South Dakota State University

Bachelor of Science
Major: Healthcare Systems Engineering
2025-2026 Sample 4-Year Plan
Total Degree Requirements: 130 credits

Student _____ **Student ID#** _____ **Student Phone #** _____

Advisor _____ **Minimum GPA** _____ **Minor/Career Interest(s)** _____

Students are not limited to this plan; it is meant to be used as a guide for planning purposes in consultation with your advisor. The sample schedule is one possible path to completing your degree within four years. For official program requirements, please refer to the Undergraduate Catalog.

FIRST YEAR

Fall

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
CHEM 112 or CHEM 106	General Chemistry I (SGR #6) or Chemistry Survey (SGR #6)[2]	p. MATH 114 or higher, c. CHEM 112L c. CHEM 106L	3		
CHEM 112L or CHEM 106L	General Chemistry I Lab (SGR #6) or Chemistry Survey Lab (SGR #6)[2]	c. CHEM 112 c. CHEM 106	1		
GE 101	Introduction to Engineering and Technical Professions		1		
INFO 102	Data Ethics (SGR #3)		3		
MATH 123	Calculus I (SGR #5)	p. MATH 115 or 120 or placement	4		
NUR 201 or VET 183	Medical Terminology or Veterinary Medical Terminology[2]		1		
SGR #2	Oral Communication		3		
		Total Credit Hours	16		

Spring

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
EM 214	Statics	p. MATH 123	3		
MATH 125	Calculus II	p. MATH 123	4		
PHYS 207	Fundamentals of Physics I	p. MATH 123	3		
PHYS 207L	Fundamentals of Physics I Lab	c. PHYS 207	1		
SGR #1	Written Communication	p. Placement	3		
		Total Credit Hours	14		

SECOND YEAR

Fall

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
BIOL 151	General Biology I		3		
BIOL 151L	General Biology I Lab		1		
CSC 150	Computer Science I		3		
EM 215	Dynamics	p. EM 214	3		
GE 310	Thinking in Systems		1	F	
ME 212	Mechanical Engineering Design Technologies	p. MATH 123	2		
PHYS 209	Fundamentals of Physics II	p. PHYS 207	3		
PHYS 209L	Fundamentals of Physics II Lab	c. PHYS 209	1		
		Total Credit Hours	17		

Spring

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
BIOL 221 or VET 223	Human Anatomy or Anatomy and Physiology of Domestic Animals[2]		3	S	
BIOL 221L or VET 223L	Human Anatomy Lab or Anatomy and Physiology of Domestic Animals Lab[2]	c. BIOL 221 c. VET 223L	1		
CSC 201	Introduction to Modern Computing	p. CSC 150	2		
EM 321	Mechanics of Materials	p. EM 214	3		
EM 331	Fluid Mechanics	p. EM 215	3		
SGR #4	Arts and Humanities		3		

Information Subject to Change. This is not a contract.

p. = Course Prerequisite, c.= Course Co-requisite
Semester: F = Fall, S = Spring, SU = Summer

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
		Total Credit Hours	15		

THIRD YEAR

Fall

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
BIOL 153 or BIOL 235	General Biology II (SGR #6)[2] or Introduction to Biotechnology (SGR #6)		3 or 2	F	
BIOL 153L or BIOL 235L	General Biology II Lab (SGR #6)[2] or Introduction to Biotechnology Lab (SGR #6)		1	F	
EE 300	Basic Electrical Engineering I	p. MATH 125 and PHYS 209	2	F	
EE 300L	Basic Electrical Engineering I Lab	c. EE 300	1	F	
GE 385	Introduction to Systems Engineering and Management		3	F	
HIM 150	Introduction to Digital Health Informatics and Information Management	Online from DSU	3	F	
ME 314	Thermodynamics	p. PHYS 207 and MATH 125	3	F	
		Total Credit Hours	15 or 16		

Spring

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
BIOL 325	Physiology	p. BIOL 151 or 221 and Chem 106 or 112	3		
BIOL 325L	Physiology Lab	c. BIOL 325	1		
EE 302	Basic Electrical Engineering II		2	S	
EE 302L	Basic Electrical Engineering II Lab		1	S	
ENGL 201 or ENGL 277	Composition II (SGR #1) or Technical Writing in Engineering (SGR #1)		3		
HIM 169	Legal Aspects of Health Information Management	p. HIM 150; Online from DSU	1	S	
HIM 225	Digital Health Information Systems	p. HIM 150; Online from DSU	2	S	
STAT 381	Introduction to Probability and Statistics	p. MATH 125	3		
		Total Credit Hours	16		

FOURTH YEAR

Fall

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
EE 422	Engineering Economics and Management		2	F	
GE 478	Healthcare Systems Engineering Capstone I	Senior standing	3	F	
HSC 452	Interprofessional Issues in Health Care		3	F	
SGR #3	Social Sciences	Must meet civics requirement	3		
SGR #4	Arts and Humanities		3		
Technical Electives			4		
		Total Credit Hours	18		

Spring

Prefix + Number	Course Title	Prerequisites/Comments	Credits	Semester	Grade
GE 479	Healthcare Systems Engineering Capstone II		3		
PHA 470	Introduction to Drug Discovery and Development		3		
Technical Electives			11 or 12		
		Total Credit Hours	17-18		

COMMENTS/NOTES

Students from all academic majors can pursue graduation with Fishback Honors College distinction. View the Honors program requirements.

Technical Electives - Students must select 15-16 credits from the following courses including at least 6 credits from CSC, EE, or ME prefix. Students will be able to complete coursework in different emphasis areas including AI/Data, Animal Industry, Pre-Med, and Sensors and Devices. It is strongly recommended that students choose one of the emphasis areas.

Emphasis Areas:
[1] AI/Data
[2] Animal Industry
[3] Pre-Med
[4] Sensors and Devices

Information Subject to Change. This is not a contract.

p. = Course Prerequisite, c.= Course Co-requisite
Semester: F = Fall, S = Spring, SU = Summer

Prefix	Number	Course Title	Prerequisites/Comments	Credit Hours
AS	101	Introduction to Animal Science [2]	c. AS 101L	3
AS	101L	Introduction to Animal Science Lab [2]	c. AS 101	1
CHEM	108	Organic and Biochemistry [2]	p. CHEM 106 or CHEM 112; c. CHEM 108L	4
CHEM	108L	Organic and Biochemistry Lab [2]	p. CHEM 106L or CHEM 112L	1
CHEM	114	General Chemistry II [3]	p. CHEM 112 and MATH 123 or MATH 125; c. CHEM 114	3
CHEM	114L	General Chemistry II Lab [3]	p. CHEM 112L; c. CHEM 114	1
CHEM	326	Organic Chemistry I [3]	p. CHEM 114; c. CHEM 326L	3
CHEM	326L	Organic Chemistry I Lab [3]	p. CHEM 114L; c. CHEM 326	1
CHEM	328	Organic Chemistry II [3]	p. CHEM 326; c. CHEM 328L	3
CHEM	328L	Organic Chemistry II Lab [3]	p. CHEM 326L; c. CHEM 328	1
CHEM	464	Biochemistry [3]	p. CHEM 328	3
CSC	422	Computer Vision and Pattern Recognition [1]	p. MATH 250	3
CSC	485	AI Assisted Medical Image Processing [1]	p. MATH 250	3
EE	360	Electronic Devices [4]	p. "C" or better in EE 260	3
EE	454	Biomaterials and Medical Devices [4]	p. EE 321 or consent	3
EE	460	Sensor and Measurements [4]	p. EE 360; c. EE 460L	2
EE	460L	Sensor and Measurements Lab [4]	c. EE 460	1
HSC OR VET	445 403	Epidemiology [2] Animal Diseases and Their Control [2]	Junior or senior standing Sophomore standing or higher	3
MATH	250	Introduction to Linear Algebra and Proof [1]	p. MATH 123	3
ME	321	Fundamentals of Machine Design [4]	p. EM 215	3
ME	442	Computational Fluid Dynamics [3]	p. MATH 321, EM 331 and ME 311	3
ME	446	Engineering Mechanics for Biomedical Applications [3, 4]	p. EM 331 and ME 321	3
ME	448	Mechanical Behavior of Biomaterials [3, 4]	p. ME 241 or instructor consent	3
NURS	463	Systems-Based Practice in Healthcare [3]	Department consent	3
STAT	415	R Programming [1]	p. CSC 150 or INFO 101	3
STAT	435	Applied Bioinformatics [1]		3
STAT	442	Exploratory and Cloud-Based Data Analysis [1]	p. STAT 381 and (STAT 414 or STAT 415)	3
STAT	451	Predictive Analytics I [1]	p. STAT 482 and STAT 415	3
		Other courses with department approval		