B.S. ELECTRICAL ENGINEERING

(Materials Science & Engineering (MSE) Minor)

College of Engineering | University of St.Thomas

Plan of Study

* arrow indicates that the two courses can be interchanged

	Fall		Spring
Year 1	**FYEX** Foundation for College Success		
	ENGR 100 (FYE) Introduction to Engineering Design		**ENGR 230** Digital Design (Lab)
	ENGR 175 Introduction to Electrical & Computer Engineering		**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		
	January-term		**Summer**
	CORE requirement	⟷	
Year 2	**Fall**		**Spring**
	ENGR 240 Circuit Analysis (Lab)		**ENGR 361** Engineering Materials (Lab) *(Counts as Engineering Elective 1)*
	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	⟷	
Year 3	**Fall**		**Spring**
	ENGR 340 Signals & Systems		**ENGR 410** Control Systems & Automation (Lab)
	ENGR 345 Electronics I (Lab)		**ENGR 346** Electronics II
	ENGR 331 Applications of Microprocessors (Lab)		**ENGR XXX** Engineering Elective 2 - **PHYS 410** Statistical Mechanics & Thermodynamics
	CORE requirement		**CORE** requirement
	January-term		**Summer**
		⟷	**IDSC 365** Materials Science & Engineering Practicum
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
	ENGR XXX Engineering Elective 3 – **PHYS 347** Optics		**CORE** requirement
	CORE requirement		**CORE** requirement
	January-term		**Summer**

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

Complete Course Listing:

Engineering Courses:

ENGR 100 – Introduction to Engineering (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)

36 Allied Requirement Credits

Materials Science Engineering Minor Requirements:

*PHYS 410 – Statistical Mechanics & Thermodynamics (4 credits) *(offered every other year)*
PHYS 347 - Optics (4 credits)
IDSC 365 – Materials Science & Engineering Practicum (0 credits)
*ENGR/ Materials Electives (4 credits) [doubles as ENGR elective]
Materials Elective (4 credits) (outside of ENGR)
**Courses with asterisk are requirements for both electrical engineering and the MSE minor*

24 Materials Credits (12 credits are also included in the electrical engineering major requirements)

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