



SUSTAINABLE DESIGN & RENEWABLE ENERGY (CERT.)

Total Credits: 24

FIRST SEMESTER

12 credits

GSS 122 Science of Energy

3 Credits

Pre-Req: None

GSS 128 Green Building Practices

3 Credits

Pre-Req: None

GSD 130 Green Building Materials

3 Credits

Co-Req: GSS128

GSD 132 Green Projects Case Studies

3 Credits

Co-Req: GSS128

SECOND SEMESTER

12 credits

GSD 200 Wind Turbines/Solar Panels Applications

3 Credits

Pre-Req: GSS 122, GSS 128

GSD 202 On-site Water Recycling/Wastewater Treatment

3 Credits

Pre-Req: GSS 128

GSD 204 Energy Codes and Energy Analysis

3 Credits

Pre-Req: GSS 128

GSD 206 HVAC/Air Quality

3 Credits

Pre-Req: GSS 128

*Schedules subject to change due to enrollment and/or budget conditions
Enrollment for courses is based on the results of the NCC placement exam*

GSS 122 - Science of Energy

This introductory course covers the scientific principles and technological innovations related to Energy resources. The study of mechanics, electricity, magnetism and thermodynamics pertinent to energy are explained. Students develop an appreciation of energy use in the contemporary world by examining alternate energy systems such as solar, wind, photovoltaic, hydro, biomass, the ocean, renewable alternative energy sources and environmental sustainability processes.

GSS 128 - Green Building Practices

This course introduces students to the science governing fundamental sustainable design and green building practices and their implementation. Topics include building site selection, building orientation, water and energy efficiency, renewable energy and storage, on-site power generation, improvement of indoor air quality including air quality and efficient use of building materials.

GSD 130 - Green Building Materials

This course will introduce students to the design, application, recycling and cost analysis of various green building materials in residential and commercial buildings and their ability to increase the energy efficiency in buildings. The selection and installation of various construction materials to include the insulation, foundations, concrete slabs on grade, the building envelope, roof, windows and doors, finished floor materials, low volatile organic compound wall finishes, and FSC wood will be discussed including harvesting and transporting. .

GSD 132 - Green Projects Case Studies

This course will allow students to research and analyze various green building projects on Long Island and New York City to learn different methods used to achieve sustainable design through the use of green building practices. Building projects will be evaluated in terms of site selection, orientation, water and energy efficiency, renewable energy and storage, on-site power generation, indoor air quality and the efficient use of building materials. Students will be required to visit one project site discussed, during the semester.

GSD 200 - Wind Turbines/Solar Panels Applications

Students will be introduced to the methodology by which different wind turbines function and produce electricity including power generation, wind speed, turbine size, efficiency of turbine aerodynamics, power storage potential, and payback. Comparison of different locations for wind turbine installation and structural design and construction will be discussed. Students will be introduced to the concept by which various types of solar panels (photovoltaic panels) installations produce electricity including direct and alternating current. Site selection and evaluation for installation of the solar panels on residential homes and buildings including correct sizing for building consumption, power storage potential, code compliance and government incentives will be discussed.

GSD 202 - On-site Water Recycling/Wastewater Treatment

This course will introduce students to the principles of design, application, and the cost analysis of water recycling and reuse methods and on-site wastewater treatment for building construction including the layout and design of building piping. Methods of water retention, filtration and reuse of rainwater through erosion control measures and green roofs, greywater, black water, infiltration systems, various plumbing fixtures, and direct and indirect strategies for on-site wastewater treatment including living machines and constructed wetlands will be discussed.

GSD 204 - Energy Codes and Energy Analysis

This course will introduce students to the techniques used to make residential and commercial buildings more energy efficient including energy analysis software, energy audits, construction costs and maintenance costs. Methodology used during construction to maintain compliance with the Energy Conservation Construction Code of New York State, ASHRAE 90.1, Energy Standard for Buildings and ASHRAE 90.2 Energy Efficient Design of Residential Buildings.

GSD 206 - HVAC/Air Quality

This course will introduce students to the various factors in building design and construction that affect the indoor air quality including the comparison of various passive and mechanical ventilation systems. Compliance with ASHRAE standard 189.1, Standard for the Design of High Performance Green Buildings, MERV ratings, use of low and zero volatile organic compounds and construction air quality control plans will be discussed.