

Course Change Request

New Course Proposal

Date Submitted: 02/26/19 10:22 am

Viewing: **ECEN 713 : Data Sciences and Applications for Modern Power**

Last edit: 03/05/19 11:19 am

Changes proposed by: cbrodriguez

Faculty Senate
Number

Contact(s)

In Workflow

1. **ECEN Department Head**
2. **Curricular Services Review**
3. **EN Committee Preparer GR**
4. **EN Committee Chair GR**
5. **EN College Dean GR**
6. **GC Preparer**
7. **GC Chair**
8. **Faculty Senate Preparer**
9. Faculty Senate
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path

1. 02/21/19 3:03 pm
Crystal Rodriguez (cbrodriguez):
Approved for ECEN Department Head
2. 02/25/19 1:43 pm
Terra Bissett (t.bissett): Rollback to Initiator
3. 02/26/19 10:23 am
Crystal Rodriguez (cbrodriguez):
Approved for ECEN Department Head
4. 02/28/19 4:21 pm
Terra Bissett (t.bissett):
Approved for Curricular Services Review
5. 03/08/19 4:30 pm
Jennifer Veracruz (jveracruz):

- Approved for EN
Committee
Preparer GR
6. 03/27/19 1:17 pm
Harry Hogan (h-
hogan): Approved
for EN Committee
Chair GR
7. 03/27/19 1:19 pm
Harry Hogan (h-
hogan): Approved
for EN College
Dean GR
8. 04/23/19 8:15 am
LaRhesa Johnson
(lrjohnson):
Approved for GC
Preparer
9. 05/02/19 4:12 pm
LaRhesa Johnson
(lrjohnson):
Approved for GC
Chair

Name	E-mail	Phone
Crystal Rodriguez	cbrodriguez@tamu.edu	9798629188

Course prefix	ECEN	Course number	713
Department	Electrical & Computer Eng		
College/School	College of Engineering		
Academic Level	Graduate		
Academic Level (alternate)	Undergraduate		
Effective term	2020-2021		
Complete Course Title	Data Sciences and Applications for Modern Power		
Abbreviated Course Title	DATA SCIENCES & APP MODERN PWR		

Catalog course description	Introduction to the foundation of high dimensional statistics; data analytical tools necessary to model and operate a modern power system; projects offer realistic data sets to construct tools and models for smart grid operations.
Prerequisites and Restrictions	ECEN 420 or ECEN 460, or equivalent.
Concurrent Enrollment	No

Should catalog prerequisites / concurrent enrollment be enforced?	No	
Crosslistings	No	Crosslisted With
Stacked	No	Stacked with

Semester 3 Credit Hour(s)	Contact Hour(s) (per week):	Lecture: 3 3	Lab: 0	Other: 0	Total
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Repeatable for credit? No

Three-peat? No

CIP/Fund Code 1410010006

Default Grade Mode Letter Grade (G)

Alternate Grade Modes Satisfactory/Unsatisfactory

Method of instruction Lecture

Will this course be taught at another branch? No

Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) No

Will this course be taught as a distance education course? No

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

Program(s)
(MEN-CEEN) Master of Engineering in Computer Engineering
(MEN-ELEN) Master of Engineering in Electrical Engineering
(MS-CEEN) Master of Science in Computer Engineering
(MS-ELEN) Master of Science in Electrical Engineering
(PHD-CEEN) Doctor of Philosophy in Computer Engineering
(PHD-ELEN) Doctor of Philosophy in Electrical Engineering

Course Syllabus

Syllabus: Upload syllabus

Upload syllabus [Syllabus_SP2020_Xie.doc](#)

Letters of support or other documentation No

Additional information

Reviewer Comments **Terra Bissett (t.bissett) (02/25/19 1:43 pm):** Rollback: Please update catalog course description to comply with catalog style guide (<http://registrar.tamu.edu/Our-Services/Curricular-Services/Catalog/Style-Guide-for-Catalog-Course-Descriptions>); Syllabus: Please update ADA statement to the standard statement.
Terra Bissett (t.bissett) (02/28/19 4:17 pm): Minor edits made to catalog course description to comply with catalog style guide.
Terra Bissett (t.bissett) (02/28/19 4:21 pm): Updates received.

Reported to state?

Add
CS

Key: 19052



Course title and number ECEN 713: Data Sciences and Applications for Modern Power Systems
Term (e.g., Fall 200X) SP 2020
Meeting times and location Tu/Thur 5:30-6:45pm WEB 049

Course Description and Prerequisites

This course introduces the foundation of high dimensional statistics and data analytical tools necessary to model and operate a modern power system; course projects offer realistic data sets to allow students to construct tools and models for smart grid operations

Prerequisites: ECEN 420 or 460, or equivalent.

Learning Outcomes

We will introduce basics of high dimensional space. We will introduce a suite of tools for statistical time series analysis and dimensionality reduction. We will discuss the differences between first principle models and data-driven models in real-time operations. Classroom discussion and computer-based simulation projects will prepare the students to understand better how to integrate data-driven and physics-based reasoning in modern power systems.

Instructor Information

Name Le Xie
Telephone number 9798457563
Email address Le.xie@tamu.edu
Office hours Tuesdays 4-5pm
Office location WEB 301H

Textbook and/or Resource Material

There is no official textbook in this course. The instructor will post reading materials as the course progresses.

Grading Policies

Homework Assignments (20%) + Mid-term Exam (30%) + Final Project (40%) + In-class Quiz (10%)

Grading Scale: 90-100 A; 80-89 B; 70-79 C; 60-69 D; below 60 F

Attendance and Make-up Policies

Attendance is required in this course in accordance of student rule 7, <http://student-rules.tamu.edu/rule07>. Any sick or excused absence will require students' written note to the instructor at least 8 hours in advance.

Course Topics, Calendar of Activities, Major Assignment Dates (Subject to Change)

Week	Topic	Required Reading
1	Intro to Data Availability in Power Systems	
2	Statistics Basics	
3	High Dimensional Space	
4	Singular Value Decomposition	
5	Application of SVD in Power System Anomaly Detection	
6	Application of SVD in Bad Data Processing for State Estimation	
7	Recap & Mid-term Exam	
8	Statistical Time Series Analysis	
9	Systems Identification Basics	
10	Application of Time Series Analysis in Demand Response	
11	Application of Time Series Analysis in Renewable Forecasting	
12	Application of Time Series Analysis in Electricity Price Forecast	
13	Application in Power System Model Validation	
14	Final Project Presentation, Report Due	

Other Pertinent Course Information

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in White Creek complex on west campus, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

Academic Integrity

For additional information please visit: <http://aggiehonor.tamu.edu>

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”