

**Motion:** *Set the minimum cumulative GPA to receive a graduate certificate to 2.75 (instead of the current 3.0) for students who do not enroll in a related master's degree program.*

**Submitted by:** Ying Wu College of Computing

**Justification:** YWCC has recently started to use graduate certificates instead of bridge courses as a way to prepare students who lack formal computing background, but may have some professional computing background, for MS programs. Students who complete the certificate successfully can continue to the MS program and transfer all the credit earned in the certificate (typically 12 credits). This has two benefits for students: (1) they do not have to spend time, effort and money on extra preparatory coursework beyond that required for the MS degree. (2) they obtain a graduate-level credential even if they do not continue to the MS degree.

Currently the threshold CGPA required to graduate with a certificate is 3.0 - the same threshold required to continue to the MS. We would like to reduce the graduation threshold so that students may obtain a certificate even though they will not be allowed to continue to the MS degree.

In YWCC, as many as 50% of our domestic applicants are using the MS degrees to either transition into computing from a different field or earn a formal degree related to the work they are already doing. Having a certificate replace the traditional bridge course requirement and offering it as a “consolation prize” if a MS is beyond reach will make our programs much more attractive to these types of students. The burden of the proof that they are worthy of entering the MS program is still on the students.

Changing the threshold CGPA for graduate certificate completion to 2.75 will apply to all graduate certificates at NJIT for both domestic and international students. International students may now apply for F1 visas for certificate studies. This provides consistency across NJIT and allows other colleges, if they so desire, to also replace bridge courses with graduate certificates for MS applicants who do not have the necessary formal background.

Students who have already been notified by NJIT that they have been conditionally accepted to an MS program with bridge course requirements will be given the option to convert to the certificate track.

**Proposed change to NJIT Graduate Catalog in “Graduate Certificate Requirements”**  
**Section:**

**Replace**

*Certificates require completion of at least 12 specified credits with a GPA of 3.0 or better. Only one course repetition is permitted for certificate students to improve their GPA. The cumulative GPA of the entire graduate record must be at least 3.0 if the student also pursues a relevant master's degree. Graduate certificate credits may be applied to a relevant master's degree. Dual use of credits from a completed first master's degree to a second and following certificate is not permitted.*

**with**

*Graduate certificates require completion of at least 12 specified credits with a cumulative GPA of 2.75 or higher. Only one course repetition is permitted for certificate students to improve their GPA. The cumulative GPA must be at least 3.0 for the student to pursue a relevant master's degree within seven years of the certificate award and count all certificate credits towards the master's degree. Students who receive a certificate with a cumulative GPA lower than 3.0 and get admitted to a related MS degree*

*program within seven years of receiving the certificate may be allowed to transfer only certificate courses with a grade of B or higher. Dual use of credits from a completed first master's degree to a second and following certificate is not permitted.*

# Program Change Request

Date Submitted: 04/18/21 6:22 pm

Viewing: **SL-CHEM-MS : M.S. in Chemistry**

Last approved: 02/21/20 11:16 am

Last edit: 04/18/21 6:22 pm

Changes proposed by: Edgardo Farinas (edgardo)

## In Workflow

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

## Approval Path

1. 03/27/21 12:59 pm  
Omowunmi Sadik (sadik): Approved for CHES Chair
2. 03/29/21 11:20 am  
Mesfin Ayne (ayne): Approved for AIS
3. 03/29/21 1:41 pm  
John Wolf (jwolf): Approved for SL Dean
4. 04/08/21 1:17 pm  
Sotirios Ziavras (ziavras): Rollback to Initiator

Catalog Pages Using this Program

[M.S. in Chemistry](#)

Department(s) / College(s)

Department	College
Chemistry & Environmental Sci. (CHES)	Coll of Science & Liberal Arts (SL)

Name of Program M.S. in Chemistry

Academic Level(s) Graduate

Degree Designation MS

Campus(es) where the program will be offered Newark

CIP Code

Effective Catalog Edition 2021-2022

Faculty Senate Review required?

Related

Department(s)

Department(s)

## Department(s)

**Chemistry & Environmental Sci. (CHES)**

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

Articulation with other institutions, if any

## Objectives

---

5. 04/17/21 3:57 pm  
Omowunmi Sadik (sadi): Approved for CHES Chair
6. 04/18/21 6:14 pm  
Mesfin Ayne (ayne): Rollback to Initiator
7. 04/18/21 6:24 pm  
Omowunmi Sadik (sadi): Approved for CHES Chair
8. 04/18/21 6:26 pm  
Mesfin Ayne (ayne): Approved for AIS
9. 04/19/21 10:23 am  
John Wolf (jwolf): Approved for SL Dean

## History

1. Feb 21, 2020 by  
Mesfin Ayne (ayne)

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

A minimum of 30 degree credits is required. Students must attain a cumulative GPA of 3.0 or better in the core courses listed below, and a minimum overall GPA of 3.0.

**Seminar:** In addition to the minimum 30 degree credits required, all students who receive departmental or research-based awards must enroll each semester in [CHEM 791](#) Graduate Seminar.

### **M.S. in Chemistry (courses only)**

---

Required Courses

12

Take four of the following five core courses:

- |                          |                                         |
|--------------------------|-----------------------------------------|
| <a href="#">CHEM 605</a> | Advanced Organic Chemistry I: Structure |
| <a href="#">CHEM 610</a> | Advanced Inorganic Chemistry            |
| <a href="#">CHEM 658</a> | Advanced Physical Chemistry             |
| <a href="#">CHEM 661</a> | Instrumental Analysis Laboratory        |
| <a href="#">CHEM 673</a> | Biochemistry                            |

If a student successfully completes all five core courses, one course will count towards fulfilling the electives requirement. Students must maintain a 3.0 GPA or higher.

Elective Courses

Two 600- or 700-level chemical engineering or chemistry courses

6

Four electives 1

12

Total Credits 30

1 A maximum of 6 elective credits may be taken from outside chemistry or chemical engineering; a maximum of 3 credits may be at the 500 level.

## M.S. in Chemistry (Master's thesis)

---

Required Courses 12

Take four of the following five core courses:

<a href="#">CHEM 605</a>	Advanced Organic Chemistry I: Structure
<a href="#">CHEM 610</a>	Advanced Inorganic Chemistry
<a href="#">CHEM 658</a>	Advanced Physical Chemistry
<a href="#">CHEM 661</a>	Instrumental Analysis Laboratory
<a href="#">CHEM 673</a>	Biochemistry

If a student successfully completes all five core courses, one course will count towards fulfilling the electives requirement. Students must maintain a 3.0 GPA or higher.

Thesis 1 6

**Track 1**

<a href="#">CHEM 700B</a>	<b>Masters Project</b>
<a href="#">CHEM 701B</a>	Masters Thesis

**Track 2**

<a href="#">CHEM 701B</a> & <a href="#">CHEM 701B</a>	<b>Masters Thesis and Masters Thesis</b>
----------------------------------------------------------	----------------------------------------------

**Track 3**

<a href="#">CHEM 701C</a>	<b>Masters Thesis</b>
---------------------------	-----------------------

Elective Courses 2

Four electives 12

Total Credits 30

1 With permission of their research advisor, students intending to do an MS thesis may first register in the 700B MS Project course. They must receive a satisfactory (S) grade in CHEM 700B before CHEM 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 CHEM 700B. Alternatively, students may be allowed to register in the 3-credit MS thesis course CHEM 701B in two consecutive semesters, or in the 6-credit MS thesis course CHEM 701C in a single semester with permission of their research advisor.

2 A maximum of 6 elective credits may be taken from outside chemistry or chemical engineering; a maximum of 3 credits may be at the 500 level.

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	<p><b>Sotirios Ziavras (ziavras) (04/08/21 1:17 pm):</b> Rollback: Change prerequisites section as per the CGE decision</p> <p><b>Mesfin Ayne (ayne) (04/18/21 6:14 pm):</b> Rollback: Make corrections to the total</p>
----------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



# Program Change Request

Date Submitted: 03/04/21 11:17 am

Viewing: **EN-COE-MS : M.S. in Computer Engineering**

Last approved: 02/21/20 12:54 pm

Last edit: 03/04/21 11:17 am

Changes proposed by: Durga Misra (dmisra)

Catalog Pages

Using this

Program

[M.S. in Computer Engineering](#)

Department(s) /

College(s)

## In Workflow

1. **ECE 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. 03/04/21 12:56 pm  
Leonid Tsybeskov (tsybesko): Approved for ECE Chair
2. 03/05/21 4:59 pm  
Mesfin Ayne (ayne): Approved for AIS
3. 03/20/21 1:28 pm  
Kam Moshe (kam): Approved for EN Dean

## History

1. Feb 21, 2020 by Mesfin Ayne (ayne)

Department

College

Department	College
Electrical & Computer Engr. (ECE)	Newark College of Engineering (EN)

Name of Program    M.S. in Computer Engineering

Academic

Level(s)

Graduate

Degree                    MS

Designation

Campus(es)

where the  
program will be  
offered

Newark

CIP Code

Effective Catalog    2021-2022

Edition

Faculty Senate

Review required?

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.

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

The MSCoE program at NJIT is flexible and customizable to a student's individual goals. It allows students to pursue computer engineering disciplines in depth, as well as to take a selection of courses from other NJIT engineering, computer science or management majors. The program provides in-depth studies of modern computer engineering topics including computer architecture and embedded systems, intelligent systems, communications and networking, signal, information and data processing, machine learning, and cyber-physical systems. BS CoE degree (or equivalent) is a general enrollment requirement.

### **Program Requirements and Options**

---

Upon entering the program, students select an area of specialization supervised by the MSCoE Program Advisor. The master's program consists of 30 credits. There are three program options: 24 course credits and 6 credits of master's thesis; or 27 course credits and 3 credits of master's project; or 30 course credits not to include either a master's project or thesis. Students should consult with the Program Advisor or designee before registering for courses to make sure they are meeting degree requirements. As a requirement for graduation, students must achieve a 3.0 cumulative GPA in graduate-level courses not including the master's thesis. Courses at the 500-or-below level are not acceptable for credit toward a graduate degree in computer engineering.

**With permission of their research advisor, in some MS programs students intending to do an MS thesis may first register in the 700B MS Project course; the curriculum of the academic program must explicitly show that this project-thesis combination is allowed. 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.**

**Effective Fall 2020, the allowable grades in the 700B MS Project are S or U (for federated departments and joint programs with other universities, the allowed MS Project grades may differ).**

## Bridge Program

---

Students who lack an appropriate background may be admitted and be required to take selected courses in addition to the degree requirements in order to make up deficiencies. They must attain a grade of B or better in each course. At the discretion of the department, students who have taken courses equivalent to these may have their bridge programs reduced accordingly.

Bridge Courses (undergraduate degree in computer science)

<a href="#">ECE 353</a>	Computer Organization and Architecture	3
<a href="#">ECE 395</a>	Microprocessor Laboratory	2
<a href="#">ECE 231</a>	Circuits and Systems I	3
<a href="#">ECE 684</a>	Advanced Microprocessor Systems	3

Total Credits 11

Bridge Courses (undergraduate degree in electrical engineering)

<a href="#">CS 505</a>	Programming, Data Structures, and Algorithms	3
or <a href="#">CS 506</a>	Foundations of Computer Science	
<a href="#">ECE 353</a>	Computer Organization and Architecture	3
<a href="#">ECE 395</a>	Microprocessor Laboratory	2
<a href="#">ECE 684</a>	Advanced Microprocessor Systems	3

Total Credits 11

MSCoE Required Core Courses

<a href="#">CS 610</a>	Data Structures and Algorithms	3
<a href="#">ECE 690</a>	Computer Systems Architecture	3

Total Credits 6

## ECE Department Focused Areas:

---

Communications, Signal Processing and Microwave; Computer Networking; Computer Architecture; Solid State, VLSI and Electro-optics Systems; and Intelligent Systems.

Students need to contact the MSCoE Program Adviser or designee for guidance and suggested courses for different focus areas. Three non-ECE graduate courses of 600 level may be chosen including CS 610 and must be approved as not all outside ECE department courses are applied for MSCoE.

Recommended MSEE Technical Electives – total 8 courses/24 credits

(additional courses including those in Computer Science and Management can be selected and approved by the program advisor)

<a href="#"><u>ECE 605</u></a>	Discrete Event Dynamic Systems	3
<a href="#"><u>ECE 610</u></a>	Power System Steady-State Analysis	3
<a href="#"><u>ECE 611</u></a>	Transients in Power Systems	3
<a href="#"><u>ECE 613</u></a>	Protection of Power Systems	3
<a href="#"><u>ECE 616</u></a>	Power Electronics	3
<a href="#"><u>ECE 617</u></a>	Economic Control of Interconnected Power Systems	3
<a href="#"><u>ECE 618</u></a>	Renewable Energy Systems	3
<a href="#"><u>ECE 626</u></a>	Optoelectronics	3
<a href="#"><u>ECE 636</u></a>	Computer Networking Laboratory	3
<a href="#"><u>ECE 637</u></a>	Internet and Higher-Layer Protocols	3
<a href="#"><u>ECE 639</u></a>	Principles of Broadband Networks	3
<a href="#"><u>ECE 640</u></a>	Digital Signal Processing	3
<a href="#"><u>ECE 641</u></a>	Laboratory for High Performance Digital Signal Processing	3
<a href="#"><u>ECE 642</u></a>	Communication Systems I	3
<a href="#"><u>ECE 644</u></a>	Wireless Communication	3
<a href="#"><u>ECE 645</u></a>	Wireless Networks	3
<a href="#"><u>ECE 657</u></a>	Semiconductor Devices	3
<a href="#"><u>ECE 658</u></a>	VLSI Design I	3
<a href="#"><u>ECE 660</u></a>	Control Systems I	3
<a href="#"><u>ECE 661</u></a>	Control System Components	3
<a href="#"><u>ECE 681</u></a>	High Performance Routers and Switches	3
<a href="#"><u>ECE 683</u></a>	Computer Network Design and Analysis	3
<a href="#"><u>ECE 684</u></a>	Advanced Microprocessor Systems	3
<a href="#"><u>ECE 690</u></a>	Computer Systems Architecture	3
<a href="#"><u>ECE 692</u></a>	Embedded Computing Systems	3
<a href="#"><u>ECE 698</u></a>	Selected Topics in Electrical and Computer Engineering	3
<a href="#"><u>ECE 744</u></a>	Optimization for Communication Networks	3
<a href="#"><u>ECE 754</u></a>	Statistical Machine Learning and Pattern Recognition	3
<a href="#"><u>ECE 758</u></a>	VLSI Design II	3
<a href="#"><u>ECE 760</u></a>	<b>Control Systems II</b>	<b>3</b>

<a href="#">ECE 776</a>	Information Theory	3
<a href="#">ECE 783</a>	Computer Communication Networks	3
<a href="#">ECE 788</a>	Selected Topics in Electrical and Computer Engineering	3
Project		
<a href="#">ECE 700B</a>	Master's Project	3
Thesis		
<a href="#">ECE 701B</a>	Master's Thesis	3
<a href="#">ECE 791</a>	Graduate Seminar 1	0
1	Not Mandatory for MS Students	

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

**Add ECE 760 Control Systems II to the MSCOE Technical Electives**

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

Reviewer  
Comments

# Program Change Request

Date Submitted: 04/08/21 2:10 pm

Viewing: **EN-EE-MS : M.S. in Electrical Engineering**

Last approved: 02/23/20 5:28 pm

Last edit: 04/08/21 2:10 pm

Changes proposed by: Durga Misra (dmisra)

## In Workflow

1. ECE 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. 03/04/21 12:56 pm  
Leonid Tsybeskov (tsybesko):  
Approved for ECE Chair
2. 03/05/21 5:00 pm  
Mesfin Ayne (ayne):  
Approved for AIS
3. 03/20/21 1:28 pm  
Kam Moshe (kam):  
Approved for EN Dean
4. 04/08/21 1:21 pm  
Sotirios Zivavras (zivavras): Rollback to Initiator

Catalog Pages Using  
this Program

[M.S. in Electrical Engineering](#)

Department(s) /  
College(s)

Department	College
Electrical & Computer Engr. (ECE)	Newark College of Engineering (EN)

Name of Program M.S. in Electrical Engineering

Academic Level(s) Graduate

Degree Designation MS

Campus(es) where  
the program will be  
offered Newark

CIP Code

Effective Catalog  
Edition 2021-2022

Faculty Senate  
Review required?

Related

Department(s)

Department(s)



## Department(s)

**Electrical & Computer Engr. (ECE)**

5. 04/09/21 7:39 pm  
Leonid Tsybeskov  
(tsybesko):  
Approved for ECE  
Chair
6. 04/10/21 12:48 am  
Mesfin Ayne (ayne):  
Approved for AIS
7. 04/22/21 11:04 am  
Kam Moshe (kam):  
Approved for EN  
Dean

## History

1. Feb 23, 2020 by  
Mesfin Ayne (ayne)

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

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

The MSEE program at NJIT is flexible and customizable to a student’s individual goals. It allows students to pursue electrical engineering disciplines in depth, as well as to take a selection of courses from other NJIT engineering, computer science or management majors. The program provides in-depth studies of modern engineering topics including physical devices, circuits and systems, communications and networking, signal, information and data processing. BS EE degree (or equivalent) is a general enrollment requirement.

## Program Requirements and Options

---

Upon entering the program, students select an area of specialization supervised by the MSEE Program Advisor. The master’s program consists of 30 credits. There are three program options: 24 course credits and 6 credits of master’s thesis; or 27 course credits and 3 credits of master’s project; or 30 course credits not to include either a master’s project or thesis. Students should consult with the Program Advisor or designee before registering for courses to make sure they are meeting degree requirements. As a requirement for graduation, students must achieve a 3.0 cumulative GPA in graduate-level courses not including the master's thesis. Courses at the 500-or-below level are not acceptable for credit toward a graduate degree in electrical engineering.

### Additional Thesis Option:

**With permission of their research advisor, MS EE students intending to do an MS thesis 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.**

## Bridge Program

---

Students who lack an appropriate background may be admitted and be required to take selected courses in addition to the degree requirements in order to make up deficiencies. They must attain a grade of B or better in each course. At the discretion of the department, students who have taken courses equivalent to these may have their bridge programs reduced accordingly.

### MSEE Bridge Courses

<a href="#"><u>ECE 321</u></a>	Random Signals and Noise	3
<a href="#"><u>ECE 232</u></a>	Circuits and Systems II	3
<a href="#"><u>ECE 333</u></a>	Signals and Systems	3
<a href="#"><u>ECE 361</u></a>	Electromagnetic Fields I	3
<a href="#"><u>ECE 362</u></a>	Electromagnetic Fields II	3

<a href="#">ECE 372</a>	Electronic Circuits II	3
Total Credits		18
MSEE Required Core Courses		
<a href="#">ECE 601</a>	Linear Systems	3
<a href="#">ECE 673</a>	Random Signal Analysis I	3
Total Credits		6

## **ECE Department Focused Areas:**

---

Communications, Signal Processing and Microwave; Computer Networking; Computer Architecture; Solid State, VLSI and Electro-optics Systems; Intelligent Systems.

Students need to contact the MSEE Program Adviser or designee for guidance and suggested courses for different focus areas. Two non-ECE graduate courses of 600 level may be chosen and must be approved as not all outside ECE department courses are applied for MSEE.

Recommended MSEE Technical Electives – total 8 courses/24 credits

(additional courses including those in Computer Science and Management can be selected and approved by the program advisor)

<a href="#">ECE 605</a>	Discrete Event Dynamic Systems	3
<a href="#">ECE 610</a>	Power System Steady-State Analysis	3
<a href="#">ECE 611</a>	Transients in Power Systems	3
<a href="#">ECE 613</a>	Protection of Power Systems	3
<a href="#">ECE 616</a>	Power Electronics	3
<a href="#">ECE 617</a>	Economic Control of Interconnected Power Systems	3
<a href="#">ECE 618</a>	Renewable Energy Systems	3
<a href="#">ECE 626</a>	Optoelectronics	3
<a href="#">ECE 636</a>	Computer Networking Laboratory	3
<a href="#">ECE 637</a>	Internet and Higher-Layer Protocols	3
<a href="#">ECE 639</a>	Principles of Broadband Networks	3
<a href="#">ECE 640</a>	Digital Signal Processing	3
<a href="#">ECE 641</a>	Laboratory for High Performance Digital Signal Processing	3
<a href="#">ECE 642</a>	Communication Systems I	3
<a href="#">ECE 644</a>	Wireless Communication	3
<a href="#">ECE 645</a>	Wireless Networks	3
<a href="#">ECE 657</a>	Semiconductor Devices	3
<a href="#">ECE 658</a>	VLSI Design I	3
<a href="#">ECE 660</a>	Control Systems I	3
<a href="#">ECE 661</a>	Control System Components	3

<a href="#">ECE 681</a>	High Performance Routers and Switches	3
<a href="#">ECE 683</a>	Computer Network Design and Analysis	3
<a href="#">ECE 684</a>	Advanced Microprocessor Systems	3
<a href="#">ECE 690</a>	Computer Systems Architecture	3
<a href="#">ECE 692</a>	Embedded Computing Systems	3
<a href="#">ECE 698</a>	Selected Topics in Electrical and Computer Engineering	3
<a href="#">ECE 744</a>	Optimization for Communication Networks	3
<a href="#">ECE 754</a>	Statistical Machine Learning and Pattern Recognition	3
<a href="#">ECE 758</a>	VLSI Design II	3
<a href="#">ECE 760</a>	<b>Control Systems II</b>	<b>3</b>
<a href="#">ECE 776</a>	Information Theory	3
<a href="#">ECE 783</a>	Computer Communication Networks	3
<a href="#">ECE 788</a>	Selected Topics in Electrical and Computer Engineering	3
Project		
<a href="#">ECE 700B</a>	Master's Project	3
Thesis		
<a href="#">ECE 701B</a>	Master's Thesis	3
<a href="#">ECE 791</a>	Graduate Seminar 1	0
1	Not Mandatory for MS Students	

Is licensure required of program graduates to gain employment?

**No**

Will the institution seek accreditation for this program?

**No**

Add any additional information you would like brought to the attention of CUE/ CGE here **Add ECE 760 Control Systems II to the Recommended MS EE Technical Electives**

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

Reviewer  
Comments

**Sotirios Zivras (zivras) (04/08/21 1:21 pm):** Rollback: As per the CGE decision, add "With permission of their research advisor, students intending to do an MS thesis 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."

# Program Change Request

Date Submitted: 04/18/21 7:12 pm

Viewing: **SL-EVSC-MS : M.S. in Environmental Science**

Last edit: 04/18/21 7:12 pm

Changes proposed by: Edgardo Farinas (edgardo)

## In Workflow

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

## Approval Path

1. 03/27/21 1:00 pm  
Omowunmi Sadik (sadik): Approved for CHES Chair
2. 03/29/21 11:20 am  
Mesfin Ayne (ayne): Approved for AIS
3. 03/29/21 1:42 pm  
John Wolf (jwolf): Approved for SL Dean
4. 04/08/21 1:17 pm  
Sotirios Zivarras (zivarras): Rollback to Initiator

Catalog Pages Using this Program [M.S. in Environmental Science](#)

Department(s) / College(s)	Department	College
	Chemistry & Environmental Sci. (CHES)	Coll of Science & Liberal Arts (SL)

Name of Program M.S. in Environmental Science

Academic Level(s) Graduate

Degree Designation MS

Campus(es) where the program will be offered Newark

CIP Code

Effective Catalog Edition 2021-2022

Faculty Senate Review required?

Related Department(s)	Department(s)
	<b>Chemistry &amp; Environmental Sci. (CHES)</b>

- 5. 04/17/21 3:58 pm  
Omowunmi Sadik  
(sadi): Approved  
for CHES Chair
- 6. 04/18/21 6:29 pm  
Mesfin Ayne (ayne):  
Rollback to Initiator
- 7. 04/19/21 9:38 am  
Omowunmi Sadik  
(sadi): Approved  
for CHES Chair
- 8. 04/19/21 11:22 am  
Mesfin Ayne (ayne):  
Approved for AIS
- 9. 04/19/21 11:52 am  
John Wolf (jwolf):  
Approved for SL  
Dean

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

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

A minimum of 30 degree credits is required. Candidates must consult with the graduate advisor (not thesis advisor) in designing appropriate programs of study. Students must attain a minimum GPA of 3.0 in the core courses listed below, and a minimum overall GPA of 3.0.

Seminar: In addition to the minimum 30 degree credits required, all students who receive departmental or research-based awards must enroll each semester in [EVSC 600](#) Environmental Science Seminar.

## M.S. in Environmental Science (courses only)

---

Core Courses

<a href="#">EM 631</a>	Legal Aspects in Environmental Engineering	3
<a href="#">EVSC 610</a>	Environmental Chemical Science	3
<a href="#">EVSC 612</a>	Environmental Analysis	3
<a href="#">EVSC 616</a>	Toxicology	3
<a href="#">EVSC 627</a>	Environmental Microbiology	3

Elective 1

Select five of the following: 15

<a href="#">EVSC 602</a>	Special Topics in Environmental Science I
<a href="#">EVSC 611</a>	Hazardous Waste Management
<a href="#">EVSC 613</a>	Environmental Problem Solving
<a href="#">EVSC 614</a>	Quantitative Environmental Risk Assessment
<a href="#">EVSC 615</a>	Global Environmental Problems
<a href="#">EVSC 700</a>	<span style="border: 1px solid red; padding: 2px;">Course EVSC 700 Not Found</span>
<a href="#">EVSC 702</a>	Special Topics in Environmental Science II
<a href="#">EVSC 711</a>	Advanced Environmental Analysis
<a href="#">EVSC 725</a>	Independent Study I
<a href="#">EVSC 726</a>	Independent Study II
<a href="#">ENE 673</a>	Sustainability and Life Cycle Analysis
<a href="#">ENE 672</a>	Stormwater Management

<a href="#">ENE 660</a>	Introduction to Solid and Hazardous Waste Problems
<a href="#">ENE 662</a>	Site Remediation
<a href="#">ENE 664</a>	Physical and Chemical Treatment
<a href="#">ENE 665</a>	Biological Treatment
<a href="#">CE 602</a>	Geographic Information System
<a href="#">CHEM 664</a>	Advanced Analytical Chemistry
<a href="#">R120 551</a>	Biology Of Pollution
<a href="#">R120 522</a>	Resource Sustainability
<a href="#">R120 534</a>	Biological Invasion
<a href="#">R120 523</a>	Scale Of Biodiversity
<a href="#">IE 615</a>	Industrial Hygiene and Occupational Health
<a href="#">EPS 612</a>	Introduction to Environmental Policy Studies
<a href="#">EPS 622</a>	Sustainable Politics and Policy
<a href="#">EPS 614</a>	Environmental Economics and Management
<a href="#">EPS 638</a>	Physical Geography

Total Credits 30

1 Course are offered at NJIT and Rutgers-Newark and selected with the graduate advisors (not thesis advisors) approval.

## **M.S. in Environmental Science (Master's thesis)**

---

### Core Courses

<a href="#">EM 631</a>	Legal Aspects in Environmental Engineering	3
<a href="#">EVSC 610</a>	Environmental Chemical Science	3
<a href="#">EVSC 612</a>	Environmental Analysis	3
<a href="#">EVSC 616</a>	Toxicology	3
<a href="#">EVSC 627</a>	Environmental Microbiology	3
Thesis 1		6

### Track 1

<a href="#">EVSC 700B</a>	<b>Master's Project</b>
<a href="#">EVSC 701B</a>	Master's Thesis

### Track 2

<a href="#">EVSC 701B</a> & <a href="#">EVSC 701B</a>	<b>Master's Thesis and Master's Thesis</b>
----------------------------------------------------------	------------------------------------------------

### Track 3

<a href="#">EVSC 701C</a>	<b>Master's Thesis</b>
---------------------------	------------------------

Select three of the following:

<a href="#"><u>EVSC 602</u></a>	Special Topics in Environmental Science I
<a href="#"><u>EVSC 611</u></a>	Hazardous Waste Management
<a href="#"><u>EVSC 613</u></a>	Environmental Problem Solving
<a href="#"><u>EVSC 614</u></a>	Quantitative Environmental Risk Assessment
<a href="#"><u>EVSC 615</u></a>	Global Environmental Problems
<a href="#"><u>EVSC 700</u></a>	Course EVSC 700 Not Found
<a href="#"><u>EVSC 702</u></a>	Special Topics in Environmental Science II
<a href="#"><u>EVSC 711</u></a>	Advanced Environmental Analysis
<a href="#"><u>EVSC 725</u></a>	Independent Study I
<a href="#"><u>EVSC 726</u></a>	Independent Study II
<a href="#"><u>ENE 673</u></a>	Sustainability and Life Cycle Analysis
<a href="#"><u>ENE 672</u></a>	Stormwater Management
<a href="#"><u>ENE 660</u></a>	Introduction to Solid and Hazardous Waste Problems
<a href="#"><u>ENE 662</u></a>	Site Remediation
<a href="#"><u>ENE 664</u></a>	Physical and Chemical Treatment
<a href="#"><u>ENE 665</u></a>	Biological Treatment
<a href="#"><u>CE 602</u></a>	Geographic Information System
<a href="#"><u>CHEM 664</u></a>	Advanced Analytical Chemistry
<a href="#"><u>R120 551</u></a>	Biology Of Pollution
<a href="#"><u>R120 522</u></a>	Resource Sustainability
<a href="#"><u>R120 534</u></a>	Biological Invasion
<a href="#"><u>R120 523</u></a>	Scale Of Biodiversity
<a href="#"><u>IE 615</u></a>	Industrial Hygiene and Occupational Health
<a href="#"><u>EPS 612</u></a>	Introduction to Environmental Policy Studies
<a href="#"><u>EPS 622</u></a>	Sustainable Politics and Policy
<a href="#"><u>EPS 614</u></a>	Environmental Economics and Management
<a href="#"><u>EPS 638</u></a>	Physical Geography

Total Credits

30

1 With permission of their research advisor, students intending to do an MS thesis may first register in the EVSC 700B MS Project course. They must receive a satisfactory (S) grade in EVSC 700B before EVSC 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. Alternatively, students may be allowed to register in the 3-credit MS thesis course EVSC 701B in two consecutive semesters, or in the 6-credit MS thesis course EVSC 701C in a single semester with permission of their research advisor.

2 Courses are offered at NJIT and Rutgers-Newark and selected with the graduate advisors (not thesis advisors) approval.

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	<b>Sotirios Ziavras (ziavras) (04/08/21 1:17 pm):</b> Rollback: Change prerequisites section as per the
Comments	CGE decision
	<b>Mesfin Ayne (ayne) (04/18/21 6:29 pm):</b> Rollback: Put the thesis 6 credits in the right place

# Program Change Request

Date Submitted: 04/13/21 10:24 am

Viewing: **SM-BUS-MS : Master of Science in Management (MSM)**

Last approved: 12/21/20 9:37 pm

Last edit: 04/13/21 10:24 am

Changes proposed by: Michael S Koskinen (michaelk)

Catalog Pages

Using this

Program

[Master of Science in Management \(MSM\)](#)

Department(s) /

College(s)

## In Workflow

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

## Approval Path

1. 04/15/21 12:32 pm  
Melodi D. Guilbault (guilbault): Approved for MGMT Chair
2. 04/15/21 12:36 pm  
Mesfin Ayne (ayne): Approved for AIS
3. 04/15/21 12:44 pm  
Oya Tukel (tukel): Approved for SM Dean

## History

1. Dec 21, 2020 by Michael S

Koskinen  
(michaelk)

Department	College
Management (MGMT)	Martin Tuchman Sch of Mgmt (SM)

Name of Program     Master of Science in Management (MSM)

Academic  
Level(s)  
Graduate

Degree                 MS  
Designation

Campus(es)  
where the  
program will be  
offered  
Newark

CIP Code

Effective Catalog     2021-2022  
Edition

Faculty Senate  
Review required?

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.

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.)

The MSM curriculum puts it all together and prepares managers who know how to use technology to meet strategic objectives; who have business smarts; and who can meet the growing demand for technology savvy leadership

## Curriculum Structure & Content

The MSM curriculum is divided into two modules: the business core and concentration area. The business core comprises one-half (15 credits) of the degree requirements with the remaining 15 credits focusing on the concentration's management knowledge component.

**The Business Core:** The business core provides the fundamental business knowledge needed to evaluate business models and to assume managerial positions. Coursework includes key functional areas in business: accounting, finance, marketing, information systems, leadership and organizational behavior.

**Management Concentration Area:** Each student selects a management area with a technical focus for in-depth study. Concentration courses are designed to complement the concepts offered in the 15 credit business core. Current concentration areas include: Business Analytics, Global Project Management, and Web Systems and Media, and **Financial Technology (FinTech)**.

~~Management Concentrations Each student must select an area of concentration. The concentration consists of 5 classes for a total of 15 credits. Global Project Management What is Global Project Management about? The Global Project Management specialization is focused on Manufacturing, Construction, Supply Chain, and Business Process Management. The areas include the expertise of the engineering resource planning function such as Production Planning, Global Project Planning, Engineering Management, and Construction Planning and Control. Who is it for? Professionals who are interested in the field of complex Project Management, relationship facilitation and coordination between project teams and customers, and harmonizing the demands among project scope, time, expenditures and quality of the end product. Many students who select Global Project Management have undergraduate degrees in International Business, Civil Engineering, and Architecture, and are seeking a career focused more on corporate and project management fields. Where Can It Take Me? Career tracks begin with managing focused projects and leading to work on larger international and national projects. Global Project Management professionals would then transition into managerial roles and run Operations departments. Sustained career progress tracks to the COO position. Business Analytics What is Business Analytics? The Business Analytics specialization is focused on business development, solutions, product development and analysis of the customer requirements. Prized skills include expertise in business forecasting, project costing and accounting, business development, and structured solutions to customer complex business problems. Who is it for? Candidates who are interested in business solutions, consultation, business development and strategies, and infrastructure and planning management. Many students who select business analytics have undergraduate degrees in Engineering, Technology, and Applied Science and are seeking a career focused on business solutions development and management. Where Can It Take Me? The career track begins with managing focused projects as business analysts with technological, solution provider, governmental, and non-profit organizations. Business analysts then transition into managerial roles and lead business development teams. Sustained career progress tracks to the director of operations, COO and CTO. Web Systems and Media What is Web Systems and Media? The Web Systems and Media specialization is focused on the development of a revolutionized way of web applications and social media applications. They include expertise in marketing strategies, front end—user experience analysis, SEO (Search Engine Optimization) management, and working closely with development teams for final product design. Who is it for? Candidates who are interested in web development, graphics development, media and journalism, and online marketing strategy development. Many students who select Web Systems and Media have undergraduate degrees in Information Technology, Computer Science,~~

Journalism, Graphic design, and professional and technical communications. Where Can It Take Me? The career track begins with work on focused projects as front-end developer or content developer supporting web development teams. Web Systems and Media professionals then move into managerial roles, leading project development teams. Sustained career progress tracks to project lead and CTO.

**Financial Technology** What is Financial Technology? Financial Technology (FinTech) is a rapidly growing subsector of the financial services industry, which involves the application of new technologies including software tools, networking, user experience and interface platforms, and modern modeling and analytical techniques to improve the efficiency and deployment of traditional financial services. The rapid increase in the quantity, variety, and availability of new data and information sources has fundamentally changed legacy business practices in the financial services industry. Big data creates an increasing market need for talents who utilize new technologies and innovations to understand hidden patterns in investor habits and market behaviors as well as assist managers in making informed data-driven decisions. The requisite skillset required to process and analyze such information has resulted in considerable demand for staff with software development, mathematical and statistical modeling, and practical problem-solving expertise. New financial technologies include, but are not limited to, cryptocurrencies (e.g., bitcoin), blockchain, cloud computing, retail banking automation, machine learning and deep learning, automated investment advisement, algorithmic trading, and risk management framework development and associated visualization tools.

**Who is it for?** Students who are interested in applying modern tools to improve financial activities, design new applications, processes, products or business models related to financial services. Typically, students who undertake the FinTech concentration have obtained undergraduate degrees in Engineering, Technology, Finance or the applied sciences and are seeking a career focused on applying technical tools for the development of new financial services.

**What are Potential Career Prospects in FinTech?** There are various career paths one may pursue after completing the FinTech concentration. In particular, careers in finance, technology, and entrepreneurship such as investment banking, international finance, commercial banking, sales and trading, information technology, social entrepreneurship, etc. are vocations within the scope of this program. Graduates may work for FinTech startups as well which concentrate in cryptocurrency management and trading, blockchain technologies including smart contracts, open banking, insurtech, Robo-advisement, machine learning and data mining applications and cybersecurity. Some may work for traditional financial services companies, which are in need of staff with technical skillsets to improve existing business practices and/or develop new processes related to technological innovations.

**IT Sales & Analytics** **Who is it for?** The concentration in IT Sales & Analytics will help to prepare students with technology backgrounds into careers with effective sales and management roles within technology companies. Focused on connecting consumers with innovative tech products, IT sales is all about identifying the customers who can benefit from a particular solution and showing them how that solution can meet their needs. Encompassing hardware (computers, servers, networking devices), software (operating systems), and services (applications, big data, and cloud computing) technology sales can vary greatly depending on the particular company you work for and the type of sales you do. Strong technical knowledge of the product and industry is important to identify the customer base that would benefit.

**What are Potential Career Prospects in IT Sales?** Careers in IT Sales include many roles in the from sales representatives to chief sales officers in companies.

~~Focus in the non-career representatives to other career careers in companies.~~

## Curriculum

The MSM program blends technical expertise with fundamental management knowledge.

### Concentration Areas:

---

Business Analytics

Global Project Management

Web Systems and Media

Financial Technology (FinTech)

~~IT Sales & Analytics Management: The Next Step for Professionals with Technical Backgrounds At some point in their careers, successful professionals are faced with the prospect of moving into managerial positions as the next logical step in their career progressions. The MSM program is designed to facilitate this transition. It is more focused than is the MBA curriculum through a stronger emphasis on mastery of a clearly defined concentration area. The MSM is best suited for candidates who wish to have more influence in their organizations by moving into managerial positions, but who also desire to retain their allegiance to an area of technical expertise. A Fast Tracked Program for Fast Tracked Professionals The MSM program is delivered with special attention to people on the move. Students can complete the degree requirements in two years of part-time study or in a single year of full-time study. Courses are offered during the evenings to accommodate the schedules of working professionals. In addition, the 15-credit MSM core is available on-line.~~ MS in Management Curriculum

The **Master of Science in Management** is a 30 credit program that prepares graduates for managerial roles in organizations. Its emphasis is on melding business fundamentals and technical knowledge within specific areas of concentration including Business Analytics, Global Project Management, and Web Systems and Media, and **Financial Technology (FinTech)**.

#### Core Courses

<u>ACCT 615</u>	Management Accounting	3
<u>FIN 600</u>	Corporate Finance I	3
<u>HRM 601</u>	Organizational Behavior	3
<u>MIS 645</u>	Information Systems Principles	3
or <u>IS 677</u>	Information System Principles	
<u>MRKT 620</u>	Competing in Global Markets	3

Select 15 credits from one area: 15

Global Project Management 1

ECON 610 Managerial Economics

or FIN 610 Global Macro Economics

EM 636 Project Management

EM 637 Project Control

EM 691 Cost Estimating for Capital Projects

IE 618 Engineering Cost and Production Economics

IE 659 Supply Chain Engineering

<u>IS 614</u>	Command and Control Systems
<u>IS 684</u>	Business Process Innovation
<del>MGMT 641</del>	<del>Global Project Management</del>
Web Systems and Media 2	
<u>IS 661</u>	User Experience Design
<u>IS 664</u>	Customer Discovery
<u>IS 688</u>	Web Mining
<u>IS 690</u>	Web Services and Middleware
<del>MRKT 637</del>	<del>Marketing Communications and Promotions 4</del>
<u>MRKT 645</u>	Internet Marketing Strategy
<u>PTC 601</u>	Advanced Professional and Technical Communication
<u>PTC 605</u>	Elements of Visual Design
<u>PTC 606</u>	Advanced Information Design
<u>PTC 650</u>	eLearning Design for Mobile
Business Analytics 3	
<u>CS 634</u>	Data Mining
<u>IS 631</u>	Enterprise Database Management
<b>EM 636</b>	<b>Project Management</b>
<u>IS 687</u>	Transaction Mining and Fraud Detection
<u>IS 688</u>	Web Mining
<u>MATH 661</u>	Applied Statistics
<u>MGMT 625</u>	Distribution Logistics
<u>MGMT 630</u>	Decision Analysis
<u>MGMT 635</u>	Data Mining and Analysis
<u>MGMT 650</u>	Knowledge Management
<del>MGMT 710</del>	<del>Forecasting Methods for Business Decisions</del>
<u>MIS 648</u>	Decision Support Systems for Managers
<b>MRKT 645</b>	<b>Internet Marketing Strategy</b>
Financial Technology 4	
<del>FIN 611</del>	<del>Intro to Topics in Fin Tech</del>
<del>FIN 616</del>	<del>Data Driven Financial Modeling</del>
<del>FIN 620</del>	<del>Adv Financial Data Analytics</del>
<del>MGMT 735</del>	<del>Deep Learning in Business</del>
<b>FIN 611</b>	<b>Intro to Topics in Fin Tech</b>
<b>FIN 616</b>	<b>Data Driven Financial Modeling</b>
<b>FIN 620</b>	<b>Adv Financial Data Analytics</b>
<u>FIN 641</u>	Derivatives Markets
<u>FIN 626</u>	Financial Investment Institutions
<u>FIN 624</u>	Corporate Finance II
<b>MGMT 735</b>	<b>Deep Learning in Business</b>

MGMT 635 Data Mining and Analysis~~IT Sales & Analytics~~~~IS-678 IT Service Management (MRKT-655 Sales Process and Analytics (New Course))~~~~MRKT-655 Sales Process and Analytics~~~~MGMT-691 Legal and Ethical Issues in a Digital World~~~~MRKT-638 Sales Management for Technical Professionals (MRKT-XXX Sales Process and Analytics (New Course))~~~~MRKT-636 Design and Development of High Technology Products~~~~or MRKT-631 Marketing Research~~~~or MRKT-632 Marketing Strategy for Technology Based Organizations~~

Total Credits

30

1 One course must be either ECON 610 Managerial Economics or MGMT 641 Global Project Management

2 One course must be MRKT 637 Marketing Communications and Promotions

3 One course must be MGMT 630, MGMT 635, MGMT 710, MIS 648, or MRKT 645.

4 One course must be FIN 611 and two courses must be FIN 616, FIN 620 and MGMT 735

~~Bridge Course~~~~MGMT-501 Management Foundations~~

3

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

# Program Change Request

Date Submitted: 04/06/21 12:54 pm

Viewing: **EN-OSHE-MS : M.S. in Occupational Safety and Health**

## Engineering

Last edit: 05/06/21 11:52 am

Changes proposed by: Arijit Sengupta (sengupta)

[M.S. in Occupational Safety and Health Engineering](#)

Catalog Pages Using  
this Program

Department(s) / College(s)	<b>Department</b> Mechanical & Industrial Engr (MIE)	<b>College</b> Newark College of Engineering (EN)
Name of Program	M.S. in Occupational Safety and Health Engineering	
Academic Level(s)	Graduate	
Degree Designation	MS	
Campus(es) where the program will be offered	Newark	
CIP Code		
Effective Catalog Edition	2021-2022	
Faculty Senate Review required?		

### 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. 04/06/21 6:11 pm  
Joga Rao (raoi):  
Approved for MIE  
Chair
2. 04/08/21 2:15 pm  
Jessie Tsui (tsui):  
Approved for AIS
3. 04/22/21 11:04 am  
Kam Moshe (kam):  
Approved for EN  
Dean

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.

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

A minimum of 36 credits is required.

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

*Seminar:* In addition to the minimum 36 degree credits required, all students who receive departmental or research-based awards must enroll each semester in [IE 791](#) Graduate Seminar.

## M.S. in Occupational Safety and Health (courses only)

---

### Required Courses

<a href="#">EM 633</a>	Legal Aspects of Health and Safety	3
<a href="#">IE 604</a>	Advanced Engineering Statistics	3
<a href="#">IE 614</a>	Safety Engineering Methods	3
<a href="#">IE 615</a>	Industrial Hygiene and Occupational Health	3
<a href="#">IE 665</a>	Applied Industrial Ergonomics	3
<a href="#">IE 685</a>	Systems Safety	3

### Elective Courses

Select six of the following: 18

<a href="#">BME 670</a>	Introduction to Biomechanical Engineering
<a href="#">BME 671</a>	Biomechanics of Human Structure and Motion
<a href="#">EVSC 603</a>	Hazardous Waste Operations and Emergency Response
<a href="#">EVSC 614</a>	Quantitative Environmental Risk Assessment
<a href="#">EVSC 616</a>	Toxicology
<a href="#">IE 608</a>	Product Liability Control
<a href="#">IE 661</a>	Man-Machine Systems
<a href="#">IE 662</a>	Cognitive Engineering
<a href="#">IE 664</a>	Advanced Ergonomics
<a href="#">IE 669</a>	Human Design Factors in Engineering
<a href="#">IE 675</a>	Safety in Facility and Product Design
<a href="#">IE 681</a>	Interdisciplinary Seminar in Occupational Safety and Health
<a href="#">IE 682</a>	Industrial Safety and Health Evaluation
<a href="#">IE 700</a>	Course IE 700 Not Found
<a href="#">HRM 601</a>	<b>Organizational Behavior</b>
<a href="#">IE 700B</a>	<b>Master's Project (Remove IE 700 from the list)</b>
<a href="#">IE 725</a>	Independent Research
<a href="#">ME 660</a>	Noise Control

Total Credits

36

# M.S. in Occupational Safety and Health (Master's thesis)

---

## Required Courses

<u>EM 633</u>	Legal Aspects of Health and Safety	3
<u>IE 604</u>	Advanced Engineering Statistics	3
<u>IE 614</u>	Safety Engineering Methods	3
<u>IE 615</u>	Industrial Hygiene and Occupational Health	3
<u>IE 665</u>	Applied Industrial Ergonomics	3
<u>IE 685</u>	Systems Safety	3
Thesis 1		
<del>IE 701</del>		<del>6</del>
<u>IE 701C</u>	<b>Master's Thesis</b>	<b>6</b>
OR		
<u>IE 701B</u>	<b>Master's Thesis</b>	<b>3</b>
<u>IE 701B</u>	<b>Master's Thesis</b>	<b>3</b>

## Elective Courses

Select four of the following: 12

<u>BME 670</u>	Introduction to Biomechanical Engineering
<u>BME 671</u>	Biomechanics of Human Structure and Motion
<u>EVSC 603</u>	Hazardous Waste Operations and Emergency Response
<u>EVSC 614</u>	Quantitative Environmental Risk Assessment
<u>EVSC 616</u>	Toxicology
<u>IE 608</u>	Product Liability Control
<u>IE 661</u>	Man-Machine Systems
<u>IE 662</u>	Cognitive Engineering
<u>IE 664</u>	Advanced Ergonomics
<u>IE 669</u>	Human Design Factors in Engineering
<u>IE 675</u>	Safety in Facility and Product Design
<u>IE 681</u>	Interdisciplinary Seminar in Occupational Safety and Health
<u>IE 682</u>	Industrial Safety and Health Evaluation
<u>IE 700</u>	<b>Course IE 700 Not Found</b>
<u>HRM 601</u>	<b>Organizational Behavior</b>
<u>IE 725</u>	Independent Research
<u>ME 660</u>	Noise Control

1 Required for NIOSH; trainees; optional for all others.

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

**IE 701 and IE 700 courses are replaced by IE 701C (6 credit) and IE 700B (3 credit), respectively.**  
**Instead of IE 701C ( 6 credit) I would have preferred to include IE 701B (3 credits) at least for two semesters, however, the system is not allowing me to repeat the same course twice.**

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

Reviewer

Comments

# Program Change Request

Date Submitted: 04/08/21 2:16 pm

Viewing: **EN-PES-MS : M.S. in Power and Energy Systems**

Last edit: 04/08/21 2:16 pm

Changes proposed by: Durga Misra (dmisra)

## In Workflow

1. ECE 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. 03/04/21 12:56 pm  
Leonid Tsybeskov (tsybesko):  
Approved for ECE Chair
2. 03/05/21 5:06 pm  
Mesfin Ayne (ayne):  
Approved for AIS
3. 03/20/21 1:28 pm  
Kam Moshe (kam):  
Approved for EN Dean
4. 04/08/21 1:23 pm  
Sotirios Ziavras (ziavras): Rollback to Initiator

Catalog Pages Using this Program [M.S. in Power and Energy Systems](#)

Department(s) / College(s)	Department	College
	Electrical & Computer Engr. (ECE)	Newark College of Engineering (EN)

Name of Program M.S. in Power and Energy Systems

Academic Level(s) Graduate

Degree Designation MS

Campus(es) where the program will be offered Newark

CIP Code

Effective Catalog Edition 2021-2022

Faculty Senate Review required?

Related Department(s)

- 5. 04/09/21 7:40 pm  
Leonid Tsybeskov  
(tsybesko):  
Approved for ECE  
Chair
- 6. 04/10/21 12:49 am  
Mesfin Ayne (ayne):  
Approved for AIS
- 7. 04/22/21 11:04 am  
Kam Moshe (kam):  
Approved for EN  
Dean

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

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

## Bridge Program

---

Students who have earned a Bachelor of Science in Engineering Technology (B.S.E.T.) degree, or who lack an appropriate background may be admitted and be required to take selected courses in addition to the degree requirements in order to make up deficiencies. They must attain a grade of B or better in each course. At the discretion of the department, students who have taken courses equivalent to these may have their bridge programs reduced accordingly.

## Master's Program

---

This master's program consists of 30 credits. As a requirement for graduation, students must achieve a 3.0 cumulative GPA in graduate-level courses, not including the master's thesis or project. The project grade must be B or better.

## Master's Project/Master's Thesis

---

If you do a Master's Project, you need to take in total 9 courses plus **ECE 700B Master's Project**; ~~ECE 700~~ ~~Course ECE 700 Not Found~~; and if you do a Master's thesis, you need to take 8 courses plus **two semesters of ECE 701B Master's Thesis**. ~~ECE 701~~ ~~Course ECE 701 Not Found~~. These options are highly recommended if you like research and plan to pursue for your Ph.D. degree.

### Additional Thesis Option:

**With permission of their research advisor, in MS PES program students intending to do an MS thesis 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.**

## M.S. in Power and Energy Systems

### Bridge Courses

<a href="#">ECE 321</a>	Random Signals and Noise	3
<a href="#">ECE 232</a>	Circuits and Systems II	3
<a href="#">ECE 333</a>	Signals and Systems	3
<a href="#">ECE 341</a>	Energy Conversion	3
<a href="#">ECE 361</a>	Electromagnetic Fields I	3
<a href="#">ECE 372</a>	Electronic Circuits II	3
Total Credits		18

### Core Courses

<a href="#">ECE 601</a>	Linear Systems	3
<a href="#">ECE 610</a>	Power System Steady-State Analysis	3

### Specialized Courses/Electives



Select three of the following:

9

<a href="#">ECE 611</a>	Transients in Power Systems
<a href="#">ECE 616</a>	Power Electronics
<a href="#">ECE 618</a>	Renewable Energy Systems
<a href="#">ECE 698</a>	Selected Topics in Electrical and Computer Engineering
<a href="#">MGMT 620</a>	Management of Technology

Electives

15

<a href="#">ECE 613</a>	Protection of Power Systems
<a href="#">ECE 617</a>	Economic Control of Interconnected Power Systems
<a href="#">ECE 698</a>	Selected Topics in Electrical and Computer Engineering
<a href="#">ECE 698</a>	Selected Topics in Electrical and Computer Engineering
<a href="#">ECE 605</a>	Discrete Event Dynamic Systems
<a href="#">ECE 637</a>	Internet and Higher-Layer Protocols
<a href="#">ECE 661</a>	Control System Components
<a href="#">ECE 664</a>	Real-time Computer Control Systems
<a href="#">ECE 673</a>	Random Signal Analysis I
<a href="#">ME 607</a>	Advanced Thermodynamics
<a href="#">ME 610</a>	Applied Heat Transfer
<a href="#">ENE 671</a>	Environmental Impact Analysis 1
<a href="#">IE 614</a>	Safety Engineering Methods
<a href="#">ARCH 665</a>	Sustainable Design of Energy Efficient Buildings

Total Credits

30

1 [MGMT 692](#) Strategic Management and other business and management courses can be included as optional electives based on the student background, instructor approval and advisor approval.

Is licensure required of program graduates to gain employment?

**No**

Will the institution seek accreditation for this program?

**No**

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	<p><b>Sotirios Ziavras (ziavras) (04/08/21 1:23 pm):</b> Rollback: As per CGE decision, correct the 700 and 701 course numbers and change the new language to "With permission of their research advisor, students intending to do an MS thesis 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."</p>
----------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

# Program Change Request

Date Submitted: 04/08/21 2:01 pm

Viewing: **EN-TELC-MS : M.S. in Telecommunications**

Last edit: 04/08/21 2:01 pm

Changes proposed by: Durga Misra (dmisra)

## In Workflow

1. ECE 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. 03/04/21 12:56 pm  
Leonid Tsybeskov (tsybesko):  
Approved for ECE Chair
2. 03/05/21 5:04 pm  
Mesfin Ayne (ayne):  
Rollback to ECE Chair for AIS
3. 03/06/21 10:50 am  
Leonid Tsybeskov (tsybesko): Rollback to Initiator
4. 03/06/21 8:23 pm  
Leonid Tsybeskov (tsybesko):

### M.S. in Telecommunications

Catalog Pages Using  
this Program

Department(s) /  
College(s)

Department	College
Electrical & Computer Engr. (ECE)	Newark College of Engineering (EN)

Name of Program M.S. in Telecommunications

Academic Level(s) Graduate

Degree Designation MS

Campus(es) where  
the program will be  
offered Newark

CIP Code

Effective Catalog  
Edition 2021-2022

Faculty Senate  
Review required?

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.

Articulation with other institutions, if any

**Objectives**

---

- Approved for ECE Chair
- 5. 03/08/21 11:01 am Mesfin Ayne (ayne): Approved for AIS
- 6. 03/20/21 1:28 pm Kam Moshe (kam): Approved for EN Dean
- 7. 04/08/21 1:24 pm Sotirios Ziavras (ziavras): Rollback to Initiator
- 8. 04/09/21 7:40 pm Leonid Tsybeskov (tsybesko): Approved for ECE Chair
- 9. 04/10/21 12:53 am Mesfin Ayne (ayne): Approved for AIS
- 10. 04/22/21 11:05 am Kam Moshe (kam): Approved for EN Dean

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

The curriculum requires a basic knowledge of computer and communications fundamentals such as programming, data structures, computer architecture, signals and systems, and basic communication systems. Bridge courses do not count toward the degree. The bridge courses are selected from the following list depending on individual background in consultation with the graduate advisor. See the [undergraduate catalog](#) for descriptions of 200- to 400-level courses.

Candidates must complete a minimum of 30 credits: 12 in core courses and 18 in elective courses in an area of specialization with a minimum overall GPA of 3.0.

In addition, a minimum average 3.0 GPA is required in the five core courses. Students with an exceptionally strong telecommunications background may be allowed to replace required courses with advanced electives. Permission of the graduate advisor is required.

### **M.S. in Telecommunications (courses only)**

Bridge Courses

<a href="#">ECE 353</a>	Computer Organization and Architecture	3
<a href="#">ECE 252</a>	Microprocessors	3
<a href="#">CS 332</a>	Principles of Operating Systems	3
<a href="#">CS 333</a>	Introduction to UNIX Operating Systems	3
<a href="#">CS 505</a>	Programming, Data Structures, and Algorithms	3
<a href="#">ECE 321</a>	Random Signals and Noise	3
<a href="#">ECE 333</a>	Signals and Systems	3
<a href="#">ECE 481</a>	Digital Communications Systems	3

Core Courses

<a href="#">ECE 642</a>	Communication Systems I	3
<a href="#">ECE 644</a>	Wireless Communication	3
<a href="#">ECE 673</a>	Random Signal Analysis I	3
<a href="#">ECE 683</a>	<b>Computer Network Design and Analysis</b>	<b>3</b>

Electives

Select six of the following: 1 15

<a href="#">CS 631</a>	Data Management System Design	
<a href="#">CS 633</a>	Distributed Systems	
<a href="#">CS 650</a>	Computer Architecture	
or <a href="#">ECE 690</a>	Computer Systems Architecture	
<a href="#">CS 652</a>	Cognitive Cloud Networking - Architectures and Applications	3
<a href="#">CS 656</a>	Internet and Higher-Layer Protocols	
or <a href="#">ECE 637</a>	Internet and Higher-Layer Protocols	
<a href="#">CS 665</a>	Algorithmic Graph Theory	
<a href="#">CS 668</a>	Parallel Algorithms	
<a href="#">CS 696</a>	Network Management and Security	
or <a href="#">ECE 638</a>	Network Management and Security	
<a href="#">ECE 673</a>	Random Signal Analysis I	
<a href="#">ECE 742</a>	Communication Systems II	
<a href="#">ECE 755</a>	Advanced Topics in Digital Communications	
<a href="#">ECE 783</a>	Computer Communication Networks	

Total Credits 30

1 These courses are to be used in an area of specialization.

## **M.S. in Telecommunications (Master's project)**

---

Bridge Courses

<a href="#">ECE 353</a>	Computer Organization and Architecture	3
<a href="#">ECE 252</a>	Microprocessors	3
<a href="#">CS 332</a>	Principles of Operating Systems	3
<a href="#">CS 333</a>	Introduction to UNIX Operating Systems	3
<a href="#">CS 505</a>	Programming, Data Structures, and Algorithms	3
<a href="#">ECE 321</a>	Random Signals and Noise	3
<a href="#">ECE 333</a>	Signals and Systems	3
<a href="#">ECE 481</a>	Digital Communications Systems	3

1 [ECE 321](#) Random Signals and Noise and [ECE 333](#) Signals and Systems may be substituted for .

#### Core Courses

<a href="#">ECE 642</a>	Communication Systems I	3
<a href="#">ECE 644</a>	Wireless Communication	3
<a href="#">ECE 673</a>	Random Signal Analysis I	3
<a href="#">ECE 683</a>	<b>Computer Network Design and Analysis</b>	<b>3</b>

#### Project

<a href="#">ECE 700B</a>	Master's Project	3
or <a href="#">CS 700B</a>	Master's Project	

#### Electives

Select five of the following: 1 15

<a href="#">CS 631</a>	Data Management System Design	
<a href="#">CS 633</a>	Distributed Systems	
<a href="#">CS 650</a>	Computer Architecture	
or <a href="#">ECE 690</a>	Computer Systems Architecture	
<a href="#">CS 652</a>	Cognitive Cloud Networking - Architectures and Applications	3
<a href="#">CS 656</a>	Internet and Higher-Layer Protocols	
or <a href="#">ECE 637</a>	Internet and Higher-Layer Protocols	
<a href="#">CS 668</a>	Parallel Algorithms	
<a href="#">CS 696</a>	Network Management and Security	
or <a href="#">ECE 638</a>	Network Management and Security	
<a href="#">ECE 673</a>	Random Signal Analysis I	
<a href="#">ECE 742</a>	Communication Systems II	
<a href="#">ECE 755</a>	Advanced Topics in Digital Communications	
<a href="#">ECE 783</a>	Computer Communication Networks	

Total Credits 33

1 These courses are to be used in an area of specialization.

## **M.S. in Telecommunications (Master's thesis)**

---

#### Bridge Courses

<a href="#">ECE 353</a>	Computer Organization and Architecture	3
<a href="#">ECE 252</a>	Microprocessors	3
<a href="#">CS 332</a>	Principles of Operating Systems	3
<a href="#">CS 333</a>	Introduction to UNIX Operating Systems	3



<a href="#"><u>CS 505</u></a>	Programming, Data Structures, and Algorithms	3
<a href="#"><u>ECE 321</u></a>	Random Signals and Noise	3
<a href="#"><u>ECE 333</u></a>	Signals and Systems	3
<a href="#"><u>ECE 481</u></a>	Digital Communications Systems	3
Core Courses		
<a href="#"><u>ECE 642</u></a>	Communication Systems I	3
<a href="#"><u>ECE 644</u></a>	Wireless Communication	3
<a href="#"><u>ECE 673</u></a>	Random Signal Analysis I	3
<a href="#"><u>ECE 683</u></a>	<b>Computer Network Design and Analysis</b>	<b>3</b>
Thesis		
<a href="#"><u>ECE 701C</u></a>	Master's Thesis	6
or <a href="#"><u>CS 701B</u></a>	Master's Thesis	
Electives		
Select four of the following: 1		12
<a href="#"><u>CS 631</u></a>	Data Management System Design	
<a href="#"><u>CS 633</u></a>	Distributed Systems	
<a href="#"><u>CS 650</u></a>	Computer Architecture	
or <a href="#"><u>ECE 690</u></a>	Computer Systems Architecture	
<a href="#"><u>CS 652</u></a>	Cognitive Cloud Networking - Architectures and Applications	3
<a href="#"><u>CS 656</u></a>	Internet and Higher-Layer Protocols	
or <a href="#"><u>ECE 637</u></a>	Internet and Higher-Layer Protocols	
<a href="#"><u>CS 668</u></a>	Parallel Algorithms	
<a href="#"><u>CS 696</u></a>	Network Management and Security	
or <a href="#"><u>ECE 638</u></a>	Network Management and Security	
<a href="#"><u>ECE 673</u></a>	Random Signal Analysis I	
<a href="#"><u>ECE 742</u></a>	Communication Systems II	
<a href="#"><u>ECE 755</u></a>	Advanced Topics in Digital Communications	
<a href="#"><u>ECE 783</u></a>	Computer Communication Networks	
Total Credits		33

1 These courses are to be used in an area of specialization.

## Area of Specialization

---

The following are suggested areas of specialization and sample elective courses for each. Students may develop an individual area of specialization in consultation with a graduate advisor.

## Management and Administration

<a href="#">CS 696</a>	Network Management and Security	3
or <a href="#">ECE 638</a>	Network Management and Security	

## Communication Systems

<a href="#">ECE 673</a>	Random Signal Analysis I	3
<a href="#">ECE 742</a>	Communication Systems II	3
<a href="#">ECE 755</a>	Advanced Topics in Digital Communications	3

## Networking

<a href="#">CS 633</a>	Distributed Systems	3
<a href="#">CS 650</a>	Computer Architecture	3
or <a href="#">ECE 690</a>	Computer Systems Architecture	
<a href="#">CS 652</a>	<b>Cognitive Cloud Networking - Architectures and Applications</b>	<b>3</b>
<a href="#">CS 656</a>	Internet and Higher-Layer Protocols	3
or <a href="#">ECE 637</a>	Internet and Higher-Layer Protocols	
<a href="#">CS 668</a>	Parallel Algorithms	3
<a href="#">CS 696</a>	Network Management and Security	3
or <a href="#">ECE 638</a>	Network Management and Security	
<a href="#">ECE 639</a>	Principles of Broadband Networks	3
<a href="#">ECE 673</a>	Random Signal Analysis I	3
<a href="#">ECE 783</a>	Computer Communication Networks	3

## Information Technologies

<a href="#">CS 631</a>	Data Management System Design	3
<a href="#">CS 696</a>	Network Management and Security	3
or <a href="#">ECE 638</a>	Network Management and Security	

Other CS and ECE courses related to telecommunications may be selected as elective courses with the written approval of the corresponding graduate advisor.

### Additional Thesis Option:

**With permission of their research advisor, MS Telecom students intending to do an MS thesis 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.**

Is licensure required of program graduates to gain employment?

**No**

Will the institution seek accreditation for this program?

**No**

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

**Mesfin Ayne (ayne) (03/05/21 5:04 pm):** Rollback: The total credits for the communication shows 27 credits but in the description it is mentioned 30 credits.

**Leonid Tsybeskov (tsybesko) (03/06/21 10:50 am):** Rollback: Back to you

**Sotirios Ziavras (ziavras) (04/08/21 1:24 pm):** Rollback: As per CGE decision, add CS 652 as an elective and change the new language to "With permission of their research advisor, students intending to do an MS thesis 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."

# Program Change Request

Date Submitted: 04/05/21 12:26 pm

Viewing: **SL-EVSC-PHD : PHD. ~~Phd~~.in**

## Environmental Science

Last edit: 04/05/21 12:26 pm

Changes proposed by: Somenath Mitra (mitra)

Catalog Pages

Using this

Program

[Ph.D. in Environmental Science](#)

Department(s) /

College(s)

### In Workflow

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

### Approval Path

1. 04/09/21 12:39 pm  
Omowunmi Sadik (sadik): Approved for CHES Chair
2. 04/09/21 2:48 pm  
Mesfin Ayne (ayne): Approved for AIS
3. 04/15/21 6:27 pm  
John Wolf (jwolf): Approved for SL Dean

Department	College
Chemistry & Environmental Sci. (CHES)	Coll of Science & Liberal Arts (SL)

Name of Program **PHD. ~~Phd~~.in Environmental Science**

Academic

Level(s)

Doctoral

Degree	PHD
Designation	
Campus(es) where the program will be offered	
Newark	
CIP Code	
Effective Catalog Edition	2021-2022
Faculty Senate Review required?	
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.

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

## Ph.D. in Environmental Science

### **Independent Learning**

---

The grounding in scientific research methodology provided by the dissertation requirement is a central focus of the PhD program. One of the primary means of education and training in the PhD program is achieved through successful completion of an original research project in close mentorship by their research adviser and the presentation and defense of the PhD dissertation. This intense research experience provides the education and training necessary for the student to substantiate his/her expertise and develop the skills necessary to become an independent professional. By the end of the second semester, students will choose a dissertation adviser. Students will conduct research either on site at NJIT or at the professional laboratories/organizations where they work. In either case, a member

of the NJIT Department of Chemistry and Environmental Science faculty will serve as research adviser and approve the research topic. This research culminates in the writing and presentation of the dissertation. The student will present his/her dissertation for examination by a committee consisting of a minimum of five members including the research adviser. One of the committee members will be from outside the department. A majority of the program committee members will hold tenure-earning faculty appointments in the Department of Chemistry and Environmental Science. The committee has to be approved by the director of the PhD Environmental Science graduate program, the department chair and the Office of Graduate Studies. With the exception of the outside member the other committee members need to have graduate faculty status. The dissertation must be judged worthy of publication by the dissertation committee and may not be submitted for examination until so deemed. For students performing their dissertation research off campus, the dissertation adviser will visit the student's laboratory/organization, where their research is to be performed, before the research begins and on a regular basis until the work is complete.

Total Minimum Hours Required for PhD for students entering with Bachelor's Degree (without MS degree) - 36 Credit Hours of 600/700-level Courses

Total Minimum Hours Required for PhD for students entering with MS degree - 12 Credit Hours of 700-level Courses

## I. For Students Entering Without a MS Degree

---

### Required Courses

Students must take the following five core courses and maintain a 3.0 GPA or higher: 15

<a href="#">EVSC 610</a>	Environmental Chemical Science
<a href="#">EVSC 612</a>	Environmental Analysis
<a href="#">EVSC 616</a>	Toxicology
<a href="#">EVSC 627</a>	Environmental Microbiology
<a href="#">EM 631</a>	Legal Aspects in Environmental Engineering

### Elective Courses 21

Students are required to take a minimum of seven 600- or 700-level courses (21 credit hours) with at least four (12 credit hours) of these at the 700-level. Courses are to be chosen from the departmental offerings or from outside of the department as deemed necessary. Up to six credit hours of Independent Study courses may be earned in fulfillment of the elective courses requirements.

<a href="#">EVSC 622</a>	Bioremediation
<a href="#">EVSC 613</a>	Environmental Problem Solving
<a href="#">EVSC 614</a>	Quantitative Environmental Risk Assessment
<a href="#">EVSC 615</a>	Global Environmental Problems
<a href="#">EVSC 702</a>	Special Topics in Environmental Science II
<a href="#">EVSC 711</a>	Advanced Environmental Analysis
<a href="#">EVSC 712</a>	Hazardous Substance Management
<a href="#">EVSC 715</a>	Energy and Sustainability
<a href="#">EVSC 725</a>	Independent Study I



<a href="#"><u>EVSC 726</u></a>	Independent Study II
<a href="#"><u>ENE 630</u></a>	Physical Processes of Env Syst
<a href="#"><u>ENE 660</u></a>	Introduction to Solid and Hazardous Waste Problems
<a href="#"><u>ENE 661</u></a>	Environmental Microbiology
<a href="#"><u>ENE 662</u></a>	Site Remediation
<a href="#"><u>ENE 663</u></a>	Water Chemistry
<a href="#"><u>ENE 664</u></a>	Physical and Chemical Treatment
<a href="#"><u>ENE 665</u></a>	Biological Treatment
<a href="#"><u>ENE 672</u></a>	Stormwater Management
<a href="#"><u>ENE 673</u></a>	Sustainability and Life Cycle Analysis
<a href="#"><u>IE 615</u></a>	Industrial Hygiene and Occupational Health
<a href="#"><u>EPS 612</u></a>	Introduction to Environmental Policy Studies
<a href="#"><u>EPS 614</u></a>	Environmental Economics and Management
<a href="#"><u>EPS 622</u></a>	Sustainable Politics and Policy
<a href="#"><u>EPS 638</u></a>	Physical Geography
<a href="#"><u>CHEM 714</u></a>	Pharmaceutical Analysis
<a href="#"><u>CHEM 748</u></a>	Nanomaterials
<a href="#"><u>CHEM 764</u></a>	Advanced Analytical Chemistry
<a href="#"><u>CHE 681</u></a>	<del>Course CHE 681 Not Found</del>
<a href="#"><u>CHE 724</u></a>	Sustainable Energy
<a href="#"><u>MTSE 719</u></a>	Physical Principles of Characterization of Solids

Total Credits

36

### **Dissertation Research Credits**

[EVSC 792B](#) Pre-Doctoral Research (after completing qualifying exam requirements)

[EVSC 790](#) Doctoral Dissertation (after completing research proposal requirements)

### **Qualifying Examination**

By the end of the second year, students must pass the PhD qualifying oral examination. A student is given two chances to clear the exam. The qualifying examination consists of writing and orally defending an original research proposal to the student's dissertation committee in which the committee conducts an oral exam of the candidate (majority vote of the committee required). The original research proposal will focus on a topic not directly related to the student's dissertation research and must be approved by the dissertation committee prior to development of the proposal. Failure to pass the PhD qualifying exam will result in dismissal from the program.

### **Dissertation Research Proposal**

By the end of the first year of passing the qualifying exam (excluding summers), students must successfully present a proposal of their dissertation research to their dissertation committee and gain approval by a majority vote of the committee.

### **Dissertation Defense**

The final requirement for the PhD degree is completion of a satisfactory written dissertation of the student's research, along with successful presentation and defense of the dissertation to the student's

dissertation committee (majority vote of the committee).

## II. For Students Entering With a MS Degree

Students with a recognized MS degree in environmental, chemical and biological sciences or closely related field such as engineering may, with approval of the PhD Graduate Committee be admitted to pursue the PhD degree in Environmental Science and be required to earn a minimum of 12 credit hours of coursework at the 700-level. Students entering the program without a MS in Environmental Science are required to take the core courses outlined in I along with the 700 level credits. Students with a MS in Environmental Science will be waived core requirements if they have taken similar courses before, and will complete only those among the core that they have not completed before.

### Elective Courses

12

Students are required to take a minimum of four 700-level courses (12 credit hours). Courses are to be chosen from the departmental offerings while up to three credit hours may be selected from outside of the department.

<a href="#">EVSC 702</a>	Special Topics in Environmental Science II
<a href="#">EVSC 711</a>	Advanced Environmental Analysis
<a href="#">EVSC 712</a>	Hazardous Substance Management
<a href="#">EVSC 715</a>	Energy and Sustainability
<a href="#">EVSC 725</a>	Independent Study I
<a href="#">EVSC 726</a>	Independent Study II
<a href="#">CHEM 714</a>	Pharmaceutical Analysis
<a href="#">CHEM 748</a>	Nanomaterials
<a href="#">CHEM 764</a>	Advanced Analytical Chemistry
<a href="#">CHEM 777</a>	Principles Pharm Chemistry
<a href="#">CHE 724</a>	Sustainable Energy
<a href="#">MTSE 719</a>	Physical Principles of Characterization of Solids

### Total Credits

12

### Dissertation Research Credits

[EVSC 792B](#) Pre-Doctoral Research (after completing qualifying exam requirements)

[EVSC 790](#) Doctoral Dissertation (after completing research proposal requirements)

### Qualifying Examination

By the end of the second year, students must pass the PhD qualifying oral examination. A student is given two chances to clear the exam. The qualifying examination consists of writing and orally defending an original research proposal to the student's dissertation committee in which the committee conducts an oral exam of the candidate (majority vote of the committee). The original research proposal will focus on a topic not directly related to the student's dissertation research and must be approved by the adviser and advisory committee prior to development of the proposal. Failure to pass the PhD proficiency exam will result in dismissal from the program.

### Dissertation Research Proposal

Within a year of passing the qualifying exam, students must successfully present a proposal of their dissertation research to their dissertation committee and gain approval by a majority vote of the committee.

### **Dissertation Defense**

The final requirement for the PhD degree is completion of a satisfactory written dissertation of the student's research, along with successful presentation and defense of the dissertation to the student's dissertation committee (majority vote of the committee).

### **Grades**

All students must maintain a grade point average of at least 3.0.

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