SECONDARY EDUCATION AND TEACHING, BACHELOR OF SCIENCE IN EDUCATION (B.S.ED.) WITH A CONCENTRATION IN ENGINEERING EDUCATION

Note: Admission to this program is temporarily suspended.

The purpose of the B.S.Ed. in Secondary Education and Teaching with a concentration in engineering education is to prepare students to serve as initially licensed teachers in grades 6-12, as well as to serve as educators and leaders in schools and community-based settings. The program will focus on providing students with a solid foundation in secondary education, engineering, mathematics and sciences to meet the requirements for licensure. Through the core education curriculum, students will become knowledgeable about professional roles and workplace responsibilities while learning basic abilities in the planning and implementation of engineering lessons for students in grades 6-12. The core curriculum instills fundamental knowledge and skills, with opportunities for observation and application in a variety of engineering settings. Through the core engineering, science and mathematics curriculum, students will develop the content knowledge and skills of those fields in order to deliver relevant and rigorous lessons in engineering and integration of other content areas with engineering. Graduates will be prepared to work in public and private middle and high schools across Virginia, with particular focus in urban and other high-need areas. Graduates will be capable of working with diverse learners and adapting instructional programs based on the needs of their students and clients. Successful completion of the program will result in licensure in secondary engineering education (6-12).

See Admission to undergraduate programs (http://bulletin.vcu.edu/undergraduate/education/admission-baccalaureate/) for admission requirements to this program.

Student learning outcomes

1. **Learner and learning:** Students will understand human development and learning theories appropriate to the age group they will teach and acquire an awareness of the diversity of the school-age populations' cultural backgrounds, learning strengths and needs.
2. **Content:** Students will demonstrate knowledge of the subjects they will teach.
3. **Instructional practice:** Students will demonstrate an ability to plan and implement effective teaching and measure student learning in ways that lead to sustained development and learning.
4. **Professional responsibility:** Students will develop an understanding of purposes for education and a defensible philosophical approach toward teaching and demonstrate professional dispositions.

Note: Admission to this program is temporarily suspended.

Special requirements

- Students must have received a minimum grade of C in all required education courses (CLED, ECSE, EDUS, SEDP and TEDU).
- Students must have received a minimum grade of C in all prerequisite courses for all required upper-level education courses (CLED, ECSE, EDUS, SEDP and TEDU).
- Required education courses (CLED, ECSE, EDUS, SEDP and TEDU) in which students earn a grade of D or F must be repeated.
- Students must achieve a 2.8 GPA to be admitted to teacher preparation and a 3.0 GPA to be admitted to clinical internship.

Degree requirements for Secondary Education and Teaching, Bachelor of Science in Education (B.S.Ed.) with a concentration in engineering education

Course	Title	Hours
General education (http://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/)		
Select 30 credits of general education courses in consultation with an adviser.		30
Major requirements		
• Major core requirements		
EDUS 202	Diversity, Democracy and Ethics	3
EDUS 301	Human Development and Learning	3
EDUS 304	Educational Psychology for Teacher Preparation	3
SEDP 330	Survey of Special Education	3
SEDP/EDUS 401	Assessment in Diverse Settings	3
TEDU/SEDP 410	Building a Community of Learners: Classroom Management	3
TEDU 413	Curriculum Methods and Instructional Models	3
TEDU 452	Teaching Multilingual Learners	2
TEDU 510	Instructional Technology in PK-12 Environments	2
• Concentration requirements		
Science and math		
CHEM 102 & CHEZ 102	General Chemistry II and General Chemistry Laboratory II	4
MATH 201	Calculus with Analytic Geometry II	4
PHYS 207	University Physics I	5
PHYS 208	University Physics II	5
STAT 441	Applied Statistics for Engineers and Scientists	3
Engineering		
Select from:		3-4
CLSE 101	Introduction to Engineering	
EGRB 102 & EGRB 104	Introduction to Biomedical Engineering and Introduction to Biomedical Engineering Laboratory	
EGRE 101	Introduction to Engineering	
EGMN 103 & EGMN 190 & EGMN 203	Mechanical and Nuclear Engineering Practicum I and Introduction to Mechanical and Nuclear Engineering and Mechanical and Nuclear Engineering Practicum	

CLSE 115	Introduction to Programming for Chemical and Life Science Engineering	4
EGMN 102	Engineering Statics	3
EGMN 202	Mechanics of Deformables	3
EGMN 215	Engineering Visualization and Computation	3
EGRE 206	Electric Circuits	4
EGRE 245	Engineering Programming	4
or CMSC 255	Introduction to Object-oriented Programming	
EGRE 246	Advanced Engineering Programming	3-4
or CMSC 256	Introduction to Data Structures	
Secondary education		
TEDU 381	Middle School Practicum for Engineering Education	2
TEDU 382	High School Practicum for Engineering Education	1
TEDU 420	Teaching Middle and High School Engineering	3
TEDU 478	Internship I for Engineering Education	4
TEDU 479	Internship II for Engineering Education	4
TEDU 480	Investigations and Trends in Teaching: Engineering	3
TEDU 562	Reading Instruction in the Content Areas	3
Ancillary requirements		
BIOL 103	Global Environmental Biology (satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	4
CHEM 101 & CHEZ 101	General Chemistry I and General Chemistry Laboratory I (both satisfy general education AOI for scientific and logical reasoning)	4
MATH 200	Calculus with Analytic Geometry I (satisfies general education quantitative foundations)	4
Total Hours		**123**

The minimum number of credit hours required for this degree is 123.

Note: Admission to this program is temporarily suspended.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Freshman year

Fall semester		**Hours**
CHEM 101 & CHEZ 101	General Chemistry I and General Chemistry Laboratory I (both satisfy general education AOI for scientific and logical reasoning)	4
MATH 200	Calculus with Analytic Geometry I (satisfies general education quantitative foundations)	4
UNIV 111 Play course video for Focused Inquiry I	Focused Inquiry I (satisfies general education UNIV foundations)	3
Select one of the following:		3-4
CLSE 101	Introduction to Engineering	-
EGRB 102 & EGRB 104	Introduction to Biomedical Engineering and Introduction to Biomedical Engineering Laboratory	-
EGRE 101	Introduction to Engineering	-
EGMN 103 & EGMN 190 & EGMN 203	Mechanical and Nuclear Engineering Practicum I and Introduction to Mechanical and Nuclear Engineering and Mechanical and Nuclear Engineering Practicum	-
	Term Hours:	**14-15**

Spring semester

BIOL 103	Global Environmental Biology (satisfies general education BOK for natural sciences and AOI for scientific and logical reasoning)	4
MATH 201	Calculus with Analytic Geometry II	4
PHYS 207	University Physics I	5
UNIV 112 Play course video for Focused Inquiry II	Focused Inquiry II (satisfies general education UNIV foundations)	3
	Term Hours:	**16**

Sophomore year

Fall semester

CHEM 102 & CHEZ 102	General Chemistry II and General Chemistry Laboratory II	4
EDUS 202	Diversity, Democracy and Ethics	3
EGMN 102	Engineering Statics	3
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations)	3
General education course		3
	Term Hours:	**16**

Spring semester

2.8 GPA required for admission to teacher preparation

EDUS 301	Human Development and Learning	3
EGMN 215	Engineering Visualization and Computation	3
EGRE 245 or CMSC 255	Engineering Programming or Introduction to Object-oriented Programming	4
STAT 441	Applied Statistics for Engineers and Scientists	3
General education course		3
	Term Hours:	**16**

Junior year

Fall semester

CLSE 115	Introduction to Programming for Chemical and Life Science Engineering	4

EGMN 202	Mechanics of Deformables	3
EGRE 246 or CMSC 256	Advanced Engineering Programming or Introduction to Data Structures	3-4
TEDU/SEDP 410	Building a Community of Learners: Classroom Management	3
General education course		3-4
	Term Hours:	**16-18**
Spring semester		
3.0 GPA required for admission to clinical internship		
EDUS 304	Educational Psychology for Teacher Preparation	3
EGRE 206	Electric Circuits	4
PHYS 208	University Physics II	5
SEDP 330	Survey of Special Education	3
TEDU 510	Instructional Technology in PK-12 Environments	2
	Term Hours:	**17**
Senior year		
Fall semester		
SEDP/EDUS 401	Assessment in Diverse Settings	3
TEDU 381	Middle School Practicum for Engineering Education	2
TEDU 382	High School Practicum for Engineering Education	1
TEDU 413	Curriculum Methods and Instructional Models	3
TEDU 420	Teaching Middle and High School Engineering	3
TEDU 562	Reading Instruction in the Content Areas	3
	Term Hours:	**15**
Spring semester		
TEDU 452	Teaching Multilingual Learners	2
TEDU 478	Internship I for Engineering Education	4
TEDU 479	Internship II for Engineering Education	4
TEDU 480	Investigations and Trends in Teaching: Engineering	3
	Term Hours:	**13**
	Total Hours:	**123-126**

The minimum number of credit hours required for this degree is 123.