

# Civil Engineering & Architecture

## COURSE SYLLABUS

Boca Ciega High School

Fall 2020 – Spring 2021

Mr. Medici

Room 9-1, 9-2 & 9-3

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### COURSE OVERVIEW

Civil Engineering and Architecture is the study of the design and construction of residential and commercial building projects. The course includes an introduction to many of the varied factors involved in building and site design and construction including building components and systems, structural design, storm water management, site design, utilities and services, cost estimation, energy efficiency, and careers in the design and construction industry.

The major focus of the CEA course is to expose students to the design and construction practices of residential and commercial building projects, design teams and teamwork, communication methods, building codes and ordinances, engineering design calculations, and technical documentation. Problem solving skills and design experience are gained through an activity-project-problem-based (APPB) teaching and learning pedagogy. Used in combination with a teaming approach, APPB-learning challenges students to continually hone their interpersonal skills and creative abilities while applying math, science, and technology knowledge learned in other courses to solve design problems and communicate their solutions.

Students will use industry standard 3D architectural modeling software to facilitate site and building design and technical documentation. As the course progresses and the complexity of the design problems increase, students will learn more advanced computer modeling skills as they become more independent in their learning, more professional in their collaboration and communication, and more experienced in problem solving and design.

Civil Engineering and Architecture is a high school level course that is appropriate for 10th or 11th grade students interested in careers related to civil engineering and architecture. No previous knowledge is assumed, but students should be concurrently enrolled in college preparatory mathematics and science courses in order to facilitate the use and understanding of appropriate math and science concepts necessary for the successful completion of CEA coursework.

Civil Engineering and Architecture is one of the specialization courses in the Project Lead The Way® high school pre-engineering program. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.

### COURSE RESOURCES

- Engineers Notebook
- Powerpoints
- Handouts
- Computer/software

### STUDENT EVALUATION AND ASSESSMENTS

- Class Assignments – 50%
- Cornell Way Notes – 35%
- Class Notebook (part of the school-wide binder initiative) – 15%
- Final grades for each 9 weeks are calculated using Pinellas County requirements: 90-100% (A), 80-89% (B), 70-79% (C), 60-69% (D), below 60% (F). For example, a student earning 90-100% of all available points for a grading period will earn an A for that grading period.

- An end-of-term comprehensive exam will be given following the fall & spring terms. These are known as “semester exams”. Students who do not maintain a 3.0 or above grade point average and have more than the designated number of absences will also be required to take the semester exam in both terms. All students MUST take them except those with a signed and fully executed exemption form.
- An end-of-course comprehensive exam will be given following the spring term. This test will be known as an “End-of-Course Exam”. **All students are required to take the comprehensive, End-of-Course exam at the end of the spring term. This exam is provided by PLTW.** The End-of-Course exam is used to evaluate the overall learning gains of the student throughout the year.

## CORE PHILOSOPHIES AND GUIDING PRINCIPLES

In this course, we will use a variety of instructional methods, including lecture, multi-media, student presentations, collaborative group work, and both large and small group discussions. I am a supporter of “active learning.” In this course, that means reading the information presented, completing assignments with integrity, participating in discussions, asking questions, assisting other students to sharpen skills, and studying for exams. My role is to help you learn, but you must take responsibility for your own success.

Essentials for course success:

- **Attendance:** There is a clear correlation between attendance and success in class. The responsibility to come to class is yours and as such, **you are responsible for any material missed due to absence.** Though I am happy to assist in the case of excused absences, it should be noted that attendance, by itself, is not enough to ensure student success; you must be prepared to engage in a meaningful way.
- **Civility and Respect for Learning:** The classroom is a place for serious learning, active engagement, and respect for fellow learners. Please be on time—coming in late is disruptive to both me and your fellow students. Class is over when I am finished. Please don't close your notebook, zip up your backpack, etc until we are completely finished. Please turn off/silence, and put away all cell phones and portable electronic devices (and take ear buds out of your ears), before class begins.

## COURSE POLICIES AND PROCEDURES

### A. Materials:

- Students should come prepared with writing utensils each day.
- School-wide Binders will be needed. **Do not** purchase a second binder for the class, but make certain you bring your binder daily.

### B. Make-up Work/Attendance:

- Students are expected to attend class each day it comes up on the Blue/Gold rotation.
- It is your responsibility to obtain the work that you missed on the day that you return. You have the number of days equal to the number of days absent to turn in the work. Any work assigned prior to your absence is due on the date you return.
- Tests and quizzes must be made up within one week of the absence and must be made up outside of normal class time.
- If you are absent, please make arrangements with classmates to get any notes you may have missed.

### C. Tardiness:

- It is extremely important to be in class on time. The Boca Ciega tardy policy will be strictly enforced. If you are tardy, please check in with me at the end of class to ensure that your attendance is coded correctly. Punctuality is a life skill . . . please work diligently to be on time all the time.

### D. Assignments

- All class documents can be found in FOCUS. This is done so the proprietary documents belonging to PLTW can be password protected.
- Assignments are due at the conclusion of class on the designated day placed in FOCUS.
- Assignments should be emailed to my inbox upon completion, at the date due, unless otherwise instructed. My email is [MEDICIR@pcsb.org](mailto:MEDICIR@pcsb.org) and please place IED in the subject line.

- Late work must be completed, but will not be given credit. The assignments must be completed as the skills in one assignment are often included in subsequent assignments. If there are extenuating circumstances, arrangements must be discussed prior to the due date.

#### E. Resources

- Autodesk Software – Students in PLTW classes can get and use at home, free of charge, the Autodesk Revit software.
  - [www.autodesk.com](http://www.autodesk.com)
- Quizlet – Students in PLTW classes will need to sign up for a FREE account in Quizlet. Once signed up, search for Boca Ciega PLTW.
  - [www.quizlet.com](http://www.quizlet.com)
- Facebook – If you or your student is on Facebook, there are some great pages! American Institute of Architects, Autodesk Revit and 3D Printing are some of the worthwhile pages on Facebook to LIKE.

#### E. Class Way of Work

- Be in your seat, prepared with the proper tools, and ready to work **when the bell rings**.
- Treat your colleagues, teachers and their personal property with respect.
- Communicate in positive ways- **foul language or put-downs will not be allowed**.
- Come each day committed to giving your best.
- Work together as a team so everyone succeeds.

#### F. Classroom Expectations

- Boca Ciega and Pinellas County Schools use the restorative practices model when deemed acceptable to the situation.

### UNIT OVERVIEW

The course of study includes:

- Overview of Civil Engineering and Architecture
  - History of Civil Engineering and Architecture
    - Past Civil Engineering and Architecture
    - Principles and Elements of Design
    - Architectural Styles
  - Careers in Civil Engineering and Architecture
- Residential Design
  - Building Design and Construction practices
    - Building codes
    - Building components
    - Green technology and LEED
    - Universal Design
    - Affordable housing design
    - Site plans
  - Cost estimates
  - Energy efficiency
  - Storm water analysis
  - Water supply
  - Plumbing
  - Electrical systems
  - Wastewater management
  - Design and construction documentation
  - 3D architectural software
- Commercial Applications
  - Commercial Buildings
    - Building codes
    - Land Use and Development

- Commercial building components
- Structural Design
  - Steel deck
  - Precast concrete floors
  - Steel joints
  - Structural steel beams
  - Spread footings
- Services and Utilities
  - Energy Codes
  - Plumbing (Optional)
  - Electrical systems (Optional)
  - Heating, Ventilating and Air-Conditioning systems
  - Wastewater management
- Site Considerations
  - Land surveying
  - Soil analysis
  - Road design (Optional)
  - Parking lot design
  - Storm water management
  - Site grading (Optional)
  - Low impact development
- Commercial Building Design
  - Commercial Building Design Project
    - Property description
    - Site discovery
    - Commercial project viability
    - Project management
  - Commercial Building Design Presentation