New Courses

Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

• Submit original form and attach a course syllabus.•

1. This request is submitted by the Department of Aerospace Engineering

2. Course prefix, number and complete title of course: AERO 661 Optical Methods in Aerospace Engineering

3. Catalog course description (not to exceed 50 words): Analysis and design of imaging and interferometric instruments for flight in and above the atmosphere and ground-based observation of orbiting objects; assessment of optical component and system performance.

4. Prerequisite(s): Graduate classification

   Cross-listed with: _____

   Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

   b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*
   MS, MEng, PhD in aerospace engineering or related fields

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
AERO	661	OPTICAL METHODS FOR AERO

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	HCE Code
03	00	03	14270100006	0100	14-15	00 3632

Level: 6

Approval recommended by:

Rodney D. Bowersox/John E. Hurtado
Department Head - *Type Name & Sign* — Date 6-7-2013

Department Head - *Type Name & Sign* (if cross-listed course) — Date

Chair, College Review Committee Scott Miller — Date 6/12/13

Dean of College — Date 6/12/13

Dean of College Scott Miller — Date 8-22-13

Submitted to Coordinating Board by:

Associate Director, Curricular Services — Date

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/09

TEXAS A&M UNIVERSITY

SYLLABUS

AEROSPACE ENGINEERING

Course title and number	**AERO 661 – Optical Methods in Aerospace Engineering**
Term	**Fall 2015**
Credit/Hours	**3.0**
Meeting times/location	TR 2:20-3:35 PM / HRBB 134

Course Description and Prerequisites

Analysis and design of imaging and interferometric instruments for flight in and above the atmosphere and ground-based observation of orbiting objects; assessment of optical component and system performance.

Prerequisite: Graduate Classification.

Learning Outcomes or Course Objectives

Students will gain understanding of:

- mathematical modeling of optical devices and systems of varying degrees of complexity,
- mathematical modeling of errors and aberrations in optical components and systems,
- measurement of aberrations and evaluation of optical system performance,
- design and optimization of optical systems for high altitude, high speed and space flight,
- manipulation of imaging and temporal non-imaging data to detect or enhance objects or events,
- detector selection for specific environmental or mission requirements.

Instructor Information

Name	Thomas C. Pollock
Telephone number	979-845-1686
Email address	pollock@tamu.edu
Office hours	TBA
Office location	HRBB 741B

Textbook and/or Resource Material

Texts and reference materials (purchase not required): *Principles of Optics* by Born and Wolf, *Introduction to Lens Design* by Geary.

Grading Policies

Homework:	33 percent
Mid-term exam:	33 percent
Project:	34 percent
	100 percent

A 90 – 100%
B 80 – 89%
C 70 – 79%
D 60 – 69%
F below 60%

Course Topics

Topic	Weeks
1. Introduction and review of imaging optics	Lectures 1 - 4
1.1 The E-M spectrum and imaging sensors	(Weeks 1 & 2)
1.2 Image formation: point objects and extended objects	
1.3 Refractive and reflective optical components	
1.4 2D Fourier transforms	
2. Detectors	
2.1 CCD	Lectures 5 - 6
2.2 CMOS	(Week 2)
2.3 Light amplification	
2.4 Photon counters	
2.5 Non-imaging	
2.6 Noise	
3. Aberrations and image degradation	
3.1. Seidel and Zernike polynomials	Lectures 7 - 14
3.2 Point spread functions	(Weeks 3 – 5)
3.3 Optical transfer functions	
3.4 Optical tolerances and performance	
3.5 Resolution limits	
3.6 Optical model of the atmosphere	
3.7 Thermal, structural and mechanical effects on optical components	
3.8 Control of stray light	
4. Design of imaging optics	
4.1 Achromatic Doublet	Lectures 16 - 22
4.2 Apochromatic Triplet	(Weeks 6 – 8)
4.3 Petzval corrector	
4.4 Double Gauss and related camera lenses	
4.5 Single mirror systems	
4.6 Multiple mirror systems	
4.7 Optimization to minimize or manage aberrations	
4.8 Designing for high g, high altitude and space flight	
5. Image analysis, manipulation and enhancement	
5.1 Noise reduction algorithms	Lectures 23 - 29
5.2 Filter algorithms - convolution	(Weeks 10 - 12)
5.3 Deconvolution	
5.4 Super-resolution and faint object detection	
5.5 Shape detection and identification	
5.6 Enhancement algorithms	
6. Visible wavelength interferometers	
6.1 Configuration and design	Lectures 30 - 32
6.2 Remote data collection and measurement of material properties	(Week 13)
6.3 Spectroscopy of celestial objects	
7. Laboratory Experiments/Demonstrations (during class hours)	
7.1. Measurement of the physical parameters of imaging systems	Week 4
7.2. Measurement of point spread functions and determination of modulation transfer functions of imaging systems.	Week 6
7.4. Remote measurement and analysis of reflective surfaces	
7.3. Interferometric measurements	Week 13
8. Introduction to project topics	Week 9
8.1. Design of imaging optics	
8.3. Algorithms for image noise reduction	
8.4. Algorithms for shape detection	
8.5. Observability of objects	
8.6. Other as proposed	
9. Project presentations	Week 14

Other Pertinent Course Information

Students are expected to attend class. For additional information visit the student rules website on attendance: http://student-rules.tamu.edu/rule07 and http://student-rules.tamu.edu/academicrules .

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 Cain Hall, 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."

Texas A&M University
Departmental Request for a New Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attach a course syllabus.•

1. This request is submitted by the Department of: Electrical and Computer Engineering

2. Course prefix, number and complete title of course: ECEN 715Physical and Economical Operations of Sustainable Energy Systems

3. Catalog course description (not to exceed 50 words):

Operational issues for sustainable electric energy systems. Basic relevant topics in engineering, optimization and economic concepts. Modular view of individual electric energy processing components. Physical and market operations in electricity industry in support of sustainable energy integration. Computer simulations and demonstrations to create and evaluate examples of power systems.

4. Prerequisite(s): ECEN 214, 420, 460 or instructor approval

Cross-listed with: Stacked with ECEN 415

Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☑ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☑ No If yes, this course may be taken _____ times.
Will this course be repeated within the same semester? ☐ Yes ☑ No

7. This course will be:

a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*
MEN, MS, Ph.D. in electrical and computer engineering

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
ECEN	715	PHYS ECON OP SUST ENERGY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code
03	00	03	14100100060	0036	13-14	003632

Level: 6

Approval recommended by:

C. Singh Gnana Narayanan
Department Head - *Type Name & Sign* Date

Department Head - *Type Name & Sign* Date
(if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Chair, College Review Committee 6/12/13
Date

Dean of College 6/12/13
Date

Dean of College 8-22-13
Date

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/09

TEXAS A&M UNIVERSITY

SYLLABUS

Course title and number	ECEN 715: Physical and Economical Operations of Sustainable Energy Systems
Term (e.g., Fall 200X)	Fall 201X
Meeting times and location	TBA

Course Description and Prerequisites

This course aims to introduce graduate students the operational issues for sustainable electric energy systems. The first part of the course will introduce basic engineering, optimization and economic concepts relevant to this course. The second part of the course will discuss the "modular" view of individual electric energy processing components (e.g., variable generation, flexible demands). The third part of this course will present both physical and market operations in today's changing electricity industry. Computer simulations and demos will be available for students to create and evaluate examples of power systems.

Prerequisite: ECEN 214, ECEN 420/460, or permission from the instructor

Learning Outcomes or Course Objectives

We will discuss a broad variety of important engineering and economics issues related to integration of sustainable energy resources. We will introduce the key differences in operations and planning at the system level, as well as at the individual power producers' level. Classroom discussion and final project presentations will prepare the students to understand better how to plan and operate sustainable electric energy systems with many more renewable energy resources.

Instructor Information

Name	Dr. Le Xie
Telephone number	979-845-7563
Email address	lxie@ ece.tamu.edu
Office hours	TBA
Office location	WEB 301H

Textbook and/or Resource Material

1. D.S. Kirschen and G. Strbac, Fundamentals of Power System Economics, Wiley 2006
2. Published papers assigned by the instructor

Grading Policies for Graduate Students in 689

Homework Assignments (20%) + Mid-term Exam (25%) + Final Exam (25%) + Final Project (25%) + In-class Quiz (5%)

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

Course Topics, Calendar of Activities, Major Assignment Dates

Lecture	Date	Topic

#1		Course Motivation and Overview; Syllabus
#2		Basic Concepts from Economics [1]. Ch 2
#3		Basic Concepts from Economics [1]. Ch 2
#4		Basic Concepts from Optimization
#5		Basic Concepts from Optimization
#6		Conventional Generation Resources
#7		Renewable Variable Energy Resources: Wind
#8		Renewable Variable Energy Resources: Solar, and others
#9		Conventional Electricity Demands
#10		Flexible Electricity Demands in Smart Grids
#11		Electric Power System Fundamentals: Power Flows
#12		Balancing Supply and Demand: ED and Optimal Power Flows
#13		Balancing Supply and Demand with many Variable Generation Resources
#14		Balancing Supply and Demand in the Regulated Industry and Electricity Markets
#15		Material Review; Simulations Demonstrations
#16		Midterm Exam
#17		Balancing Supply and Demand Deviations from Forecast in the Regulated Industry;
#18		Ancillary Service Markets as a Means of Balancing Demand Deviations from Forecast in the Changing Industry
#19		Participating in Markets for Electric Energy [1], Ch 4
#20		Participating in Markets for Ancillary Services
#21		Power Delivery under System Constraints in the Regulated Industry (Optimal Power Flow)
#22		Transmission Networks and Electricity Markets
#23		Nodal Markets: LMP Fundamentals
#24		Nodal Markets: LMP Fundamentals
#25		Financial Transmission Rights
#26		Guest Lecture on ERCOT Market Operations
#27		Coordinating Variable Generation Through Flexible Demands
#28		Summary
#29		Final Project Presentation

Makeup Work Policy

Please refer to http://student-rules.tamu.edu/rule07

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Academic Integrity

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

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

Texas A&M University
Departmental Request for a New Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attach a course syllabus.•

Form Instructions

1. Request submitted by *(Department or Program Name)*: Department of Veterinary Physiology and Pharmacology

2. Course prefix, number and complete title of course: VTPP 651 Epigenetics & Systems Physiology

3. Catalog course description (not to exceed 50 words): Journal club format focusing on epigenetic regulation of physiological systems; assignment of papers from primary literature and weekly oral presentations detailing opinions on research; emphasis on fundamental concepts in epigenetics, physiology and the molecular techniques employed to address research hypotheses, discussions of scientific ethics and fraud.

4. Prerequisite(s): Graduate Classification

   Cross-listed with: _____ Stacked with: _____

   Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken _____ times.

   Will this course be repeated within the same semester? ☐ Yes ☒ No

7. This course will be:

   a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

   b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*

   graduate students enrolled in all of the life sciences

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. **Attach approval letters.**

9.

Prefix	Course #	Title (excluding punctuation)
VTPP	651	EPIGENETICS & SYSTEMS PHYSIOLOGY

Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code
03	00	03	2609050002	292020	14-15	003632

Level: 6

Approval recommended by:

Dr. John N Stallone 06/28/13
Department Head or Program Chair *(Type Name & Sign)* Date

Chair, College Review Committee 7-3-2013 Date

Department Head or Program Chair *(Type Name & Sign)* Date
(if cross-listed course)

Dean of College 07/02/2013 Date

Submitted to Coordinating Board by:

Chair, GC or UCC 8-22-13 Date

Associate Director, Curricular Services Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10

COLLEGE OF VETERINARY MEDICINE
& BIOMEDICAL SCIENCES
Department of Veterinary Physiology & Pharmacology

TEXAS A&M UNIVERSITY

VTPP 651 Epigenetics & Systems Physiology
Fall Semester 2013
3 Credit Hours

Course Description

Epigenetics is an emerging area of research with far-reaching implications into mammalian development and disease. In VTPP 651, students will evaluate and discuss current research examining the epigenetic mechanisms controlling systems physiology. This class will focus on the role of chromatin structure in the regulation of cellular homeostasis and organ function rather than concentrate on specific, isolated nuances of gene transcription. By doing so, students will gain an appreciation for the impact of epigenetic mechanisms upon mammalian development and normal homeostasis. Special emphasis will be paid to current studies applying epigenetic-based therapies to disease contexts and / or examining the disruptive role of teratogens in epigenetic programming.

By using a journal club format, this course will focus on developing skills in deciphering experimental design, critical paper reading, and technical fluency while at the same time, fostering the development of oral presentation skills. Students will be assigned two weekly papers taken from the most current primary literature. Students will be expected to analyze the data and research strategies described in the paper. For each manuscript discussed, one student will be expected to give an oral presentation detailing the research findings while another student will be assigned to lead the discussion of the paper. Each week, two papers will be discussed and marks will be assigned based on the quality of the oral presentations and active group participation.

Learning Outcomes and Course Objectives

The purpose of this course is to provide graduate level students with a journal club style seminar class focusing on the most current research in Epigenetics as it relates to systems physiology and disease. It is essential that graduate education teach students to think independently, access existing information, and acquire new knowledge on their own. This course will focus on "big picture" concepts and require students to focus their presentations on the scientific methods employed, rather than emphasizing an understanding of the specific biological systems being studied.

Learning Objectives

- list the common elements found in all scientific manuscripts
- discuss cases of scientific fraud and examine current procedures for reporting and preventing academic misconduct
- for a given scientific paper, identify the hypothesis being addressed
- break a scientific paper into it's component parts and evaluate the methodologies used to address the scientific hypothesis
- use the online search tool PubMed as a resource to obtain background information on a given study
- assimilate information from multiple sources into an oral presentation
- effectively communicate to a large group of people
- define epigenetics and explain the role of chromatin structure in controlling cellular development / homeostasis
- list the major molecular techniques used to examine epigenetic phenomena
- describe how changes in chromatin structure influence gene expression and organism phenotype
- list the current therapeutic strategies that target epigenetic aspects of cellular function
- define the term teratogen and explain the relevance of this term to development
- define epigenetic programming and apply this concept to mammalian development

Learning Outcomes

By the end of the course, the graduate student will have:
- integrated epigenetic mechanisms into their understanding of systems physiology
- gained a firm understanding of how cellular differentiation contributes to organ development and function
- developed an improved ability to critically evaluate scientific literature
- improved ability to give oral presentations and lead group discussions
- improved their technical fluency in the areas of epigenetics and cellular physiology
- attained a greater understanding of the current techniques used in molecular biology
- developed an appreciation for issues surrounding academic misconduct and scientific fraud
- gained improved critical thinking skills and a greater capacity to evaluate scientific literature

Prerequisites

Graduate Classification

Open to graduate students enrolled in all of the life sciences.

Meeting Times & Important Dates

VTTP 651 will meet once a week in the RSC conference room from 1:00 to 4:00 PM.

Grading policies

Grading scale A= 85-100
B= 75-84
C= 65-74
Fail = Less than 65

Course Breakdown

Class Room Participation	10%
Effective Communication and Presentation skills	50%
Performance as Discussion Leader	25%
Writing Assignment (Due November 14th 2013)	15%

Class Room Participation

Students will be evaluated on their participation in the discussion of the papers being presented. Students need to read the assigned papers before class and come ready with a written list of questions and / or comments on the manuscript. Students will be given opportunity to question / comment on the study and will be evaluated on their active participation in this process.

Writing Assignment

Students will be asked to complete one writing assignment during the course of the semester. The purpose of this project is to further familiarize students with a gene of their choice controlling a developmental process discussed in class. Students will submit a "Wikipedia style" entry summarizing what is known about their gene and properly reference the **PRIMARY sources** they derived this information from. This entry will be uploaded to Wikipedia and the online submission graded by the instructors. **This assignment will be due November 14th 2013.**

Course Calendar

Week 1 August 28th 2013	Critically Evaluating the Scientific Literature
Week 2 September 4th 2013	Scientific Misconduct and Academic Fraud
Week 3 September 11th 2013	Delivering Effective Oral Presentations 1 - Speaking Effectively
Week 4 September 18th 2013	Delivering Effective Oral Presentations 2 - Organizing Your Talk

Weeks 5 to 14
September 25th to November 27th 2013 Student Presentations

November 14th - Writing Assignment is Due

Instructor Information

Michael Golding PhD.
Assistant Professor
Department of Veterinary Physiology and Pharmacology
College of Veterinary Medicine and Biomedical Sciences
Texas A&M University
College Station, Texas
77843-4466
979-862-1332
mgolding@cvm.tamu.edu

Beiyan Zhou PhD.
Assistant Professor
Department of Veterinary Physiology and Pharmacology
College of Veterinary Medicine and Biomedical Sciences
Texas A&M University
College Station, Texas
77843-4466
979-845-7175
BZhou@cvm.tamu.edu

Attendance:

Class attendance is expected. Your arrival to the class on time will be appreciated. Should you arrive late, please enter the classroom as quietly as possible and apologize to the students who you may disrupt as you take your seat in the classroom.

"The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments."

"If the student is seeking an excused absence, the student must notify the instructor as soon as possible after the absence, but **no later** than the end of the second working day after the last date of absence."

Please see Texas A&M Student Rule #7 - http://student-rules.tamu.edu/rule07 for more information.

Classroom Communication:

The university has established a formal process for handling of student grievances associated with any course. If there are major concerns about the conduct of a course, which cannot be resolved by meeting with the instructor of a course, a Classroom Communication Concerns form should be completed and submitted to the appropriate department head.

For more information on Classroom Policies please visit the official TAMU website by following this link http://student-rules.tamu.edu/

Americans with Disabilities Act:

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 accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall, Rm B118 or call 845-1637. For additional information visit http://disability.tamu.edu

Academic Integrity and **Scholastic Dishonesty:**

"It is the responsibility of students and instructors to help maintain scholastic integrity at the university by refusing to participate in or tolerate scholastic dishonesty."

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

All examinations in this course are closed book, closed note, and closed neighbor exams. Video recording devices and other technological means may be used to supplement documentation of acts involving Scholastic Dishonesty. The instructors of this course regard Scholastic Dishonesty as a **very serious offense** and disciplinary action will be taken. Sanctions will include a grade of zero on the examination and a grade of "F" or "F*" in the course. All violations of the Aggie Honor Code in this course will result in a letter of reprimand being made a part of the student's records. Upon appeal of an accusation of Scholastic Dishonesty, the Honors Council can institute additional sanctions including separation from the University.

Folks: do not be confused, these instructors do not tolerate cheating. If you engage in an act of scholastic dishonesty, there is a very high probability that you will be caught. The capabilities and talents of the instructors to identify and verify cheating and their commitment to prosecute cheaters should not be underestimated. Almost every semester, one or more students fail to take this warning seriously. Please do not jeopardize your reputation, academic studies or future professional career.

See Aggie Honor Code at aggiehonor.tamu.edu