory and Cognition . . . . .	3
Electives*	Credits
BA 511 Operations Research . . . . .	3
HFS 515 Ergonomics . . . . .	3
HFS 520 Team Resource Management . . . . .	3
HFS 521 Simulating Humans in Complex Systems	3
HFS 525 Human and Organizational Factors in Technological Systems . . . . .	3
HFS 526 Aerospace Physiology . . . . .	3
HFS 527 Drugs in Aviation and Society . . . . .	3
HFS 530 Systems Psychology . . . . .	3
HFS 535 Applied Ergonomic Design, Analysis, & Evaluation . . . . .	3
HFS 590 Graduate Seminar . . . . .	3
HFS 625 Applied Testing and Selection . . . . .	3
HFS 630 Cognitive Systems . . . . .	3
HFS 635 Human Computer Interaction . . . . .	3
HFS 640 Aviation/Aerospace Psychology . . . . .	3
HFS 645 Underpinnings of Human Factors and Ergonomics . . . . .	3
HFS 650 Human Factors of Aviation/Aerospace Applications . . . . .	3
HFS 696 Internship in Human Factors and Systems (highly recommended) . . . . .	3
HFS 699 Special Topics in Human Factors and Systems . . . . .	3

MSA 611 Aviation/Aerospace System Safety . . . . .	3
MSA 612 Aviation/Aerospace Industrial Safety Management . . . . .	3
MSE 500 Software Engineering Discipline . . . . .	3

\* Electives are selected with the consent of the student's graduate advisor. Other elective courses may be selected with the approval of the graduate advisor. A total of four electives must be fulfilled for degree completion.

#### Option I

HFS 700 Thesis . . . . .	6
-OR-	

#### Option II

HFS 515 Ergonomics . . . . .	3
-AND-	
HFS 611 Work Physiology . . . . .	3
-AND-	
Comprehensive Exam . . . . .	0

**Total Required** 36

### SYSTEMS TRACK

Core Courses	Credits
HFS 500 Systems Concepts, Theory, and Tools . . . . .	3
HFS 505 System Engineering I . . . . .	3
HFS 510 Research Design and Analysis I . . . . .	3
HFS 600 Human Factors in Systems . . . . .	3
HFS 605 System Engineering II . . . . .	3
HFS 610 Research Design and Analysis II . . . . .	3
Electives*	Credits
BA 511 Operations Research . . . . .	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation . . . . .	3
BA 521 Global Information and Technology Management . . . . .	3
HFS 515 Ergonomics . . . . .	3
HFS 520 Team Resource Management . . . . .	3
HFS 521 Simulating Humans in Complex Systems	3
HFS 525 Human and Organizational Factors in Technological Systems . . . . .	3
HFS 526 Aerospace Physiology . . . . .	3
HFS 527 Drugs in Aviation and Society . . . . .	3
HFS 530 Systems Psychology . . . . .	3
HFS 535 Applied Ergonomic Design, Analysis & Evaluation . . . . .	3
HFS 590 Graduate Seminar . . . . .	3
HFS 625 Applied Testing and Selection . . . . .	3
HFS 635 Human Computer Interaction . . . . .	3
HFS 640 Aviation/Aerospace Psychology . . . . .	3
HFS 645 Underpinnings of Human Factors and Ergonomics . . . . .	3
HFS 650 Human Factors of Aviation/Aerospace Applications . . . . .	3

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HFS 696	Internship in Human Factors and Systems (highly recommended) . . . . .	3
HFS 699	Special Topics in Human Factors and Systems . . . . .	3
MSA 611	Aviation/Aerospace System Safety . . . . .	3
MSA 612	Aviation/Aerospace Industrial Safety Management . . . . .	3
MSA 641	Production & Procurement Management in the Aviation/Aerospace Industry . . . . .	3
MSA 643	Management of Research & Development in the Aviation/Aerospace Industry . . . . .	3
MSE 500	Software Engineering Discipline . . . . .	3
MSE 520	Formal Methods for Software Engineering . . . . .	3
MSE 540	Simulation and Software Engineering. . . . .	3
MSE 545	Specification and Design of Real-Time Systems . . . . .	3

\* Electives are selected with the consent of the student's graduate advisor. Other elective courses may be selected with the approval of the graduate advisor. A total of four electives must be fulfilled for degree completion.

### *Option I*

HFS 700	Thesis . . . . .	6
	-OR-	

### *Option II*

HFS 515	Ergonomics . . . . .	3
	-AND-	
HFS 611	Work Physiology . . . . .	3
	-AND-	
	Comprehensive Exam	

<b>Total Required</b>		<b>36</b>
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