ESG 198 FUNDAMENTALS OF ENGINEERING CHEMISTRY (REQUIRED)

Credit: 3

COURSE CATALOG DESCRIPTION:

A quantitative introduction to chemistry (stoichiometry, bonding, states of matter, equilibrium) with emphasis on topics of interest to students in engineering (metals and semiconductors; thermochemistry; electrochemistry and corrosion; polymers). Labs include an introduction to analytical techniques, electrochemistry and chemical synthesis. Both quantitative and qualitative methods are emphasized. May not be taken for credit in addition to CHE 131/133, 141/143.

PRE- OR COREQUISITE(S): PHY 132 or 142 or 126 and 127; MAT 127 or 132 or 142 or AMS 161

TEXT(S) OR OTHER REQUIRED MATERIAL: JA Beran, Laboratory Manual for Principles of General Chemistry, Wiley; 7 edition (April 15, 2004), ISBN 0471214981;

COURSE LEARNING OUTCOMES	SOs	ASSESSMENT TOOLS
Students will gain an understanding of oxidation and reduction reactions as they relate to engineering applications, such as corrosion.	a, e, i, h, j	Homework assignments; quizzes; written exams
Students will learn to balance chemical equations, using proper nomenclature	a	Homework assignments; quizzes; written exams
Students will perform laboratory experiments related to solubility and pK.	a,b, e, j	quizzes; written exams
Students will perform laboratory experiments in electrochemistry.	a,b, e, j	quizzes; written exams

COURSE TOPICS:

Week 1. Nomenclature/introduction
Week 2. Oxidation and reduction reactions
Week 3. Periodic table and Periodic Law;
Week 4. States of matter
Week 5. Acids, bases, salts, pH
Week 6. Equations (e.g., stoichiometry)
Week 7. Equilibrium
Week 8. Metals and nonmetals
Week 9. Solubility product; pK
Week 10. electrochemistry
Week 11. Organic chemistry (nomenclature, structure, qualitative and quantitative analyses)
Week 12. Organic chemistry (balanced equations, reactions, synthesis)
Week 13. Introduction to nuclear chemistry

CLASS/ LABORATORY SCHEDULE:

ESG	198	FUNDMNTLS OF ENG CHEM	LEC	1	MW	6:50 PM	8:10 PM
			REC	R01	F		

CURRICULUM

This course contributes 3 credit hours toward meeting the required 32 hours of College-level Mathematics and Basic Science.

STUDENT OUTCOMES (SCALE 1-3):

A	B	C	D	E	F	G	H	I	J	K
3	3			2			2	2	2	

3 – Strongly supported **2 – Supported** **1-Minimally supported**

LEAD COORDINATOR(S) WHO PREPARED THIS DESCRIPTION AND DATE OF PREPARATION:

Elizabeth Casey 09/15/2016