

PROGRAM SUMMARY

- **Credit Hours:** 123 hours
 - **Concentrations:** 1) Engineering Management, 2) Energy Systems
 - **Declaring the Major:** Freshmen can request entry into the major when applying to the university. Transfer students are required to have a minimum overall GPA of 2.50 and grade of C or higher in pre-calculus or higher math. Change of major forms are accepted year around.
 - **Advising (For the Major):** Required on admission to the department. Participation in academic advising is mandatory. Freshmen are advised by the Office of Student Development and Success, while sophomores and upper classmen are advised within the department. Department advising takes place regularly twice a year during Fall and Spring semesters by the department faculty advisors.
 - **Advising (For General Education):** Regularly done twice a year during Fall and Spring by the department faculty advisors.
 - **Minimum Grades/GPA:** Minimum GPA of 2.0 and a Major GPA of 2.0 are required.
 - **Teacher Licensure:** No
 - **Evening Classes Available:** Some may be available.
 - **Weekend Classes Available:** No
 - **Other Information:** No
 - **Contact(s):** Department of Systems Engineering and Engineering Management, uncc-seem@uncc.edu, 704-687-1953.
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PROGRAM REQUIREMENTS

The main objective of the undergraduate program in Systems Engineering is to equip graduates with the essential Systems Engineering skills that are needed in industry to enable them to perform in a global engineering environment. These skills include:

- Decision and Risk Analysis
- Systems Modeling and Optimization
- Systems Design, Planning, and Analysis
- Supply Chain and Logistics Engineering
- Quality Engineering
- Engineering Management
- Communication and Presentation
- Understanding of Global Business Dynamics

These objectives are accomplished through a flexible curriculum and through interactions with other departments and colleges of the University and with the professional community.

"Systems Engineering is an engineering discipline whose responsibility is creating and executing an interdisciplinary process to ensure that the customers' and stakeholders' needs are satisfied in a high quality, trustworthy, cost-efficient and schedule-compliant manner throughout a system's entire life cycle." (INCOSE, 2007)

Systems Engineering as an engineering field has very broad applications in a wide variety of industries including energy, telecommunications, construction, manufacturing, transportation and distribution, information technology, financial services, automotive, retail, healthcare and airlines, at all levels from an entry position to top management. This wide applicability, along with a very strong focus to model, analyze and manage complex engineered systems with proven tools and techniques are the primary strengths of SE. Practically every organization requires Systems Engineers to identify, characterize, and solve the right problems and to eliminate inefficiencies and root-causes that generate these problems.

The program offers a Bachelor of Science in Systems Engineering (BSSE) degree and a Master of Science in Engineering Management (MSEM) degree. For information about the master's program, see the UNC Charlotte Graduate Catalog.

Concentration courses, technical and liberal studies electives allow flexibility for study in specific areas. Each student may design a technical elective program with his or her advisor's approval in order to achieve individual goals and follow a desired track.

BSSE students can select one of the following optional concentrations areas by the end of their sophomore year:

- 1) Engineering Management
- 2) Energy Systems

The courses that are marked as "concentration courses" in the study plan are determined on the basis of the concentration area as described.

Engineering Management Concentration

The students need to take the following three required courses

- SEGR 2111 Introduction to Engineering Management (3)
- SEGR 3112 Value Engineering Management (3)
- SEGR 4150 Leadership Skills for Engineers (3)

Plus one of the following

- OPER 3100 Operations Management (3)
- OPER 3204 Management of Service Operations (3)
- OPER 3208 Supply Chain Management (3)

Energy Systems Concentration

The students need to take the following four courses

- SEGR 4961 Introduction to Energy Systems (3)
- SEGR 4962 Energy Markets (3)
- SEGR 4963 Energy Systems Planning (3)
- SEGR 4964 Case Studies in the Energy Industry (3)

Students who are not enrolled in a concentration can take any four of the systems engineering technical elective courses to fulfill their BSSE degree requirements.

Qualified students may apply for early-entry into the graduate program in Engineering Management during their junior or senior year. If accepted, students may take optional courses for graduate credit and begin work on their master's degree while completing their undergraduate degree.

Areas	Credit Hours	Description
Pre-Major/ Prerequisites	-	
Major	93	12 of these credit hours (four courses) can be taken in a concentration area. Three of the required courses also fulfill the General Education Communication Skills requirements (Written and Oral Communication).
General Education <i>(not satisfied by other major requirements)</i>	18	Six courses to fulfill the General Education and Liberal Studies Education requirements.
Related Work	-	
Foreign Language	-	
Electives	12	Three technical elective courses and one science elective that can be taken from other departments. These courses help students specialize in a field of interest.
Total Credit Hours	123	

SUGGESTED PLAN OF STUDY

Freshman Year

Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
ENGR 1201	Introduction to Engineering I	2			Requires a grade of "C" or better
XXXX XXXX	Science Elective	3			Requires a grade of "C" or better
MATH 1241	Calculus I	3	X		Requires a grade of "C" or better
UWRT 1101	Writing and Inquiry in Academic Contexts I	3	X		Requires a grade of "C" or better
LBST 110X	LBST 1100 Series: Arts and Society	3	X		
<i>Spring Semester</i>					
ENGR 1202	Introduction to Engineering II	2			Requires a grade of "C" or better
PHYS 2101	Physics I	3	X		Requires a grade of "C" or better
PHYS 2101L	Physics I Lab	1	X		Requires a grade of "C" or better
MATH 1242	Calculus II	3	X		Requires a grade of "C" or better
UWRT 1102	Writing and Inquiry in Academic Contexts II	3	X		Requires a grade of "C" or better
ECON 1101	Economics of Social Issues	3	X		Requires a grade of "C" or better

29 Credit Hours for Year

Sophomore Year

Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 2102	Physics II	3	X		
PHYS 2102L	Physics II Lab	1			
SEGR 2101	Systems Engineering Concepts	3			Requires a grade of "C" or better
MATH 2241	Calculus III	3			
MATH 2164	Matrices & Linear Algebra	3			
SEGR 2106	Engineering Economic Analysis	3			
<i>Spring Semester</i>					
SEGR 2105	Computational Methods for Systems Engineering I	3			
STAT 3128	Probability and Statistics for Engineers	3			Requires a grade of "C" or better
CHEM 1251	Chemistry I	3			
CHEM 1251L	Chemistry I Lab	1			
LBST 2101	Western Cultural & Historical Awareness	3	X		
XXXX XXXX	Technical Elective	3			

32 Credit Hours for Year

Junior Year

Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
SEGR 3101	System Design and Deployment	3			
SEGR 3105	Computational Methods for System Engineering II	3			
SEGR 3107	Decision and Risk Analysis	3			
OPRS 3111	Operations Research: Deterministic Models	3			
XXXX XXXX	Concentration Course	3			
<i>Spring Semester</i>					
SEGR 3102	System Simulation, Modeling & Analysis	3			
SEGR 3111	Project Management	3	X	W,O	
MATH 2171	Differential Equations	3			
XXXX XXXX	Concentration Course	3			
XXXX XXXX	Technical Elective	3			

30 Credit Hours for Year

Senior Year

Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
SEGR 3290	Systems Design Project I	1		W,O	
ENGR 3295	Multidisciplinary Professional Development	1			
SEGR 3670	Total Quality Systems	3			
SEGR 3114	Production Control Systems	3			
LBST 2102	Global and Intercultural Connections	3	X		
XXXX XXXX	Technical Elective	3			
XXXX XXXX	Concentration Course	3			
<i>Spring Semester</i>					
SEGR 3291	Design Project II	3	X	W,O	
OPRS 3113	Operations Research: Probabilistic Models	3			
SEGR 4141	Engineering Experimental Design	3			
LBST 221X	LBST 2200 Series: Ethical Issues and Cultural Critique	3	X		
XXXX XXXX	Concentration Course	3			

32 Credit Hours for Year

ADVISING RESOURCES

- General Education Requirements for ALL Students: ucol.uncc.edu/general-education
- Undergraduate Catalog: catalog.uncc.edu
- Central Advising website: advising.uncc.edu
- William States Lee College of Engineering advising website: coe.uncc.edu/current-students/advising.html
- University Advising Center website: advisingcenter.uncc.edu