CORROSION ENGINEERING (4250)

4250:101 Tools for Corrosion Engineering (2 Credits)
Corequisites: 3450:149 and 4200:110. Introduction to corrosion engineering. Basic concepts of engineering practice. Introduction to professional level software needed for later studies.

4250:105 Corrosion Engineering Computations (2 Credits)

4250:194 Design Project 1 (1 Credit)
Prerequisite: Permission. Individual design project in Corrosion Engineering that is supervised by a faculty member.

4250:200 Material and Energy Balances for Corrosion Engineers (4 Credits)
Prerequisites: [4200:121 or 4250:105], 3150:151 and 3450:221. Introduction to material and energy balance calculations applied to the solution of chemical processing and corrosion engineering problems.

4250:294 Design Project 2 (1-2 Credits)
Prerequisite: Sophomore Standing. Individual design project in Corrosion Engineering that is supervised by a faculty member.

4250:300 Fundamentals of Aqueous Corrosion (3 Credits)
Prerequisites: 4200:225 and [4200:305 or 4600:380] and admission to a engineering major within the College of Engineering and Polymer Science. Corequisite: 4250:301. Fundamentals of aqueous corrosion will cover corrosion tendencies, processes and rates at low temperature. An in-depth understanding of the aqueous corrosion mechanisms, materials performance, and the effects of stress will be covered.

4250:301 Aqueous Corrosion Lab I (1 Credit)
Prerequisites: 3150:154 and admission to an engineering major within the College of Engineering and Polymer Science. Corequisite: 4250:300. Laboratory exercises will reinforce the fundamentals of aqueous corrosion.

4250:305 Aqueous Corrosion Prevention (3 Credits)
Prerequisites: 3150:263, 4250:300 and admission to an engineering major within the College of Engineering and Polymer Science. Corequisites: 4250:306, 4300:202 and 4400:307. This course presents a functional approach to controlling and preventing aqueous corrosion based upon engineering methodologies to proper materials selection, organic coatings, chemical inhibitors, and electrochemical protection. Applications in specific industries will be covered.

4250:306 Aqueous Corrosion Lab II (1 Credit)
Prerequisites: 4250:301 and admission to an engineering major within the College of Engineering and Polymer Science. Corequisite: 4250:305. Laboratory exercises will reinforce the fundamentals of aqueous corrosion.

4250:310 Fundamentals of Dry Corrosion (3 Credits)
Prerequisites: 4250:300 and admission to an engineering major within the College of Engineering and Polymer Science. Corequisite: 4250:311. Fundamentals of dry/hot corrosion will cover corrosion tendencies, processes and rates at high temperature. An in-depth understanding of the high temperature corrosion mechanisms, materials performance, and the effects of stress will be covered.

4250:311 High Temperature Corrosion Lab (1 Credit)
Prerequisites: 4250:306 and admission to an engineering major within the College of Engineering and Polymer Science. Corequisite: 4250:310. Laboratory exercises will reinforce the fundamentals of high temperature corrosion.

4250:340 Corrosion Prevention (Dry) (3 Credits)
Prerequisite: 4250:305. Corequisite: 4250:310, 4600:380. This course presents a functional approach to controlling and preventing dry corrosion based upon engineering methodologies to proper materials selection, inorganic coatings, and passivation. Applications in specific industries will be covered.

4250:394 Design Project 3 (1-3 Credits)
Prerequisite: Junior Standing. Individual design project in Corrosion Engineering that is supervised by a faculty member.

4250:440 Corrosion Engineering Design I (3 Credits)
Prerequisites: 4250:305 and admission to an engineering major within the College of Engineering and Polymer Science. This course applies the lessons learned in corrosion prevention and laboratory courses to corrosion case studies. Solutions to existing corrosion problems will be developed based on the analysis of test data.

4250:441 Corrosion Engineering Design II (3 Credits)
Prerequisites: 4250:440 and admission to an engineering major within the College of Engineering and Polymer Science. This course focuses on understanding the financial, political, social and health implications of corrosion, corrosion mitigation, and corrosion prevention. Solutions to existing corrosion problems will be developed based on economic, political, social, and health issues. The course will also cover methodologies for preserving assets and reducing operation costs.

4250:450 Engineering Principles of Corrosion (3 Credits)
Prerequisite: Junior level standing or permission. Engineering principles for understanding corrosion and corrosion mitigation methods. Case studies of corrosion management to reliability and reduce corrosion. Multidisciplinary engineering enrollment encouraged.

4250:494 Design Project 4 (1-3 Credits)
Prerequisite: Senior Standing. Individual design project in Corrosion Engineering that is supervised by a faculty member.

4250:496 Special Topics in Corrosion Engineering (1-3 Credits)
Prerequisite: Permission. (May be repeated for a total of six credits). Topics selected from new and developing areas of corrosion engineering.

4250:497 Honors Project (1-3 Credits)
Prerequisites: Senior standing in Honors College or permission. Individual research or design project in Corrosion Engineering that is supervised by a faculty member. Conducted in accordance with the Honors College requirements.