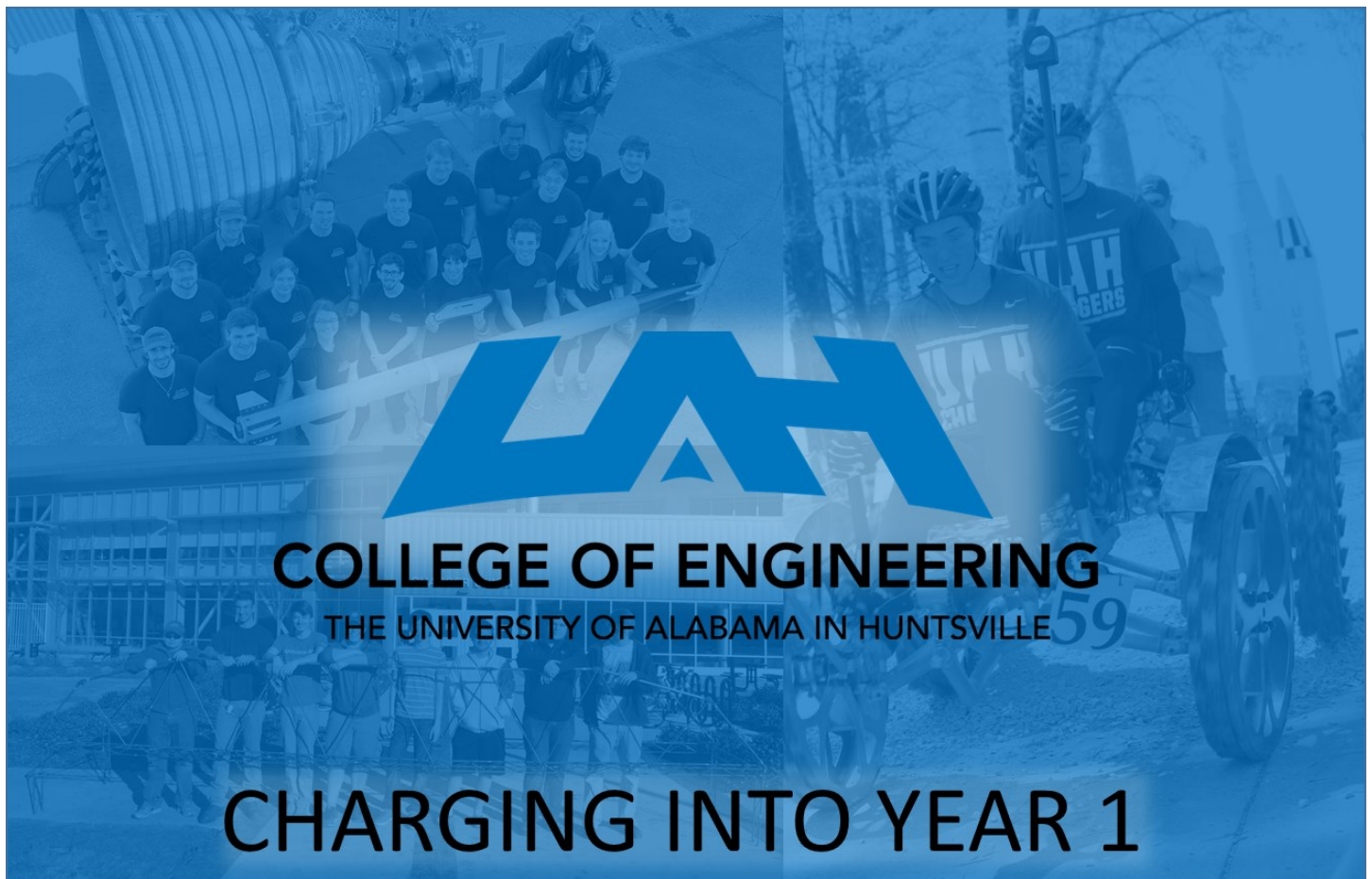


Curriculum Guide

2020-2021





In this guide, students can see the suggested schedules for the engineering majors and a glimpse into what is taught in some of those courses. You can find out more about the courses in the UAH catalog at www.catalog.uah.edu. You can find checksheets and flowcharts on the Orientation Canvas Page.

Note: The Advising and Mentoring Courses for each major do not appear in the curriculum guide, but are in the flowcharts/checksheets

Aerospace	Chemical	Civil	Computer
Cybersecurity	Electrical	Industrial & Systems	Mechanical

CURRICULUM: Bachelor of Science in Aerospace Engineering (BSAE)

General Engineering

YEAR 1						
Fall Semester			Hrs	Spring Semester		Hrs
MA 171	Calculus A		4	MA 172	Calculus B	4
CH 121	General Chemistry I		3	PH 111	Physics with Calculus I	3
CH 125	Chemistry Lab I		1	PH 114	Physics I Lab	1
EH 101	College Writing I		3	EH 102	College Writing II	3
ENG 101	Computing for Engineers		3	FYE 101	Charger Success for Engineers	1
	HSBS/HFA		3		HSBS/HFA	3
Total			17	Total		15

All Engineers program.

Drafting in the Third Dimension.

Dimension.

YEAR 2							
Fall Semester			Hrs	Spring Semester			Hrs
MA 201	Calculus C		4	MA 238	Differential Equations		3
MA 244	Linear Algebra		3	MAE 200	Prin. of Aero/Astronautics		3
PH 112	Physics with Calculus II		3	MAE 284	Numerical Methods		3
PH 115	Physics II Lab		1	MAE 272	Dynamics		3
MAE 211	Intro to Comp. Aided Design		2	MAE 370	Mechanics of Materials		3
MAE 271	Statics		3	MAE 375	Mech of Materials Lab		1
Total			16	Total			16

Energy, Enthalpy, & Entropy... Oh my!

Solve problems with MATLAB.

Flight The Basics

MACH! More than a number.

YEAR 3					
Fall Semester		Hrs	Spring Semester		Hrs
MAE 330/331	Fundamentals of Aerodynamics/Lab	4	MAE 311	Prin of Measurement and Instrumentation	3
MAE 341	Thermodynamics I	3	MAE 343	Compressible Aerodynamics	3
MAE 371	Aerospace Structures	3	MAE 488	Analysis of Eng Systems	3
EE 213	Electrical Circuits I	3	ISE 321	Engineering Economy	3
	Science Elective	3		HSBS/HFA	6
Total		16	Total		18

Heavier than air? No problem!

How to fly to

YEAR 4						
Fall Semester			Hrs	Spring Semester		Hrs
MAE 440 or MAE 441	Rocket Propulsion or Air Breathing Propulsion		3	MAE 471	Advanced Aero Structures & Materials	3
MAE 480	Aircraft Stability & Control		3	MAE 468	Spacecraft Design	3
MAE 490	Senior Design I		3	MAE 491	Senior Design II	3
	Technical Elective		3		Technical Elective	3
	HSBS/HFA				HSBS/HFA	3
Total			16	Total		16

More power!!

Engineering Capstone Design. Build. Test.

CURRICULUM: Bachelor of Science in Chemical Engineering (BSCHE)

General Engineering

All
Engineers
program.

CHE—Where it
all begins!

Material balances
in CHE systems.

Learn the
limits of
materials.

Heat flows from
hot to cold.

Make your life
more turbulent.

Build a
refinery.

Let's not have
an explosion!

Big pipes or
little pipes?

Engineering Capstone
Design. Build. Test.

YEAR 1							
Fall Semester			Hrs	Spring Semester			Hrs
MA 171	Calculus A		4	MA 172	Calculus B		4
CH 121/125	General Chemistry I/Lab		3	CH 123/126	General Chemistry II/Lab		4
EH 101	College Writing I		3	PH 111/114	Physics I/ Lab		4
ENG 101	Computing for Engineers		3	EH 102	College Writing II		3
	HSBS/HFA		3	FYE 101E	Charger Success for Engineers		1
Total			17	Total			16
YEAR 2							
Fall Semester			Hrs	Spring Semester			Hrs
PH 112/114	Physics II/Lab		4	MA 238	Differential Equations		3
MA 201	Calculus C		4	CH 341	Physical Chemistry I		3
CHE 201	Intro Chemical Eng Processes		2	CHE 244	Chemical Engineering Systems		3
CH 331/335	Organic Chemistry I/Lab		4	CH 332	Organic Chemistry II		3
	HSBS/HFA		3	BYS 311	Intro Molecular Biological Sys		3
Total			17	Total			15
YEAR 3							
Fall Semester			Hrs	Spring Semester			Hrs
MAE 271	Statics		3	MAE 310	Fluid Mechanics		3
CHE 294	Nature & Properties of Matls		3	CHE 342	Transport Phenomena		3
CHE 295	Nature & Properties Lab		1	CHE 439	Unit Operations I		2
CHE 344	Chemical Eng Thermo		3	CHE 441	Chem Kinetics/Reactor Design		3
CHE 347	Quantitative Modeling for CHE		3		Technical Elective		3
	Concentration Elective		3		HSBS/HFA		3
Total			16	Total			17
YEAR 4							
Fall Semester			Hrs	Spring Semester			Hrs
CHE 440	Unit Operations II		2	CHE 485	Process Safety & Toxicology		3
CHE 443	Mass Transfer Operations		3	CHE 448	Chemical Engineering Design		3
CHE 446	Analy & Des Transport Equip		3	CHE 445	Chemical Process Control		3
	Concentration Elective		3		Concentration Elective		3
	HSBS/HFA		6		HSBS/HFA		3
Total			17	Total			15

CURRICULUM: Bachelor of Science in Civil Engineering (BSCE)

General Engineering									
YEAR 1									
Fall Semester				Hrs	Spring Semester				Hrs
MA 171	Calculus A			4	MA 172	Calculus B			4
CH 121	General Chemistry I			3	PH 111	Physics I			3
CH 125	Chemistry Lab I			1	PH 114	Physics I Lab			1
EH 101	College Writing I			3	EH 102	College Writing II			3
ENG 101	Computing for Engineers			3	FYE 101	Charger Success for Engineers			1
	HSBS/HFA			3		HSBS/HFA			3
Total				17	Total				15
YEAR 2									
Fall Semester				Hrs	Spring Semester				Hrs
PH 112/115	Physics II/Lab			3	MA 238	Differential Equations			3
MA 201	Calculus C			4	CE 272	Dynamics			3
MA 244	Linear Algebra			3	CE 370	Mechanics of Materials			4
CE 271	Statics			3	BYS 119	Biology			4
CE 211	Civil Engineering Graphics			2		HSBS/HFA			3
CE 284	Surveying			2					
Total				18	Total				17
YEAR 3									
Fall Semester				Hrs	Spring Semester				Hrs
MAE 341	Thermodynamics I			3	MAE 310	Fluid Mechanics			3
ISE 390	Probability & Eng Statistics I			3	CE 380	Civil Engineering Materials			3
CE 381	Structural Analysis I			3	CE 372/373	Soil Mechanics/Lab			4
ISE 321	Engineering Economy			3	CE 321	Transportation Eng & Design			3
	HSBS/HFA			3		HSBS/HFA			3
Total				15	Total				16
YEAR 4									
Fall Semester				Hrs	Spring Semester				Hrs
CE 449	Intro to Environmental Eng			3	CE 422	Traffic Engineering Design			3
CE 483	Reinforced Concrete Design			3	CE 441	Hydraulic Engineering Design			3
CE 484	Steel Design			3	CE 485	Foundation Engineering			3
CE 498	Civil Engineering Design I			1	CE 499	Civil Engineering Design II			2
	CE Concentration 1			3		CE Concentration 2			3
	HSBS/HFA			3					
Total				16	Total				14

All Engineers program.

Modern engineering drafting methods.

Newton's 2nd Law in action.

Field work.

Learn about concrete, asphalt & metals.

Design a highway with good traffic flow.

Build a bridge that won't fall down.

Clean air & water.

Good design starts with a solid foundation.

Specialize!

Specialize!

Engineering Capstone Design. Build. Test.

CURRICULUM: Bachelor of Science in Computer Engineering (BSCPE)

General Engineering									
YEAR 1									
Fall Semester				Hrs	Spring Semester				Hrs
MA 171	Calculus A		4	MA 172	Calculus B		4		
CH 121	General Chemistry I		3	PH 111	Physics I		3		
CH 125	Chemistry Lab I		1	PH 114	Physics I Lab		1		
EH 101	College Writing I		3	EH 102	College Writing II		3		
ENG 101	Computing for Engineers		3	FYE 101	Charger Success for Engineers		1		
	HSBS/HFA		3		HSBS/HFA		3		
			Total	17				Total	15
YEAR 2									
Fall Semester				Hrs	Spring Semester				Hrs
PH 112/115	Physics II/Lab		4	MA 238	Differential Equations		3		
MA 201	Calculus C		4	EE 213	Elec Circuits I		3		
MA 244	Linear Algebra		3	CS 214	Discrete Structures		3		
CPE 211	Intro Computer Programming		3	CPE 212	Fund of Software Engineering		3		
EE 202	Digital Logic Design		3	CPE 221	Computer Organization		3		
			Total	17				Total	15
YEAR 3									
Fall Semester				Hrs	Spring Semester				Hrs
EE 315	Electronics Analysis & Design		3	CPE 381	Signals & Systems		3		
CPE 323/325	Embedded Computer Sys/Lab		4	EE 385 or ISE 390	Random Signals & Noise Or Probability & Statistics I		3		
CPE 353	Software Des & Eng		3	CPE 322/324	Digital Hardware Design Fundamentals/Lab		4		
CS 317	Analysis of Algorithms		3	EE 316	Electrical Ckts Design Lab		1		
	HSBS/HFA		3	CPE 348	Intro to Computer Networks		3		
			Total	16				Total	17
YEAR 4									
Fall Semester				Hrs	Spring Semester				Hrs
CPE 431	Intro Computer Architecture		3	EE 384	Digital Signal Process Lab		1		
CPE 495	Comp Engineering Design I		3	CPE 434/435	Operating Systems/Lab		3		
	CPE Electives		6	CPE 496	Comp Engineering Design II		3		
	HSBS/HFA		3		CPE Electives		6		
			Total	15				Total	17
Specialize!									
Engineering Capstone Design. Build. Test.									

CURRICULUM: Bachelor of Science in Cybersecurity Engineering (BSCBS)

YEAR 1							
Fall Semester			Hrs	Spring Semester			Hrs
MA 171	Calculus A		4	MA 172	Calculus B		4
CH 121	General Chemistry I		3	PH 111	Physics I		3
CH 125	Chemistry Lab I		1	PH 114	Physics I Lab		1
EH 101	College Writing I		3	EH 102	College Writing II		3
ENG 101	Computing for Engineers		3	FYE 101	Charger Success for Engineers		1
	HSBS/HFA		3		HSBS/HFA		3
Total			15	Total			17
YEAR 2							
Fall Semester			Hrs	Spring Semester			Hrs
PH 112/115	Physics II/Lab		4	MA 244	Linear Algebra		3
MA 201	Calculus C		4	EE 203	Digital Logic Lab		1
EE 202	Digital Logic Design		3	CS 214	Discrete Structures		3
CPE 211	Intro Computer Programming		3	CPE 212	Fund of Software Engineering		3
	HSBS/HFA		3	CPE 221	Computer Organization		3
					HSBS/HFA		3
Total			17	Total			16
YEAR 3							
Fall Semester			Hrs	Spring Semester			Hrs
ISE 390	Probability and Eng. Statistics		3	CPE 455	Secure Software Development		3
CPE 323/325	Embedded Computer Sys/Lab		4	CPE 434/435	Operating Systems with Laboratory		4
CPE 353 or CS 307	Software Des & Eng or Object Oriented C++ Prog.		3	CPE 348	Intro to Computer Networks		3
CS 317	Analysis of Algorithms		3		CBS Elective		3
	HSBS/HFA		3		HSBS/HFA		3
Total			16	Total			16
YEAR 4							
Fall Semester			Hrs	Spring Semester			Hrs
CPE 457	Software Reverse Engineering		3	CPE 459	System Security		3
CPE 449	Intro to Cybersecurity Engineering		3	CS 480	Digital Forensics		3
CS 465	Network Security		3	CPE 498	CBS Capstone II		3
IS 450	Cybersecurity Management		3		CPE Electives		3
CPE 488	CBS Capstone I		3				
Total			15	Total			12

General Engineering

All Engineers program.

Design circuits that go 101101010010.

Program like a boss in C++.

Just how does a computer work?

Connect computers to the world.

Protecting cyber-physical systems

Specialize!

Engineering Capstone Design. Build. Test.

Cryptographic and computer security hardware

The mind behind the robot.

Making your code visual.

CURRICULUM: Bachelor of Science in Electrical Engineering (BSEE)

YEAR 1							
Fall Semester			Hrs	Spring Semester			Hrs
MA 171	Calculus A		4	MA 172	Calculus B		4
CH 121	General Chemistry I		3	PH 111	Physics I		3
CH 125	Chemistry Lab I		1	PH 114	Physics I Lab		1
EH 101	College Writing I		3	EH 102	College Writing II		3
ENG 101	Computing for Engineers		3	FYE 101	Charger Success for Engineers		1
	HSBS/HFA		3		HSBS/HFA		3
Total			17	Total			15
YEAR 2							
Fall Semester			Hrs	Spring Semester			Hrs
PH 112	Physics II		3	MA 238	Differential Equations		3
PH 115	Physics II Lab		1	MA 244	Linear Algebra		3
MA 201	Calculus C		4	CPE 221	Computer Organization		3
CPE 211	Intro Computer Programming		3	EE 203	Digital Logic Design Lab		1
EE 202	Digital Logic Design		3	EE 223	Des & Mod Elec Ckts & Sys		3
EE 213	Electrical Circuit Analysis I		3	PH 113/116	Physics III/Lab		4
Total			17	Total			17
YEAR 3							
Fall Semester			Hrs	Spring Semester			Hrs
EE 310	Solid State Fundamentals		3	EE 308	Electromagnetic Engineering		3
EE 307	Electricity & Magnetism		3	EE 383	Multi/Discrete Time Systems		3
EE 382	Continuous Time Systems		3	EE 386	Controls/Robotics Systems		3
EE 315	Electronics Analysis & Design		3	EE 385	Random Signals & Noise		3
CPE 323/325	Embedded Computer Sys/Lab		4	EE 316	Electrical Ckts Design Lab		1
Total			16	Total			13
YEAR 4							
Fall Semester			Hrs	Spring Semester			Hrs
ISE 321	Engineering Economy		3	EE 384	Digital Signal Processing Lab		1
	ECE Elective		3	EE 494	EE Design Project		3
	ECE Elective		3		ECE Elective		3
	Technical Elective		3		ECE Elective		3
	HSBS/HFA		3		HSBS/HFA		3
	HSBS/HFA		3		HSBS/HFA		3
Total			18	Total			16

General Engineering

All Engineers program.

Design circuits that go 101101010010.

Just how does a computer work?

Learn how a Maglev train works.

Before you build, you must design.

Model a radar system.

Control those robots!

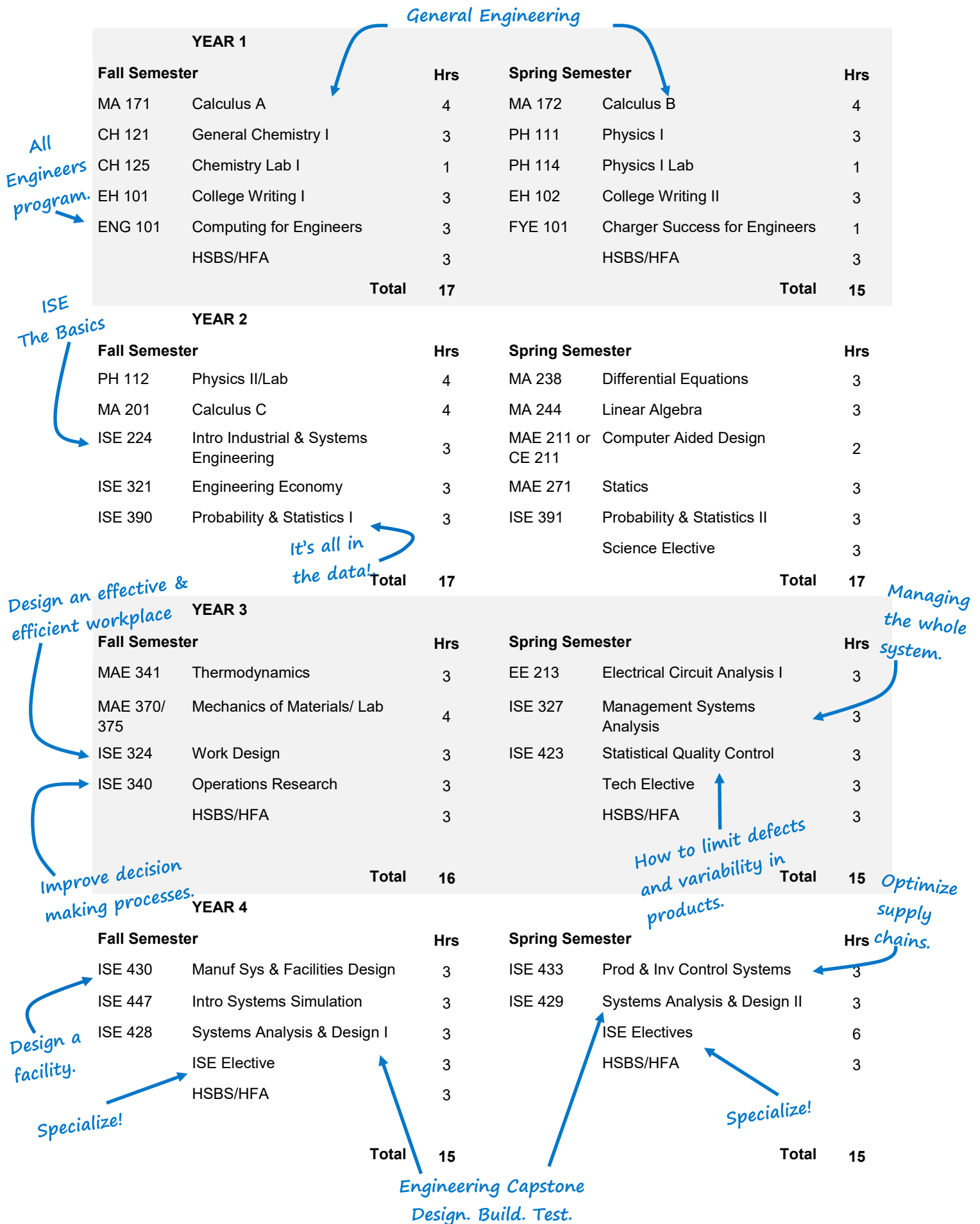
Design an amplifier.

Specialize!

Specialize!

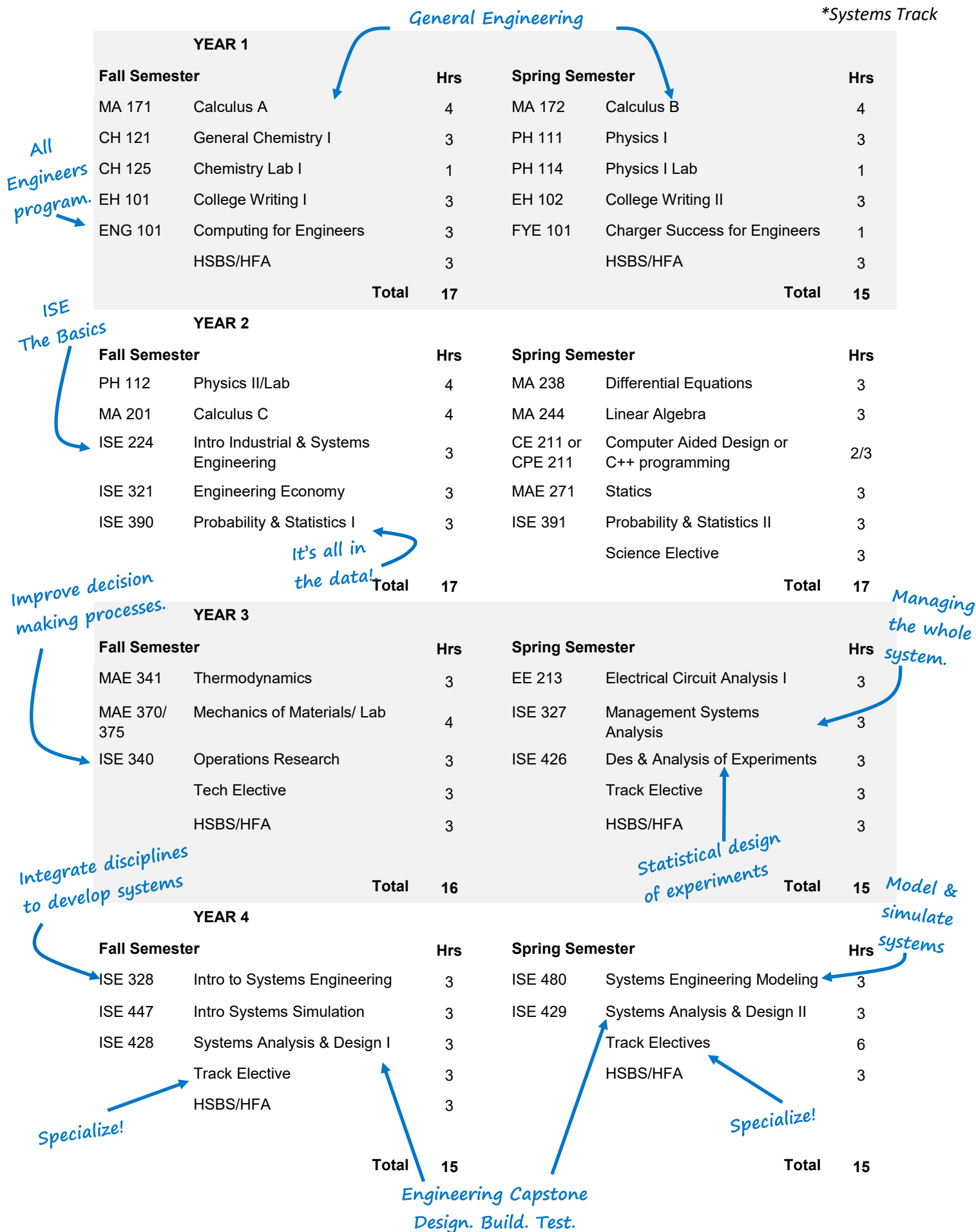
Engineering Capstone Design. Build. Test.

CURRICULUM: Bachelor of Science in Industrial & Systems Engineering (BSISE)



CURRICULUM: Bachelor of Science in Industrial & Systems Engineering (BSISE)*

*Systems Track



CURRICULUM: Bachelor of Science in Mechanical Engineering (BSME)

General Engineering

YEAR 1

Fall Semester

	Hrs
MA 171 Calculus A	4
CH 121 General Chemistry I	3
CH 125 Chemistry Lab I	1
EH 101 College Writing I	3
ENG 101 Computing for Engineers	3
HSBS/HFA	3

Total 17

Spring Semester

	Hrs
MA 172 Calculus B	4
PH 111 Physics with Calculus I	3
PH 114 Physics I Lab	1
EH 102 College Writing II	3
FYE 101 Charger Success for Engineers	1
HSBS/HFA	3

Total 15

All Engineers program.

Drafting in the Third Dimension.

YEAR 2

Fall Semester

	Hrs
MA 201 Calculus C	4
MA 244 Linear Algebra	3
PH 112 Physics with Calculus II	3
PH 115 Physics II Lab	1
MAE 211 Intro to Comp. Aided Design	2
MAE 271 Statics	3

Total 16

Spring Semester

	Hrs
MA 238 Differential Equations	3
MAE 272 Dynamics	3
MAE 284 Numerical Methods	3
ISE 321 Engineering Economy	3
Science Elective	3
HSBS/HFA	3

Total 18

Energy, Enthalpy, & Entropy... Oh my!

Solve problems with MATLAB.

Newton's 2nd Law in action.

Learn why it's a material world.

YEAR 3

Fall Semester

	Hrs
MAE 341 Thermodynamics I	3
MAE 370/375 Mechanics of Materials/ Lab	3
EE 213 Electrical Circuit Analysis I	3
MAE 310 Fluid Mechanics	3
HSBS/HFA	3

Total 16

Spring Semester

	Hrs
MAE 342 Thermodynamics II	3
MAE 311 Prin of Measurement and Instrumentation	3
MAE 378 Materials & Manuf Processes	3
MAE 364 Kinematics/Dyn of Machines	3
HSBS/HFA	3

Total 15

Make your life more turbulent.

Putting everything together.

YEAR 4

Fall Semester

	Hrs
MAE 450/ Introduction to Heat & Mass/	4
MAE 466 Mech & Design Machine Elem	3
MAE 489 Computer Aided Engineering	3
MAE 490 Sr. Design I	3
Tech Elective	3

Total 16

Spring Semester

	Hrs
MAE 488 Analysis of Engineering	3
MAE 455 Design of Thermal Systems	3
MAE 491 Senior Design II	3
Tech Elective	3
HSBS/HFA	3

Total 15

Design a machine that does cool stuff!

Water heater or car engine?

Engineering Capstone Design. Build. Test.