

CourseNo: ARCHA4684_001_2014_2

Meeting Time: TR 06:10P-08:00P **Meeting Location:** AVERY HALL 600

Instructor Information:

Davidson Norris

Teaching Assistant Information:

Anna Lauren Oursler

Columbia University

School of Architecture, Planning and Preservation

SUSTAINABLE DESIGN (EARTH INSTITUTE)

Course number: ARCH A4684_001_2014_2

Time: Tuesday and Thursday , 6:10-8:00pm

Room: Ware Lounge, 600 Avery (except on 27+ 29 May class will be in 200N Buell)

Instructor: Davidson Norris - Davidson Norris Architect & Carpenter Norris Consulting

NOTE:

1. This course is offered for students who are interested in sustainable design but who do not have architectural design skills or ambitions. The final project will be a design narrative, not a drawing set of plans, sections and elevations. If you are more interested in the design implications of sustainability, consider taking A4684_001: Sustainable Design (GSAPP), offered in the Fall semester.

INTRODUCTION

The purpose of the course will be to familiarize students with core architectural design strategies and mechanical / technical systems that can and will make existing facilities or new ones more resource and task efficient, all while creating an architectural environment that is, for its occupants, thermally comfortable, psychologically affective, sustainably instructive and, with any luck, architecturally poetic.

To be successful, a sustainable building must be an inspired and inspirational combination of architecture and sustainable science. The course will therefore focus on how the principals and technical details of climatic analysis and thermal comfort can, in combination with a buildings program, create a logical framework that can creatively and rationally guide the development of a sustainable building.

While many of the sustainable strategies explored apply to both existing and new construction, the focus in this course will be on new buildings.

The course requires no previous experience with architecture, sustainable design or climatic analysis. Though many of the topics will be technical, students will not be required to perform detailed calculation such as heat loss or solar gain.

Students have the option of working in pairs for all assignments and for the final project. If one chooses to work in a team of two, the quantity and caliber of output will increase, and all grades will be shared among both team members. The course TA will hold a weekly review session to assist students with homework assignments and course content.

OBJECTIVE

Each class will focus on and explore the technical requirements, sustainable opportunities and design implications of a particular sustainable strategy, technique or technology. We will start with broad issues such as solar site design and move on to increasingly more specific issues up to and including sustainable control technologies. The idea is to incrementally familiarize students with the broad range of sustainable building design options but also to alert them to the critical need to evaluate, mix and trade off these technologies within the developing framework and process of an integrated building design.

ASSIGNMENTS

Homework assignments will be weekly and will cover materials acquired in class and in the readings. Students will apply that week's particular technology to a hypothetical building design, in our case, a new High School of Sustainable Design to be located in Central Park. As the technologies accumulate, the student will struggle with and resolve the design compatibilities and conflicts between them (passive solar glazing vs. daylight glazing). I will review and return your previous week's assignment before you initiate the next week's. For the summer session, we will hold class twice per week, but there will only be one assignment per week, covering one of the weeks topics.

FINAL PROJECT

You will develop and present the design brief for the High School of Sustainable Design. Your role will be that of the broad sustainable objectives as well as your understanding of appropriate technical solutions.

GRADE

There are no papers or quizzes or exams so grades will be based exclusively on the weekly homework assignments (60%) and the Final Project (40%).

OFFICE HOURS

I do not have an office at CU so do not have office hours. We will be assisted by very experienced TA who who will be able to answer most all of your questions. If not, I remain accessible via email.

TEXTBOOKS AND READINGS

All required readings will be posted on courseworks. Many of these readings come from the following two textbooks, which we think are critical books for practitioners in the field of sustainable design:

1. Sun, Wind & Light, Architectural Design Strategies, 2nd edition, Brown, G. and DeKay, M., Wiley
2. Heating, Cooling and Lighting, Sustainable Methods for Architects, 3rd edition, Lechner, N., Wiley

COURSE OUTLINE:

- 05.27 - The sustainable building argument
- 05.29 - Sustainable design basics
- 06.03 - Building heat gain and loss and occupant thermal comfort
- 06.05 - Sustainable site strategies
- 06.10 - Sustainable waste and water strategies
- 06.12 - Envelope s strategies
- 06.17 - Active and passive solar heating
- 06.19 - Passive cooling
- 06.24 - Natural ventilation
- 06.26 - Daylighting
- 07.01 - Mechanical systems (heating and cooling)
- 07.03 - Indoor Air Quality (IAQ) and Building Energy Management Systems (BEMS)