Fall
2022

SCUPI
Sichuan University - Pittsburgh Institute

Prerequisites:

ME 1041 Mechanical Measurements 1

Textbook:

Theory and Design for Mechanical Measurements, 7th Edition, Figliola and Beasley, Wiley, 2019. Other resources will be released on BB platform.

Website: https://pibb.scu.edu.cn/

Topics Covered:

Topic 1: Solid Mechanics and Design
Geared Systems
Forced and Free Vibrations
Uniaxial Tension Test of Materials
Heat Treatment of Materials

Topic 2: Control System
Automated Level Control using Programmable Logic Controllers (PLCs)
Fundamentals of Feedback Control
PD Control of Unstable Systems
Robot Manipulator Control

Topic 3: Thermal & Fluid Labs
Fluid Mechanics
Bench-top Heat Exchangers
Radiation Heat Transfer

Course Schedule:

Week	Lecture	Lab
1	Feb 23 Course Introduction	Feb 28 Lab Introduction and Safety
2	March 2 Gear Systems	March 7 Gear Systems
3	March 9 Uniaxial Tension Test	March 14 Uniaxial Tension Test W1
4	March 16 Forced and Free Vibrations	March 21 Uniaxial Tension Test W2 Forced and Free Vibrations W1
5	March 23 Heat Treatment of Materials	March 28 Forced and Free Vibrations W2 Heat Treatment of Materials W1

	March 30 r e e ie	April 4 Heat Treatment of Materials W2
	$ULO (DP,	April 11 No lab
	$ULO 3URJUDPPDEOH/RJLF&RQWURROOHUV	April 18 Programmable Logic Controllers
	$ULO)XQGDPHQWDOVRI)HHGEDFN&RQWURO	April 25 Fundamentals of Feedback Control
1	$ULO 8QVWDEOH6\VWHPV	May 2 Unstable Systems
1	0D\ 5RERW0DQLSXODWRU&RQWURO	May 9 Robot Manipulator Control
1	0D\ (DP,,	0D\ No Lab
1	May 18 Fluid Mechanics	0D\ Fluid Mechanics W1
1	May 25 Heat Exchangers	0D\ Fluid Mechanics W2 Heat Exchangers W1
1	June 1 Radiation +HDW 7UDQVIHU	-XQH Heat Exchangers W2 Radiation W1
1	June 8 &&VH Review	-XQH Radiation W2
1	Final Exam (TBD)	

Course Gradings:

- Studio 5 %
- δ %
- Lab reports 30 %
- Midterm exam I 20 %
- Midterm exam II 20 %
- Final exam 20 %

Grading Scale:

Letter	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Percentage (%)	100~90	89~85	84~80	79~76	75~73	72~70	69~66	65~63	62~61	60	<60

Class Policies:

- On-time attendance at all class activities is expected. Student is responsible for any material that was covered, and any changes to the exam dates and homework assignments announced in class.
- In general, no late assignment or make up exams will not be accepted. If you have a serious conflict with an exam schedule, you must discuss it with the instructor and **take the exam early**. Failure to contact the instructor prior to the exam or assignment due date will result in **a zero** on that exam/assignment. Exams missed due to a serious illness or a family emergency (these must be documented) will be dealt with on a case-by-case basis according to the University Policy.
- Late submission for studio or homework is calculated based on the following equation

  Late submission full mark = 100% $\times r^n$

  $r = 0.8$: discounted return coefficient; n : number of late weeks and n is an integer number which will be round up, e.g. $n = 1$ for the late submission within a week
- Any questions regarding the grading discrepancy should be brought up **within a week** after returning the homework, report or exam.
- Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation in oral or written form. Such violations will be dealt with severely, in accordance with University policy.

Laboratory Policies:

- **Students must attend all scheduled labs**. Exceptions will be made for a valid excuse consistent with University Policy. If you cannot attend a laboratory, you must contact the instructor prior to the lab session in order to reschedule. While in the laboratory, all safety guidelines and procedures must be followed. Failure to comply with safe laboratory practices will result in removal from the course.