

B.S. ELECTRICAL ENGINEERING & Biomedical Engineering Minor Plan of Study

Year 1	Fall		Spring	
	FYEX Foundation for College Success			
	ENGR 100 (FYE) Introduction to Engineering Design			
	ENGR 175 Intro to Electrical & Comp Eng		PHYS 211 Classical Physics I	
	MATH 113 Calculus I		MATH 114 Calculus II	
	CORE requirement		CISC 130 Introduction to Programming & Problem Solving in the Sciences	
	CORE requirement		CORE requirement	
	January-term		Summer	
CORE requirement		CORE requirement		
Year 2	Fall		Spring	
	ENGR 230 Digital Design (Lab)		ENGR 240 Circuit Analysis (Lab)	
	MATH 200 Multi-Variable Calculus		MATH 210 Introduction to Differential Equations & Systems	
	PHYS 212 Classical Physics II		PHYS 225 Application of Modern Physics (Lab)	
	CORE requirement		CORE requirement	
	January-term		Summer	
CORE requirement		CORE requirement		
Year 3	Fall		Spring	
	ENGR 340 Signals & Systems		ENGR 410 Control Systems & Automation (Lab)	
	ENGR 345 Electronics I (Lab)		ENGR 346 Electronics II	
	Odd year: CORE requirement Even year: ENGR 312 + 313 Bioelectricity and Instrumentation + Biomedical Imaging		ENGR 310 + 311 Biomedical Engr. + Medical Device Manufacturing	
	BIOL 105 Human Biology (Lab) or EXSC 214		ENGR 331 Applications of Microprocessors (Lab)	
	January-term		Summer	
CORE requirement		CORE requirement		
Year 4	Fall		Spring	
	ENGR 480 Engineering Design Clinic I		ENGR 481 Engineering Design Clinic II	
	PHYS 341 Electricity & Magnetism		ENGR 342 Electromagnetic Fields & Waves	
	BIOMED elective [†]		ENGR XXX Engineering Elective [†]	
	Odd year: CORE requirement Even year: ENGR 312 + 313 Bioelectricity and Instrumentation + Biomedical Imaging		CORE requirement	
	January-term		Summer	
CORE requirement		CORE requirement		

* arrow indicates that the two courses can be interchanged

* this illustrates just one example of how all courses could be taken within a 4-year plan

[†] [check the reverse side for details](#)

Complete Course Listing:

Engineering Courses:

ENGR 100 – Introduction to Engineering Design (2 credits)
ENGR 175 – Introduction to Electrical & Computer Engineering (2 credits)
ENGR 230 – Digital Design (4 credits)
ENGR 240 – Circuit Analysis (4 credits)
ENGR 331 – Applications of Microprocessors (4 credits)
ENGR 340 – Signals & Systems (4 credits)
ENGR 342 – Electromagnetic Fields & Waves (4 credits)
ENGR 345 – Electronics I (4 credits)
ENGR 346 – Electronics II (4 credits)
ENGR 410 – Control Systems and Automation (4 credits)
ENGR 480 – Engineering Design Clinic I (4 credits)
ENGR 481 – Engineering Design Clinic II (4 credits)
ENGR Electives –THREE technical elective courses as approved by the program.

Two of the elective courses must be from ONE track.

Power Track:

ETLS 744 Power Systems and Smart Grids [required in track] (3 credits)
ETLS 746 Power Electronics (3 credits)
ETLS 747 Electrical Machines and Vehicles (3 credits)
ETLS 748 Renewable Energy and the Future (3 credits)
ETLS 750 Smart Distribution Systems (3 credits)

Signal Processing & Communications Track:

ETLS 620 Analog Communications (3 credits)
ETLS 621 Digital Communications (3 credits)
ETLS 675 Digital Signal Processing (3 credits)
ETLS 676 Real Time DSP (3 credits)
ETLS 810 Advanced Control Systems (3 credits)

Embedded Systems Track:

ENGR 330 Microprocessor Architectures (4 credits)
ENGR 431 Embedded Systems (4 credits)
ENGR 432 Current Trends in Computing Systems (4 credits)

Physics Track:

PHYS 215 Modern Physics (4 credits)
PHYS 347 Optics (4 credits)
OR four credits of physics electives as approved by the chair
56 Engineering Credits

Allied Requirements:

MATH 113 – Calculus I (4 credits)
MATH 114 – Calculus II (4 credits)
MATH 200 – Multi-Variable Calculus (4 credits)
MATH 210 – Introduction to Differential Equations and Systems (4 credits)
PHYS 211 – Classical Physics I (4 credits)
PHYS 212 – Classical Physics II (4 credits)
PHYS 225 – Applications of Modern Physics (4 credits)
PHYS 341 – Electricity & Magnetism (4 credits)
CISC 130 – Introduction to Programming and Problem Solving in the Sciences (4 credits)

40 Allied Requirement Credits

University of St. Thomas Core Curriculum:

FYEX Foundation for College Success (1 credit)
Language and Culture (0-8 credits)
Literature and Writing (4 credits)
Philosophy and Theology (12 credits)
Social Analysis (4 credits)
Fine Arts (4 credits)
Historical Studies (4 credits)
Integrations in the Humanities (8 credits)
Some of these courses must satisfy the flagged requirements; check your degree evaluation

45 Core Curriculum Credits

Biomedical Engineering Minor Requirements:

BIOL 105 – Human Biology (4 credits) OR EXSC 214 – Physiology (4 credits)
ENGR 310 – Biomedical Engineering (2 credits)
ENGR 311 – Medical Device Manufacturing (2 credits)
ENGR 314 – Biomaterials in Engineering (4 credits; also satisfies engineering elective)
4 credits of Biomedical Engineering Minor electives

Biomedical Engineering Minor electives

[†]ENGR 314 – Biomaterials in Engineering (4 credits)
[†]ETLS 507 – Introduction to Systems Engineering (3 credits)
[†]ETLS 675 – Digital Signal Processing (3 credits) + additional
[†]ETLS 720 – Anatomy & Physiology for Medical Dev (3 credits)
EXSC 213 Anatomy (4 credit)
EXSC 326 Kinesiology (4 credits)
NSIC 340 Computational neuroscience (4 credits)
BIOL 354 Neurobiology (4 credits)
PHYS 347 Optics (4 credits)
BIOL 349 Comparative Anatomy and Physiology (4 credits)
BIOL 364 Immunology
EXSC 426 Biomechanics

[†]If ENGR or ETLS course above is selected as the BIOMED elective, the Engineering Elective is not necessary. **Note**, ETLS courses require additional 1 (one) credit independent study

