Course Syllabus

REINFORCED CONCRETE DESIGN

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Program: Oceanographic Engineering

1. Course number and name

CIVG1018 - REINFORCED CONCRETE DESIGN

2. Credits and contact hours

3 credits and 4 contact hours

3. Instructor's course or coordinator's name

NADIA ROSAURA QUIJANO ARTEAGA

4. Text book, tittle, author, and year

• Darwin, David. Dolan, Charles W.Nilson, Arthur. Design of Concrete Structures (15th Edition)

a.Other supplemental materials

• McCormac, Jack. Brown, Russell. Diseño de concreto reforzado (8va Edición)

• Comité ACI 318. Requisitos de Reglamento para Concreto Estructural (2014)

• Gonzáles Cuevas, Oscar. Fernández Villegas, Francisco. Aspectos fundamentales del concreto reforzado (4ta Edición)

5. Specific course information

a. Brief description of the content of the course (catalog description)

Thecoursedealswiththestudyofthebehaviorof reinforcedconcreteelements, focusingonthedesignof structuralelementsandthecurrentconstruction regulations. Inaddition,itsbehaviorisexposedwhenitis subjectto compression, traction, flexion, shearing and torsionstresses,aswellasthestudyofdeflectionsunder loadsin serviceconditions. Subsequently, the design of the structural reinforcement of columns with axial loads and eccentric loads with uniaxial and biaxial flexion is covered. Finally, reinforced slabs are analyzed and designed in one direction, in two directions as well as different types of surface foundations.

b. Prerequisites

STRUCTURAL ANALYSIS - CIVG1017

c. This course is: Required

6. Specific goals for the course

a. Specific outcomes of instruction

1.- Apply the design criteria for the sizing of reinforced concrete sections, through the analysis of axial force, bending moment, shear force and torque moment.

2.- Analyze the deflections of reinforced concrete elements, for the verification of their limit state of service.

3.- Apply the criteria for detailed plans of beams, columns, slabs and foundations, for the

proper illustration of the design in structural plans.

4.- Interpret data and results obtained in the design processes, for the analysis and verification of the design obtained.

b. Explicity indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

• A recognition of the need for and an ability to engage in life-long learning.

• An ability to design a naval engineering system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability

7. Brief list of topics to be covered

1.- Fundamental principles of reinforced concrete

2.- Elements subjected to flexion

3.- Elements subjected to shear and torsion

4.- Introducction to design of columns

5.- Introducction to design of slabs

6.- Introducction to design of foundations