COURSE #: CHE 343 (4 credits)	**COURSE TITLE:** Separation Processes
TERMS OFFERED: Fall	**PREREQUISITES:** CHE 230: Introduction to Material and Energy Balances, CHE 330: Chemical & Engineering Thermodynamics, Preceded or accompanied by CHE 342: Mass and Heat Transfer
TEXTBOOKS/REQUIRED MATERIAL: Separation Process Engineering: Includes Mass Transfer Analysis (4th Edition), Wankat, P.C., Prentice Hall, NJ (2012). ISBN: 0133443655	**COGNIZANT FACULTY:** Lenert, Tadd, Tessier
INSTRUCTOR: Tadd, Tessier	**FACULTY APPROVAL:** 2019-11-05
CoE BULLETIN DESCRIPTION: Introduction and survey of separations based on physical properties, phase equilibria, and rate processes. Emphasis on analysis and modeling of separation processes. Staged and countercurrent operations. Includes applications to chemical, biological, and environmental systems.	**COURSE TOPICS:** (number of hours in parentheses) 1. Classification and systems of separation units (3) 2. Equilibrium-based separations: a. General properties, operation, and complexities (9) b. Mass separating agents (10) c. Energy separating agents (10) 3. Rate-based separations (3)
COURSE STRUCTURE/SCHEDULE: Lecture: 3 per week @ 1 hour; Discussion: 1 per week @ 1 hour	
COURSE OBJECTIVES	Links shown in brackets are to course outcomes that satisfy these objectives. 1. Teach students the predominant separation processes used in chemical engineering [a-g] 2. Introduce students to chemical engineering processes and equipment [a-g] 3. Show students how previous work in mathematics and physics is useful to them [b-f] 4. Show students how the design of separation units impacts the environment [f] 5. Provide the opportunity for computer solution of problems [b-f]
COURSE OUTCOMES	Links shown in brackets are to ABET student outcomes 1-7 a. Explain the fundamentals of chemical engineering separation processes, with consideration of the environment. [1,2] b. Design distillation equipment including both batch and continuous, with consideration of the environment. [1,2] c. Design extraction systems [1,2] d. Design absorption and stripping units [1,2] e. Incorporate environmental concerns and applications, as well as knowledge of the hazards of separation processes, into the design and operation of separation equipment. [4,7] f. Explain the operation and design of adsorption, crystallization, membrane, and hybrid/integrated separation processes [1,2] g. Apply separation techniques to biological applications [1]
ASSESSMENT TOOLS	1. Weekly homework problems assess outcomes a-g 2. Written examinations assess outcomes a-g 3. End of term course evaluation provides student self-assessment of outcomes a-g