CASE SCHOOL
OF ENGINEERING

CASE WESTERN RESERVE
U N I V E R S I T Y

COMPUTER ENGINEERING

Dual Degree Program Course Requirements

Engineering Requirements for all majors/departments		
Course Code	**Course Title**	**Semester Credit Hours**
CHEM 105	Principles of Chemistry I	3
CHEM 106	Principles of Chemistry II	3
CHEM 113	Principles of Chemistry Lab	2
ENGR 131	Elementary Computer Programming (JAVA)	3
MATH 121	Calculus for Science and Engineering I	4
MATH 122	Calculus for Science and Engineering II	4
MATH 223	Calculus for Science and Engineering III	3
MATH 224	Elementary Differential Equations	3
PHYS 121	General Physics I	4
PHYS 122	General Physics II	4
	Humanities and Social Science (including college level writing proficiency)	22
	Physical Education (2 semesters)	0
		55

The Computer Engineering Department recommends that the following courses be taken prior to beginning the Dual Degree Program at Case Western Reserve University. If the courses cannot be fulfilled, they will be integrated into the curriculum, which may possibly extend the program timeline.

Recommended Engineering Courses for Computer Engineering			
Course Code	Course Title	Semester Credit Hours	Description
EECS 309	Electromagnetic Fields I	3	Maxwell's integral and differential equations, boundary conditions, constitutive relations, energy conservation and Pointing vector, wave equation, plane waves, propagating waves and transmission lines, characteristic impedance, reflection coefficient and standing wave ratio, in-depth analysis of coaxial and strip lines, electro- and magneto-quasistatics, simple boundary value problems, correspondence between fields and circuit concepts, energy and forces. Prereq: MATH 223 and PHYS 122. Coreq: MATH 224.
ENGR 210	Introduction to Circuits and Instrumentation	4	Modeling and circuit analysis of analog and digital circuits. Fundamental concepts in circuit analysis: voltage and current sources; Kirchhoff's Laws; Thevenin and Norton equivalent circuits, inductors capacitors, and transformers; modeling sensors and amplifiers and measuring DC device characteristics; characterization and measurement of time dependent waveforms; transient behavior of circuits; frequency dependent behavior of devices and amplifiers; frequency measurements; AC power and power measurements; noise in real electronic systems; electronic devices as switches; digital logic circuits; introduction to computer interfaces; and analog/digital systems for measurement and control. Prereq: MATH 122. Coreq: PHYS 122.
ENGR 200	Statics and Strength of Materials	3	An introduction to the analysis, behavior and design of mechanical/structural systems. Course topics include: concepts of equilibrium; geometric properties and distributed forces; stress, strain and mechanical properties of materials; and, linear elastic behavior of elements. Prereq: PHYS 121.
ENGR 225	Thermodynamics, Fluid Dynamics, Heat and Mass Transfer	4	Elementary thermodynamic concepts: first and second laws, and equilibrium. Basic fluid dynamics, heat transfer, and mass transfer: microscopic and macroscopic perspectives. Prereq: CHEM 111, ENGR 145, and PHYS 121. Coreq: MATH 223.
STAT 312	Statistics for Engineering and Science	3	For advanced undergraduate students in engineering, physical sciences, life sciences. Comprehensive introduction to probability models and statistical methods of analyzing data with the object of formulating statistical models and choosing appropriate methods for inference from experimental and observational data and for testing the model's validity. Balanced approach with equal emphasis on probability, fundamental concepts of statistics, point and interval estimation, hypothesis testing, analysis of variance, design of experiments, and regression modeling. Note: Credit given for only one (1) of STAT 312, 313, 333, 433. Prereq: MATH 122 or equivalent.

Sample Course Sequence for Computer Engineering

Fall Year 1

Subject Code	Course Number	Course Title	Hours per Week		Semester Credit Hours
			Class	Lab	
ENGL	398N	Professional Communication	3	0	3
ENGR	210	Circuits and Instrumentation	3	2	4
EECS	281	Computer Org. Logic Design	3	2	4
EECS	233	Introduction to Data Structures	3	2	4
MATH	304	Discrete Math	3	0	3
			15	6	18

Spring Year 1

Subject Code	Course Number	Course Title	Hours per Week		Semester Credit Hours
			Class	Lab	
ENGR	225	Thermo, Fluid Dynamics, Heat & Mass Transfer	4	0	4
EECS	315	Digital Systems Design	3	2	4
EECS	337	Systems Programming	3	2	4
EECS	314	Computer Architecture	3	0	3
			13	4	15

Fall Year 2

Subject Code	Course Number	Course Title	Hours per Week		Semester Credit Hours
			Class	Lab	
EECS	301	Digital Electronics Laboratory	0	4	2
EECS	318	VLSI/CAD **(or)**	3	2	4
		EECS 338 Operating Systems	*3*	*1*	*4*
		Approved Technical Elective	3	0	3
		Approved Technical Elective	3	0	3
		Approved Technical Elective	3	0	3
			12	6 (or 5)	15

Spring Year 2

Subject Code	Course Number	Course Title	Hours per Week		Semester Credit Hours
			Class	Lab	
ENGR	200	Statics and Strength of Materials	3	0	3
STAT	312	Statistics for Engineering and Science	3	0	3
EECS	398	Engineering Projects I	0	8	4
		Approved Technical Elective	3	0	3
		Approved Technical Elective	3	0	3
			12	8	16

Please Note: The course sequence serves as an example of the classes necessary to complete the Dual Degree Program. Courses and the semesters taken will be based on the student's transfer credit and discussion with the Case Western Reserve University faculty advisor.