North Central State College
MASTER SYLLABUS
2019-2020

A. <u>Academic Division</u>: Business, Industry and Technology

B. <u>Discipline</u>: Mechanical Engineering

C. <u>Course Number and Title</u>: ENGR 4210 Design of Engineering Experiments

D. <u>Course Coordinator</u>: Mike Beebe
   <u>Assistant Dean</u>: Toni Johnson, PhD

   <u>Instructor Information</u>:
   - Name: Click here to enter text.
   - Office Location: Click here to enter text.
   - Office Hours: Click here to enter text.
   - Phone Number: Click here to enter text.
   - E-Mail Address Click here to enter text.

E. <u>Credit Hours</u>: 3

F. <u>Prerequisites</u>: MATH1151

G. <u>Syllabus Effective Date</u>: Fall, 2019

H. <u>Textbook(s) Title</u>:

   Introduction to the Design & Analysis of Experiments
   - Authors: Canavos, Koutrouvelis
   - Copyright Year: 2009
   - Edition: 1st Edition
   - ISBN: 9780136158639

I. <u>Workbook(s) and/or Lab Manual</u>: None; Class Handouts will be distributed

J. <u>Course Description</u>: This course prepares students to analyze statistically designed experiments and their importance in data analysis, industrial experiments, role of randomization, fixed and random effect models and ANOVA, block design, Latin square design, factorial and fractional factorial designs and their analysis.

K. <u>College-Wide Learning Outcomes</u>:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L.   Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Definition of an experiment	Report, quiz, midterm, final
2. Design of experiments statistical problem solving and analysis	Quiz, midterm
3. Use of Minitab software	Lab work, quiz and midterm, final
4. Design an experiment	Quiz, report
5. Perform a factorial analysis	Quiz, midterm, and final
6. Perform an ANOVA analysis	Quiz, midterm, and final
7. Perform a Weibull analysis	Midterm and final exam
8. Perform a Taguchi analysis	Midterm and final

ABET Outcomes:
- *Outcome b.* Use of computer aided drafting and design software;
- *Outcome c.* Perform selection, set-up, and calibration of measurement tools/instrumentation;
- *Outcome k.* Application of industry codes, specifications and standards;
- *Outcome l.* Technical communication typically used in preparation of engineering proposals, reports, and specification.

M.   Topical Timeline (Subject to Change):

Unit 1   Experiments and types of analysis performed
Unit 2   Minitab Software Introduction
Unit 3   Design of Experiments Methods
Unit 4   Factorial Method
Unit 5   ANOVA Method
Unit 6   Weibull Method
Unit 7   Taguchi Method

N.   Course Assignments:

- Reports
- Quizzes
- Midterm
- Final Exam

O.   Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average

60-62	D-	0.67	Poor
00--59	F	0.00	Failure

P.   <u>Grading and Testing Guidelines</u>:

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Q.   <u>Examination Policy</u>:

Click here to enter text.

R.   <u>Class Attendance and Homework Make-Up Policy</u>:

Click here to enter text.

S.   <u>Classroom Expectations</u>:

Click here to enter text.

T.   <u>College Procedures/Policies</u>:

Important information regarding College Procedures and Policies can be found on the [syllabus supplement](https://sharept.ncstatecollege.edu/committees/1/curriculum/SiteAssets/SitePages/Home/SYLLABUS%20SUPPLEMENT.pdf) located at https://sharept.ncstatecollege.edu/committees/1/curriculum/SiteAssets/SitePages/Home/SYLLABUS%20SUPPLEMENT.pdf

The information can also be found Choose an item.