

# Technology, Engineering and Design Education (BS): Licensure Concentration

The degree of Bachelor of Science in Technology, Engineering, and Design Education is offered by the Department of STEM Education in the College of Education. With an emphasis on innovation and active learning, this program prepares individuals for a variety of engineering and design employment opportunities, including a teacher licensure option and a non-licensure graphics communications option.

## Teacher Licensure

Through the study of engineering and design processes, students learn how to solve technological problems, innovate and invent. They actively design, model, simulate and analyze solutions to technological challenges studies courses and explore the contributions of systems engineering for developing and sustaining a well-designed world. Methods in teaching middle and high school students about engineering and design processes are also covered.

The goals and objectives of the BS degree in Technology, Engineering, and Design Education: Teaching Licensure are:

- Develop technical skills and an understanding of technical processes
- Develop the ability to apply knowledge, skill and creativity in solving technical problems
- Understand and appreciate the historical evolution of technology
- Understand and assess the impact of current technological developments and trends
- Demonstrate an ability to teach others about technology

For more information about this program, visit our website (<https://ced.ncsu.edu/stem-ed/>).

Department of Science, Technology, Engineering and Mathematics Education (STEM)  
North Carolina State University  
510 Poe Hall, 2310 Stinson Drive  
Raleigh, NC 27695

## Contact

**Nolan Fahrner**  
Assistant Teaching Professor  
919.515.1741  
nefahrner@ncsu.edu

## Plan Requirements

Code	Title	Hours	Counts towards
<b>Writing and Speaking</b>			
COM 110	Public Speaking	3	

ENG 101	Academic Writing and Research <sup>1</sup>	4
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### Social Sciences and IP

PSY 376	Developmental Psychology	3
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STS 302	Contemporary Science, Technology and Human Values	3
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### Mathematical and Natural Sciences

MA 103	Topics in Contemporary Mathematics <sup>1</sup>	3
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Select one of the following: <sup>1</sup> 3

MA 121	Elements of Calculus	
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MA 131	Calculus for Life and Management Sciences A	
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MA 141	Calculus I	
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Select one of the following: 4

CH 100	Chemistry and Society	
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CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	
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Select one of the following: 4

PY 131	Conceptual Physics	
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PY 201	University Physics I	
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PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	
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PY 211	College Physics I	
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BIO 105	Biology in the Modern World	3
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### Professional Technical Content

D 100	Design Inquiry I: Methods and Processes <sup>2</sup>	3
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or ISE 216	Product Development and Rapid Prototyping	
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GC 120	Foundations of Graphics <sup>2</sup>	3
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GC 250	Architectural Graphic Communications <sup>2</sup>	3
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TDE 110	Materials & Processes Technology <sup>2</sup>	3
TDE 131	Technology through Engineering and Design I <sup>2</sup>	3
TDE 205	Desktop Publishing and Imaging Technology <sup>2</sup>	3
TDE 331	Technology Through Engineering and Design II <sup>2</sup>	3
TDE 481	Research & Development in Technology Education <sup>2</sup>	3
<b>TDE Technical Electives</b>		
TDE Technical Electives (p. 3) <sup>1</sup>		12
<b>Professional Education</b>		
E 101	Introduction to Engineering & Problem Solving <sup>2</sup>	1
or ED 100	Intro to Education	
ED 204	Introduction to Teaching in Today's Schools <sup>2</sup>	2
TDE 202	Introduction to Teaching Technology Engineering and Design Education <sup>2</sup>	2
ELP 344	School and Society <sup>2</sup>	3
ED 311	Classroom Assessment Principles and Practices <sup>2</sup>	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab <sup>2</sup>	1
EDP 304	Educational Psychology <sup>2</sup>	3
ECI 416	Teaching Exceptional Students in the Mainstreamed Classroom <sup>2</sup>	3

TDE 452	Lab Planning in Technology Education <sup>2</sup>	3
TDE 456	Curriculum and Methods in Technology Education <sup>2</sup>	4
TDE 457	Student Teaching in Technology Education <sup>2</sup>	8
TDE 495	Senior Seminar in Technology Education <sup>2</sup>	3

**GEP Courses**

GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )	6
GEP Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a> )	3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	2
GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)	3
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )	2
GEP U.S. Diversity ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/</a> ) (verify requirement)	
GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (verify requirement)	
Foreign Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a> ) (verify requirement)	
<b>Free Electives</b>	
Free Electives <sup>3</sup>	3

**Total Hours** 120<sup>1</sup> A grade of C- or higher is required.<sup>2</sup> A grade of C or higher is required.

## TDE Technical Electives

Code	Title	Hours	Counts towards
GC 320	3D Spatial Relations	3	
GC 330	Basic Technical Animation	3	
GC 340	Concepts of Website Development	3	
GC 350	Applied CAD/D and Geometric Controls	3	
GC 420	Visual Thinking	3	
GC 450	Advanced Graphics Usage with CAD	3	
TDE 230	Scientific and Technical Visualization	3	
TDE 261	Digital Media Education	3	
TDE 351	Ceramics: The Art and Craft of Clay	3	
TDE 359	Electronics Technology	3	
TDE 371	Emerging Issues in Technology	3	
TDE 385	Robotics Education	3	

## Semester Sequence

This is a sample.

### First Year

Fall Semester	Hours
ED 100 or E 101 Intro to Education <sup>1</sup> or Introduction to Engineering & Problem Solving	1-2
ENG 101 Academic Writing and Research	4
GC 120 Foundations of Graphics <sup>1,2</sup>	3
GEP Mathematical Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-mathematical-sciences/</a> ) <sup>4</sup>	3
TDE 110 Materials & Processes Technology <sup>1,2</sup>	3
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	1
<b>Hours</b>	<b>15</b>

### Spring Semester

Chemistry (p. 1)	3
COM 110 Public Speaking	3
GC 250 Architectural Graphic Communications	3
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )	3

Calculus (p. 1) <sup>4</sup>	3
<b>Hours</b>	<b>15</b>

### Second Year

#### Fall Semester

GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	1
Physics (p. 1)	4
ED 204 Introduction to Teaching in Today's Schools <sup>1,2</sup>	2
TDE 202 Introduction to Teaching Technology Engineering and Design Education <sup>1,2</sup>	2
TDE 131 Technology through Engineering and Design I <sup>1,2</sup>	3
TDE 205 Desktop Publishing and Imaging Technology <sup>1,2</sup>	3
<b>Hours</b>	<b>15</b>

#### Spring Semester

BIO 105 Biology in the Modern World	3
GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )	3
GEP Social Sciences ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a> )	3
ISE 216 or D 100 Product Development and Rapid Prototyping <sup>1</sup> or Design Inquiry I: Methods and Processes	3
TDE Technical Electives (p. 3) <sup>3</sup>	3
<b>Hours</b>	<b>15</b>

### Third Year

#### Fall Semester

ED 311 Classroom Assessment Principles and Practices <sup>1</sup>	2
ED 312 Classroom Assessment Principles and Practices Professional Learning Lab <sup>1</sup>	1
EDP 304 Educational Psychology <sup>1</sup>	3
ELP 344 School and Society <sup>1</sup>	3
TDE Technical Electives (p. 3) <sup>3</sup>	3
TDE Technical Electives (p. 3) <sup>3</sup>	3
<b>Hours</b>	<b>15</b>

#### Spring Semester

GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)	3
PSY 376 Developmental Psychology	3
STS 302 Contemporary Science, Technology and Human Values	3
TDE 331 Technology Through Engineering and Design II <sup>1</sup>	3
TDE Technical Electives (p. 3) <sup>3</sup>	3
<b>Hours</b>	<b>15</b>

### Fourth Year

#### Fall Semester

ECI 416 Teaching Exceptional Students in the Mainstreamed Classroom	3
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Free Electives		4
GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )		2
TDE 456	Curriculum and Methods in Technology Education	4
TDE 481	Research & Development in Technology Education <sup>1</sup>	3
<b>Hours</b>		<b>16</b>
<b>Spring Semester</b>		
TDE 452	Lab Planning in Technology Education <sup>1</sup>	3
TDE 457	Student Teaching in Technology Education <sup>1</sup>	8
TDE 495	Senior Seminar in Technology Education <sup>1</sup>	3
<b>Hours</b>		<b>14</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> A grade of C or higher is required.

<sup>2</sup> Critical Path (CP): This course is required in the first year of TDE and part of the critical path.

<sup>3</sup> A grade of C- or higher is required.

<sup>4</sup> Only one course in this category may be passed with a D. The other course must be at least a C-.