

ARCHITECTURAL DESIGN

The Architectural Design major seeks to integrate engineering and architecture in ways that promote innovative design syntheses within parameters associated with sustainable architecture. The curriculum focuses on design processes and decision-making methods that can integrate contributions and perspectives from many disciplines.

The major provides a flexible curriculum that can assist students in preparing for graduate masters degree programs in architecture; more generally, it provides exposure to processes of designing the built environment from both architectural and engineering perspectives. Depending on their personal interests, students can structure their majors to have a strong art/architecture studio emphasis or more of a technical engineering emphasis.

While the Architecture Design major is hosted by the Department of Civil and Environmental Engineering, it is *NOT* an ABET accredited degree. Students in this major receive a Bachelor of Science degree in Engineering with a specialization in Architectural Design. Students who have an interest in both civil engineering (structural engineering and construction) and architecture should strongly consider doing the Civil Engineering (CE) major, which is an ABET-accredited degree, while taking additional architecture courses as electives

For students majoring in related fields, such as Urban Studies, Product Design, and Studio Arts, the course offerings in architecture and engineering can be used to fulfill the requirements for a minor in the Department of Civil and Environmental Engineering.

REQUIREMENTS

A total of 100 units are required, distributed as follows.

Mathematics: 20 units minimum.

20 units minimum required.

1 course in Statistics is required. For other courses, choose from the School of Engineering approved list of mathematics courses (Figure 3-1).

Science: 16 units minimum.

16 units minimum required.

Physics 21 or 41 (Mechanics) is required.

For other courses, choose from the School of Engineering approved list of science courses (Figure 3-2), and the following list of recommended and additional approved courses:

- Earth Systems 101 (Energy & Environment)
- Earth Systems 102 (Renewable Energy Sources and Greener Energy)
- Geology & Env Sciences 1 (Fundamentals of Earth Science)
- CEE 63 (Weather and Storms)
- CEE 64 (Air Pollution: Urban Smog to Global Change)
- CEE 70 (Environmental Science and Technology)
- Physics 23 or 43 (Electricity).

Technology in Society

One course required. Choose from the approved list of courses in this handbook (Figure 3-3).

Engineering Fundamentals and Depth

60 units minimum required from Engineering Fundamentals; Required Depth Classes; and Required Depth Electives

ENGINEERING FUNDAMENTALS: THREE COURSES REQUIRED

Course	Title	Units
ENGR 14	Applied Mechanics: Statics (req'd)	3
ENGR 60	Engineering Economy (req'd)	3
	Fundamentals Elective	3-5

REQUIRED DEPTH COURSES

Course	Title	Units
CEE 100	Managing Sustainable Building Projects <i>*fulfills writing in major*</i>	4
CEE 101A	Mechanics of Materials	4
CEE 110	Building Information Modeling	4
CEE 31 <i>or</i> 31Q	Accessing Architecture Through Drawing	4
CEE 130	Architectural Design: 3-D Modeling, Methodology, and Process	4
CEE 134A <i>or</i> 137A	Site and Space <i>or</i> Form and Structure	4,4
CEE 136	Green Architecture	4
CEE 156	Building Systems	4
Art History 3	Introduction to The History of Architecture	5

DEPTH ELECTIVES

The number of units of Depth Electives must be such that courses in Engineering Fundamentals, Required Depth and Depth Electives total at least 60 units.

Choose from following *with at least three units from courses within the School of Engineering*

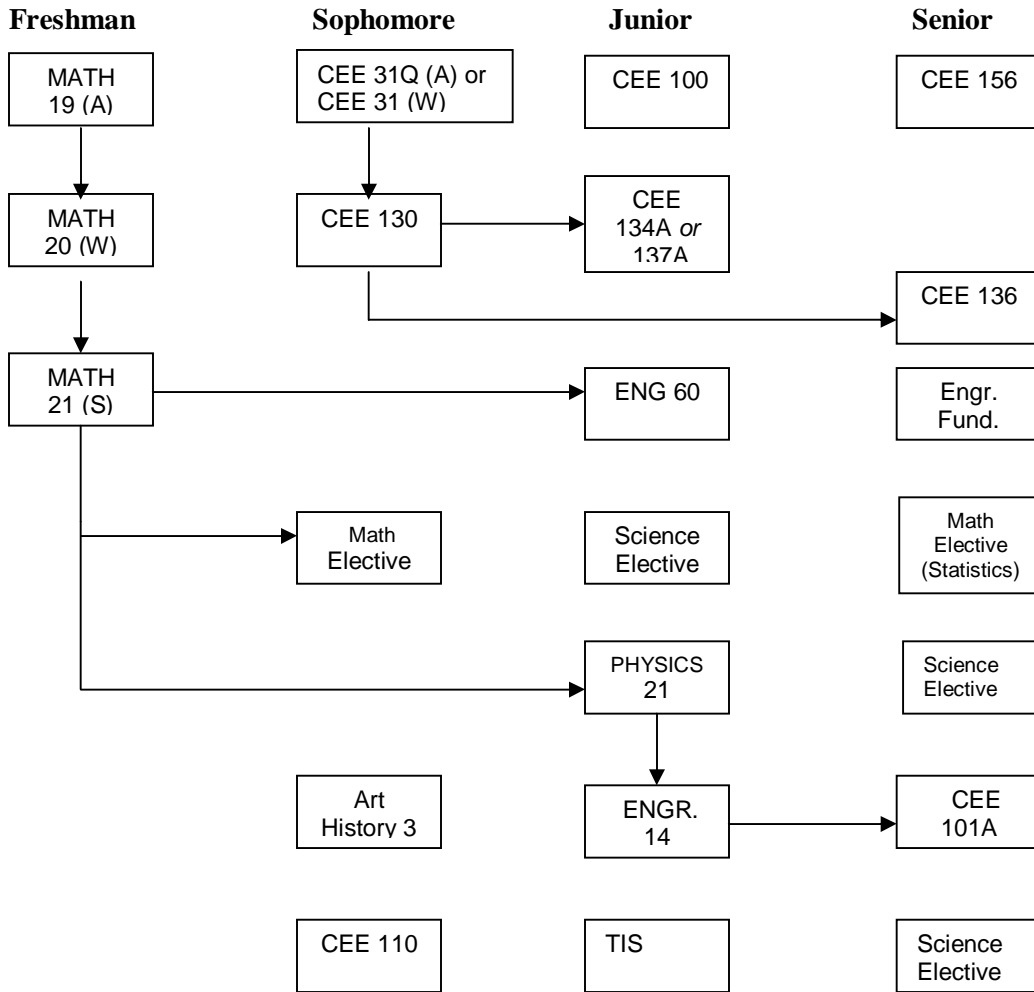
Course	Title	Units
CEE 101B	Mechanics of Fluids	4
CEE 101C	Geotechnical Engineering	3-4
CEE 111	Multidisciplinary Modeling and Analyses	3-4
CEE 115	Goals and Methods for Sustainable Design of Buildings	3-4
CEE 122A,B	Computer Integrated Architecture/Engr./Construction	4
CEE 131	Architecture Design Process	4
CEE 132	Interplay of Architecture and Engineering	4
CEE 134A	Site and Space	4
CEE 137A	Form and Structure	4
CEE 139	Design Portfolio Methods	3
CEE 154	Cases in Estimating Costs	3
CEE 172A	Indoor Air Quality	2-3
CEE 176A	Energy Efficient Buildings	3-4
CEE 180	Structural Analysis	4
CEE 181	Design of Steel Structures	4
CEE 182	Design Experience – Steel Structures	4
CEE 183	Integrated Building Design	4
ENGR 50	Introductory Science of Materials	4
ME 110A	Design Sketching	1
ME 115	Human Values in Design	3
ME 120	History and Philosophy of Design	3-4
ME 121	Design and Construction in Wood	1-3
ME 222	Beyond Green Theory: Workshop in Ecological Design	2
Art Studio 60	Design I: Fundamental Visual Language	3
Art Studio 70	Introduction to Photography	4
Art Studio 140	Drawing I	3
Art Studio 145	Painting I	3
Art Studio 148	Printmaking	3

SUGGESTED COURSE CONCENTRATIONS AND SEQUENCES

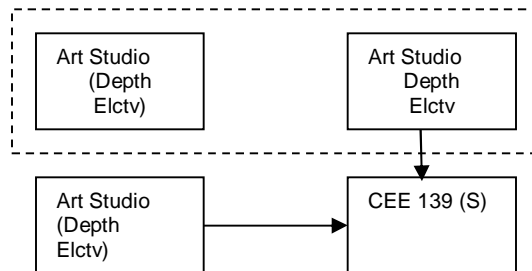
Subject to the requirements outlined above, students have considerable leeway in choosing their depth electives and other courses to best suit their background and interests. Two suggested programs are outlined on the following pages, one with an architectural studio emphasis and the second with a stronger engineering emphasis. Either approach can provide the necessary preparation to apply to a professional graduate master's degree program in Architecture. The program with an architectural studio emphasis outlines an earlier and more in-depth commitment to art and architecture studio courses, which are important for admission to many graduate programs. By careful selection of technically-oriented depth electives, students can complement their studio experience with courses in structural analysis, construction, cost estimating, and energy efficiency.

Students intent on applying to architecture graduate school are encouraged to take studio art courses as early as possible in their academic career and to take more than the required number of architecture studio courses. In preparation for architecture graduate school applications, students should plan on taking the portfolio preparation class. It is also recommended that students take computer modeling courses which will enable them to pursue summer internships. Internships are valuable since they allow students to test their interest in architecture as a profession.

Architectural Design Typical Sequence of Courses, Arch. Studio Emphasis



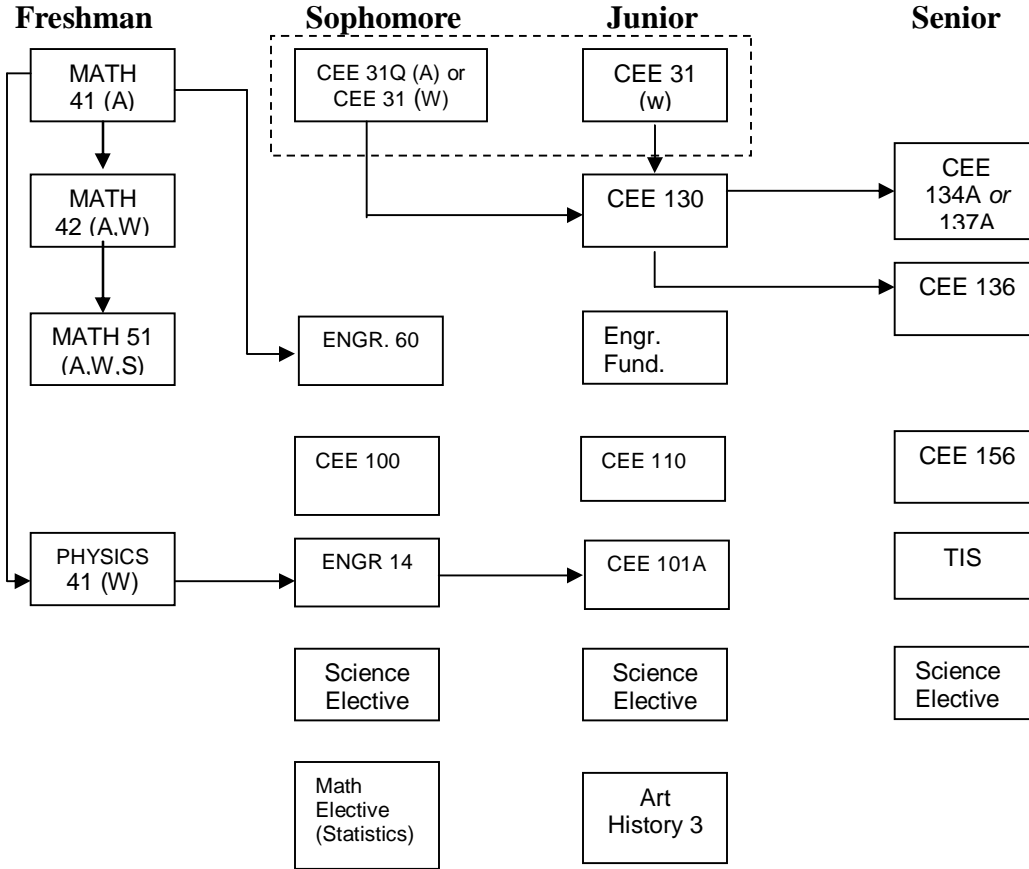
Depth electives recommended for students interested in architecture school



*Arrows represent direct prerequisites
 *Dashed-line boxes enclose alternates. These may indicate alternate years in which to take a given course, or alternate courses that may be taken at a given time.

Plus other courses to include:
 *Third Engineering Fundamentals course
 *The number of units of Depth Electives must be such that courses in Eng Fund, Required Depth, and Depth Electives total at least 60 units.

Architectural Design Typical Sequence of Courses, Engineering Emphasis



*Arrows represent direct prerequisites
 *Dashed-line boxes enclose alternates. These may indicate alternate years in which to take a given course, or alternate courses that may be taken at a given time.

Plus other courses to include:
 *Third Engineering Fundamentals course
 *The number of units of Depth Electives must be such that courses in Eng Fund, Required Depth, and Depth Electives total at least 60 units.

Architectural Design

Architecture Studio Emphasis

Typical 4 Year Plan

	<i>Fall</i>				<i>Winter</i>				<i>Spring</i>			
	Class	Math/Sci.	Engr.	Other	Class	Math/Sci.	Engr.	Other	Class	Math/Sci.	Engr.	Other
<i>Freshman</i>	MATH 19	3			MATH 20	3			MATH 21	4		
	IHUM			5	IHUM			5	IHUM			5
	Writing			3	Writing			3	GER			5
	GER			4	GER			4				
	<i>Subtotals</i>	<i>3</i>	<i>0</i>	<i>12</i>	<i>Subtotals</i>	<i>3</i>	<i>0</i>	<i>12</i>	<i>Subtotals</i>	<i>4</i>	<i>0</i>	<i>10</i>
	Total			15	Total			15	Total			14
<i>Sophomore</i>	Language			5	Language			5	Language			5
	CEE 31 or 31Q		4		CEE 130		4		ARTHIS3		5	
	CEE 100*		4		GER			5	Depth Elctv		3	
	Depth Elctv		3						Unrstr Elctv			3
	<i>Subtotals</i>	<i>0</i>	<i>11</i>	<i>5</i>	<i>Subtotals</i>	<i>0</i>	<i>4</i>	<i>10</i>	<i>Subtotals</i>	<i>0</i>	<i>8</i>	<i>8</i>
	Total			16	Total			14	Total			16
<i>Junior</i>	PHYSICS 21	4			ENGR 60		3		ENGR 14			3
	CEE 110		4		Depth Elctv		4		Science Elctv	5		
	CEE 134A or 137A (Wtr)		4		Unrstr Elctv			4	Math Elctv	5		
	Unrstr Elctv			3	GER			4	Depth Elctv		4	
	<i>Subtotals</i>	<i>4</i>	<i>8</i>	<i>3</i>	<i>Subtotals</i>	<i>0</i>	<i>7</i>	<i>8</i>	<i>Subtotals</i>	<i>10</i>	<i>7</i>	<i>0</i>
	Total			15	Total			15	Total			17
<i>Senior</i>	Fundamtlis Elctv		4		CEE 101A		4		CEE 156			4
	TIS			4	CEE 136		4		Science Elctv	4		
	Science Elctv	3			STAT 60	5			Unrstr Elctv			5
	Unrstr Elctv			3	Unrstr Elctv			3				
	<i>Subtotals</i>	<i>3</i>	<i>4</i>	<i>7</i>	<i>Subtotals</i>	<i>5</i>	<i>8</i>	<i>3</i>	<i>Subtotals</i>	<i>4</i>	<i>4</i>	<i>5</i>
	Total			14	Total			16	Total			13

Total Math & Science Units: 36
 Total Engineering Units: 61
 Total Other Units: 83
Total Units: 180

Notes:

* CE100 fulfills the WIM (writing in the major) requirement.

+ At least 3 units of Depth Electives must be taken from departments within the School of Engineering.

Architectural Design

Engineering Emphasis

Typical 4 Year Plan

	<i>Fall</i>				<i>Winter</i>				<i>Spring</i>			
	Class	Math/Sci.	Engr.	Other	Class	Math/Sci.	Engr.	Other	Class	Math/Sci.	Engr.	Other
<i>Freshman</i>	MATH 41	5			MATH 42	5			MATH 51	5		
	IHUM			5	IHUM			5	IHUM			5
	Writing			3	Writing			3	GER			5
	GER			4	PHYS 41	4						
	<i>Subtotals</i>	<i>5</i>	<i>0</i>	<i>12</i>	<i>Subtotals</i>	<i>9</i>	<i>0</i>	<i>8</i>	<i>Subtotals</i>	<i>5</i>	<i>0</i>	<i>10</i>
Total	17			Total	17			Total	15			
<i>Sophomore</i>	Language			5	Language			5	Language			5
	CEE 31 or 31Q		4		Science Elctv	5			STAT Elctv	5		
	CEE 100*		3		ENGR 60		3		GER			4
	ENGR 14		3									
	<i>Subtotals</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>Subtotals</i>	<i>5</i>	<i>3</i>	<i>5</i>	<i>Subtotals</i>	<i>5</i>	<i>0</i>	<i>9</i>
Total	15			Total	13			Total	14			
<i>Junior</i>	CEE 110		4		CEE 130		4		ARTHIS3			5
	Fundamtl's Elctv		4		CEE 101A		4		Science Elctv	4		
	Unrstr Elctv			3	Depth Elctv		4		Depth Elctv			4
					Unrstr Elctv			4	Unrstr Elctv			3
	<i>Subtotals</i>	<i>0</i>	<i>8</i>	<i>3</i>	<i>Subtotals</i>	<i>0</i>	<i>12</i>	<i>4</i>	<i>Subtotals</i>	<i>4</i>	<i>9</i>	<i>3</i>
Total	11			Total	16			Total	16			
<i>Senior</i>	CEE 134A or 137A		4		CEE 136		4		Depth Elctv			4
	TIS			4	CEE 156		4		Unrstr Elctv			5
	Depth Elctv		3		Science Elctv	3			GER			5
	GER			4	Unrstr Elctvs			6				
	<i>Subtotals</i>	<i>0</i>	<i>7</i>	<i>8</i>	<i>Subtotals</i>	<i>3</i>	<i>8</i>	<i>6</i>	<i>Subtotals</i>	<i>0</i>	<i>4</i>	<i>10</i>
Total	15			Total	17			Total	14			

Total Math & Science Units: 36

Total Engineering Units: 61

Total Other Units: 83

Total Units: 180

Notes:

* CE100 fulfills the WIM (writing in the major) requirement.

+ At least 3 units of Depth Electives must be taken from departments within the School of Engineering.

INSTRUCTIONS FOR DECLARING MAJOR IN ENGINEERING: ARCHITECTURAL DESIGN

- Print your Stanford unofficial transcript from Axess.
- Download the program sheet from the School of Engineering web site at <http://ughb.stanford.edu> (or pick one up outside Terman 390 or Terman 599). Complete the program sheet.
- Type up a 4-year study plan; for assistance see proposed 4-year study plans and charts on previous pages (templates available at <http://ughb.stanford.edu>).
- Bring the program sheet and proposed 4-year study plan to Patti Walters to approve and sign.
- Deliver your approved program sheet, 4-year study plan and unofficial transcript (from Axess), to Firoozeh Verplanke in the CEE office M42 Terman. Ask her to add your email address to the department's cee-undergrads-dry email list.
- Declare the major on Axess: Select **ENGR-BS** as your major and **Architectural Design** as your subplan.

Architectural Design Program Sheet (continued)

Engineering Fundamentals (3 courses required)

ENGR	14	Applied Mechanics: Statics (req'd)	3			
ENGR	60	Engineering Economy (req'd)	3			
		Elective				
<i>Engineering Fundamentals Total</i>				<i>(3 courses required)</i>		

Required Depth (37 units minimum; delete courses not taken)

Dept	Course	Title	Units	Grade	✓ if Transfer	Transfer/AP Approval	
						Initials	Date
CEE	100	Managing Sustainable Building Projects (WIM; see note 3)	4				
CEE	101A	Mechanics of Materials (req'd)	4				
CEE	110	Building Information Modeling	4				
CEE	31(Q)	Assessing Architecture Through Drawing	4				
CEE	130	Architectural Design	4				
CEE	134A or 137A	Site and Space <i>or</i> Form and Structure	4,4				
CEE	136	Green Architecture	4				
CEE	156	Building Systems	4				
ARTHIST	3	Introduction to Architecture History	5				
<i>Required Depth Total</i>				<i>(37 units required)</i>			

Depth Elective (Elective units must be such that courses in Eng Fundamentals, Required Depth, and Depth Electives total at least 60 units, at least 3 units from courses within the School of Engineering)

Dept	Course	Title	Units	Grade	✓ if Transfer	Transfer/AP Approval	
						Initials	Date
<i>Depth Total</i>							

Program Totals

Mathematics and Science		<i>(36 units minimum)</i>
Technology in Society Units		<i>(1 course required)</i>
Engineering Fundamentals Units		<i>(3 courses required)</i>
Required Depth Units		<i>(37 units minimum)</i>
Depth Electives		<i>(no. of required units to bring total to 100)</i>
TOTAL		<i>(100 units minimum)</i>

NOTES continued

(3) Fulfills the "Writing in the Major" requirement.

Program Approvals

Advisor

Printed Name: _____ Date: _____
 Signature: _____

Departmental

Printed Name: _____ Date: _____
 Signature: _____

School of Engineering

Printed Name: _____ Date: _____
 Signature: _____