Date Submitted: 03/24/22 4:28 pm

Viewing: CC-BIS-MS : M.S. in Business and Information Systems

Last edit: 04/07/22 3:45 pm

Changes proposed by: Shaohua Wang (davidsw)

Catalog Pages Using this Program	M.S. in Business and Information Systems

Department(s) / College(s)	**Department**	**College**
	Informatics (INFO) ~~IS~~	Ying Wu Coll of Computing (CC)
Name of Program	M.S. in Business and Information Systems	
Academic Level(s)	Graduate	
Degree Designation	MS	
Campus(es) where the program will be offered	Newark	
CIP Code		
Effective Catalog Edition	2022-2023	

Related Department(s)	**Department(s)**
	Informatics (INFO)

If the change involves altering the department's curriculum paradigm as currently outlined in the NJIT catalog, please attach existing and proposed paradigms.

In Workflow

1. **INFO Chair**
2. **AIS**
3. **CC Dean**
4. **Vice Provost of Graduate Studies**
5. **President of the Faculty Senate**
6. Provost's Office
7. Academic Issues Committee

Approval Path

1. 03/28/22 3:41 pm Julie Ancis (jra49): Approved for INFO Chair
2. 03/30/22 10:07 am Mesfin Ayne (ayne): Approved for AIS
3. 03/30/22 10:31 am Ali Mili (mili): Approved for CC Dean
4. 04/07/22 3:46 pm Sotirios Ziavras (ziavras): Approved for Vice Provost of Graduate Studies

Articulation with other institutions, if any

Objectives

Briefly summarize the program and indicate its objectives; e.g., the nature and focus of the program, the knowledge and skills students will acquire, any cooperative arrangements with other institutions or external agencies in offering this program, etc.

Need

Provide justification of the need for this program. If the program falls within the liberal arts and sciences and does not specifically prepare students for a career, then provide evidence of student demand and indicate opportunities for students to pursue advanced study (if the degree is not terminal with regard to further education). If the program is career-oriented or professional in nature, then in addition to student demand give evidence of labor market need and results of prospective employer surveys. Report labor market need as appropriate on local, regional, and national bases. Specify job titles and entry-level positions for program graduates, and/or indicate opportunities for graduates to pursue additional studies.

Relationship to the University and State Master Plans

Describe the relationship of the program to the following: institutional master plans and priorities.

Relationship to Similar Programs in the State and Region

List similar programs within the state and in neighboring states. How does this program compare to those currently being offered?

Distinguished Programs Nationally

For doctoral programs: Supply a select list of distinguished programs nationally in this discipline.

Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

Course Development Plan

Names of faculty involved

Libraries and Computing Facilities

Classrooms and Laboratories Needs

Catalog Description (For PHD programs, include information about the qualifying exams, and other program milestones.)

Curriculum

These degree requirements apply to on campus and online programs.

(30 Credits)

M.S. in Business and Information Systems

Business Core (2 courses)		
IS 677	Information System Principles	3
or MIS 645	Information Systems Principles	
Select one of the following:		3
ACCT 615	Management Accounting [1]	
FIN 600	Corporate Finance I [1]	

HRM 601	Organizational Behavior [1]	
Information Systems Core (6 courses)		
IS 601	Web Systems Development	3
IS 631	Enterprise Database Management	3
IS 663	System Analysis and Design	3
IS 665	Data Analytics for Info System	3
IS 684	Business Process Innovation	3
Select one of the following:		3
IS 685	Enterprise Architecture and Integration	
IS 678	IT Service Management	
Total Credits		24

Electives and Specialization Areas

We strongly encourage students to design and conduct a Masters Project or Thesis with an Informatics professor. If you are considering a Project or Thesis, please consult the professor early to determine the best electives to support your work. IS 700 Course IS 700 Not Found can substitute for one elective and IS 701 Course IS 701 Not Found for two electives, and be considered part of a specialization with the MS Advisor's permission.

Select two of the following electives or [2]		6
Select IS 700B and one of the following electives or		
Select IS 701 to substitute for both of your electives:		
Data Analytics		
Recommended Electives:		
IS 634	Information Retrieval	3
IS 687	Transaction Mining and Fraud Detection	3
IS 688	Web Mining	3
Additional Electives:		
CS 602	Java Programming	3
CS 632	Advanced Database System Design	3
CS 634	Data Mining	3
CS 636	Data Analytics with R Program	3
CS 644	Introduction to Big Data	3
CS 675	Machine Learning	3
CS 676	Cognitive Computing	3
CS 731	Applications of Database Systems	3
CS 732	Advanced Machine Learning	3

CE 602	Geographic Information System	3
MATH 644	Regression Analysis Methods	3
MATH 660	Introduction to statistical Computing with SAS and R	3
MATH 678	Stat Methods in Data Science	3
MGMT 635	Data Mining and Analysis	3
MGMT 682	Business Research Methods I	3
PTC 628	Analyzing Social Networks	3
Business Decision Making		
IS 678	IT Service Management	3
ACCT 615	Management Accounting	3
FIN 600	Corporate Finance I	3
HRM 601	Organizational Behavior	3
MIS 648	Decision Support Systems for Managers	3
MIS 680	Management Science	3
MGMT 620	Management of Technology	3
MGMT 630	Decision Analysis	3
MGMT 650	Knowledge Management	3
MGMT 685	Operations Research and Decision Making	3
MGMT 688	Information Technology, Business and the Law	3
MRKT 620	Global Marketing Management	3
MRKT 645	Digital Marketing Strategy	3
Healthcare Informatics		
CS 639	Elec. Medical Records: Med Terminologies and Comp. Imp.	3
IE 686	Intro to Healthcare Systems	3
IE 687	Healthcare Enterprise Systems	3
IE 688	Healthcare Sys Perfor Modeling	3
PTC 640	Health Communications	3
R834 581	Health Systems and Policy	3
R834 582	Health Care Management	3
R834 659	Healthcare Finance	3
User Experience Design		
Recommended Electives:		
IS 661	User Experience Design [4]	3
IS 664	Customer Discovery [4]	3

IS 686	Pervasive Computing: An HCI Perspective	3
IS 735	Social Media	3
IE 661	Man-Machine Systems	3
IE 662	Cognitive Engineering	3
IE 664	Advanced Ergonomics	3
PTC 605	Elements of Visual Design	3
PTC 606	Advanced Information Design	3
PTC 629	Theory and Practice of Social Media	3
PTC 650	eLearning Design for Mobile	3
Security and Network Management		
IS 680	Information Systems Auditing	3
IS 681	Computer Security Auditing	3
IS 682	Forensic Auditing for Computing Security	3
CS 608	Cryptography and Security	3
CS 645	Security and Privacy in Computer Systems	3
CS 646	Network Protocols Security	3
CS 647	Counter Hacking Techniques	3
CS 652	Cognitive Cloud Networking - Architectures and Applications	3
CS 656	Internet and Higher-Layer Protocols	3
CS 696	Network Management and Security	3
CS 708	Advanced Data Security and Privacy	3
CS 755	Security and Privacy in Wireless Networks	3
CS 756	Mobile Computing and Sensor Networks	3
IT 620	Wireless Networks Security and Administration	3
IT 640	Network Services Administration	3
Systems Analysis and Design		
IS 676	Requirement Engineering	3
IS 683	Web Systems Development	3
IS 685	Enterprise Architecture and Integration	3
IS 661	User Experience Design	3
IS 664	Customer Discovery	3
CS 673	Software Design and Production Methodology	3
CS 683	Software Project Management	3
CS 684	Software Testing and Quality Assurance	3

CS 685	Software Architecture	3
EM 636	Project Management	3
EM 637	Project Control	3
MRKT 636	Design and Development of High Technology Products	3
Web Systems		
IS 634	Information Retrieval	3
IS 661	User Experience Design	3
IS 664	Customer Discovery	3
IS 688	Web Mining	3
IS 690	Web Services and Middleware	3
PTC 605	Elements of Visual Design	3
PTC 628	Analyzing Social Networks	3
PTC 632	Content Management and Information Architecture	3

Build Your Own Specialization

Students may propose a coherent set of courses that have a common thread related to an area that you are interested in. The MS BIS advisor approves the proposed specialization.

1

Students who have taken an undergraduate equivalent of one of these courses may substitute up to one business core course with an additional elective.

2

Students may optionally choose 2 or more courses from a single area, which will constitute a specialization.

4

Students considering a Master's Project or Thesis with the User Experience specialization are encouraged to take both IS 661 User Experience Design and IS 664 Customer Discovery as electives.

Is licensure required of program graduates to gain employment?

Will the institution seek accreditation for this program?

Add any additional information you would like brought to the attention of CUE/ CGE here

Attach any additional information you would like brought to the attention of CUE/ CGE here: Uploaded Files:

Reviewer Comments	**Shaohua Wang (davidsw) (03/24/22 4:35 pm):** We simply wanted to add a statement into the catalog description: "Degree requirement is the same for the online only program.'

Key: 127

Date Submitted: 04/06/22 9:21 am

Viewing: EN-IE-MS : M.S. in Industrial Engineering

Last edit: 04/14/22 2:37 pm

Changes proposed by: Sanchoy Das (das)

Catalog Pages Using this Program	M.S. in Industrial Engineering

Department(s) / College(s)	**Department**	**College**
	Mechanical & Industrial Engr (MIE)	Newark College of Engineering (EN)

Name of Program	M.S. in Industrial Engineering
Academic Level(s)	Graduate
Degree Designation	MS
Campus(es) where the program will be offered	Newark
CIP Code	
Effective Catalog Edition	2022-2023
Related Department(s)	

If the change involves altering the department's curriculum paradigm as currently outlined in the NJIT catalog, please attach existing and proposed paradigms.

In Workflow

1. **MIE Chair**
2. **AIS**
3. **EN Dean**
4. **Vice Provost of Graduate Studies**
5. **President of the Faculty Senate**
6. Provost's Office
7. Academic Issues Committee

Approval Path

1. 02/10/22 3:57 pm Joga Rao (raoi): Approved for MIE Chair
2. 02/10/22 4:53 pm Mesfin Ayne (ayne): Approved for AIS
3. 02/18/22 12:28 pm Kam Moshe (kam): Approved for EN Dean
4. 03/03/22 4:33 pm Sotirios Ziavras (ziavras): Rollback to Initiator
5. 04/06/22 9:40 am Joga Rao (raoi):

Articulation with other institutions, if any

Objectives

Briefly summarize the program and indicate its objectives; e.g., the nature and focus of the program, the knowledge and skills students will acquire, any cooperative arrangements with other institutions or external agencies in offering this program, etc.

Need

Provide justification of the need for this program. If the program falls within the liberal arts and sciences and does not specifically prepare students for a career, then provide evidence of student demand and indicate opportunities for students to pursue advanced study (if the degree is not terminal with regard to further education). If the program is career-oriented or professional in nature, then in addition to student demand give evidence of labor market need and results of prospective employer surveys. Report labor market need as appropriate on local, regional, and national bases. Specify job titles and entry-level positions for program graduates, and/or indicate opportunities for graduates to pursue additional studies.

Relationship to the University and State Master Plans

Describe the relationship of the program to the following: institutional master plans and priorities.

Relationship to Similar Programs in the State and Region

List similar programs within the state and in neighboring states. How does this program compare to those currently being offered?

Distinguished Programs Nationally

For doctoral programs: Supply a select list of distinguished programs nationally in this discipline.

Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

Course
Development Plan

Names of faculty
involved

Libraries and
Computing
Facilities

Classrooms and
Laboratories Needs

Catalog Description (For PHD programs, include information about the qualifying exams, and other program milestones.)

Curriculum

Degree Requirements

Students who do not have a bachelor of science degree in industrial engineering may be admitted and required to complete the bridge program. Bridge courses do not count toward degree requirements.

A minimum of 30 credits beyond a baccalaureate degree is required. A master's thesis or independent research is optional. Students select an area of specialization and individually design their programs in consultation with the graduate advisor. The MS degree students opting for the project or thesis option must make an arrangement with a faculty member for supervision and obtain the departmental approval in order to receive permits to register for the proper section. ~~advisor.~~ Students opting for a project must register for the M.S. project (IE 700B) for 3 credits. Students opting for a thesis must register for the M.S. thesis (IE 701B) or the combination of M.S. project (IE 700B) and thesis (IE 701B) for 6 credits and successfully defend the thesis before graduation. For the project-thesis combination, they must receive a satisfactory (S) grade in 700B before 701B MS Thesis registration in the immediate following semester with the same advisor (the MS thesis topic should be continuation of the work done in 700B). Thesis option is required of all students who receive departmental or research-based awards.

~~*Faculty advisor approval must be obtained by students before they are permitted to register for IE 701 Course IE 701 Not Found.*~~ *Seminar:* In addition to the minimum 30 degree credits required, all students who receive departmental or research-based awards must enroll each semester in IE 791 Graduate Seminar.

M.S. in Industrial Engineering (courses only)

Bridge Courses		
EM 502	Engineering Cost Analysis	3
EM 602	Management Science	3
IE 501	Fundamentals of Industrial Engineering	3
Total Credits		9
Core Courses		
IE 604	Advanced Engineering Statistics	3
IE 618	Engineering Cost and Production Economics	3
IE 621	Systems Analysis and Simulation	3
IE 650	Advanced Topics in Operations Research	3
Areas of Specialization		
Select three of the following: [1]		9
Quality Systems Engineering		
IE 672	Industrial Quality Control	
IE 673	Total Quality Management	
MNE 654	Design for Manufacturability	
Operations Research		
IE 704	Sequencing and Scheduling	
IE 650	Advanced Topics in Operations Research	

~~Information Systems Design~~

~~CS 610 Data Structures and Algorithms~~

~~CS 631 Data Management System Design~~

~~EM 655 Management Aspects of Information Systems~~

CS 636 Data Analytics with R Program

Supply Chain & Logistics

~~IE 642 Network Flows and Applications~~

~~IE 699 Special Topics in Industrial Engineering~~

IE 659 Supply Chain Engineering

EM 640 Distribution Logistics

EM 636 Project Management

Service Systems Engineering

~~IE 651 Industrial Simulation~~

IE 651 Industrial Simulation

MIS 648 Decision Support Systems for Managers

EM 691 Cost Estimating for Capital Projects

Total Credits 21

[1]

Students may choose to specialize in any one of the following areas. Completion of all three courses in a specialization will qualify the student for a specialization certificate to be issued by the department. This will be awarded in conjunction with successful completion of the MS degree.

M.S. in Industrial Engineering (project option) ~~(independent research)~~

Bridge Courses

EM 502	Engineering Cost Analysis	3
EM 602	Management Science	3
IE 501	Fundamentals of Industrial Engineering	3
Total Credits		9

Core Courses

IE 604	Advanced Engineering Statistics	3
IE 618	Engineering Cost and Production Economics	3
IE 621	Systems Analysis and Simulation	3
IE 650	Advanced Topics in Operations Research	3

Project Course

~~IE 725~~	~~Independent Research~~	~~3~~

IE 700B	Master's Project	3
Areas of Specialization		
Select three of the following: [1]		9
Quality Systems Engineering		
IE 672	Industrial Quality Control	
IE 673	Total Quality Management	
MNE 654	Design for Manufacturability	
Operations Research		
IE 704	Sequencing and Scheduling	
IE 650	Advanced Topics in Operations Research	
~~Information Systems Design~~		
~~CS 610~~	~~Data Structures and Algorithms~~	
~~CS 611~~	~~Introduction to Computability and Complexity~~	
~~EM 655~~	~~Management Aspects of Information Systems~~	
CS 636	Data Analytics with R Program	
Supply Chain & Logistics		
~~IE 642~~	~~Network Flows and Applications~~	
~~IE 699~~	~~Special Topics in Industrial Engineering~~	
EM 640	Distribution Logistics	
IE 659	Supply Chain Engineering	
EM 636	Project Management	
Service Systems Engineering		
~~IE 651~~	~~Industrial Simulation~~	
IE 651	Industrial Simulation	
MIS 648	Decision Support Systems for Managers	
EM 691	Cost Estimating for Capital Projects	
Total Credits		24

1

Students may choose to specialize in any one of the following areas. Completion of all three courses in a specialization will qualify the student for a specialization certificate to be issued by the department. This will be awarded in conjunction with successful completion of the MS degree.

M.S. in Industrial Engineering (thesis option) ~~(Master's thesis)~~

Bridge Courses		
EM 502	Engineering Cost Analysis	3

EM 602	Management Science	3
IE 501	Fundamentals of Industrial Engineering	3
Total Credits		9
Core Courses		
IE 604	Advanced Engineering Statistics	3
IE 618	Engineering Cost and Production Economics	3
IE 621	Systems Analysis and Simulation	3
IE 650	Advanced Topics in Operations Research	3
Thesis		
IE 700B	Master's Project	3
& IE 701B	and Master's Thesis	
IE 701B	Master's Thesis	6
& IE 701B	and Master's Thesis	
or IE 701C	Master's Thesis	
Areas of Specialization		
Select three of the following: [1]		9
Quality Systems Engineering		
IE 672	Industrial Quality Control	
IE 673	Total Quality Management	
MNE 654	Design for Manufacturability	
Operations Research		
IE 704	Sequencing and Scheduling	
IE 650	Advanced Topics in Operations Research	
~~Information Systems Design~~		
~~CS 610~~	~~Data Structures and Algorithms~~	
~~CS 611~~	~~Introduction to Computability and Complexity~~	
~~EM 655~~	~~Management Aspects of Information Systems~~	
CS 636	Data Analytics with R Program	
Supply Chain & Logistics		
~~IE 642~~	~~Network Flows and Applications~~	
~~IE 699~~	~~Special Topics in Industrial Engineering~~	
EM 640	Distribution Logistics	
IE 659	Supply Chain Engineering	
EM 636	Project Management	

Service Systems Engineering	
~~IE 651~~	~~Industrial Simulation~~
IE 651	Industrial Simulation
MIS 648	Decision Support Systems for Managers
EM 691	Cost Estimating for Capital Projects
Total Credits	30

1

Students may choose to specialize in any one of the following areas. Completion of all three courses in a specialization will qualify the student for a specialization certificate to be issued by the department. This will be awarded in conjunction with successful completion of the MS degree.

Is licensure required of program graduates to gain employment?

No

Will the institution seek accreditation for this program?

Add any additional information you would like brought to the attention of CUE/ CGE here	Thanks for the conditional approval. I have made the changes as instructed.

Attach any additional information you would like brought to the attention of CUE/ CGE here: Uploaded Files:

Reviewer Comments	**Sotirios Ziavras (ziavras) (03/03/22 4:33 pm):** Rollback: Course conditionally approved. YOu must add explicit language to the curriculum about the MS Project/MS Thesis combination. Talk to Bladikas who was at the CGE meeting.

Key: 165

Date Submitted: 03/29/22 3:56 pm

Viewing: CC-IS-MS : M.S. in Information Systems

Last approved: 08/19/20 2:57 pm

Last edit: 04/07/22 3:46 pm

Changes proposed by: Shaohua Wang (davidsw)

Catalog Pages Using this Program	M.S. in Information Systems

Department(s) / College(s)	**Department**	**College**
	Informatics (INFO)	Ying Wu Coll of Computing (CC)
Name of Program	M.S. in Information Systems	
Academic Level(s)	Graduate	
Degree Designation	MS	
Campus(es) where the program will be offered	Newark	
CIP Code		
Effective Catalog Edition	2022-2023	
Related Department(s)		

If the change involves altering the department's curriculum paradigm as currently outlined in the NJIT catalog, please attach existing and proposed paradigms.

In Workflow

1. **INFO Chair**
2. **AIS**
3. **CC Dean**
4. **Vice Provost of Graduate Studies**
5. **President of the Faculty Senate**
6. Provost's Office
7. Academic Issues Committee

Approval Path

1. 04/01/22 9:34 am Julie Ancis (jra49): Approved for INFO Chair
2. 04/01/22 10:47 am Mesfin Ayne (ayne): Approved for AIS
3. 04/01/22 12:01 pm Ali Mili (mili): Approved for CC Dean
4. 04/07/22 3:46 pm Sotirios Ziavras (ziavras): Approved for Vice Provost of Graduate Studies

Articulation with other institutions, if any

History

1. Aug 19, 2020 by Jessie Tsui (tsui)

Objectives

Briefly summarize the program and indicate its objectives; e.g., the nature and focus of the program, the knowledge and skills students will acquire, any cooperative arrangements with other institutions or external agencies in offering this program, etc.

Need

Provide justification of the need for this program. If the program falls within the liberal arts and sciences and does not specifically prepare students for a career, then provide evidence of student demand and indicate opportunities for students to pursue advanced study (if the degree is not terminal with regard to further education). If the program is career-oriented or professional in nature, then in addition to student demand give evidence of labor market need and results of prospective employer surveys. Report labor market need as appropriate on local, regional, and national bases. Specify job titles and entry-level positions for program graduates, and/or indicate opportunities for graduates to pursue additional studies.

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List similar programs within the state and in neighboring states. How does this program compare to those currently being offered?

Distinguished Programs Nationally

For doctoral programs: Supply a select list of distinguished programs nationally in this discipline.

Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

Course Development Plan

Names of faculty involved

Libraries and Computing Facilities

Classrooms and Laboratories Needs

Catalog Description (For PHD programs, include information about the qualifying exams, and other program milestones.)

Curriculum

These degree requirements apply to on campus and online programs.

(30 Credits)

M.S. in Information Systems

IS Core Courses

IS 601	Web Systems Development	3
IS 663	System Analysis and Design	3
IS 631	Enterprise Database Management	3
IS 665	Data Analytics for Info System	3
IS 684	Business Process Innovation	3

Select one of the following User Experience courses		3
IS 661	User Experience Design	
IS 664	Customer Discovery	
Select one of the following Analytics courses:		3
IS 634	Information Retrieval	
IS 687	Transaction Mining and Fraud Detection	
IS 688	Web Mining	
Electives and Specialization Areas [1]		
Select three of the following electives or [2]		9
Select IS 700B and two of the following electives or		
Select IS 701 and one of the following electives:		
Data Analytics		
IS 634	Information Retrieval	
IS 687	Transaction Mining and Fraud Detection	
IS 688	Web Mining	
CS 602	Java Programming	
CS 632	Advanced Database System Design	
CS 634	Data Mining	
CS 636	Data Analytics with R Program	
CS 644	Introduction to Big Data	
CS 675	Machine Learning	
CS 676	Cognitive Computing	
CS 731	Applications of Database Systems	
CS 732	Advanced Machine Learning	
CE 602	Geographic Information System	
MATH 644	Regression Analysis Methods	
MATH 660	Introduction to statistical Computing with SAS and R	
MATH 678	Stat Methods in Data Science	
MGMT 635	Data Mining and Analysis	
MGMT 682	Business Research Methods I	
PTC 628	Analyzing Social Networks	
Business Decision Making		
IS 677	Information System Principles	
IS 678	IT Service Management	

ACCT 615	Management Accounting
FIN 600	Corporate Finance I
HRM 601	Organizational Behavior
MIS 648	Decision Support Systems for Managers
MIS 680	Management Science
MGMT 620	Management of Technology
MGMT 630	Decision Analysis
MGMT 650	Knowledge Management
MGMT 685	Operations Research and Decision Making
MGMT 688	Information Technology, Business and the Law
MGMT 710	Forecasting Methods for Business Decisions
MRKT 620	Global Marketing Management
MRKT 645	Digital Marketing Strategy
Healthcare Informatics	
CS 639	Elec. Medical Records: Med Terminologies and Comp. Imp.
IE 686	Intro to Healthcare Systems
IE 687	Healthcare Enterprise Systems
IE 688	Healthcare Sys Perfor Modeling
PTC 640	Health Communications
R834 581	Health Systems and Policy
R834 582	Health Care Management
R834 659	Healthcare Finance
User Experience Design	
IS 661	User Experience Design
IS 664	Customer Discovery [3]
IS 686	Pervasive Computing: An HCI Perspective
IS 735	Social Media
IE 661	Man-Machine Systems
IE 662	Cognitive Engineering
IE 664	Advanced Ergonomics
PTC 605	Elements of Visual Design
PTC 606	Advanced Information Design
PTC 629	Theory and Practice of Social Media
PTC 650	eLearning Design for Mobile

Security and Network Management

IS 680	Information Systems Auditing
IS 681	Computer Security Auditing
IS 682	Forensic Auditing for Computing Security
IS 687	Transaction Mining and Fraud Detection
CS 608	Cryptography and Security
CS 645	Security and Privacy in Computer Systems
CS 646	Network Protocols Security
CS 647	Counter Hacking Techniques
CS 651	Data Communications
CS 652	Cognitive Cloud Networking - Architectures and Applications
CS 656	Internet and Higher-Layer Protocols
CS 696	Network Management and Security
CS 708	Advanced Data Security and Privacy
CS 755	Security and Privacy in Wireless Networks
CS 756	Mobile Computing and Sensor Networks
IT 620	Wireless Networks Security and Administration
IT 640	Network Services Administration

Systems Analysis and Design

IS 664	Customer Discovery
IS 676	Requirement Engineering
IS 685	Enterprise Architecture and Integration
CS 673	Software Design and Production Methodology
CS 683	Software Project Management
CS 684	Software Testing and Quality Assurance
CS 685	Software Architecture
EM 636	Project Management
EM 637	Project Control
MRKT 636	Design and Development of High Technology Products

Web Systems

IS 634	Information Retrieval
IS 664	Customer Discovery
IS 688	Web Mining
IS 690	Web Services and Middleware

PTC 605	Elements of Visual Design
PTC 628	Analyzing Social Networks
PTC 632	Content Management and Information Architecture

Build Your Own Specialization

Students may propose a coherent set of courses that have a common thread related to an area that you are interested in. The MS IS advisor approves the proposed specialization.

Total Credits 30

[1] Please consult the professor or academic advisor early to determine the best electives to support your work.

[2] Students may optionally choose 2 or more courses from a single area, which will constitute a specialization. Students will choose 3 electives if taking the course-only option, 2 electives if taking IS 700B Master's Project, or 1 elective if taking IS 701B Master's Thesis. We strongly encourage students to design and conduct a Master Project or Master Thesis with an Informatics professor. If you are considering a Project or Thesis, please consult the professor early to determine the best electives to support your work. A Master Project or Master Thesis can be considered part of a specialization with the MS Advisor's permission.

[3] Students considering a Master's Project or Thesis with the User Experience specialization are encouraged to take both IS 661 User Experience Design and IS 664 Customer Discovery - one as a core course and the other as an elective.

MS in Information Systems – Professional Management Option (36 credits)

All 7 MSIS core courses (21 credits) are required.

Experiential Aspect: A one-semester IS Capstone Project (IS 700B - 3 credits), two-semester MS Thesis (IS 701 – 6 credits), or Co-Op experience (not counting towards degree credits) is required.

Electives: To meet the 36-credit requirement, students will take 9-15 credits of electives, where each elective course is 3 credits. The electives required will depend on which Experiential Aspect is chosen.

Students who take the IS Capstone Project (IS 700B - 3 credits) must take 4 elective courses: 1 course from the list of IS electives, 1-2 courses from the list of PTC electives and 1-2 courses from the list of Management electives.

Students who take the MS Thesis (IS 701 – 6 credits) must take 3 elective courses: 1-2 courses from the list of PTC electives and 3-6 credits from the list of Management electives.

Students who take the Co-Op experience (IS 590) must take 5 elective courses: 1-2 courses from the list of IS electives, 1-3 courses from the list of PTC electives and 1-3 courses from the list of Management electives.

MS IS Core Course Requirements		21
IS 601	Web Systems Development	3
IS 663	System Analysis and Design	3
IS 631	Enterprise Database Management	3
IS 661	User Experience Design	3

IS 665	Data Analytics for Info System	3
IS 684	Business Process Innovation	3
Select one of the following Analytics courses:		3
IS 634	Information Retrieval	
IS 687	Transaction Mining and Fraud Detection	
IS 688	Web Mining	
IS Experiential Aspect		0-6 credits

Select one of the following Capstone or Co-op options. The Co-op does not count towards the degree credits. All Experiential options will be undertaken in collaboration with industry, and evaluated by a faculty member.

IS 700B	Master's Project	3
IS 701B	Master's Thesis	6
& IS 701B	and Master's Thesis	
or IS 701C	Master's Thesis	
IS 590	Graduate Co-op Work Experience I	1
Information System Electives		0-6 credits

Students who take the IS Capstone Project (IS 700B) choose 1 IS elective. Students who take the MS Thesis (IS 701) choose no IS electives. Students who take the Co-Op experience (IS 590) choose 1-2 IS electives.

IS 634	Information Retrieval
IS 664	Customer Discovery
IS 676	Requirement Engineering
IS 677	Information System Principles
IS 678	IT Service Management
IS 680	Information Systems Auditing
IS 681	Computer Security Auditing
IS 682	Forensic Auditing for Computing Security
IS 685	Enterprise Architecture and Integration
IS 686	Pervasive Computing: An HCI Perspective
IS 687	Transaction Mining and Fraud Detection
IS 688	Web Mining
IS 735	Social Media

PTC (Professional and Technical Communications) Electives	3-9 elective credits

Students who take the IS Capstone Project (IS 700B) choose 1-2 PTC electives. Students who take the MS Thesis (IS 701) choose 1-2 PTC electives. Students who take the Co-Op experience (IS 590) choose 1-3 PTC electives.

PTC 601	Advanced Professional and Technical Communication
PTC 605	Elements of Visual Design
PTC 606	Advanced Information Design
PTC 610	Research Methods for Information Design
PTC 620	Proposal Writing
PTC 622	Working in Teams: Collaborative and Interpersonal Communications
PTC 624	Professional and Technical Editing
PTC 628	Analyzing Social Networks
PTC 629	Theory and Practice of Social Media
PTC 632	Content Management and Information Architecture
PTC 6XX	User Experience Design

Management Electives 3-9 elective credits

Students who take the IS Capstone Project choose 1-2 Management electives. Students who take the MS Thesis (IS 701) choose 1-2 Management electives. Students who take the Co-Op experience (IS 590) choose 1-3 Management electives.

ACCT 615	Management Accounting
EM 636	Project Management
FIN 600	Corporate Finance I
HRM 601	Organizational Behavior
MIS 648	Decision Support Systems for Managers
MIS 680	Management Science
MGMT 620	Management of Technology
MGMT 630	Decision Analysis
MGMT 641	Global Project Management
MGMT 650	Knowledge Management
MGMT 682	Business Research Methods I
MGMT 685	Operations Research and Decision Making
MGMT 688	Information Technology, Business and the Law
MGMT 691	Legal and Ethical Issues in a Digital World
MGMT 710	Forecasting Methods for Business Decisions
MRKT 620	Global Marketing Management
MRKT 636	Design and Development of High Technology Products

MRKT 645	Digital Marketing Strategy

Is licensure required of program graduates to gain employment?

Will the institution seek accreditation for this program?

Add any additional information you would like brought to the attention of CUE/ CGE here

Attach any additional information you would like brought to the attention of CUE/ CGE here: Uploaded Files:

Reviewer Comments	**Shaohua Wang (davidsw) (03/29/22 3:57 pm):** resubmitted as requested. We simply want to add one line of statement "Degree requirement is the same for the online only program.'' into the catalog description. Thank you

Key: 130

Date Submitted: 10/01/21 10:51 am

Viewing: EN-ME-MS : M.S. in Mechanical Engineering

Last approved: 07/18/20 1:00 pm

Last edit: 10/01/21 10:51 am

Changes proposed by: Zhiming Ji (ji)

Catalog Pages Using this Program	M.S. in Mechanical Engineering

Department(s) / College(s)	**Department**	**College**
	Mechanical & Industrial Engr (MIE)	Newark College of Engineering (EN)
Name of Program	M.S. in Mechanical Engineering	
Academic Level(s)	Graduate	
Degree Designation	MS	
Campus(es) where the program will be offered	Newark	
CIP Code		
Effective Catalog Edition	2022-2023	

Related Department(s)	**Department(s)**
	Mechanical & Industrial Engr (MIE)

If the change involves altering the department's curriculum paradigm as currently outlined in the NJIT catalog, please attach existing and	MSME curriculum current version with markup.docx

In Workflow

1. **MIE Chair**
2. **AIS**
3. **EN Dean**
4. **Vice Provost of Graduate Studies**
5. **President of the Faculty Senate**
6. Provost's Office
7. Academic Issues Committee

Approval Path

1. 02/10/22 3:58 pm Joga Rao (raoi): Approved for MIE Chair
2. 02/10/22 4:55 pm Mesfin Ayne (ayne): Approved for AIS
3. 02/18/22 12:28 pm Kam Moshe (kam): Approved for EN Dean
4. 03/03/22 4:34 pm Sotirios Ziavras (ziavras): Approved for Vice Provost of Graduate Studies

proposed paradigms.

MSME curriculum new version.docx

Articulation with other institutions, if any

History

1. Mar 24, 2020 by Mesfin Ayne (ayne)
2. Jul 2, 2020 by Mesfin Ayne (ayne)
3. Jul 18, 2020 by Mesfin Ayne (ayne)

Objectives

Briefly summarize the program and indicate its objectives; e.g., the nature and focus of the program, the knowledge and skills students will acquire, any cooperative arrangements with other institutions or external agencies in offering this program, etc.

Need

Provide justification of the need for this program. If the program falls within the liberal arts and sciences and does not specifically prepare students for a career, then provide evidence of student demand and indicate opportunities for students to pursue advanced study (if the degree is not terminal with regard to further education). If the program is career-oriented or professional in nature, then in addition to student demand give evidence of labor market need and results of prospective employer surveys. Report labor market need as appropriate on local, regional, and national bases. Specify job titles and entry-level positions for program graduates, and/or indicate opportunities for graduates to pursue additional studies.

Relationship to the University and State Master Plans

Describe the relationship of the program to the following: institutional master plans and priorities.

Relationship to Similar Programs in the State and Region

List similar programs within the state and in neighboring states. How does this program compare to those currently being offered?

Distinguished Programs Nationally

For doctoral programs: Supply a select list of distinguished programs nationally in this discipline.

Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

Course
Development Plan

Names of faculty
involved

Libraries and
Computing
Facilities

Classrooms and
Laboratories Needs

Catalog Description (For PHD programs, include information about the qualifying exams, and other program milestones.)

Curriculum

Degree Requirements

Students who lack appropriate undergraduate preparation may be admitted and are asked to make up deficiencies by taking a program of bridge courses that is designed in consultation with the graduate advisor. These courses are taken in addition to the degree requirements and may include undergraduate courses.
The Master of Science in Mechanical Engineering program offers three areas of specialization.
CAD/CAM, Mechanisms & Control - computer aided engineering, mechanisms, biomechanical & medical devices, robotics and controls.
Mechanics & Material Processing - tissues & biomechanics, continuum mechanics, plastics, micro/nano materials, particle technology.
Thermo-Fluid Systems & Energy - biofluids, computational & multiphase fluid dynamics, granular science, HVAC, energy.

The student consults the graduate advisor to plan and develop an individualized and cohesive sequence of courses that meet program requirements of at least 30 degree credits. The MS degree students opting for the project or thesis option must make an arrangement with a faculty member for supervision and obtain the departmental approval in order to receive permits to register for the proper section. Students opting for a project must register for the M.S. project (ME 700) for 3 credits. Students opting for a thesis must register for the M.S. thesis (ME 701) for 6 credits and successfully defend the thesis before graduation. Thesis option is required of all students who receive departmental or research-based awards.

Seminar: In addition to the minimum 30 degree credits required, every student must take a minimum of two semesters of ME 791 Mechanical Engineering Colloquium. Students who receive departmental or research-based awards must enroll every semester in ME 791 Mechanical Engineering Colloquium.

M.S. in Mechanical Engineering (courses only)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select three of the following:		9
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	
ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Elective ME Graduate Courses		
Select three or more of the following:		9
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	
ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	

ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	
General Elective Courses		
Graduate courses from other departments or programs		9
Seminar		
ME 791	Mechanical Engineering Colloquium [1]	0
Total Credits		30

[1] Required for two semesters.

M.S. in Mechanical Engineering (Master's project)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select three of the following:		9
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	
ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Project		
ME 700B	Master's Project	3
Elective ME Graduate Courses		
Select two or more of the following:		6
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	

ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	
ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	
General Elective Courses		
Graduate courses from other departments or programs		9
Seminar		
ME 791	Mechanical Engineering Colloquium [1]	0
Total Credits		30

[1] Required for two semesters.

M.S. in Mechanical Engineering (Master's thesis)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select three of the following:		9
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	

ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Thesis [1]		
ME 701B	Master's Thesis	6
& ME 701B	and Master's Thesis	
or ME 701C	Master's Thesis	
Elective ME Graduate Courses		
Select one or more of the following:		3
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	
ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	
ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	
General Elective Courses		
Graduate courses from other departments or programs		9
Seminar		
ME 791	Mechanical Engineering Colloquium [2]	0

Total Credits	30

1
Required of all students who receive departmental or research-based awards.

2
Required every semester.

Is licensure required of program graduates to gain employment?

Will the institution seek accreditation for this program?

Add any additional information you would like brought to the attention of CUE/ CGE here	We would like to add the project-thesis combination as part of the thesis option in our MSME curriculum. Since the standard format for degree programs in the current graduate catalog does not fully reflect certain flexibility in our MSME curriculum, we would also like to make a few minor changes/explanations.

Attach any additional information you would like brought to the attention of CUE/ CGE here: Uploaded Files:

Reviewer Comments

Key: 166

Update to MSME curriculum

The current Academic Policies and Procedures at the Graduate Studies website contains the following statement on the project-thesis combination: "the curriculum of the academic program must explicitly show that this project-thesis combination is allowed". The proposed change to the MSME curriculum will add the project-thesis combination as part of the thesis option.

Since the standard format for degree programs in the current graduate catalog does not fully reflect certain flexibility in the MSME curriculum, a few minor changes/explanations are also proposed.

All the proposed changes are shown as markup to the current version.

Degree Requirements

Students who lack appropriate undergraduate preparation may be admitted and are asked to make up deficiencies by taking a program of bridge courses that is designed in consultation with the graduate advisor. These courses are taken in addition to the degree requirements and may include undergraduate courses.

The Master of Science in Mechanical Engineering program offers three areas of specialization.

1. *CAD/CAM, Mechanisms & Control* - computer aided engineering, mechanisms, biomechanical & medical devices, robotics and controls.
2. *Mechanics & Material Processing* - tissues & biomechanics, continuum mechanics, plastics, micro/nano materials, particle technology.
3. *Thermo-Fluid Systems & Energy* - biofluids, computational & multiphase fluid dynamics, granular science, HVAC, energy.

The student consults the graduate advisor to plan and develop an individualized and cohesive sequence of courses that meet program requirements of at least 30 degree credits. The MS degree students opting for the project or thesis option must make an arrangement with a faculty member for supervision and obtain the departmental approval in order to receive permits to register for the proper section. Students opting for a project must register for the M.S. project (ME 700) for 3 credits. Students opting for a thesis must register for the M.S. thesis (ME 701) or the combination of M.S. project (ME 700) and thesis (ME 701) for 6 credits and successfully defend the thesis before graduation. Thesis option is required of all students who receive departmental or research-based awards.

Seminar: In addition to the minimum 30 degree credits required, every student must take a minimum of two semesters of ME 791 Mechanical Engineering Colloquium. Students who

receive departmental or research-based awards must enroll every semester in ME 791 Mechanical Engineering Colloquium.

M.S. in Mechanical Engineering (courses only)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select at least three of the following [1]:		9 or more
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	
ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Elective ME Graduate Courses		
Select three or more of the following:		9
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	
ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	
ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	
Optional General Elective Courses		
Graduate courses from other departments or programs		9 or less
Seminar		
ME 791	Mechanical Engineering Colloquium ~~1~~2	0

Total Credits		30

[1] If more than 9 credits are taken from this list, then the extra will be counted as credits in Elective ME Graduate Courses.

[2] Required for two semesters.

M.S. in Mechanical Engineering (Master's project)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select at least three of the following [1]:		9 or more
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	
ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Project		
ME 700B	Master's Project	3
Elective ME Graduate Courses		
Select two or more of the following:		6
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	
ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	
ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	

Optional General Elective Courses		
Graduate courses from other departments or programs		9 or less
Seminar		
ME 791	Mechanical Engineering Colloquium ~~1~~2	0
Total Credits		30

[1] If more than 9 credits are taken from this list, then the extra will be counted as credits in Elective ME Graduate Courses.

[2] Required for two semesters.

M.S. in Mechanical Engineering (Master's thesis)

Required Courses		
ME 616	Matrix Methods in Mechanical Engineering	3
or MATH 651	Methods of Applied Mathematics I	
Select at least three of the following [1]:		9 or more
ME 610	Applied Heat Transfer	
ME 611	Dynamics of Incompressible Fluids	
ME 614	Continuum Mechanics	
ME 620	Mechanics of Materials	
ME 632	Mechanical Engineering Measurements	
ME 635	Computer-Aided Design	
Thesis ~~1~~2		
ME 700~~1~~B	Master's ~~Thesis~~Project [3]	6
& ME 701B	and Master's Thesis	
Or ME 701B	Master's Thesis	
& ME 701B	and Master's Thesis	
or ME 701C	Master's Thesis	
Elective ME Graduate Courses		
Select one or more of the following:		3
ME 607	Advanced Thermodynamics	
ME 618	Selected Topics in Mechanical Engineering	
ME 621	Advanced Mechanics of Material	
ME 622	Finite Element Methods in Mechanical Engineering	
ME 624	Microlevel Modeling in Particle Technology	
ME 625	Introduction to Robotics	
ME 630	Analytical Methods in Machine Design	
ME 636	Mechanism Design: Analysis and Synthesis	
ME 637	Kinematics of Spatial Mechanisms	
ME 655	Introduction to Modern Control Methods	
ME 670	Introduction to Biomechanical Engineering	
ME 678	Engineering Design of Plastic Products	
ME 679	Polymer Processing Techniques	

ME 712	Mechanics of Viscous Fluids	
ME 713	Non-Newtonian Fluid Dynamics	
ME 714	Principles of Particulate Multiphase Flows	
ME 717	Selected Topics in Mechanical Engineering I	
ME 718	ST: (Selected Topics in Mechanical Engineering II)	
ME 735	Advanced Topics in Robotics	
ME 736	Advanced Mechanism Design	
ME 738	Computer Aided Engineering	
Optional General Elective Courses		
Graduate courses from other departments or programs		9 or less
Seminar		
ME 791	Mechanical Engineering Colloquium [2][4]	0
Total Credits		30

[1] If more than 9 credits are taken from this list, then the extra will be counted as credits in Elective ME Graduate Courses.

[2] Required of all students who receive departmental or research-based awards.

[3] With permission of their research advisor, students may first register in the 700B MS Project course. They must receive a satisfactory (S) grade in 700B before 701B MS Thesis registration in the immediate following semester with the same advisor. The MS thesis topic should be continuation of the work done in 700B.

[4] Required for two semesters and every semester in which 700B or 701B or 701C is registered.