

<b>Instructor</b>	Prof. John Yin ( <a href="mailto:john.yin@wisc.edu">john.yin@wisc.edu</a> )		
office hour	Tuesdays, 12:30-1:30pm, 3633 Engineering Hall or arrange by email		
<b>Teaching Assistants</b>	Eun Seo “Michelle” Choi	<a href="mailto:echoi45@wisc.edu">echoi45@wisc.edu</a>	
	Byungjun “Jay” Lee	<a href="mailto:blee267@wisc.edu">blee267@wisc.edu</a>	
office hours	to be announced		
<b>Lectures</b>	MWF	11:00-11:50 pm	3345 Engineering Hall
<b>Discussion</b>	M	1:20-2:10pm	3345 Engineering Hall
Course website	<a href="https://canvas.wisc.edu/courses/332470">https://canvas.wisc.edu/courses/332470</a>		
Textbook (required)	<i>Process Dynamics, Modeling, and Control</i> BA Ogunnaike and WH Ray, Oxford Univ. Press, 1994		
Grading	Term Exams	50%	
	Final Exam	40%	
	Homework (drop lowest)	10%	
	Class Participation (discretionary)	0–1%	
Hourly	Exam 1	March 3 (Friday, in class)	
	Exam 2	April 14 (Friday, in class)	
FINAL EXAM	May 12 (Friday) 2:45-4:45 pm		

**Homework** will be due by on-line submission every Wednesday at 9:00am. Since solutions will be posted within 24h on **Canvas**, late homework will earn a grade of zero (0). The use of computers on homework is encouraged, but all steps of a solution should be clearly and thoroughly documented. Homework may be discussed with anyone but not copied. You may be called upon to explain your work.

**PIAZZA** For class discussions, will use Piazza, a system designed for efficient communication. As questions arise on course material, you are encouraged to look through existing posts on Piazza, *before* contacting the teaching staff; if you don’t see your question addressed, then add a new post to Piazza. **Feel free to post questions or notes anonymously**. Use private posts to the instructors (instead of to the entire class) only for private matters (e.g., special accommodation is needed). If you have any problems or feedback for the developers, email [team@piazza.com](mailto:team@piazza.com).

**BYOL** Bring your own lunch. Get to know your instructor, Prof. Yin, outside of class and help him get to know you. Together with one or two of your classmates, suggest dates and times your group could lunch for 30-45min with Prof. Yin at the Discovery Building.

**Class Schedule** (subject to change) follows below.

Week of		TOPIC (chapter in <u>Ogunnaike and Ray</u> )
Jan	23	Introduction (1)
		<b>PROCESS DYNAMICS</b>
Feb	30	Elements of dynamic analysis (3), The process model (4)
	6	First-order systems (5)
	13	Higher-order systems (6)
	20	Inverse-response systems (7)
	27	Frequency-response analysis (9), EXAM 1
March	6	Nonlinear systems (10), Stability (11)
		<b>PROCESS MODELING AND IDENTIFICATION</b>
	13	Spring Recess: no discussion or class meetings
	20	Theoretical and empirical process modeling (12, 13)
		<b>PROCESS CONTROL</b>
April	27	Feedback control (14)
	3	Feedback controller design (15, 16)
		<b>MULTIVARIABLE PROCESS CONTROL</b>
May	10	Multivariable systems (20-21), EXAM 2
	17	Model predictive control (27), Process safety (class notes)
	24	Batch processing and control (class notes)
	1	Review
	12	FINAL EXAM

### **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/>