The University Of Toledo

New Graduate Course Proposal

* denotes required fields

1. College*: College of Engineering

   Department*: Civil Engineering

2. Contact Person*: Youngwoo Seo Phone: 530-8131 (xxx - xxxx) Email: youngwoo.seo@utoledo.edu

3. Alpha/Numeric Code (Subject area - number)*: CIVE - 8670

4. Proposed title*: Physicochemical Processes

   Proposed effective term*: 201740 (e.g. 201140 for 2011 Fall)

5. Is the course cross-listed with another academic unit? ○ Yes ◉ No

   Approval of other academic unit (signature and title)

   Is the course offered at more than one level? ○ Yes ◉ No

   If yes, an undergraduate course proposal form must also be submitted. If the undergraduate course is new, complete the New Undergraduate Course Proposal; if the undergraduate course is existing, submit an Undergraduate Course Modification Proposal.

6. Credit hours*: Fixed: 3 or Variable: to

7. Delivery Mode:

	Primary*	Secondary	Tertiary
a. Activity Type *	Lecture	Lecture	Recitation
b. Minimum Credit Hours *	3		
Maximum Credit Hours *	3		
c. Weekly Contact Hours *	3		

8. Terms offered: ☐ Fall ☑ Spring ☐ Summer

   Years offered: ○ **Every** ◉ **Alternate**

Year **Years**

9. Are students permitted to register for more than one section during a term? ○ No ◉ Yes

   May the courses be repeated for credit? ◉ No ○ Yes Maximum Hours

10. Grading System*:
    - ◉ Normal Grading (A-F, S/U, WP/WF, PR, I)
    - ○ Satisfactory/Unsatisfactory (A-C, less than C)
    - ○ Grade Only (A-F, WP/WF, PR, I)
    - ○ Audit Only
    - ○ No Grade

11. Prerequisites (must be taken **before**): i.e. C or higher in (BIOE 4500 or BIOE 5500) and C or higher in MATH 4200

    General chemistry or equivalent courses, Fluid mechanics or equivalent

    ◉ PIN (Permisson From Instructor) ○ PDP (Permission From Department)

    Co-requisites (must be taken **together**):

12. Catalog Description* (**75 words Maximum**)

    The course will discuss theories and designs for water treatment processes.

13. Attach a syllabus - a syllabus template is available from the University Teaching Center. Click here for the Center's template.

File Type	View File
Syllabus	View

14. Comments/Notes:

The course was taught before for graduate students. The instructor wants to make an official course section.
The course will cross-listed with CIVE 6612. For PhD level, additional assignments will be given as term projects.

15. Rationale:

Course Approval:

Department Curriculum Authority:	douglas nims	Date	2017/03/19
Department Chairperson:	Ashok Kumar	Date	2017/03/21
College Curriculum Authority or Chair:	Efstratios Nikolaidis	Date	2017/04/18
College Dean:	Mohamed Samir Hefzy	Date	2017/04/18
Graduate Council:	Constance Schall, GC mtg 5/2/17	Date	2017/05/03
Dean of Graduate Studies:	Amanda C. Bryant-Friedrich	Date	2017/05/04
Office of the Provost :	marcia king-blandford	Date	2017/05/15

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Administrative Use Only

Effective Date:	2016/08/22 (YYYY/MM/DD)
CIP Code:	14.0801
Subsidy Taxonomy:	doctoral
Program Code:	
Instructional Level:	

Registrar's Office Use Only

Processed in Banner on:	
Processed in Banner by:	
Banner Subject Code:	
Banner Course Number:	
Banner Term Code:	
Banner Course Title:	

CIVE 8612

Physicochemical Processes for Water Quality Control
Spring Semester 2017

Course Information

Text book:	None (Lecture handouts will be provided)
Reference books:	Water Treatment Principles and Design, Third Edition, John Wiley, 2012 Unit Operations and Processes in Environmental Engineering, 2nd Edition, T.D. Reynolds and Paul A. Richards, PWS Publishing Company, 1996 Water Quality and Treatment: A Handbook of Community Water Supplies, 5th Edition, American Water Works Association, 1999
Class Instructor:	Dr. Young Seo, Ph.D.
Office:	Nitschke 3031
Phone:	419-530-8131 (includes voicemail)
Email:	youngwoo.seo@utoledo.edu
Class Hours:	T 4:15 – 6:45 at PL 3190
Office Hours:	To be determined

Course Description
The course topics will include aquatic chemistry, particle behavior (colloidal stability) in water, coagulation-flocculation, sedimentation/floatation, filtration (granular media filtration, membrane filtration), softening, disinfection (disinfection kinetics, models, parameter estimation, and disinfection by-products), adsorption (isotherm theories and parameter estimation), and microbial quality control in the water distribution system.

Course Goal
- To introduce and apply theoretical concepts of chemical and physical process engineering
- To enable students to design physicochemical treatment processes with practical design constraints

Course Assignments:
Several homework assignments will be distributed throughout the semester (a minimum of one week before their due date). Due dates for the homework will be announced in class and included on the handout. Occasionally, the instructor may provide an *ungraded* in-class assignment to gauge the student's learning.
The term project involves critical literature review related to current water quality issues. Multiple small assignments will be provided for students to prepare a final review paper and presentation.

Grading

	% of Final Grade
Two Exams	60 %
Home Works	15 %
Term Project	25 %
Total	100 %

Term Project

For a Ph.D. level student, either full literature review paper project or water treatment plant design project will be assigned.

Computer Usage

General computer skills (excel spreadsheet and solver) are expected.

Other Supplementary Materials

- Lecture handouts from Dr. Tobiason (University of Massachusetts at Amherst)
- Relevant journal articles

Course Policies

Make-up exams and late homework assignments will not be permitted unless an acceptable excuse has been provided in accordance with the University of Toledo Missed Class Policy (http://www.utoledo.edu/facsenate/missed_class_policy.html). In the case of excused absences, the instructor should be contacted prior to the scheduled assignment or exam. In case of extenuating circumstances, please contact the instructor as early as is possible.

Academic Dishonesty

You are encouraged to work together in groups and discuss assignments. However, any written work that you submit must be substantially your own. Do not submit someone else's work as your own and do not lift unattributed material from the web. Penalties range from an F on the assignment, to suspension and expulsion. Refer to the university's policy on Academic Dishonesty found on pp. 25-26 of the university catalog.

Course Schedule