

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
CIVL 381 – Introduction to Architectural Engineering**

Created by: Yilei Shi

Updated by:

Canino School of Engineering Technology

Department: Civil and Construction Technology

Semester/Year: Fall 2019

A. **TITLE:** Introduction to Architectural Engineering

B. **COURSE NUMBER:** CIVL 381

C. **CREDIT HOURS:** 3 credit hour(s) per week for 15 weeks

- One hour (50 minutes) of lecture per week 3
 Two to three hours of lab or clinical per week
 Two hours of recitation per week
 40 hours of internship

D. **WRITING INTENSIVE COURSE:** Yes No

E. **GER CATEGORY:** None: Yes: GER
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall Spring Fall & Spring

G. **COURSE DESCRIPTION:**

This course introduces the functional parts and systems that make up a building as well as their interactions in delivering required sustainable and resilient performance. There is a general overview of professional design services and documents of architecture and engineering disciplines that encompasses foundations, structures, building enclosures, heating and air conditioning, electrical, plumbing and fire safety systems. Concepts of building performance and aspects of pertinent building codes and standards are also discussed. This course incorporates basic principles of building science, green construction, and professional ethics.

H. **PRE-REQUISITES:** None Yes If yes, list below:

CONS 272 Strength of Materials for Technicians or ENGS 203 Engineering Strength of Materials, or permission from the instructor

CO-REQUISITES: None Yes If yes, list below:

I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
a. Select the necessary design services and documents of building parts and systems.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
b. Discuss the history of architecture and the future trends of architecture design.	2488: SO 1		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
c. Select the appropriate structural system to resist vertical loads in buildings.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
d. Select the appropriate structural system to resist lateral loads in buildings.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
e. Discuss the needs of mechanical, electrical, plumbing and fire safety systems for buildings.	2488: SO 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
f. Perform basic research on the latest technology of building systems; for example: sustainability, resilience and smart buildings and cities.	2488: SO 1, 7		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets

			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

K. **TEXTS:**

No text required.

L. **REFERENCES:**

Stephen Emmitt, Architectural Technology, 2nd ed., Wiley, 2012, ISBN: 978-1-4051-9479-2
James Ambrose, Patrick Tripeny, Simplified Engineering for Architects and Builders, 12th ed., Wiley, 2016, ISBN: 978-1-118-97504-6.

Frank Dagostino, Joseph B Wujek, Mechanical and Electrical Systems in Architecture, Engineering and Construction, 5th ed., Pearson, 2009, ISBN: 978-0135000045.

Robert Brown Butler, Architectural Engineering Design: Mechanical Systems, McGraw-Hill, 2002, ISBN: 9780071500869.

Leonard R. Bachman, Integrated Buildings: The Systems Basis of Architecture, Wiley, 2002, ISBN: 978-0-471-38827-2.

M. **EQUIPMENT:** None Needed: scientific calculator, scale/straight edge, engineering paper

N. **GRADING METHOD:** A - F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Assignments, Term Paper and/or Poster, Exams

P. **DETAILED COURSE OUTLINE:**

1. Professional design services and documents of architecture and engineering disciplines
2. Components and brief history of architectural Design
 - a. Components of architectural design
 - b. Brief history of architectural Design
 - c. Notable architects and representative designs
 - d. Building classifications and type of construction
3. Fundamentals of architecture design
 - a. Design considerations of residential buildings
 - b. Design considerations of commercial buildings
 - c. Design considerations of public buildings

- d. Design considerations of sports and large span structures
- 4. Building structural system
 - a. Foundation
 - b. Building structures
 - c. Vertical force resisting systems
 - d. Lateral force resisting systems
 - e. Topics of tall building structures design
- 5. Building mechanical system
 - a. Heating system
 - b. Air conditioning system
 - c. Plumbing system
- 6. Building electrical system
- 7. Building fire safety system
- 8. Building sustainable and resilient design
- 9. Smart building and cities
- 10. Professional ethics (Optional)

Q. LABORATORY OUTLINE: None Yes

NONE