

PERFORMANCE-BASED SEISMIC DESIGN

- A SEMESTER LONG UWI COURSE FOR PROFESSIONAL ENGINEERS -

Background

This course, which has been in operation for the past 7 years, was originally conceived as a means of simultaneously training professional engineers as well as MSc students. It is an optional course in our MSc Civil Engineering programme. Regarding the former set, the content of this course is essential for engineers in order to understand modern building codes which are needed for ensuring public safety. This is because there has been a revolution in the philosophy of the new building codes making them much more sophisticated. In fact, in January 2017 the new version of ASCE 7 will be released and is expected to promote performance-based seismic design as the standard approach for the design of new buildings.

The mechanism for including professional engineers as students of an MSc course is that they must register as an “occasional student”. This classification is recognised on the application form. An “occasional student” attends and fully participates in class but does not sit the exam. The detailed registration procedure is shown on the next page. If a student desires to sit the exam, he or she would have to register as a “specially admitted” student. The first cohort of students for this challenging course included a number of professional engineers.

Advertisement Information:-

Course Description: The “Performance-Based Seismic Design” course enables engineers to understand and appropriately apply the most recent building codes: IBC 2015, and the ASCE 41-10, ASCE 41-06. These skills are urgently needed given new developments and building safety requirements placing emphasis on the concept of risk analysis as applied to new and existing buildings. The course can be accessed via registration at the UWI St. Augustine School of Graduate Studies as an “occasional student” in which case the student attends all classes, participates fully, including the undertaking of all coursework, but does not write the final exam. There are 2 practical coursework exercises involving the quantitative assessment and retrofit design of an existing building. There are 12 consecutive sessions from 4:00-6:00pm usually on Thursdays and beginning from the third week of January.

Learning Outcomes: The student shall: know and understand the principles of performance-based seismic design of buildings per ASCE 41; be able to calculate the structural seismic retrofitting requirements of a building; be able to determine the management strategies for seismic structural retrofitting; know and understand the principles of the probabilistic risk assessment of a building; be able to calculate the approximate seismic risk of a given building; know and understand the principles of the regional seismic risk assessment per HAZUS.

Target Students: Practising structural or civil engineers.

Course Syllabus:

Introduction to the principles of Performance-Based Earthquake Engineering and Consequence-Based Earthquake Engineering; The Seismic Rehabilitation Design Process and Objectives; Capacity Spectrum NSP Analysis; Coefficient Method NSP Analysis; Acceptance Criteria for Systems analysed by Linear Methods and Nonlinear Methods; Retrofit and Management Strategies and Systems; SAC-FEMA Reliability Analysis Method; Vulnerability Analysis Methods; Software for Pushover Analysis and NDP Analysis; Regional Seismic Risk Assessment; Introduction to HAZUS.

Instructor: Richard Clarke PhD (quantitative seismic assessment and retrofit design specialist).

How To Access the Course:-

The university accommodates this possibility via enrolment as a student with the special designation of “Occasional Student”. As indicated, the Occasional Student attends class along with students pursuing degrees or diplomas, but does not take the exam, but participates fully including submission of coursework exercises. If the student’s attendance is above the minimum, the student receives a certificate of attendance, at least from the department.

Important: If the following process is not completed before the start of the lectures, attend class while the process continues.

Procedure:-

1. Apply to: “ Coordinator, MSc Civil Engineering, Department of Civil and Environmental Engineering”, for approval to take the course – CIEN 6030 Performance-Based Seismic Design.
2. Upon receipt of written approval, go to the Student Admissions Building (ground floor) and obtain the 2 Bank Slips – the one for the Application Fee (TT\$90), and the one for the Tuition and Compulsory Fees (TT\$4325 total).
3. Fill out the Application Fee Bank Slip only, then go to the UWI Bank and pay the fee; retain the receipt.
4. Fill out the Application Form but apply as an “occasional student”. The form can be obtained online from http://sta.uwi.edu/resources/documents/postgrad/pgspecial_admission.doc
5. Submit the following in person to the School of Graduate Studies (SGS), 1st Floor, Student Administration Building – (1) the filled out Application Form, and (2) the receipt for the payment of the Application Fee. [NB – The form will be sent to the Department of Civil and Environmental Engineering for Registration Approval].
6. Await receipt of the reply to your registration application from the School of Graduate Studies indicating approval of your registration.
7. If your application was approved you will receive a “Letter of Offer”. Follow the instructions in the letter and register online; an invoice will be presented.
8. Fill out the Bank Slip from step 1 for the Tuition and Compulsory Fees then go to the UWI bank and pay the fees. [NB – the Tuition Fee is TT\$835 per credit and the course is a 4-credit course]; retain the receipt.
9. Go to the ground floor of the Student Administration Building and deposit the following into the box provided – (1) the receipt for the payment of the Tuition and Compulsory Fees, and (2) the printout from the online registration indicating the course you registered for (i.e. CIEN 6030). This completes the registration.
10. Check online to confirm your registration which should occur within 3 days of completing step 8.
11. Get an ID number from SGS.
12. Attend class.

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