Department of Statistics and Computer Information Systems

The Faculty

Chair: Albert E. Croker

Professors:

- Ann Brandwein
- Albert E. Croker
- M. Barry Dumas
- Hammou El Barmi
- Martin Frankel
- Linda W. Friedman
- Shulamith Gross
- Kari Reiner Lang
- Michael Palley
- Abdullah Uz Tansel

Associate Professors:

- Raquel Benbunan-Fich
- William Ferns
- Elsie S. Gottlieb
- Arie Harel
- Richard Holowczak
- Marios Koufaris
- Nanda Kumar
- Pai-Chun Ma
- Kannan Mohan
- Yitzchak P. Sabban
- Isak Taksa
- Lawrence Tatum

Assistant Professors:

- Hyokyoung Hong
- Radhika Jain
- Ronald Neath
- Rongning Wu
- Yu Yue

Lecturer:

- Robert Blau

- Morris Schwartz

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Field Description

The department offers courses in the areas of computer information systems (CIS), operations research, and statistics. Courses in each of these areas provide training in problemsolving techniques useful in gaining strategic advantage in the marketplace. CIS students are afforded the opportunity to gain a strong foundation in the business, managerial, and technical issues related to information systems with courses in programming, data management, telecommunications, the Internet and e-commerce, and the analysis and design of computer-based solutions to business problems. Operations research trains students in the application of mathematical models and decision making for business, industry, and government with an emphasis on modeling methods, analysis, and implementation relevant to operational and management planning issues. Statistics students are provided with a skills base for the application of statistical techniques and tools to a wide variety of areas, including computational statistics, sample survey, experimental design, and quantitative methods in marketing.

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The Majors

General Information

The Department of Statistics and Computer Information Systems offers majors in the fields of computer information systems and statistics and quantitative modeling.

The **computer information systems** area prepares professionals in the development and use of computer-based technologies to develop systems that fulfill business information needs. Baruchs program trains students to analyze business needs and to design, implement, and use information systems to satisfy those needs.

The **operations research** area provides basic preparation for students who wish to pursue careers in the decision sciences and provides fundamental quantitative knowledge required by those who major in other business areas. Emphasis is placed on modeling methods, analysis, and implementation relevant to operational and management planning issues in many business areas, including marketing, production, finance, accounting, and information technology.

The **statistics** area not only provides the basic preparation for students who wish to pursue careers in statistics but also provides the quantitative knowledge required by those who major in other business areas. Statistics and quantitative modeling majors are provided with the base for the application of statistical techniques to a wide variety of fields.

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BBA in Computer Information Systems

The CIS program provides a strong foundation in the business and managerial issues related to information systems. Computer information systems are presented in light of their role as tools for strategic advantage in the marketplace. To facilitate this, course offerings provide computer, technological, and problem - solving skills. The CIS program addresses such areas as CASE (computer-assisted software engineering), networks and telecommunications, electronic commerce, the Internet, client-server technology, and object-oriented technologies.

Required Courses	**12 credits**	
CIS 3100	Object-Oriented Programming I	3 credits
CIS 3400	Database Management Systems I	3 credits

CIS 4800	Systems Analysis and Design	3 credits
CIS 5800	Information Technology Development and Project Management	3 credits
Elective Courses **12 credits** *Any four courses from the following list:*		
CIS 3367	Spreadsheet Applications in Business	3 credits
CIS 3444	E-Business Technologies	3 credits
CIS 3500	Networks and Telecommunications I	3 credits
CIS 3630	Principles of Web Design	3 credits
CIS 3700	Green IT	3 credits
CIS 3750	Social Media Technologies in Organizations	3 credits
CIS 4100	Object-Oriented Programming II	3 credits
CIS 4110	Object-Oriented Programming II With Java	3 credits
CIS 4160	Web Applications Development	3 credits
CIS 4350	Information Technology Audit	3 credits
CIS 4400	Data Warehousing for Analytics	3 credits
CIS 4500	Networks and Telecommunications II	3 credits
CIS 4550	Networked Information Systems Security	3 credits
CIS 4610	Expert (Knowledge-Based) Systems and Related Technologies	3 credits
CIS 4620	Financial Information Technologies	3 credits
CIS 4650	Operating Systems Concepts	3 credits
OPR 3300	Quantitative Methods for Accounting	3 credits
OPR 3450	Quantitative Decision Making for Business I	3 credits
CIS 4091	Special Topics in Computer Information Systems	1 credit
CIS 4092	Special Topics in Computer Information Systems	2 credits
CIS 4093	Special Topics in Computer Information Systems	3 credits
CIS 4094	Special Topics in Computer Information Systems	1.5 credits

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BBA in Statistics and Quantitative Modeling

The statistics and quantitative modeling major is designed to develop quantitative thinking skills that are invaluable in business. The student will take courses from a variety of quantitative disciplines that focus extensively on statistical methodology, mathematical modeling, and computer implementation issues applied to business. The use of the computer for the solution and analysis of business problems is an integral part of the program. Graduates of this program will have a broad foundation in statistics or quantitative modeling and will be well positioned for the analysis and solution of decision problems facing business and industry in the 21st century.

It is essential that the student consult with an area advisor to plan a program prior to taking any courses in the major.

Major		
Required Courses (12 credits)		
CIS 3100	Object-Oriented Programming I	3 credits
OPR 3450	Quantitative Decision Making for Business I *	3 credits
STA 3154	Business Statistics II	3 credits
STA 3155	Regression and Forecasting Models for Business Applications	3 credits
*OPR 3300 Quantitative Methods for Accounting may be substituted for OPR 3450 with the approval of the area advisor		
Elective Courses (12 Credits)		
Electives may be selected after consultation with an advisor:		
CIS 3400	Database Management Systems I	3 credits
CIS 4100	Object-Oriented Programming II	3 credits
OPR 3451	Quantitative Decision Making for Business II	3 credits
OPR 3452	System Simulation	3 credits
OPR 3453	Bayesian Statistical Inference and Decision Making	3 credits
OPR 4470	Special Topics in Operations Research	3 credits
OPR 5000	Independent Study and Research in Operations Research	3 credits
STA 3156	Sampling Theory and Practice	3 credits
STA 3253	Categorical Data Analysis	3 credits
STA 3255	Statistical Quality Control Methods	3 credits
STA 3560	Nonparametric Statistics	3 credits
STA 4000	Introduction to SAS Programming	3 credits
STA 4157	Design and Analysis of Experimental Data	3 credits
STA 4158	Analysis of Time Series	3 credits

STA 4370	Special Topics in Applied Statistics	3 credits
STA 5000	Independent Study and Research in Statistics	3 credits
ECO 4300	Mathematical Economics	3 credits
MGT 3710	Production Planning Systems	3 credits
MKT 3600	Marketing Research	3 credits
MTH 3020	Intermediate Calculus	4 credits
MTH 4120	Introduction to Probability	4 credits
MTH 4125	Introduction to Stochastic Processes	4 credits
MTH 4130	Mathematics of Statistics	4 credits
MTH 4140	Graph Theory	3 credits
MTH 4320	Fundamental Algorithms	4 credits
MTH 4451	Risk Theory	4 credits
MTH 4500	Introductory Financial Mathematics	4 credits
Note: Other quantitative courses may be selected subject to approval of the area advisor. A maximum of three elective courses may be taken outside the Zicklin School of Business.		

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Statistics: BA Major

Arts and sciences students can major in one of the following three programs in the Department of Statistics and Computer Information Systems:

- Statistical Theory
- Psychometrics
- Sociometrics

The department offers courses for students who are primarily interested in mathematics, psychology, and sociology. Statistical theory, using the Colleges extensive computer installations, provides professional training for those who desire a career in operations research, quality control and reliability, health sciences and governmental statistics, design and analysis of surveys, and computer information systems. Joint major programs in conjunction with the Departments of Psychology and Sociology and Anthropology are offered and include courses to augment study in psychometrics and sociometrics.

Statistical Theory

Base Courses

CIS 2200	Introduction to Information Systems and Technologies	3 credits
STA 2100	Statistical Methods for Social Science	3 credits
MTH 2630	Analytic Geometry and Calculus I	5 credits
MTH 3030	Analytic Geometry and Calculus II	5 credits

Major
The major consists of 24 credits, with up to 9 credits in mathematics. **Required Courses**

STA 3551	Theory of Statistics I - Introduction to Probability and Distribution Theory	3 credits
STA 4552	Theory of Statistics II - Statistical Inference	3 credits

Elective Courses

CIS 3100	Object-Oriented Programming I	3 credits
OPR 4652	Introduction to Mathematical Programming	3 credits
OPR 4653	Introduction to Statistical Decision Theory and Game Theory	3 credits
OPR 4654	Queueing Theory and Inventory Models	3 credits
STA 3156	Sampling Theory and Practice	3 credits
STA 3255	Statistical Quality Control Methods	3 credits
STA 3560	Nonparametric Statistics	3 credits
STA 4158	Analysis of Time Series	3 credits
STA 4256	Advanced Sampling Methods	3 credits
STA 5559	Introduction to Multivariate Analysis	3 credits
MTH 4010	Advanced Calculus I	3 credits
MTH 4020	Advanced Calculus II	3 credits
MTH 4100	Linear Algebra and Matrix Methods	3 credits
MTH 4120	Introduction to Probability	3 credits
MTH 4130	Mathematics of Statistics	3 credits
MTH 5010	Advanced Calculus III	3 credits

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Psychometrics

Note: A number of the courses listed below are not currently offered. Students interested in psychometrics should consult with a department advisor.

Base Courses

CIS 2200	Introduction to Information Systems and Technologies	3 credits

STA 2100	Statistical Methods for Social Science	3 credits
MTH 2630	Analytic Geometry and Calculus I	5 credits

Major: 24 credits **Required Courses**

STA 2555	Applied Methods I - Probability and Statistics	3 credits
STA 3556	Applied Methods II - Statistical Inference	3 credits
STA 4561	Factor Analysis and Classification Techniques	3 credits
PSY 3053	Tests and Measurements	3 credits

Elective Courses

OPR 4653	Introduction to Statistical Decision Theory and Game Theory	3 credits
STA 3156	Sampling Theory and Practice	3 credits
STA 3560	Nonparametric Statistics	3 credits
STA 5559	Introduction to Multivariate Analysis	3 credits
MTH 3030	Analytic Geometry and Calculus II	5 credits
MTH 4100	Linear Algebra and Matrix Methods	3 credits
PSY 3056	Social Psychology	3 credits
PSY 3180	Vocational Psychology	3 credits
PSY 3181	Business and Industrial Psychology	3 credits
PSY 3182	Interviewing Techniques	3 credits
PSY 3183	Psychology and Urban Problems	3 credits
PSY 4092	Special Problems in Psychology	2 credits
PSY 4282	Advanced Psychological Testing	3 credits

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Sociometrics

Note: A number of the courses listed below are not currently offered. Students interested in sociometrics should consult with a department advisor.

Base Courses

CIS 2200	Introduction to Information Systems and Technologies	3 credits

STA 2100	Statistical Methods for Social Science	3 credits
MTH 2630	Analytic Geometry and Calculus I	5 credits

Major: 24 credits **Required Courses**

STA 2555	Applied Methods I - Probability and Statistics	3 credits
STA 3556	Applied Methods II - Statistical Inference	3 credits
STA 3563	Design of Social Research	3 credits
SOC 4032	Methods of Sociological Research	3 credits

Elective Courses

OPR 4653	Introduction to Statistical Decision Theory and Game Theory	3 credits
STA 3156	Sampling Theory and Practice	3 credits
STA 3560	Nonparametric Statistics	3 credits
STA 5559	Introduction to Multivariate Analysis	3 credits
MTH 3030	Analytic Geometry and Calculus II	5 credits
MTH 4100	Linear Algebra and Matrix Methods	3 credits
SOC 3155	Urban Sociology	3 credits
SOC 3052	Social Stratification	3 credits
SOC 3055	Population and Society	3 credits
SOC 3064	Modern Organizations	3 credits
SOC 3082	Small Groups	3 credits

Equivalent courses in the arts and sciences and business curricula:

The following pairs of courses are considered as equivalent for purposes of credits. Students can be given credit for either course but not for both:
STA 2000 and STA 2100 (STA 2000 may be used for either the BA or BBA)
STA 3154 and STA 3556
STA 3155 and STA 4554
STA 4157 and STA 4557
OPR 3453 and OPR 4653

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The Minors

General Information

The Department of Statistics and Computer Information Systems offers three minor concentrations*. These are in the fields of computer applications in business, quantitative methods and modeling, and statistics. Each is outlined below.

- Computer Applications in Business
- Quantitative Methods and Modeling
- Statistics

- Liberal Arts Interdisciplinary Minor in Information Technology and Social Responsibility
- Minors for Non-Business Majors

* Optional second minors open only to students pursuing a major within the Zicklin School of Business

Computer Applications in Business

This minor is designed to prepare students majoring in other areas of business to be competent end users and decision makers in a computer information systems environment. The focus is on using microcomputers and higher-level applications software to implement useful applications in a wide range of business areas.

Required Courses	**9 credits**
Choose any three courses (9 credits) from the list of 3000, 4000, or 5000 level CIS courses except CIS 3270, CIS 3810 and CIS 4910. Prerequisites must be satisfied.	

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Quantitative Methods and Modeling

The minor in quantitative methods and modeling is designed to prepare students majoring in other areas of business with a background of quantitative skills that facilitate the decisionmaking process. In addition to one required course, two elective courses are selected with the approval of the area advisor to complement the students major and provide the student with an appropriate background.

Required Courses	**9 credits**	
OPR 3450	Quantitative Decision Making for Business I	3 credits
or		
OPR 3300	Quantitative Methods for Accounting	3 credits

Two courses selected with the approval of the area advisor from the following:		
CIS 3400	Database Management Systems I	3 credits
CIS 4100	Object-Oriented Programming II	3 credits
OPR 3451	Quantitative Decision Making for Business II	3 credits
OPR 3452	System Simulation	3 credits
OPR 3453	Bayesian Statistical Inference and Decision Making	3 credits
OPR 4470	Special Topics in Operations Research	3 credits
OPR 5000	Independent Study in Operations Research	3 credits
STA 3154	Business Statistics II	3 credits
STA 3155	Regression and Forecasting Models for Business Applications	3 credits
STA 4000	Introduction to SAS Programming	3 credits
Other quantitative courses may be selected subject to approval of the area advisor.		

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Statistics

The minor in statistics consists of the courses listed below.

Required Courses	**3 credits**	
STA 3154	Business Statistics II	3 credits
Elective Courses	**6 credits**	
Two courses selected from the following:		
OPR 3450	Quantitative Decision Making for Business I	3 credits
STA 3155	Intermediate Statistical Methods	3 credits
STA 3156	Sampling Theory and Practice	3 credits
STA 4000	Introduction to SAS Programming	3 credits
STA 4370	Special Topics in Applied Statistics	3 credits

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Liberal Arts Interdisciplinary Minor in Information Technology and Social Responsibility

The internet age has fostered an environment of widespread interconnectedness. This hyperconnectivity, and the new media that proliferate along with it, come with their own specific problems. The purpose of this concentration is to study the effects of these new technologies on the individual, the workplace, and society at large. In this program of study students will examine the increasing importance of individual and organizational social responsibility in today's interconnected and computer-mediated environment, as well as the specific issues that stand at the intersection of social responsibility and information technology.

Required Course:	**3 credits**	
CIS 4910	Information Technology and Social Responsibility	3 credits

Elective Courses	**6 credits**	
Two courses selected from the following:		
BLS 3013	Mass Media and the Black American	3 credits
CIS 3270	Computer Ethics (PHI 3270)	3 credits
CIS 3700	Green IT	3 credits
CIS 3810	Principles of New Media	3 credits
COM 3060	Media Analysis and Criticism	3 credits
COM 3076	International Communication	3 credits
JRN 3220	Media Ethics	3 credits
JRN 3500	Advanced Reporting and Writing	3 credits
LIB 3040	Information and Society (COM 3040 or PAF 3040)	3 credits
PHI 3040	Mind and Computers	3 credits
PHI 3050	Ethics, Economics, and the Business System	3 credits

Courses may be organized into the following suggested tracks:

Media

BLS 3013	Mass Media and the Black American	3 credits
CIS 3810	Principles of New Media	3 credits

COM 3060	Media Analysis and Criticism	3 credits
COM 3076	International Communication	3 credits
JRN 3220	Media Ethics	3 credits
Information Society		
CIS 3810	Principles of New Media	3 credits
COM 3076	International Communication	3 credits
JRN 3500	Advanced Reporting and Writing	3 credits
LIB 3040	Information and Society (COM 3040 or PAF 3040)	3 credits
Philosophy and Ethics		
CIS 3270	Computer Ethics PHI 3270	3 credits
JRN 3220	Media Ethics	3 credits
PHI 3040	Mind and Computers	3 credits
PHI 3050	Ethics, Economics, and the Business System	3 credits

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Minors for Non-Business Majors

Students in the Weissman School of Arts and Sciences or in the School of Public Affairs who wish to take business courses may do so by declaring a minor in statistics and quantitative modeling or in technology, business, and the Internet. Before declaring the minor, they must complete either BUS 1001 (1 credit) or have previously completed BUS 1000 (3 credits). To be awarded the minor, students must have a GPA of 2.0 or more in the courses included in the minor. Eligibility to declare such a minor is restricted to students who have an overall GPA of 2.0 or more at time they declare the minor. Courses that apply to the minor may not be used for any other requirement. This minor does not fulfill the requirement to complete a liberal arts minor.

Students must choose three courses (9 credits) from the following:

Statistics and Quantitative Modeling

CIS 3100	Object-Oriented Programming I	3 credits
OPR 3300	Quantitative Methods for Accounting	3 credits
OPR 3450	Quantitative Decision Making for Business I	3 credits
STA 3154	Business Statistics II	3 credits
STA 3155	Regression and Forecasting Models for Business Applications	3 credits
Technology, Business, and the Internet		
CIS 3100	Object-Oriented Programming I	3 credits

CIS 3367	Spreadsheet Applications in Business	3 credits
CIS 3400	Database Management Systems I	3 credits
CIS 3444	e-Business Technologies	3 credits
CIS 3630	Principles of Web Design	3 credits
CIS 4800	Systems Analysis and Design	3 credits
LAW 3108	Law and the Internet	3 credits
MKT 4555	Internet Marketing	3 credits

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Courses

Courses in Computer Information Systems (CIS)

CIS 1000	Problem-solving Techniques Using Microcomputers	1 hour; 1 credit
CIS 1001	Spreadsheet Techniques for Problem Solving	1 hour; 1 credit
CIS 2001	Spreadsheet Formulas and Functions	1 hour; 1 credit
CIS 2200	Introduction to Information Systems and Technologies	3 hours; 3 credits
CIS 3100	Object-Oriented Programming I	3 hours; 3 credits
CIS 3270	Computer Ethics	3 hours; 3 credits
CIS 3367	Spreadsheet Applications in Business	3 hours; 3 credits
CIS 3400	Database Management Systems I	3 hours; 3 credits
CIS 3444	E-Business Technologies	3 hours; 3 credits
CIS 3500	Networks and Telecommunications I	3 hours; 3 credits
CIS 3630	Principles of Web Design	3 hours; 3 credits
CIS 3700	Green IT	3 hours; 3 credits
CIS 3750	Social Media Technologies in Organizations	3 hours; 3 credits
CIS 3810	Principles of New Media	3 hours; 3 credits
CIS 4091	Special Topics in Computer Information Systems	1 hours; 1 credits
CIS 4092	Special Topics in Computer Information Systems	2 hours; 2 credits
CIS 4093	Special Topics in Computer Information Systems	3 hours; 3 credits
CIS 4094	Special Topics in Computer Information Systems	1.5 hours; 1.5 credits

CIS 4100	Object-Oriented Programming II	3 hours; 3 credits
CIS 4110	Object-Oriented Programming II with Java	3 hours; 3 credits
CIS 4150	Internet Applications Development	3 hours; 3 credits
CIS 4160	Web Applications Development	3 hours; 3 credits
CIS 4350	Information Technology Audit	3 hours; 3 credits
CIS 4367	Microcomputer Applications in Business II	3 hours; 3 credits
CIS 4400	Data Warehousing for Analytics	3 hours; 3 credits
CIS 4500	Networks and Telecommunications II	3 hours; 3 credits
CIS 4550	Networked Information Systems Security	3 hours; 3 credits
CIS 4610	Expert (Knowledge-Based) Systems and Related Technologies	3 hours; 3 credits
CIS 4620	Financial Information Technologies	3 hours; 3 credits
CIS 4650	Operating Systems Concepts	3 hours; 3 credits
CIS 4670	Special Topics in Computer Information Systems	3 hours; 3 credits
CIS 4800	Systems Analysis and Design	3 hours; 3 credits
CIS 4910	Information Technology and Social Responsibility	3 hours; 3 credits
CIS 5000	Independent Study and Research in Computer Information Systems	3 hours; 3 credits
CIS 5800	Information Technology Development and Project Management	3 hours; 3 credits
CIS 5900	Computer Information Systems Internship	3 hours; 3 credits
CIS 2200H	Hon Info Systems	3 hours; 3 credits
CIS 3367H	Hon Sprdsht App Bus	3 hours; 3 credits
CIS 4450H	Hon Network & Com	3 hours; 3 credits
CIS 6001H	Hon CIS I	3 hours; 3 credits per semester
CIS 6002H	Hon CIS II	3 hours; 3 credits per semester

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Courses in Statistics (STA)

STA 2000	Business Statistics I	3 hours; 3 credits
STA 2100	Statistics for Social Science	4 hours; 3 credits
STA 3150	Data Analysis and Model Building I	3 hours; 3 credits

STA 3154	Business Statistics II	3 hours; 3 credits
STA 3155	Regression and Forecasting Models for Business Applications	3 hours; 3 credits
STA 3156	Sampling Theory and Practice	3 hours; 3 credits
STA 3253	Categorical Data Analysis	3 hours; 3 credits
STA 3255	Statistical Quality Control Methods	3 hours; 3 credits
STA 3560	Nonparametric Statistics	3 hours; 3 credits
STA 4000	Introduction to SAS Programming	3 hours; 3 credits
STA 4150	Data Analysis and Model Building II	3 hours; 3 credits
STA 4157	Design and Analysis of Experimental Data	3 hours; 3 credits
STA 4158	Analysis of Time Series	3 hours; 3 credits
STA 4370	Special Topics in Applied Statistics	3 hours; 3 credits
STA 5000	Independent Study and Research in Statistics	3 hours; 3 credits
STA 2000H	Hon bus Statistics	3 hours; 3 credits
STA 2200H	Hon Bus Statistics	3 hours; 3 credits
STA 6001H	Hon Statistics I	3 hours; 3 credits
STA 6002H	Hon Statistics II	3 hours; 3 credits

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Courses in Operations Research (OPR)

OPR 3300	Quantitative Methods for Accounting	3 hours; 3 credits
OPR 3450	Quantitative Decision Making for Business I	3 hours; 3 credits
OPR 3451	Quantitative Decision Making for Business II	3 hours; 3 credits
OPR 3452	System Simulation	3 hours; 3 credits
OPR 3453	Bayesian Statistical Inference and Decision Making	3 hours; 3 credits
OPR 4470	Special Topics in Operations Research	3 hours; 3 credits
OPR 5000	Independent Study and Research in Operations Research	3 hours; 3 credits
OPR 3300H	Hon Quant Meth Acc	3 hours; 3 credits
OPR 6001H	Hon Opr I	3 hours; 3 credits
OPR 6002H	Hon Opr II	3 hours; 3 credits

OPR 6003H	Hon Opr III	3 hours; 3 credits

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