



University of Wisconsin Madison

CHEM 505 section 001 Syllabus

Aspects of Industrial Chemistry and Business Fundamentals

COURSE INFORMATION

Aspects of Industrial Chemistry and Business Fundamentals

CHEM 505 001 (3 Credits)

Spring 2017-2018 [1184]

Description

The objective of this course is to educate students in the chemistry and chemical engineering that defines societies' standard of living. Commercial chemical processes will be reviewed. Practical realities of how a discovery moves from research to commercial product will be taught through examples and case studies. Financial concepts that guide investment will be reviewed.

Prerequisite(s)

Junior standing and Chem 345

Instruction Mode

Classroom Instruction

Department: CHEMISTRY

College: Letters and Science

Canvas Course URL

<https://canvas.wisc.edu/>



2017-2018 Spring [1184]

Term Start Date: Tuesday, 23-Jan-2018 **Term End Date:** Friday, 18-May-2018

Location and Schedule: Chemistry Building B371 TR 1:00 PM-2:15 PM

CRN: 224024296

How the Credit Hours are Met

This class meets for two 75-minute class periods each week over the semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 3 hours out of classroom for every class period. The syllabus includes more information about meeting times and expectations for student work.

INSTRUCTORS AND TEACHING ASSISTANTS

Instructors



IVE HERMANS

✉ HERMANS@CHEM.WISC.EDU



William BANHOLZER

✉ WBANHOLZER@WISC.EDU

Instructor Availability

after lecture and by appointment

TA Office Hours

GRADING AND COURSE MATERIALS

Course Learning Outcomes

- 1 Provide students with an overview of the most important value-chains in the chemical industry and connect the fundamental chemistry and chemical engineering principles learned in other courses with real-world applications. Teach students how laboratory discoveries can be legally protected and successfully commercialized and how to assess alternative technologies against the state-of-the-art.
[S5273]

Grading

Grading will be based upon the evaluation of research problems (40%), a midterm exam 20%, a cumulative final exam (30%), and homework- business simulations/class participation (10%).

Letter grades will be assigned, relative to the overall performance of the class using the following intended grading scale as a starting point:

A 90 to 100% B 80 to 89.9% C 70 to 79.9% D 60 to 69.9% F <60%

Discussion Sessions

N/A

Laboratory Sessions

N/A

Required Textbook, Software, & Other Course Materials

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OTHER COURSE INFORMATION

Other Course Information

Topics covered include the following:

1. Chemical industry integration, feedstock, product flow.
2. Industrial important inorganic chemistry (e.g., Chlor-alkali, nitric, sulfuric, and phosphoric acid)
3. Industrial important organic chemistry including:
 1. Organic Feedstocks (petroleum, natural gas, bio-derived)
 2. C1-chemistry (methane, syn-gas, methanol and formaldehyde)
 3. C2-chemistry (ethane, ethene, ethylene oxide, ethylene glycol and key derivatives)
 4. C3-chemistry (propane, propene, propylene oxide, propylene glycol)
 5. C4-chemistry (butane, butenes and butadiene)
 6. C6 – aliphatic (from cyclohexane to nylon)
 7. Aromatics (benzene, toluene and xylenes (BTX) and their key-derivatives like phenol, benzoic acid and terephthalic acid)
 8. Long chain linear acids, alcohols and surfactants
 9. Plastics (overview of the most important crystalline and amorphous polymers and their applications)
4. Industrial Business fundamentals including:
 1. Financial fundamentals (NPV, IRR, Cash Flow)
 2. Source of Competitive Advantage (IP)
 3. Large Corporations, Small Company, Start-up VC
5. business simulation, and a variety of case studies

Recommended Texts for additional information (not required):

Weissermel, Hans-Jurgen Arpe, Industrial Organic Chemistry, Third Edition VCH-Wiley, 1997 ISBN-13: 978-3527288380

A. Wittcoff, B. G. Reuben, J. S. Plotkin, Industrial Organic Chemicals, Second Edition 2004 John Wiley & Sons, 2004, ISBN 0-471-44385-9

M. Schilling, Strategic Management of Technology Innovation Fourth Edition, McGraw-Hill Irwin, 2010, ISBN 978-0-07-802923-3

Clifford L. Spiro, From Bench to Boardroom, Springer, 2017, ISBN 978-3-319-64154-6

ACADEMIC POLICIES



ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>



ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA."

<http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>



DIVERSITY & INCLUSION

Institutional statement on diversity: "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status,

abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.”

<https://diversity.wisc.edu/>



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