CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1441-1442 (2019 - 2020) Semester: ☐ Fall ■ Spring

SDP Title	**Optimum pipeline design**	
Brief Description	In this project, student will design a main pipe line for a residential area in a city in KSA. The students will perform the following tasks: • Study the design criteria of pipe line system • Select a suitable material of the pipe line • Predict the future water pressure in the pipe line. • Find out the slopes of the pipe line • Economic analysis of the pipe line will be carried out., and • Report writing.	
Prerequisite Courses	- CE230	
Co-requisite elective courses	- CE 458	
Design Content of the SDP	The project will be completed by the following step: • Design concept • Selection of a study area • Data collection including layouts and commercially available pipe types and sizes • Future water demand requirements • Hydraulic design of pipe line • Excel worksheet development or reedy made program for design of pipe line. • Report writing and submission	
Constrains of the SDP	- Environmental constraints, - Economic constraints, i.e., large pipe sizes will increase the cost.	
Used Specifications and/or Codes	- Saudi Arabian Design Code	
Supervisor(s)	**Name**	**Signature**
	Prof. Dr. Alkhomairy	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1440-1441 (2019 - 2020) Semester: ■ Fall ☐ Spring

Project Title	**Geotechnical and Structural Design of Foundation Systems of Reinforced Concrete Structures**	
Brief description	Students shall utilize the given set of data to analyze the foundation systems of a structure (residential or commercial). It is required to conduct complete analyses, design and to present the proper results as well as drawings required for execution considering (two alternatives for comparison purpose) the suitable soil, economic, and environmental constrains, if any. The SDP will be continued for two semesters.	
Prerequisite/Co-requisite	CE 318 and CE 363	
Co-requisite Elective Courses	CE 403 **THE SECOND ELECTIVE COURSE WILL BE ANNOUNCED ON-DUE TIME**	
Design Content of the SDP	- Geotechnical Investigation and Design of Soil/Foundation System - Structural Design of Columns - Structural Design of Two Alternatives for Foundation Systems	
Constrains of the SDP	- Economic and Environmental	
Used Specifications and/or Codes	- Saudi Building Code and ACI	
Supervisor(s)	Name	Signature
	Dr. Sherif ElKholy	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1441-1442 (2019 - 2020) Semester: ☐ Fall ■ Spring

SDP Title	**Design of Concrete Dam Components and Recharge Well**	
Brief Description	Kingdome of Saudi Arabia receives flash floods occasionally. Several dams have been constructed and are planned to be constructed in future to harvest rainwater and complement it to groundwater which is depleting day by day. The current project will focus on the analysis and design of the following components of a dam: • Spillway (weir) and its floor • Stilling basin and In addition, the design of recharge well in the dam's pond will be considered. *Auto-Cad and Finite Element Method will be utilized.* *Data will be collected from literature, concerned authorities and field visits. Rainfall and dam data will be required. Information about subsoil strata will also be needed. Maximum water marks of past floods will also be utilized.* *The results of project will be highly useful for the community in Qassim Region.*	
Prerequisite Courses	CE330	
Co-requisite elective courses	CE458	
Design Content of the SDP	• Spillway (weir) and its floor • Stilling basin and • Recharge wells	
Constrains of the SDP	- Economic considerations - Environmental considerations.	
Used Specifications and/or Codes	Design codes for water structures available in Saudi Arabia will be used	
Supervisor(s)	**Name**	**Signature**
	Yousry Ghazaw	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1440-1441 (2019 - 2020) Semester: ■Fall ☐ Spring

SDP Title	**Deign of Wastewater Treatment Plant and Water Recycling Network for the Qassim University**
Brief Description	In this senior design project, students will design a wastewater recycling plant for Qassim University Campus, Saudi Arabia. Firstly, students will study the existing treatment plant and check the design criteria of the plant. Based on the study, they will design a new recycling plant. The students will perform the following tasks for two semesters; 391, and 392. **CE-491** **Semester -411** • Define and formulate the wastewater treatment plant design problems. • Study the design criteria of existing WWTP in the QU campus • Study the biological process through internet, lecture and available books • Study the waste water recycling option through internet, lecture and available books • Study the advanced water treatment such as RO membrane process • Development of a conceptual design concept based on the study of literature review and visiting existing plant • Estimate and predict the future wastewater flow based on the population in the selected area. • Estimate the pollutant load (BOD load) • Formulate the treatment plant design specification • Design the preliminary and primary treatment process (Equalization tank, Grit chamber, Primary sedimentation tank) • Design the secondary treatment process (Rotating Biological Reactor)) • Estimate and development the biological growth equation and performance graph of the plant • Estimate and development of performance graph of advance system **CE-492**

	Semester -412 • Design the water supply network for treated wastewater recycling process • Finalize the overall treatment process • Verify and validate the process against design standard specification of wastewater treatment. • Draw a general layout and configuration of the overall treatment plant	
Prerequisite Courses	CE-370	
Co-requisite Elective Courses	CE475	
Design Content of the SDP	The project will be completed by the following step • Study the wastewater recycling process • Making design Concept • Existing WWTP Condition • Estimate current and future population • Calculation of wastewater flow based on population and wastewater production per capita/liter/d • Calculation of the BOD load based on water flow • Calculation of other pollutant load • Develop the bacterial growth graph and treatment performance graph • WWTP main tanks Design o Area calculation o Depth calculation o Retention time calculation o Inlet and outlet design • Design the water supply network	
Constrains of the SDP	**Environmental:** Effluent quality may exceed the desirable criteria that would eventually cause surface and groundwater pollution. **Economical:** Capital cost and operational cost (due to high energy cost) of WWTP are high. **Operational:** Need skilled personal to operate the plant.	
Used Specifications and/or Codes	The following guideline will be followed - EPA's guideline for the design water and wastewater treatment plant	
Supervisor(s)	**Name**	**Signature**
	Dr. Md. Shafiquzzaman	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1440-1441 (2019 - 2020) Semester: ■ Fall ☐ Spring

SDP Title	**Structural Design of a Heavy-loaded Multistory industrial-administrative Building**	
Brief Description	The project aims to enable students to apply the knowledge, they gained through their study of structural engineering courses; in analyzing, studying, and designing a large multipurpose building (drawings attached). Students are expected to use international design codes, in conjunction with structural analysis and design software; to study various design alternatives of the building. Logical engineering judgement tools are to be used for the choice of the most appropriate design alternative. Design outputs, in the form of drawings and data sheets will be included in the project report.	
Prerequisite Courses	According to study plan	
Co-requisite elective courses	CE 403	
Design Content of the SDP	Structural design of reinforced concrete elements	
Constrains of the SDP	A good knowledge of structural analysis, design, and drafting software packages	
Used Specifications and/or Codes	ACI 318	
Supervisor(s)	**Name**	**Signature**
	Dr. Abdelraouf Kassem	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1440-1441 (2019 - 2020) Semester: ■ Fall ☐ Spring

SDP Title	**Blast Resistance Design of a Shelter Against Possible Terrorist Attacks**	
Brief Description	Blast resistance design for critical buildings rises recently due to the increase in terrorism activities around the globe. The blast resistance design is used to minimize the possibility of mass casualties from terrorist attacks against the protected buildings. The protected buildings can be designed for different levels of protection, range from very low level, i.e. heavy damage, to high level, i.e. superficial damage. This project aims to design a shelter that is subjected to possible attack from both mortars and vehicle borne improvised explosive devices (VBIEDs). The shelter is required to meet a high level of protection in accordance with the protective design center (PDC-TR-06-08). The blast resistance design process will go over five steps which includes: estimating the blast load history, providing a preliminary design using simplified methodologies, determining the maximum dynamic deflection for the selected structural components, response limits or level of protection verification and finalizing the design of the shelter components.	
Prerequisite Courses	CE 305 and CE 315	
Co-requisite elective courses	CE 418	
Design Content of the SDP	1- Estimating the blast load history 2- Providing a preliminary design using simplified methodologies 3- Determining the maximum dynamic deflection for the selected structural components 4- Response limits or level of protection verification 5- Finalizing the design of the shelter components	
Constrains of the SDP	None	
Used Specifications and/or Codes	1. Department of Defense (DoD). UFC 3-340-02 Unified Facilities Criteria: Structures to Resist the Effects of Accidental Explosions. 2014 2. US Army Corps of Engineers Protective Design Center (PDC-TR-06-08). Single Degree of Freedom Structural Response Limits for Antiterrorism Design 2008 3. Alawad OM, Gombeda MJ, Naito CJ, Quiel SE. Simplified methodologies for preliminary blast-resistant design of precast concrete wall panels. PCI Journal. 2019 Jul.	
Supervisor(s)	**Name**	**Signature**
	Dr. Omar Alawad	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1440-1441 (2019 - 2020) Semester: ☐ Fall ■ Spring

SDP Title	**Design of a Multistory RC Building**	
Brief Description	Design of a high-rise RC building according to the Saudi building code, wind and earthquake loads will be applied. Different types of structural systems will be used in the design utilizing commercial software packages. It is required to submit full set of design drawings and calculation sheet	
Prerequisite Courses	CE 318	
Co-requisite elective courses	CE 403	
Design Content of the SDP	Complete design of structural systems and elements	
Constrains of the SDP	Economical practical and safety	
Used Specifications and/or Codes	Saudi Building Code	
Supervisor(s)	**Name**	**Signature**
	Dr. Saleh Alogla	

Qassim Engineering College

CIVIL ENGINEERING DEPARTMENT, SDP – PROPOSALS

Academic year: 1439-1440 (2018 - 2019) Semester: ☐ Fall ■ Spring

SDP Title	**Effect of setting speed limit improperly on traffic safety**	
Brief Description	Speed limit is the maximum speed that is allowed for vehicle on a certain section of road. Thus, the speed limit is very important to set properly otherwise it would negatively affect the traffic safety. This project will review current procedures and guidelines of setting speed limit. The project will also include field speed study for locations with crashes for re-evaluation of speed limit. Key words: traffic safety, speed limit, and crashes.	
Prerequisite Courses	CE341	
Co-requisite elective courses	Advanced Traffic Engineering	
Design Content of the SDP	Literature Review, design methodology, data collection, and results and recommendations	
Constrains of the SDP	Speed Measurement Tool, obtaining accident data records	
Used Specifications and/or Codes		
Supervisor(s)	**Name**	**Signature**
	Dr.Omar Almutairi	

Qassim Engineering College
Civil Engineering Department
SDP – PROPOSAL, SEM. 391

Guide for use: This form is supposed to be used by the SDP committee in order to collect proposals for new **SDP's** from the faculty members then announce them to students and finally follow up the proposals applicability.

Academic year: 1440-1441 (2019 - 2020) Semester: ■ Fall ☐ Spring

SDP Title	**Design of an Integrated Solid Waste Management System for Buraydah City**	
Brief Description	In this project, student will design an integrated municipal solid waste management system for a residential area in Buraydah City. The students will perform the following tasks- • Study the applicable design criteria and standards in line with Vision 2030 of Saudi Arabia • Select a suitable residential (primarily) area in Buraydah City • Estimate the design population in the study area • Estimate the waste generation rates • Estimate the amount of solid waste generation from different source • Develop layouts for waste collection bins • Evaluate and optimize collection routes • Evaluate waste recycle, and waste reuse options • Design a transfer station if required. • Design landfill for final disposal • Cost estimations.	
Prerequisite Courses	CE 230 and CE 370	
Co-requisite Elective Courses	CE 475	
Design Content of the SDP	The project will be completed by the following step: • Design concept • Selection of a residential area in Buraydah • Data collection including layouts and waste generation rated • Estimation of future population and municipal waste quantities • Development of various options, e.g., two-bin system, and three bin system. • Cost comparisons • Design of collection routes • Design of transfer station • Design of Landfill • Report writing and submission	
Constrains of the SDP	Environmental Constraints: estimation of actual waste generation rates and uncertainties in public behavior towards three bin system. Economic Constraints: Cost estimations of collection, treatment, and disposal systems	
Used Specifications and/or Codes	- Applicable design criteria US and Saudi Arabia - Applicable design codes from local municipalities.	
Supervisor(s)	**Name**	**Signature**

	Dr. Husnain Haider	

Senior Design Project Committee		**Date of Announcement**
Name:	Signature:	
Name:	Signature:	
Name:	Signature:	

Follow up	
Announcement Feed Back	
Actions	