School of Engineering | UNIVERSITY OF St.Thomas

# B.S. ELECTRICAL ENGINEERING & B.A. GERMAN

## Plan of Study

* The plan of study illustrates an example of how all courses may be taken in 5 years without bringing in high school credits.

| | | | |
|---|---|---|---|
| Year 1 | **Fall** | | **Spring** |
| | **FYEX 100 & LLC** or **2 TBLCs** | | |
| | **ENGR 100** (FYE) Intro to Engineering Design | | |
| | **ENGR 175** Intro Electrical/Computer Engineering | | **PHYS 211** Classical Physics I |
| | **MATH 113** Calculus I | | **MATH 114** Calculus II |
| | **CORE** requirement | ⟷ | **CISC 130** Intro Programming/Problem Solving in Sciences |
| | **GERM 111** Elementary German I | | **GERM 112** Elementary German II |
| | **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** Intro to Differential Equations & Systems |
| | **PHYS 212** Classical Physics II | | **PHYS 225** Application of Modern Physics (Lab) |
| | **GERM 211** Intermediate German I (GP) | | **GERM 212** Intermediate German II (IH) |
| | **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 |
| | **ENGR 331** Application of Microprocessors (Lab) | | **CORE** requirement |
| | **GERM 300** Intro to German Studies (IH) | | **GERM (1) 3XX or 4XX** |
| | | | **GERM 330** IC Comp. Study/Work Abroad (2 cr.) |
| | **January-term** | | **Summer** |
| | **CORE** requirement | | **ENGR 305.03** LOCAL Internship (0 cr.) |
| Year 4 | **Fall – In Germany** | | **Spring – In Germany** |
| | **GERM (2) 3XX or 4XX** September language course | | **ENGR 305.A03** Global Internship (0 cr.) |
| | **GERM (3) 3XX or 4XX** | | |
| | **GERM (4) 3XX or 4XX** | | |
| | **ENGR XXX** Engineering Elective 1 | | |
| | (**CORE** requirement, **GERM** or **ENGR**) | | |
| Year 5 | **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 2 | | **ENGR XXX** Engineering Elective 3 |
| | **GERM (5) 3XX or 4XX** | | **GERM (6) 3XX or 4XX** |
| | **GERM 475** Experiential Learning (2 cr.) | | |
| | **January-term** | | **Summer** |
| | **CORE** requirement | | |

* Arrows indicate that the two courses can be interchanged
* Study Abroad semester: equivalent of 12 credit hours needed (on one transcript/in one US semester)
* Declare interest in the International Engineering Program no later than your 4th semester.

**Engineering Courses: 56 Engineering Credits**

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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.

**Allied Requirements: 40 Allied Requirement Credits**
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 Science (4 credits)

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

**German Requirements: 44 German Credits**

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GERM 111 – Elem. Germ I (4 credits), GERM 112 – Elem. Germ II (4 credits), GERM 211 – Intermediate Germ I (4 credits), GERM 212 – Intermediate German II (4 credits),
GERM 300 – Introduction to German Studies (4 credits),
GERM 3XX or 4XX (24 credits)

**International Engineering Requirement (IEP)**
ENGR 305.03 (3-months local internship) & ENGR 305.A03 (6-months international internship) (0 credits)
Study Abroad 1 semester
One GERMAN for the Professions course
One Technical GERMAN course
GERM 475 Experiential Learning (2 credits)
GERM 330: Intercultural Competence: Prep Study/Work abroad (2 credits)

**Core Curriculum Requirements: 45 Core Curriculum Credits** (may be satisfied w/ classes listed above).
For info on DISJ, GP, IH, WAC, SW see class-finder, degree evaluation, and talk to the IEP director.
*Global Perspectives* (GP): GERM 211 and above, study abroad
Integrations in the Humanities (IH) (8 credits): e.g., through GERM 212, 300, 301, 312, 330, 341, 342, 440, or LNGS 370
FYEX Foundation for College Success (1 credit)
FYE CommGood/Learning Comm: GERM 111, 211, 300
Signature Work: through ENGR Senior Design Clinic
Literature and Writing (4 credits)
Language & Culture (0-8 credits): GERM 111, GERM 112, GERM 211
Philosophy and Theology (12 credits)
Social Analysis (4 credits)
Fine Arts (4 credits)
Historical Studies (4 credits)

**Notes:**

* The plan of study is an example of how all courses may be taken in 5 years without bringing in high school credits.
* Arrows indicate that the two courses can be interchanged
* Declare interest in the International Engineering Program no later than your 4$^{th}$ semester.
* See class-finder, your degree-evaluation, and the IEP director on how to satisfy Flagged Requirements such as DISJ, GP, IH, WAC, and SW.
* Study Abroad semester: equivalent of 12 credit hours needed (on one transcript/in one US semester)