

◀ PhD Cmpttr Elec Engr - Doctor of Philosophy in Engineering

# CON Cmpt Engr Computer Engineering

Under Review | Fall 2025

# Proposal Information

## Status

Active

## Workflow Status

In Progress

Refresh **Form Submission, Proposer**

collapse ▾

Submitted for Approval | Proposer

✓ Francesca Cavallo | 3/29/2024 6:58 AM

### Department Chair Pre-Approval, Electrical & Computer Engineering

Approved | Department Chair

✓ Mark Gilmore | 3/29/2024 7:10 AM

### Registrar Office Technical Check Approval, Registrar Technical Check

Approved | Registrar Technical Check

✓ Michael Raine | 3/29/2024 1:52 PM

### College/School Dean Approval, School of Engineering

Approved | College or School approver

✓ Charles Fleddermann | 3/29/2024 2:00 PM

### Library Approval, Main Campus Library

Approved | Library Approval

✓ Sever Bordeianu | 3/30/2024 7:51 AM

### SGPC Approval, Faculty Senate Graduate and Professional Committee

Approved | Chair

✓ Robben Brown | 9/06/2024 11:59 AM

### FSCC Member notification, Faculty Senate Curriculum Committee

Notification Sent | Faculty Senate Curriculum Committee Member

- John Russell
- Gabriel Pacyniak
- Jonathan Wheeler
- Min Ro
- Randi Archuleta
- Stephanie Hands
- Laura Soito
- Robben Brown
- Megan Jacobs
- Justine Ponce
- Joe Anderson
- Jennifer Schneider
- Yiliang Zhu
- Nicole Capehart
- Kate Cartwright
- Julia So
- Antoinette Abeyta
- Joseph Poole Jr MSN, RN, CNE
- SueNoell Stone

### Faculty Senate Curriculum Committee Approval, Faculty Senate Curriculum Committee

Approved | Faculty Senate Curriculum Committee Chair

✓ Janet Vassilev

Approved per FSCC vote 10/18/24.

10/25/2024 2:33 PM

### Provost Approval, Main Campus Provost

Approved | Provost

✓ Pamela Cheek | 10/27/2024 8:41 AM

### Faculty Senate, Faculty Senate

Waiting for Approval | Faculty Senate Approval

Nancy Middlebrook

**Registrar Office Final Approval/Processing, Registrar**

Approval | Registrar final approval

Michael Raine

Maggie Sumruld

**Notification, Proposer**

Notification | Proposer

Francesca Cavallo

**EMRT notification, EMRT users**

Notification | EMRT user

Enrollment Mgt Reporting Team

**Lobotrax notification, LoboTrax Team**

Notification | LoboTrax Staff

Sherri DeLeve

Paula Freitag

Hannah Epstein

Allie Martinez

Glenda Johnson

**Changes**

- Concentration Requirements
- participants
- Proposed Effective Term and Year
- Catalog Activation Date
- Concentration Justification
- Concentration Description
- Sponsoring faculty/staff member
- Sponsoring faculty/staff email

Collapse ^

## Proposal Information

Proposed	Proposed
<b>Sponsoring faculty/staff member</b> ⓘ	<b>Sponsoring faculty/staff email</b>
Francesca Cavallo	fcavallo@unm.edu
Existing	Existing
<b>Sponsoring faculty/staff member</b> ⓘ	<b>Sponsoring faculty/staff email</b>

<b>College</b>	<b>Department</b>	<b>Campus</b>
School of Engineering	Electrical & Computer Engineering	Main Campus

## Effective Term and Year

Proposed
<b>Proposed Effective Term and Year</b>
Fall 2025
Existing
<b>Proposed Effective Term and Year</b>

Fall 2006

## Justification

Proposed

### Concentration Justification

The concentration has moved to a model where graduate students are allowed to tailor their specialization in consultation with their faculty advisor. Students are required to select core courses from a large pool of courses. The proposed changes reflect the new model.

Existing

### Concentration Justification

## Associated Forms

Select any associated course forms that exist

Select any associated program forms that exist

## Program Information

### Degree Name

PhD Cmpt'r Elec Engr - Doctor of Philosophy in Engineering

### Degree Type

Doctor of Philosophy

### Program Type

Doctoral

### Program Description

No Parent Selected

### Degree Hours

66

### Minimum Major Hours

### Degree Requirements

- Complete all of the following
  - Earn at least 48 credits from the following types of courses:
 

The minimum amount of coursework required for the Doctor of Philosophy degree is 24 credit hours beyond the master's degree or 48 credit hours beyond the bachelor's degree. This requirement is exclusive of dissertation or master's thesis. These are minimum requirements; ordinarily, more than the 48 credit hours are necessary. The program of each student is an individual matter planned by the committee on studies.
  - See Concentration below for specific requirements.

**Grand Total Credits: 48**

## Concentration Information

### Concentration Title

Computer Engineering



- ECE537 - Foundations of Computing (3)
- ECE538 - Advanced Computer Architecture (3)
- ECE540 - Advanced Networking Topics (3)
- ECE549 - Information Theory and Coding (3)
- Complete at least 1 of the following:
  - ECE506 - Optimization Theory (3)
  - ECE522 - Hardware Software Codesign with FPGAs (3)
  - ECE539 - Digital Signal Processing (3)
  - ECE541 - Probability Theory and Stochastic Processes (3)
  - ECE542 - Digital Communication Theory (3)

#### Computer Vision and Image Processing

- Complete all of the following
  - Complete at least 2 of the following:
    - ECE516 - Computer Vision (3)
    - ECE517 - Machine Learning (3)
    - ECE520 - VLSI Design (3)
    - ECE524 - Network Economics (3)
    - ECE525 - Hardware-Oriented Security and Trust (3)
    - ECE533 - Digital Image Processing (3)
    - ECE537 - Foundations of Computing (3)
    - ECE538 - Advanced Computer Architecture (3)
    - ECE540 - Advanced Networking Topics (3)
    - ECE549 - Information Theory and Coding (3)
  - Complete at least 1 of the following:
    - ECE506 - Optimization Theory (3)
    - ECE522 - Hardware Software Codesign with FPGAs (3)
    - ECE539 - Digital Signal Processing (3)
    - ECE541 - Probability Theory and Stochastic Processes (3)
    - ECE542 - Digital Communication Theory (3)

#### Information Systems

- Complete all of the following
  - Complete at least 2 of the following:
    - ECE516 - Computer Vision (3)
    - ECE517 - Machine Learning (3)
    - ECE520 - VLSI Design (3)
    - ECE524 - Network Economics (3)
    - ECE525 - Hardware-Oriented Security and Trust (3)
    - ECE533 - Digital Image Processing (3)
    - ECE537 - Foundations of Computing (3)
    - ECE538 - Advanced Computer Architecture (3)
    - ECE540 - Advanced Networking Topics (3)
    - ECE549 - Information Theory and Coding (3)
  - Complete at least 1 of the following:
    - ECE506 - Optimization Theory (3)
    - ECE522 - Hardware Software Codesign with FPGAs (3)
    - ECE539 - Digital Signal Processing (3)
    - ECE541 - Probability Theory and Stochastic Processes (3)
    - ECE542 - Digital Communication Theory (3)

#### Internet of Things

- Complete all of the following
  - Complete at least 2 of the following:
    - ECE516 - Computer Vision (3)
    - ECE517 - Machine Learning (3)
    - ECE520 - VLSI Design (3)
    - ECE524 - Network Economics (3)
    - ECE525 - Hardware-Oriented Security and Trust (3)
    - ECE533 - Digital Image Processing (3)
    - ECE537 - Foundations of Computing (3)
    - ECE538 - Advanced Computer Architecture (3)

- ECE540 - Advanced Networking Topics (3)
- ECE549 - Information Theory and Coding (3)
- Complete at least 1 of the following:
  - ECE506 - Optimization Theory (3)
  - ECE522 - Hardware Software Codesign with FPGAs (3)
  - ECE539 - Digital Signal Processing (3)
  - ECE541 - Probability Theory and Stochastic Processes (3)
  - ECE542 - Digital Communication Theory (3)

#### Requirements for all Emphases

- Complete all of the following
  - Earn at least 3 credits from the following types of courses:  
Another Computer Engineering concentration emphasis
  - Earn at least 36 credits from the following:
    - CHEM567 - Topics in Physical Chemistry (3)
    - CHEM587 - Advanced Topics in Biological Chemistry (3)
    - ECE506 - Optimization Theory (3)
    - ECE517 - Machine Learning (3)
    - ECE520 - VLSI Design (3)
    - ECE522 - Hardware Software Codesign with FPGAs (3)
    - ECE533 - Digital Image Processing (3)
    - ECE538 - Advanced Computer Architecture (3)
    - ECE539 - Digital Signal Processing (3)
    - ECE540 - Advanced Networking Topics (3)
    - ECE541 - Probability Theory and Stochastic Processes (3)
    - ECE542 - Digital Communication Theory (3)
    - ECE549 - Information Theory and Coding (3)
    - MATH471 - Introduction to Scientific Computing (3)
    - MATH514 - Applied Matrix Theory (3)
    - PHYS566 - Quantum Optics (3)
    - PHYS571 - Quantum Computation (3)
    - PHYS572 - Quantum Information Theory (3)
    - PHYS581 - Advanced Topics in Physics and Astrophysics (3)

#### Or Choose Emphasis

##### Quantum Information Science

- Complete all of the following
  - Complete the following:
    - ECE537 - Foundations of Computing (3)
    - ECE545 - Introduction to Quantum Information Science (3)
    - ECE547 - Quantum Error Correction (3)
  - Complete at least 1 of the following:
    - CHEM567 - Topics in Physical Chemistry (3)
    - PHYS566 - Quantum Optics (3)
    - PHYS571 - Quantum Computation (3)
    - PHYS572 - Quantum Information Theory (3)
    - PHYS581 - Advanced Topics in Physics and Astrophysics (3)
  - Earn at least 3 credits from the following types of courses:  
Another Computer Engineering concentration emphasis
  - Earn at least 33 credits from the following:
    - CHEM567 - Topics in Physical Chemistry (3)
    - CHEM587 - Advanced Topics in Biological Chemistry (3)
    - ECE506 - Optimization Theory (3)
    - ECE517 - Machine Learning (3)
    - ECE520 - VLSI Design (3)
    - ECE522 - Hardware Software Codesign with FPGAs (3)
    - ECE533 - Digital Image Processing (3)
    - ECE538 - Advanced Computer Architecture (3)
    - ECE539 - Digital Signal Processing (3)
    - ECE540 - Advanced Networking Topics (3)
    - ECE541 - Probability Theory and Stochastic Processes (3)
    - ECE542 - Digital Communication Theory (3)

- ECE549 - Information Theory and Coding (3)
  - MATH471 - Introduction to Scientific Computing (3)
  - MATH514 - Applied Matrix Theory (3)
  - PHYS566 - Quantum Optics (3)
  - PHYS571 - Quantum Computation (3)
  - PHYS572 - Quantum Information Theory (3)
  - PHYS581 - Advanced Topics in Physics and Astrophysics (3)
- Earn at least 2 credits from the following:
    - ECE590 - Graduate Seminar (1)

## Grand Total Credits: 50

### Proposed

#### Concentration Description

In addition to the general University doctoral degree requirements listed in the Graduate Program section of this Catalog, students pursuing the Doctor of Philosophy (Ph.D.) concentration in Computer Engineering must choose an area of emphasis in the concentration. No more than 16 credit hours of problem courses (ECE 551 or 651) may apply toward the Ph.D. Contact the department for more information about this concentration.

### Existing

#### Concentration Description

Contact the department for more information about this concentration.