Graduate Council Curriculum Committee
October 24, 2018
2:30 p.m., Millican Hall 395E

Agenda

1. Welcome and call to order
2. Review of minutes from September 26, 2018
3. General business
4. Addition of Civil Engineering MS- Smart Cities Track
5. Courses
6. Adjournment

Members of the Graduate Council Curriculum Committee

Elsie Olan, Chair, College of Community Innovation and Education
Andre Gesquiere, Vice Chair, College of Sciences
Sonia Arellano, College of Arts and Humanities
Mathilda Van Niekerk, Rosen College of Hospitality Management
Art Weeks, College of Engineering and Computer Science
Jihe (Jackie) Zhao, College of Medicine
Diane Andrews, College of Nursing
Mercedeh Khajavikhan, College of Optics and Photonics
Olga Molina, College of Health Professions and Sciences
Alex Rubenstein, College of Business Administration
Terrie Sypolt, University Libraries
Wei Wei, Rosen College of Hospitality Management
Kiana Terrell, Graduate Student Association
Tosha Dupras, College of Sciences, Administrator
Joellen Edwards, College of Nursing, Administrator
Ali Gordon, College of Engineering and Computer Science, Administrator
David Hagan, College of Optics and Photonics, Administrator
Lynn Hepner, College of Arts and Humanities, Administrator
Devon Jensen, Graduate Studies, Administrator
Glenn Lambie, College of Community Innovation and Education, Administrator
Saleh Naser, College of Medicine, Administrator
Linda Rosa-Lugo, College of Health Professions and Sciences, Administrator
Sevil Sonmez, College of Business Administration, Administrator
Youcheng Wang, Rosen College of Hospitality Management, Administrator

GCC 10-24-18 Courses

Committee	**Graduate Curriculum Committee**
Notes	
Total Proposals	**1**

Graduate Program Addition-New - College of Engineering and Computer Science - MS Civil Engineering - Smart Cities track

2018-2019 Graduate Program New

General Catalog Information

Select *Program* below, unless creating an Acalog *Shared Core*.

A *Shared Core* is a set of curriculum set up in the online catalog (Acalog) to serve multiple program pages. For more information, contact the Curriculum Specialist.

Program Type* (•) Program ( ) Shared Core

Proposal Type* Graduate Program Addition-New

Read before you begin

TURN ON help text before starting this proposal by clicking in the top right corner of the heading.
FILL IN all fields required marked with an * after importing data. You will not be able to launch the proposal without completing required fields.
LAUNCH proposal by clicking in the top left corner. DO NOT make proposed changes before launching proposal. Changes will only be tracked after proposal is launched.

Important: A pre-proposal must have been submitted and approved by the Council of Academic VPs before this proposal can proceed any further.

College* College of Engineering and Computer Science

Unit / Department / College:* Department of Civil, Environmental, and Construction Engineering

This form is to be used to ADD graduate degree programs, tracks, or certificate programs. If there are tracks being added to the program, one form must be submitted for EACH program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Proposed Effective Term / Year* Fall 2019

Name of program, track and / or certificate:* MS Civil Engineering - Smart Cities track

Unit(s) Housing Program: CECE

Type of Action:*
- [ ] Program
- [x] Track
- [ ] Certificate

Delivery:*
- [ ] Face to Face
- [ ] UCF Online
- [x] Mixed Delivery

If you will be submitting other revision forms for tracks or course actions, please list them here: 12 new courses. Attached

Will the program be a market tuition rate program?* ○ Yes ◉ No

Will the program be a cost recovery program?* ○ Yes ◉ No

Brief Program Description:* The Civil and Environmental Engineering disciplines are evolving rapidly with many new and advanced applications, tools and methods. Future Engineers need to be better prepared and equipped for future challenges to our cities. The proposed MS track is geared toward many aspects of CECE including: Smart transportation, Smart and resilient infrastructure, Smart and technological advancements in Environmental Engineering, and Water resources. We also envision that this MS track will bridge some of the gaps with other engineering

disciplines and open the door for collaboration on research and education that are relevant to the cities of the future.

Rationale:

In 2017, FUTURe CITy initiative was launched by CECS and CECE department. FUTURe CITy initiative at UCF brings together a group of researchers and educators with a vision to synergistically explore the wide-ranging technological advances towards better serving urban residents. The initiative is a pioneering effort in the state and country geared toward many aspects of CECE including: Smart transportation, Smart and resilient infrastructure, Smart and technological advancements in Environmental Engineering, and Water resources. At least 8 of the CECE faculty are already actively involved in research relevant to various aspects of Smart Cities, and the provost and dean have dedicated 3 faculty positions toward this effort. Two of them have been hired in Fall 2018 and designated as Smart City faculty.
The CECE department believes that the Civil and Environmental Engineers of the future need to learn and adapt to the new challenges in our field and be prepared with the appropriate and stat-of-the-art education, which is the primary reason to request this new track. We also envision that this MS track will bridge some of the gaps with other engineering disciplines and open the door for collaboration on research and education that are relevant to the cities of the future.

Is this a Doctoral Program? ☐ Yes ☑ No

Follow these steps to propose courses to the new program curriculum:

Step 1

There are two options for adding courses: "Add Course" and "Import Course." For courses already in the catalog, click on "Import Course" and find the courses needed. For new classes going through a Curriculog Approval Process click on "Add Course"-- a box will open asking you for the Prefix, Course Number and Course Title.

Step 2

Click on "View Curriculum Schema." Click on the area/header of the program where you would like to add courses. When you click on "Add Courses" it will bring up the list of courses available from Step 1. Select the courses you wish to add. For removing courses click on the X and proceed.

Prospective Curriculum*

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate?*	○ Yes ◉ No
If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:	
Will students have the option to stay in their existing program, track, or certificate?*	◉ Yes ○ No
If yes, how will current students be impacted by the addition of a program, track or certificate?	

Future Students

Provide a statement of who is likely to enroll and why. Please state if there is licensure or certification that depends upon this education, etc.	We believe that many of our undergraduate students would be interested to join this MS track. New market for international students will be created. That will help attract international students that are currently either joining other universities in the US or not pursuing higher education. Professionals in FL and beyond will be attracted to this new and unique MS track.

Year 1

Headcount: 20	**SCHs:** 480

Year 2

Headcount: 30	**SCHs:** 840

Year 3

Headcount: 40	**SCHs:** 1140

Indicate likely career or student outcomes upon completion:	Most students will still be placed with major Civil and Environmental Engineering large employers such as FDOT and public agencies and consulting firms. What

the new MS track will achieve is to make our students more competitive and give them access to jobs that require a Civil/Env Engineer who is exposed more to new ideas, methods and technology.

Please complete the following section on financial support:

(Specify all forms of support – assistantships, fellowships, and tuition remission.)

Year 1

Number of assistantship students:	1	**Source of funds:**	CECS/CECE
Number of fellowship students (specify fellowship):	0		
Number of tuition remissions:	1	**Source of funds:**	CECE

Year 2

Number of assistantship students:	3	**Source of funds:**	CECS/CECE/faculty
Number of fellowship students (specify fellowship):	0		
Number of tuition remissions:	1	**Source of funds:**	CECE

Year 3

Number of assistantship students:	5	**Source of funds:**	Faculty research
Number of fellowship students (specify fellowship):	0		
Number of tuition remissions:	1	**Source of funds:**	CECE

Attachments

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines.

Faculty List*	☑ Attached
Support from involved units that no duplication exists*	☐ Attached ☑ Not Applicable
Library Assessment of Resources*	☑ Attached

Administration Use Only

Program Type	
Degree Type	
Status*	◉ Active-Visible ○ Inactive-Hidden
Catalog Ownership:	

MS Civil Engineering – Smart Cities Track

Faculty list

1. Professor Mohamed Abdel-Aty
2. Professor Necati Catbas
3. Associate Professor Omer Tatari
4. Associate Professor Naveen Eluru
5. Assistant Professor Samiul Hasan
6. Assistant Professor Mohamed Zaki
7. Assistant Professor Woo Hyoung Lee
8. Assistant Professor Zhaomiao Guo
9. Assistant Professor Fudong Liu
10. Assistant Professor Shaurya Agarwal
11. Assistant Professor Luis Arboleda Monsalve

MS Civil Engineering – Smart Cities Track

Required course

- CGN5555 - Interdisciplinary Introduction to Smart Cities' Applications – Abdel-Aty *

Core Courses – Choose minimum 5 courses

- CCE5500 - Smart City Built Infrastructure – Necati Catbas *
- TTE6200 - Mobility in Smart Cities: Technologies and Application Areas – M. Zaki *
- CGN6200 - Cyber-physical Systems and Smart Cities – Shaurya Agarwal *
- TTE6500 - Connected and Autonomous Vehicles – Abdel-Aty *
- CGN6100 - Modeling Human Behavior with Emerging Data – Samiul Hasan *
- ENV 5650 - Smart Air Quality Monitoring and Air Pollution Control – Yu & Liu *
- ENV 6300 - Smart water and wastewater management – Woo Hyoung Lee *
- CEG6150 - Smart Underground Structures: Tunnels and Shafts – Luis Arboleda Monsa *
- TTE6020 - Active mobility and Technologies: Synergy and Challenges – M. Zaki *
- CGN5200: Proposed Course- Internet of Things: Applications in Smart Cities- Agarwal *
- TTE5252: Policy Aspects of Smart City Transportation – Omer Tatari *
- CGN 5550: Intelligent infrastructure management – Zhaomiao Guo *
- TTE6608 – Data Science in Smart Cities – Samiul Hasan
- CCE5220 - Sustainable Infrastructure Systems – Omer Tatari
- STA5703: Data Mining Methodology I
- Thesis (6 credit) - Advisor

*** new course suggested as part of the track**

Elective courses – Choose minimum of 4 courses

- HMG XXXX - Smart Travel and Tourism – (new course) Arthur Huang
- 5337 Urban Design
- 6387 Transportation Policy
- 6339 Housing Development and Planning
- 5356 Managing Community & Economic Development
- 6711 Sustainable Transportation Planning
- 6716 Information Systems for Public Managers and Planners
- Global Cities and Urban Resilience (New Course).
- Urban Policy and Governance (new course)
- CAP 5415 - Computer Vision
- CAP 5610 - Machine Learning
- CEN 5016 - Software Engineering
- STA 5104 – Advanced Computer Processing of Statistical Data
- STA 5206 – Statistical Analysis
- STA 5825 – Stochastic Processes and Applied Probability Theory
- STA – Data Mining Methodology II
- STA 6707 Multivariate Statistical Methods
- STA 6709 – Spatial Statistics
- CGN 6665 Regional Planning, Design and Development
- TTE 6667 Discrete Choice Models in Transportation
- TTE6270 Intelligent Transportation Systems
- EEL 5825 Pattern Recognition
- EEL 6683 Cooperative Control of Networked Autonomous Systems
- EEL 6026 Optimization of Engineering Systems
- EEL 6671 Modern and Optimal Control Systems

Graduate Program Addition-New - College of Engineering and Computer Science - MS Civil Engineering - Smart Cities track

Track Description

In 2017, FUTURe CITy initiative was launched by CECS and CECE department. FUTURe CITy initiative at UCF brings together a group of researchers and educators with a vision to synergistically explore the wide-ranging technological advances towards better serving urban residents. The initiative is a pioneering effort in the state and country geared toward many aspects of CECE including: Smart transportation, Smart and resilient infrastructure, Smart and technological advancements in Environmental Engineering, and Water resources.

The CECE department believes that the Civil and Environmental Engineers of the future need to learn and adapt to the new challenges in our field and be prepared with the appropriate and stat-of-the-art education, which is the primary reason to request this new track. We also envision that this MS track will bridge some of the gaps with other engineering disciplines and open the door for collaboration on research and education that are relevant to the cities of the future.

Curriculum

Curriculum

The Smart City track in the Civil Engineering MS program is for students with appropriate science or engineering baccalaureate backgrounds. Both thesis and non-thesis options are available with each requiring 30 credit hours. The thesis option requires 3 credit hours for a of required course, 9 credit hours of Core courses, 12 credit hours of elective graduate course work exclusive of thesis and research, and a thesis (6 credit hours). The nonthesis option requires 3 credit hours for a of required course, 15 credit hours of required graduate course work, 12 credit hours of electives, and submission of an end-of-program portfolio. Each student must have an individual program of study approved by his/her faculty committee and have completed all required articulation course work as described below. At least one-half of the required credits must be taken at the 6000 level.

Total Credit Hours Required: 30 Credit Hours

Minimum beyond the Bachelor’s Degree

Research studies or projects are required in one or more courses. The research study or project will focus on reviewing and analyzing contemporary research or engineering issues in a student’s particular specialization within the profession in order to help students acquire knowledge and skills pertaining to research-based best practices in that specialization area.

Prerequisites (Articulation)

There is no specific articulation for graduates with relevant BS degree. Several courses have specific pre-requisites that are indicated for each course. The structure of the program is flexible so the

student can choose his/her own courses by selecting among 15 core courses.

Required course: 3 credit hours

Both thesis and nonthesis students must choose the course below:

CGN 5555 Interdisciplinary Introduction to Smart Cities' Applications

Core Courses – Choose minimum 9 hours for thesis and 15 hours for non-thesis

CCE 5220 Sustainable Infrastructure Systems
CEG 6150 Smart Underground Structures: Tunnels and Shafts
CES 6876 Smart City Built Infrastructure
CGN 5550 Intelligent Infrastructure Management
CGN 6100 Modeling Human Behavior with Emerging Data
CGN 6200 Cyber-physical Systems and Smart Cities
ENV 5650 Smart Air Quality Monitoring and Air Pollution Control
ENV 6300 Smart Water and Wastewater Management
STA 5703 Data Mining Methodology I
TTE 5020 Active Mobility and Technologies: Synergy and Challenges
TTE 5252 Policy Aspects of Smart City Transportation
TTE 6200 Mobility in Smart Cities: Technologies and Application Areas
TTE 6500 Connected and Autonomous Vehicles
TTE 6608 Data Science in Smart Cities
CGN 5200 Internet of Things: Applications in Smart Cities

Elective Courses: 9 Credit Hours

All students, both thesis and nonthesis, are required to take at most 12 credit hours of approved electives. The courses may be from the list above or other courses as approved by the student's adviser. Directed Research (XXX 6918) is not permitted in the MS program of study.

CAP 5415 Computer Vision
CAP 5610 Machine Learning
CEN 5016 Software Engineering
CGN 6655 Regional Planning, Design, and Development
EEL 5825 Pattern Recognition
EEL 6026 Optimization of Engineering Systems
EEL 6671 Modern and Optimal Control Systems
EEL 6683 Cooperative Control of Networked Autonomous Systems
EMA 5104 Intermediate Structure and Properties of Materials
EMA 5504 Modern Characterization of Materials
EMA 6626 Mechanical Behavior of Materials
HMG XXXX Smart Travel and Tourism
PAD 5337 Urban Design
PAD 5356 Managing Community and Economic Development
PAD 6339 Housing Development and Planning

PAD 6387 Transportation Policy
PAD 6716 Information Systems for Public Managers and Planners
STA 5104 Advanced Computer Processing of Statistical Data
STA 5206 Statistical Analysis
STA 5825 Stochastic Processes and Applied Probability Theory
STA XXX Data Mining Methodology II
STA 6707 Multivariate Statistical Methods
STA 6709 Spatial Statistics
TTE 6270 Intelligent Transportation Systems
TTE 6667 Discrete Choice Modeling in Transportation
URP 6711 Sustainable Transportation Planning
XXX XXXX □ Global Cities and Urban Resilience
XXX XXXX □ Urban Policy and Governance

Thesis Option: 6 Credit Hours

A successful defense of the thesis is required. In addition, the College of Engineering and Computer Science requires that all thesis defense announcements be approved by the student's adviser and posted on the college's website and on the university-wide Events Calendar at the College of Graduate Studies website at least two weeks before the defense date.

XXX 6971 Thesis

Nonthesis Option: 6 Credit Hours

Nonthesis students must complete at least 6 additional credit hours of electives from either the list above or other courses as approved by the student's adviser.

- Electives **6 Credit Hours**

Portfolio Requirement

Students are required to complete a culminating experience. The culminating experience for nonthesis MS students is submission of an end-of-program portfolio. The portfolio requirements are listed on the CECE website.

Independent Learning

A research or design project serves as the independent learning experience for thesis students. Nonthesis students are required to take at least one of the courses marked with an asterisk (*), denoting an independent learning experience, and submission of an end-of-program portfolio.

Application Requirements

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline.

The College of Engineering and Computer Science strongly encourages prospective applicants to request a free pre-screening (www.cecs.ucf.edu/prescreen) of their qualifications prior to submitting an online application for graduate admission. However, a pre-screening is not required; rather, it is offered as a courtesy to all prospective applicants before they commit to submitting a complete online application and paying an application processing fee.

Admissions decisions are made on the basis of a complete online application only, and not on the basis of any pre-screening. Prospective applicants who are encouraged to apply to their intended graduate program based on the information provided for their pre-screening are not assured of admission or financial assistance when they submit a complete online application. Although it is possible, it is not likely, that prospective applicants who are discouraged from formally applying to a graduate program at the pre-screening stage will be admitted if they elect to submit a complete online application anyway.

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- A Bachelor of Science degree in civil engineering or another closely related engineering degree.
- Résumé.
- Statement of educational, research, and professional career objectives.
- Three letters of recommendation.
- Applicants applying to this program who have attended a college/university outside the United States must provide a course-by-course credential evaluation with GPA calculation. Credential evaluations are accepted from World Education Services (WES) or Josef Silny and Associates, Inc. only.

Faculty members may choose to conduct face-to-face or telephone interviews before accepting an applicant into their research program.

The GRE is not required, however, taking the GRE is highly recommended for students wishing to pursue a thesis. In order to be considered for any fellowships, a GRE score is required.

The MS degrees in specialized options are designed for students with appropriate baccalaureate backgrounds. Applicants who are applying to the programs without a directly related undergraduate degree should closely check the prerequisites. Additional undergraduate courses may be required.

Application Deadlines

Smart Cities	***Fall Priority**	**Fall**	**Spring**	**Summer**
Domestic Applicants	Jan 15	Jul 15	Dec 1	-
International Applicants	Jan 15	Jan 15	Jul 1	-
International Transfer Applicants	Jan 15	Mar 1	Sep 1	-
*Applicants who plan to enroll full time in a degree program and who wish to be considered for university fellowships or assistantships should apply by the Fall Priority date.				

Financials

Graduate students may receive financial assistance through fellowships, assistantships, tuition support, or loans. For more information, see the College of Graduate Studies Funding website, which describes the types of financial assistance available at UCF and provides general guidance in planning your graduate finances. The Financial Information section of the Graduate Catalog is another key resource.

Fellowships

Fellowships are awarded based on academic merit to highly qualified students. They are paid to students through the Office of Student Financial Assistance, based on instructions provided by the College of Graduate Studies. Fellowships are given to support a student's graduate study and do not have a work obligation. For more information, see UCF Graduate Fellowships, which includes descriptions of university fellowships and what you should do to be considered for a fellowship.

Contact Info

Graduate Program

Andrew Randall PhD PE

Professor

andrew.randall@ucf.edu

Telephone: 407-823-6429

Engineering II, 211-L

Graduate Admissions

Khue Duong Rymer

gradadmissions@ucf.edu

Telephone: 407-823-2766

Millican Hall 230

Online Application

Graduate Admissions

Mailing Address

UCF College of Graduate Studies

Millican Hall 230

PO Box 160112

Orlando, FL 32816-0112

Institution Codes

GRE: 5233

GMAT: RZT-HT-58

TOEFL: 5233

ETS PPI: 5233

Graduate Fellowships

Grad Fellowships

Telephone: 407-823-0127

gradfellowship@ucf.edu

https://funding.graduate.ucf.edu

Graduate Financial Aid

UCF Student Financial Assistance

Millican Hall 120

Telephone: 407-823-2827

Appointment Line: 407-823-5285

Fax: 407-823-5241

finaid@ucf.edu

http://finaid.ucf.edu

Memo

To: Dr. Georgios Apostolakis, Assistant Professor, Structural Engineering, CECE
Dr. Mohamed Abdel-Aty, Department Chair, Civil, Environmental, and Construction Engineering
Dr. Michael Georgiopoulos, Dean, College of Engineering & Computer Science
Mr. Barry Baker, Director of Libraries
Ms. Selma Jaskowski, Assoc. Director, Technology Services & Resource Management
Ms. Ying Zhang, Dept. Head, Acquisitions & Collections
Dr. Liz Klonoff, Dean, College of Graduate Studies
Dr. John Weishampel, Senior Associate Dean, College of Graduate Studies

From: Buenaventura (Ven) Basco, Associate Librarian, Research and Information Services

Subject: Library Assessment for the Proposed MS Civil Engineering - Smart Cities Track in the Department of Civil, Environmental, and Construction Engineering.

Date: October 12, 2018

In consultation with the faculty for the proposed MS Civil Engineering - Smart Cities Track, the following institutions were selected for comparison:

- Columbia University - Smart Cities
- University of Michigan
- New York University
- Rice University
- University of Florida

Summary and Projected Costs for New Library Resources:

Each of these institutions offers similar program to the proposed MS Civil Engineering - Smart Cities Track. In comparing the library collections with the selected aspiring programs, UCF Libraries has sufficient resources to start the proposed Master's program track, except for one database, SAE Mobilus and recently published and forthcoming books and e-books.

The proposed track is concentrating on a new and evolving research area, and therefore will require resources to keep current with new print or electronic books that are not covered by the existing library budget. As such, it is recommended that $3,000 be allocated for the next five years (for a total of $15,000). And funding needs to be continued after the initial five years to support this program.

Summary of funds requested for the next several years:

Resource Type	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	***2024-25***
Monograph	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Database	$0	$0	$0	$0	$0	*$0*
Journal	$0	$0	$0	$0	$0	*$0*
TOTAL	**$3,000**	**$3,000**	**$3,000**	**$3,000**	**$3,000**	**$3,000**

Should the program expand in scope or decide to offer a Ph.D. degree in the future, essential resources including the above-mentioned database, as well as journals may become critical, and therefore additional funds will be requested at that point. And existing resources may be canceled if the Libraries faces severe budget shortfall.

Databases

Database Name	UCF	UF	Columbia	Michigan	NYU
ASCE Civil Engineering Database	X	X	X	X	X
IEEE Xplore	X	X	X	X	X
Compendex (Ei Village)	X	X	X	X	X
Web of Science	X	X	X	X	X
Science Direct	X	X	X	X	X
Inspec	X	X	X	X	X
ABI Inform	X	X	X	X	x
Business Source Premier	X	X	X	X	X
Urban Studies Abstracts	X	NO	X	X	NO
Avery Index to Architectural Periodicals	X	X	X	X	X
ACM Digital Library	X	X	X	X	X
SAE Mobilus - Includes full text of every paper contained in the SAE Proceedings, Special Publications, and Transactions since 1906, as well as information on articles published back to 1906. Also includes access to SAE Standards and E-Books. Covers advancements in all areas of mobility engineering. Society of Automotive Engineering	NO	NO	SAE Digital Library. Technical Papers	X	NO

Databases: The UCF Libraries compares favorably well with the chosen institutions. **We have the databases needed to support MS Civil Engineering - Smart Cities Track.**

Key Journals

Key Journals in Civil Engineering - Smart Cities	UCF	UF	Columbia	Michigan	NYU
EPJ Data Science	X	X	X	X	X
Resources, Conservation and Recycling	X	X	X	X	X
Environmental Science & Technology	X	X	X	NO	X
ITS Journal	X	X	X	X	X
Transportation Research, Part C	X	X	X	X	X
IEEE Transactions on Intelligent Transportation Systems	X	X	X	X	X
IEEE Transactions on Vehicular Technology	X	X	X	X	X
Computer-Aided Civil and Infrastructure Engineering	X	X	X	X	X
Building and Environment	X	X	X	X	X

Energy and Buildings	X	X	X	X	X
Sustainable Cities and Society	X	X	X	X	X
Journal of Building Performance Simulation	X	NO	NO	X	X
Environmental Innovation and Societal Transitions	X	X	X	X	X
Landscape and Urban Planning	X	X	X	X	X
Computers, Environment and Urban Systems	X	X	X	X	X
Technological Forecasting and Social Change	X	X	X	X	X

Journals: By comparing the title by title list, UCF Libraries journal list compares favorably with the chosen institutions.

Books – Combined Print and E-Books *(by the Subject headings, keywords provided or LC ranges)*

Subject Heading	**UCF**	**UF**	**Columbia**	**Michigan**	**NYU**
ARCHITECTURE -- Urban & Land Use Planning	45	26	101	65	69
ARCHITECTURE -- Sustainability & Green Design	11	13	22	20	17
City planning -- Technological innovations	16	16	85	32	31
Communications Engineering, Networks	1746	163	1246	1279	1049
Sustainable development	4333	5043	10820	7415	5794
Energy Economics	222	20	206	181	114
Energy Efficiency	3855	3771	67	3694	604
Management of Computing and Information Systems	1894	162	868	823	1139
Information technology -- Economic aspects	225	213	803	275	461
Technological innovations -- Economic aspects	32	428	2478	588	1060
Environmental Economics	1130	564	1681	1482	1393
Landscape/Regional and Urban Planning	569	56	365	411	372
Information technology	6570	6578	8740	7569	5871
Computers and civilization	1755	321	1009	807	975
User Interfaces and Human Computer Interaction	2386	209	1204	1182	1402
Autonomous vehicles	42	45	40	67	47
Intelligent transportation systems	624	569	232	1776	309
Human behavior -- Mathematical models	22	27	46	34	22
Environmental Monitoring/Analysis	312	34	173	212	104

Subject Heading	UCF	UF	Columbia	Michigan	NYU
Data Mining	3478	1534	2794	3720	2594
Spatial analysis (Statistics)	202	254	380	296	186
Smart structures	237	130	287	332	69
TOTAL	**29706**	**20176**	**33647**	**32260**	**23682**

Books: Due to the interdisciplinary recent nature of the proposed program, the analysis of the book collection has used broad subject terms related to the program. In these broad subject areas, UCF Libraries compares favorably with UF and NYU, but lagging behind Columbia and Michigan when compared. But overall, collection specifically on “smart cities” is still small. As new publications become available, more funds need to be dedicated to the purchase of books and ebooks for this proposed program. Below are examples of new ebooks we need to support the proposed program.

Author (s)	Title	Publisher	Copyright Year	ISBN/EAN	List Price
Cirani, Simone, 1982- author.	Internet of things : architectures, protocols and standards	Wiley	2019	1119359686	$219
	Data Analytics : Concepts, Techniques, and Applications	CRC Press	2019	0429820909	$238
Willis, Katharine S.	Digital and smart cities	Routledge	2018	1315712458	$165
Rochet, Claude, author.	Smart cities : reality or fiction	ISTE	2018	1119507324	$135
Karvonen, Andrew.; Cugurullo, Federico.; Caprotti, Federico.	Inside Smart Cities : Place, Politics and Urban Innovation	Routledge	2018	1351166182	$165
	Housing Dynamics in Korea - Building Inclusive and Smart Cities	OECD	2018	9264298886	$38
Pelton, Joseph N., author.	Smart cities of today and tomorrow : better technology, infrastructure and security	Copernicus Books	2018	3319958224	$60
Information Resources Management Association	Smart Cities and Smart Spaces : Concepts, Methodologies, Tools, and Applications	IGI Engineering Science Reference	2018	1522570314	$2,450
	E-Participation in Smart Cities: Technologies and Models of Governance for Citizen Engagement	Springer	2018	3319894749	$258

	Human Dynamics Research in Smart and Connected Communities	Springer	2018	3319732471	$178
	Cities As Spatial and Social Networks	Springer	2018	3319953516	$318
	Internet of Things for Smart Urban Ecosystems	Springer	2018	3319965506	$338
Termanini, Rocky, author.	Nano Age of Digital Immunity Infrastructure Fundamentals and Applications : The Intelligent Cyber Shield for Smart Cities	CRC Press	2018	1351682881	$238
	Water Scarcity and Ways to Reduce the Impact : Management Strategies and Technologies for Zero Liquid Discharge and Future Smart Cities	Springer	2018	3319751999	$258
	Collaborative Technologies and Data Science in Smart City Applications	Logos Verlag Berlin	2018	383259065X	$264
Douay, Nicolas	Urban planning in the digital age : from smart city to open government?	ISTE	2018	1119482941	$120
Dey, Nilanjan; Tamane, Sharvari	Big Data Analytics for Smart and Connected Cities	IGI Engineering	2018	1522562087	$338
Mainka, Agnes, author.	Smart World Cities in the 21st Century	K.G. Saur	2018	3110577666	$172
Gontar, Zbigniew H.	Smart Grid Analytics for Sustainability and Urbanization	IGI Engineering	2018	1522539972	$323
Herrschel, Tassilo, 1958- author.	Smart transitions in city regionalism : territory, politics and the quest for competitiveness and sustainability	Routledge	2018	1315696770	$154
Loo, Becky P.Y.	Unsustainable Transport and Transition in China	Routledge	2018	1317389697	$154
Karlshoj, Jan	EWork and eBusiness in architecture, engineering and construction : proceedings of the 12th European Conference on Product and Process Modelling (ECPPM 2018), Copenhagen, Denmark, 12-14 September 2018	CRC Press	2018	0429013647	$486
				TOTAL	**$7,067**

APPENDIX B

Please include the signature of the Equal Opportunity Officer and the Library Director.

Signature of Equal Opportunity Officer	**Date**
 **Signature of Library Director**	October 12, 2018 **Date**

This appendix was created to facilitate the collection of signatures in support of the proposal. Signatures in this section illustrate that the Equal Opportunity Officer has reviewed section II.E of the proposal and the Library Director has reviewed sections X.A and X.B.

Graduate Council Curriculum Committee
October 24, 2018
2:30 p.m., Millican Hall 395E

Course Agenda

1.Course Additions

College of Business Administration course additions

1. ECO - 6406 - Mathematical Economics II

College of Engineering and Computer Science course additions

1. CES 6876 Smart City Built Infrastructure
2. CGN 5200 Internet of Things: Applications in Smart Cities
3. CGN 6200 Cyber-physical Systems & Smart Cities
4. CGN 6938 Mobility in Smart Cities: Technologies and Application Areas (Special Topic)
5. CGN 5555 Interdisciplinary Introduction to Smart Cities' Applications
6. ENV 5650 Smart Air Quality Monitoring and Air Pollution Control
7. CGN 5550 Intelligent Infrastructure Management
8. TTE 5252 Policy Aspects of Smart City Transportation
9. ENV 6300 Smart Water and Wastewater Management
10. TTE 6500 Connected and Autonomous Vehicles-Transportation Engineering
11. TTE 5020 Active Mobility and Technologies: Synergy and Challenges
12. TTE 6200 Mobility in Smart Cities: Technologies and Application Areas

2.Course Revisions

College of Arts and Humanities course revisions

1. ART - 5280 - Serial Content
   Edits to course description and pre-reqs.
   Rationale:
   The course description change for ART 5280 aligns with the 7-year APR recommendations to increase studio research and production coursework, reduce required credits hours (from 66cr to 60cr), and streamline advising, scheduling, and the graduate plan of study.
   Description:

   ~~Admission to Emerging Media MFA or Digital Media M. A., graduate standing, or C. I. Serial content, story forms, interactive narrative theory and practice for art, digital media and film. Traditional~~ Sequential design, production methods and ~~non-traditional forms of visual and interactive storytelling. production iew~~ materials in visual arts.

   Pre-reqs:
   Admission to Emerging Media MFA or Digital Media M. A., graduate standing, or C. I.

College of Business Administration course revisions

1. ECO - 6403 - Mathematical Economics I

   Rationale:

   Changing title to Mathematical Economics I because an additional course will be added entitled Mathematical Economics II.

   Title:

   Mathematical Economics I

GCC 10-24-18 Courses

Committee	**Graduate Curriculum Committee**
Notes	
Total Proposals	**14**

ECO - 6406 - Mathematical Economics II

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College / Department*	Department of Economics
Approved Graduate Faculty/Scholars:*	Michael Tseng
Prefix:*	ECO
Number:*	6406
Course Title:*	Mathematical Economics II
30 Character Abbreviation:	Math Econ II

Course Description:*	This is a continuation of ECO6405, with a focus on convex analysis and related material that is central to economic theory.
Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ◉ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	
Corequisite(s):	ECO6405 Mathematical Economics I
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more

advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☑ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ◉ Required Course ○ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?	There is too much material to be covered in ECO 6405 alone. The course enriches the experience for our Master of Science students and bolsters the Master of Science degree program in Economics, as it is a required course.
What majors require or recommend this course for graduation?	M.S. degree in economics
If not a major requirement, what will be the source of students?	
What is the estimated annual enrollment?	20

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	There are no conflicts with courses elsewhere on campus, as this is a continuation of an already approved course in the M.S. degree program.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

Fall 2019 Michael Tseng

University of Central Florida
Department of Economics

ECO 6406

Mathematical Economics II

Syllabus

Office:	BA2 302S
Telephone:	(407) 823-4469
E-Mail:	michael.tseng@ucf.edu
Office Hours:	TBA
Corequisites:	ECO6405 Mathematical Economics I
Textbooks:	*Convex Optimization*, by Stephen Boyd and Lieven Vandenberghe. New York: Cambridge University Press, 2004.
Recommended:	*A Gentle Introduction to Effective Computing in Quantitative Research: What Every Research Assistant Should Know*, by Harry J. Paarsch and Konstantin Golyaev. Cambridge: MIT Press, 2016.
Requirements:	yyy problem sets as well as a midterm and a final examination.
Grading:	Together, the problem sets will account for 25 percent of your grade, the midterm examination for 25 percent, and the final for the remaining 50 percent. If, however, you do better on the final than the midterm, then your final will count for 75 percent of your grade.
Lateness Policy:	Problem sets must be submitted at the beginning of the class for which they are due. Because you can always e-mail me a problem set, no late ones will be accepted. In other words, late problem sets will be assessed the score zero. E-mailed problems sets must be in PDF format.

University of Central Florida
Department of Economics

ECO6406

Mathematical Economics II

Syllabus (continued)

Group Work: You are encouraged to work on the problem sets with other students, but you must write up your answers by yourself. The examinations will be closed-book. Obviously, you must complete those alone.

Important: Students are expected to be familiar with the University's standards regarding academic integrity and academic misconduct, as well as the course of action that will be taken if a violation occurs; these links

`http://goldenrule.sdes.ucf.edu/`

and

`http://osc.sdes.ucf.edu`

provide such information. Information on accommodations for those with disabilities may be found at

`http://sds.sdes.ucf.edu/`

Grad Course Addition - College of Engineering and Computer Science - CES 6876 Smart City Built Infrastructure

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

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3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* CES 6876 Smart City Built Infrastructure

Approved Graduate Faculty/Scholars:* Fikret Necati Catbas

Prefix:* CES

Number:* 6876

Course Title:* Smart City Built Infrastructure

30 Character Abbreviation:

Course Description:*

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Structures and Geotech as well as others who are interested in smart city built infrastructure. This course will introduce various emerging concepts, methods and technologies related to design, assessment, analysis, monitoring and non-destructive evaluation methods with specific applications for smart city built infrastructure. The course will cover recent advances in analysis, sensing and decision-making for the next generation structures to be designed as well as managing existing structures in future cities. This course aims to introduce special topics, advanced methods and technologies as well as engineering research approaches for modeling, monitoring and assessment of structures and structural systems. The course material will be applicable to structures such as bridges, buildings, stadiums, wind turbines, heavy movable structures.

The course will be carried out as follows:

Formal lectures and presentations by the professor
Students presentations and contributions
Presentations and lectures by Guest Lecturers
Site visits to major projects
Final project reports and presentations by the students

Credit Hours:	3
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Structural Analysis (CES4100) with grade of “C” (2.0) or better or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ○ No
Split-Level Class:	○ Yes ○ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered?	☑ Odd Fall ☑ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as:	◉ Required Course ○ Elective Course

New Field

New Materials and Supply Fees?*	◉ Yes ○ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?	This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Structures and Geotech as well as others who are interested in smart city built infrastructure. This course will introduce various emerging concepts, methods and technologies related to design, assessment, analysis, monitoring and non-destructive evaluation methods with specific applications for smart city built infrastructure. The course will cover recent advances in analysis, sensing and decision-making for the next generation structures to be designed as well as managing existing structures in future

	cities. The course will consist of the following four modules: 1) Modeling and model updating using experimental data, 2) Monitoring and non-destructive technologies, 3) Data analysis approaches (Physics-based and data-driven methods), 4) Structural assessment and decision-making in future cities
What majors require or recommend this course for graduation?	Civil, Environmental and Construction Engineering and other engineering majors
If not a major requirement, what will be the source of students?	
What is the estimated annual enrollment?	

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	This is totally new course, no duplications or conflicts

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

CES 6876: Smart City Built Infrastructure

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Necati Catbas, Ph.D., P.E.	Term:	TBD
Office Location:	ENG2-2125	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-3743	Class Location:	TBD
Email:	catbas@ucf.edu	Course Modality:	P, RV

Course Description

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Structures and Geotech as well as others who are interested in smart city built infrastructure. This course will introduce various emerging concepts, methods and technologies related to design, assessment, analysis, monitoring and non-destructive evaluation methods with specific applications for smart city built infrastructure. The course will cover recent advances in analysis, sensing and decision-making for the next generation structures to be designed as well as managing existing structures in future cities. This course aims to introduce special topics, advanced methods and technologies as well as engineering research approaches for modeling, monitoring and assessment of structures and structural systems. The course material will be applicable to structures such as bridges, buildings, stadiums, wind turbines, heavy movable structures.

The course will be carried out as follows:

- Formal lectures and presentations by the professor
- Students presentations and contributions
- Presentations and lectures by Guest Lecturers
- Site visits to major projects
- Final project reports and presentations by the students

Pre-requisite: Structural Analysis (CES4100) with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

The course will be an interactive course with contributions from the lecturer, students and invited speakers. Upon completion of the course, the students will be able to develop an understanding of modeling methods and techniques along with sensing technologies that are envisioned to be integral parts of future built infrastructure. Also, students will be able to develop designs for modeling, sensing, decision-making for smart city built infrastructure.

1. Modeling and model updating using experimental data
2. Monitoring and non-destructive technologies (e.g. sensors, cameras),
3. Data analysis approaches (Physics-based and data-driven methods)
4. Structural assessment and decision-making in future cities

Grading

Homework Assignments?	30%
Mini-Project/Mid-term	30%
Course Project	40%
Total	100%

Topics

1. Modeling and model updating using experimental data
2. Monitoring and non-destructive technologies (e.g. sensors, cameras),
3. Data analysis approaches (Physics-based and data-driven methods)
4. Structural assessment and decision-making in future cities

Course Materials and Resources

Required text: No specific text book will be needed.
Lecture notes, Journal papers and other reading material will be distributed to the students.

Reference:

- Catbas, F.N., Kijewski-Correa, Aktan, A.E. (2013) "Structural Identification of Constructed Systems: Approaches, Methods and Technologies for Effective Proactive of Structural Identification", American Society of Civil Engineers (ASCE) Structural Engineering Institute (SEI), ISBN 978-07-8441-1971, 2013 (234 pages)
- **"***Structural Health Monitoring of Civil Infrastructure Systems"*, Woodhead Publishing Limited Abington Hall, Granta Park, Great Abington, Cambridge, edited Vistasp Karbhari and Farhad Ansari, (ISBN 1-84569-392-2), 2009
- *Structural Health Monitoring Encyclopedia*, Wiley Publishers, New York, editors C. Boller, F.-K. Chang, Y. Fujino, (ISBN: 978-0-470-05822-0), pages 2077-2088, 2009
- Journals and papers (specific papers to be assigned/identified)) such as
    - ASCE Journal of Structural Engineering, Bridge Engineering, Engineering Mechanics
    - Structure and Infrastructure Engineering (SIE) Journal
    - Structural Health Monitoring Journal

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - CGN 5200 Internet of Things: Applications in Smart Cities

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

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3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* CGN 5200 Internet of Things: Applications in Smart Cities

Approved Graduate Faculty/Scholars:* Yes

Prefix:* CGN

Number:* 5200

Course Title:* Internet of Things: Applications in Smart Cities

30 Character Abbreviation: IoT App in Smart Cities

Course Description:*	Internet of Things (IoT) for smart infrastructures, Urban infrastructure sensing, Embedded Systems, Conceptualization and Design of Smart City IoT Applications
Credit Hours:	3.0
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	CGN 3405 or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more

advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☐ Odd Fall ☐ Even Fall ☑ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart cities and connected transportation. The emergence of connected smart devices and advances in sensor and computing have enabled an opportunity to connect every 'thing' to one another, and thus creating an internet-of-things (IoT). The resultant data collection and connectivity can be utilized to solve many issues in human mobility, smart cities, smart communities and other civil engineering related problems. This course will focus on a multidisciplinary introduction to IoT and applications in Civil engineering and smart cities. This graduate course will be useful to any student who wants to leverage their existing domain knowledge and build IoT-related applications in their field. This course will cover various emerging concepts, methods, tools and relevant technological details (both hardware and software) with specific applications for smart cities and connected transportation systems.

What majors require or recommend this course for graduation? Proposed Civil Engineering M.S. track in Smart Cities

If not a major requirement, what will be the source of students? Any Engineering discipline, Computer Science, IT, Tourism

What is the estimated annual enrollment? 25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☐ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

CGN 5200: Internet of Things: Applications in Smart Cities

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Shaurya Agarwal, Ph.D.	Term:	TBD
Office Location:	ENG2-409	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-6205	Class Location:	TBD
Email:	Shaurya.agarwal@ucf.edu	Course Modality:	P, RV

Course Description

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart cities and connected transportation. The emergence of connected smart devices and advances in sensor and computing have enabled an opportunity to connect every 'thing' to one another, and thus creating an internet-of-things (IoT). The resultant data collection and connectivity can be utilized to solve many issues in human mobility, smart cities, smart communities and other civil engineering related problems. This course will focus on a multidisciplinary introduction to IoT and applications in Civil engineering and smart cities. This graduate course will be useful to any student who wants to leverage their existing domain knowledge and build IoT-related applications in their field. This course will cover various emerging concepts, methods, tools and relevant technological details (both hardware and software) with specific applications for smart cities and connected transportation systems.

Pre-requisite: Numerical Methods for Civil Engineers (CGN 3405) or Consent of Instructor

Student Learning Outcomes

Students will be able to understand the following 5 major topics (modules) by the end of the course:

1. Internet of Things (IoT)
    a. Definition and scope
    b. Smart-cities as internet of things
    c. Challenges and Applications
2. Urban Sensing
    a. Understand Basic concepts
    b. Various Legacy Sensors
    c. Data Acquisition and Integration
    d. Challenges and current research trends
3. Embedded Systems

    a. Technological Aspects
    b. Emerging Trends and Applications
    c. Challenges and Opportunities
4. Communication and Networking
    a. Basic Concepts
    b. Designing basic network for IoT applications.
    c. IoT security and privacy risks
5. Conceptualize and Design
    a. Design IoT solutions within area of interest
    b. Map out the process for an IoT solution
    c. Acquire skills in proof of concept design and testing

Grading

Grading Criteria:

Homework Assignments	35%
Paper Review	15%
Course Project	50%
Total	100%

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

1. Internet of Things (IoT)
2. Definition and scope
3. Applications of Internet of Things in smart city domain
4. Urban Sensing
5. Sensor placement
6. Embedded Systems
7. Data Acquisition and Integration
8. Communication and Networking
9. Applications of IoT to Civil Engineering and Smart CIties

Course Materials and Resources

Required text: No specific text book will be needed.
Lecture notes, Journal papers and other reading material will be distributed to the students.

Reference:

- Various articles in the journals such as IEEE Internet of Things (IoT) Journal and IEEE Transactions on ITS
- IEEE resources on Smart Cities
  http://technav.ieee.org/tag/10039/smart-cities
- USDOT Smart City Challenge
  https://www.transportation.gov/smartcity/
- World Urbanization Prospects
  https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - CGN 6200 Cyber-physical Systems & Smart Cities

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

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3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* CGN 6200 Cyber-physical Systems & Smart Cities

Approved Graduate Faculty/Scholars:* Application Pending Approval

Prefix:* CGN

Number:* 6200

Course Title:* Cyber-physical Systems & Smart Cities

30 Character Abbreviation: CPS & Smart Cities

Course Description:*

	Introduction to Cyber-physical Systems, Smart Cities as large-scale CPS, Modeling, and control of networked interconnected agents (pedestrians, vehicles, smart city components), Microscopic and Macroscopic Modeling
Credit Hours:	3.0
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Interdisciplinary Introduction to Smart Cities Applications (CGN 5555) or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and

complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☑ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart cities and connected transportation. The course will focus on a Cyber-physical system (CPS) based approach for smart city development. This course will introduce various emerging concepts, methods, and necessary technological details with specific applications for civil engineering, smart cities and connected transportation systems. The course will also cover various modeling and control techniques for CPS. Case studies and examples will include pedestrian modeling, heterogeneous traffic modeling containing CAVs, application of Mean Field Game theory, etc.

What majors require or recommend this course for graduation? Proposed Civil Engineering M.S. track in Smart Cities

If not a major requirement, what will be the source of students? Any Engineering discipline, Computer Science, IT, Tourism

What is the estimated annual enrollment? 25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check ☐ I have completed all relevant parts of the form.

Attached ☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:

Course Type

Status ○ Inactive-Hidden ○ Active-Visable

HEADING

CGN 6200: Cyber-physical Systems and Smart Cities

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Shaurya Agarwal, Ph.D.	Term:	TBD
Office Location:	ENG2-409	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-6205	Class Location:	TBD
Email:	Shaurya.agarwal@ucf.edu	Course Modality:	P, RV

Course Description

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart cities and connected transportation. The course will focus on a Cyber-physical system (CPS) based approach for smart city development. This course will introduce various emerging concepts, methods, and necessary technological details with specific applications for civil engineering, smart cities and connected transportation systems. The course will also cover various modeling and control techniques for CPS. Case studies and examples will include pedestrian modeling, heterogeneous traffic modeling containing CAVs, application of Mean Field Game theory, etc.

Pre-requisite: Interdisciplinary Introduction to Smart Cities Applications (CGN 5555) or Consent of Instructor

Student Learning Outcomes

By the end of the course students will be able to:

1. Define and understand large scale CPS
2. Understand how Smart Cities qualify as large scale CPS
3. Understand how Connected Transportation Systems qualify as large scale CPS
4. Understand modeling of networked interconnected agents – pedestrians, vehicles, etc.
5. Understand Microscopic vs Macroscopic Modeling – Mean Field Games Approach
6. Apply modeling techniques to systems in their domain
7. Design intelligent controllers
8. Perform system level optimization in Civil Engineering related Systems

Grading

Grading Criteria:

Homework Assignments	35%
Paper Review	15%
Course Project	50%
Total	100%

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

Modules

1. Introduction to Cyber-physical Systems (CPS)
    a. Definition and scope
    b. Smart-city as large scale CPS example
    c. Challenges and Applications
2. Networked Agents
    a. Multi-scale Modeling
    b. Case Study: Connected and Autonomous Vehicles
    c. Case Study: Pedestrians and Connected Cities
    d. Challenges and Opportunities
3. Urban Decisions and Control
    a. Importance of sensor data and state estimation
    b. Extraction of Actionable Intelligence
    c. Basic Concepts and Control Algorithms
    d. System-wide hierarchical control
    e. Microscopic and Macroscopic Modeling – Mean Field Games Approach
    f. System Level Optimization
    g. Cooperative control theory for autonomous vehicles and agents

Course Materials and Resources

Required text: No specific text book will be needed.
Lecture notes, Journal papers and other reading material will be distributed to the students.

Reference:

- Various articles in the journals such as IEEE Internet of Things (IoT) Journal and IEEE Transactions on ITS
- IEEE resources on Smart Cities
  http://technav.ieee.org/tag/10039/smart-cities
- IEEE resources on Cyber-physical Systems
  http://technav.ieee.org/tag/10057/cyber-physical-systems
- USDOT Smart City Challenge
  https://www.transportation.gov/smartcity/
- World Urbanization Prospects
  https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - CGN 6938: Mobility in Smart Cities: Technologies and Application Areas (Special Topic)

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College*	College of Engineering and Computer Science
Proposal Type*	Grad Course Addition
Unit / Department / College*	Department of Civil, Environmental, and Construction Engineering

For the Full Title box below, please type the course information in the following format: Prefix Code Name

Full Title*	CGN 6938: Mobility in Smart Cities: Technologies and Application Areas (Special Topic)
Approved Graduate Faculty/Scholars:*	Application Pending Approval
Prefix:*	CGN
Number:*	6938
Course Title:*	Mobility in Smart Cities: Technologies and Application Areas
30 Character Abbreviation:	Mobility in Smart Cities

Course Description:*	This course is part of the proposed Smart-city M.S. track in Civil Engineering which explores smart mobility and its technologies. The course is designed to provide students with the necessary knowledge about research developments in intelligent transportation systems infrastructure with a focus on video-based information technologies and networks connectivity. Bridging the gap between different engineering disciplines, the course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. The course is also suitable for civil engineering students who are specialized in domains other than transportation and would like to learn about the state of the art computer application in civil engineering. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, projects, and presentations.
Credit Hours:	3.0
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Highway Engineering (TTE3810) with grade of “C” (2.0) or better or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☐ Odd Fall ☐ Even Fall ☑ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ○ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

Reasons for Introduction of Course. The course is developed to fill a gap in emerging transportation technologies for smart cities. The course will introduce latest technologies adopted for traffic data acquisition and connected mobility. The instructor will focus on topics relevant to his current research including automated video data collection and mobile ad-hoc networks. The course will provide students with practical knowledge on using those technologies to solve urgent transportation issues such as road safety and sustainable mobility. The course projects will rely on open source available tools and a variety of publicly available data.

The scope of this course is different from other course offered in the civil engineering dept. Also, No course in electrical and computer engineering or Computer Science focus on the application of such techniques for urban mobility.

Demand for the Course. The course will benefit students who would like to get exposed to the transportation facet of smart cities technologies and would like to improve their skill in using new technologies in their research.

What majors require or recommend this course for graduation?	Proposed Civil Engineering M.S track in smart cities
If not a major requirement, what will be the source of students?	Any engineering discipline, computer science and Tourism
What is the estimated annual enrollment?	25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☐ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

University of Central Florida

Course Action Request Form

■ Course Addition ☐ Course Revision ☐ Course Deletion

Forward to your college office

Course Information NOTE: *Course additions and course revisions must be accompanied by a course syllabus and rationale.*
Note: Departments must also submit an electronic syllabus to the college curriculum person.

College: CECS **Department:** CECE

Department Chair: M. Abdel-Aty **Phone:** 823-2480

Approved Graduate Faculty/Scholars: M. Zaki

	Course Prefix	Number	Title	Credit Hours Ex.: 3(3,0)
Course Prefix	CGN	6938	Mobility in Smart Cities: Technologies and Application Areas	3.0
New or Proposed Revision				

30 Char. Abbreviation:

Course Description (25 word limit)

Smart Cities, Video Analysis, Road Safety, sustainable transportation, mobility, ad-hoc networks, simulation, surrogate safety measures

Will lab fees be charged? ☐ Yes ■ No

Repeat for credit? ☐ Yes ■ No If yes, indicate the total times this course may be used in the degree program.

Repeat within same semester? ☐ Yes ■ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s) and/or Corequisite(s): Highway Engineering (TTE3810) or Consent of Instructor **Graded S/U?** ☐ Yes ■ No

Split-Level Class: ☐ Yes ■ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:

NOTE: ***Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.***

Term of Offering
When will course be offered?

☐ Odd Fall ■ Odd Spring ☐ Odd Summer ☐ Every Semester

☐ Even Fall ☐ Even Spring ☐ Even Summer ☐ Occasional

Intended Utilization of Course
The course will be used primarily as:

☐ Required Courses ■ Elective Courses

Justification for Course Addition or Course Revision

What is the rationale for adding/changing this course?

The course is developed to fill a gap in emerging transportation technologies for smart cities. The course will introduce latest technologies adopted for traffic data acquisition and connected mobility. The instructor will focus on topics relevant to his current research including automated video data collection and mobile ad-hoc networks. The course will provide students with practical knowledge on using those technologies to solve urgent transportation issues such as road safety and sustainable mobility. The course projects will rely on open source available tools and a variety of publicly available data.
The scope of this course is different from other course offered in the civil engineering dept. Also, No course in electrical and computer engineering or Computer Science focus on the application of such techniques for urban mobility.

The course will benefit students who would like to get exposed to the transportation facet of smart cities technologies and would like to improve their skill in using new technologies in their research.

What majors require or recommend this course for graduation? Transportation, Smart Cities

If not a major requirement, what will be the source of students? _____

What is the estimated annual enrollment? 20

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Justification for Course Deletion

Is this course a required course for graduation in a major or prerequisite? ☐ Yes ■ No

If yes, have the involved major departments been informed, in writing, of proposed deletion? ☐ Yes ☐ No

If not, explain:Course Description (25 word limit)

Notes:

Approval Signatures

Department Chair _____ **Date** _____

College Academic Standards _____ **Date** _____

College Dean _____ **Date** _____

Graduate Council _____ **Date** _____

Graduate Dean _____ **Date** _____

CGN 6938: Mobility in Smart Cities: Technologies and Application Areas

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Zaki, Ph.D.	Term:	TBD
Office Location:	TBD	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-4824	Class Location:	TBD
Email:	mzaki@ucf.edu	Course Modality:	P, RV

Course Description

This course is part of the proposed Smart-city M.S. track in Civil Engineering which explores smart mobility and its technologies. The course is designed to provide students with necessary knowledge about research developments in intelligent transportation systems infrastructure with a focus on video-based information technologies and networks connectivity. Bridging the gap between different engineering disciplines, the course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. The course is also suitable for civil engineering students who are specialized in domains other than transportation and would like to learn about state of the art computer application in civil engineering. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, projects, and presentations.

Pre-requisite: Highway Engineering (TTE3810) with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

Lectures are the main designed activities to facilitate the students' learning outcome. The lectures focus on transportation research relating to traffic video analysis and design of mobile ad-hoc networks; as well as on the implications of the research on improving safety and mobility. It is expected that by the end of the course students will be able to:

- Learn about the key challenges and problems facings transportation infrastructure in smart cities and to identify transportation needs for smart cities
- be able to synthesize research on the development and applications of new technologies for transportation
- Know about the underlying layers that form the ITS systems and the integration with road infrastructure planning process

- Acquire the necessary background of computer vision and its applications in traffic data analysis and road safety
- Understand the network foundation of connected transportation systems and its applications in improving safety and mobility.
- Develop their own principled problem-solving strategies and effective techniques for road safety and mobility

Grading

Grading Criteria:

- Quizzes: Two in-class quizzes at 10 percent each. The quizzes will comprise a combination of design questions, data-set, and short-answer questions.
- Paper Presentations: Each student will give two review presentations at 10 percent each, related to two pre-selected research papers.
- Final Project (written report and oral presentation): Students can choose to work individually or in a group of 2 on a project relevant to the material taught in the class. Relevant software tools and data sets will be provided.
- In-class Participation: Students are expected to attend and participate in class discussion.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

Part 1: Introduction to Transportation Challenges in Smart Cities

- Smart Cities initiatives and innovations
- ITS Design Issues and Challenges
- Mobility and Safety in Transportation
- Surrogate Safety Measures: Swedish Traffic Conflicts Techniques

Part 2: Connectivity

- Ad-hoc Networks in Transportation
- Network Architecture
- Mobility Models challenges for vehicles and pedestrians
- Simulation models for Ad-hoc Networks and Performance Measures
- Applications: Road-users Mobility Management

Part 3: Data Collection

- computer vision (CV): Theory and algorithms
- Traffic Tracking Technologies

- Automated Traffic Data Collection and Management
- Evaluation Methods and Performance Measures
- Applications: Road Safety Evaluation Programs

Course Materials and Resources

Required text: No specific text book will be needed.
Course notes and handouts are the main references used in this course. Additional resources are listed below:

- Computer Vision and Imaging in Intelligent Transportation Systems. John Wiley & Sons, 2017.
- Handbook of Intelligent Vehicles. Editor: A. Eskandarian. ISBN 978-0-85729-084-7, pp. 1599, Springer, 2012
- Popescu-Zeletin, R., Radusch, I., & Rigani, M. A. (2010). Vehicular-2-X communication: state-of-the-art and research in mobile vehicular ad hoc networks. Springer Science & Business Media.
- Roy, Radhika Ranjan. Handbook of mobile ad hoc networks for mobility models. Springer Science & Business Media, 2010

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - Civil General

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

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3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* Civil General

Approved Graduate Faculty/Scholars:* Mohamed Abdel-Aty

Prefix:* CGN

Number:* 5555

Course Title:* Interdisciplinary Introduction to Smart Cities' Applications

30 Character Abbreviation: Intdisc Intro Sma City Apply

Course Description:*

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems, structural and Geotech, Environmental Engineering and Science and tourism. This course is intended to provide a broad multidisciplinary background about the different systems and technologies used in Smart Cities. Special emphasis is given to how these relate to Civil and Environmental Engineering.

Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	0
Contact Hours:	3
Variable Credit (1-99):	
Repeat for credit?	○ Yes ◉ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Highway Engineering (TTE3810) and Environmental Engineering (ENV 3001) with grade of “C” (2.0) or better or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☑ Even Fall ☑ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ◉ Required Course ○ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?	This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems, structural and Geotech, Environmental Engineering, Env. Science, Tourism and any relevant field. This course's objective is to provide a broad multidisciplinary background about the different systems and technologies used in Smart Cities. Special emphasis is given to how these relate to Civil and Environmental Engineering. With the rapid advancement in technology, sensors, software, data and systems addressing Civil and Environmental Engineering practices in cities, it is becoming essential to educate and equip the new generation of Civil and Environmental Engineers with the knowledge and tools to be successful and to contribute to the development of our future cities.
What majors require or recommend this course for graduation?	MS Civil Engineering Smart Cities Track
If not a major requirement, what will be the source of students?	Grad students in Civil Engineering, ENV Eng, Other Engineering disciplines, IT, Tourism, Public Admn, Statistics
What is the estimated annual enrollment?	25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	I have discussed the Smart Cities track and courses with the chairs of all Engneerng deppartments, Statistics, tourism and the director of Public Admn. There is no duplication and there is general support.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

CGN 5555: Interdisciplinary Introduction to Smart Cities' Applications

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Abdel-Aty, Ph.D., P.E.	Term:	TBD
Office Location:	ENG2-211	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-1374	Class Location:	TBD
Email:	m.aty@ucf.edu	Course Modality:	P, RV

Course Description

This course is intended for the proposed for students in Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems, structural and Geotech, Environmental Engineering and Science and tourism. This course is intended to provide a broad multidisciplinary background about the different systems and technologies used in Smart Cities. Special emphasis is given to how these relate to Civil and Environmental Engineering.
Pre-requisite: Highway Engineering (TTE3810) and Environmental Engineering (ENV 3001) with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

By the end of this course, students should be able to understand the following 7 major topics (modules):

1. Smart City and Connectivity
2. Smart Transportation
3. Technology adoption and usage
4. Smart air quality monitoring
5. Smart Water and wastewater management
6. Built infrastructure and Smart City
7. Smart economy and smart communities

Grading

Grading Criteria:

Short papers: 70%

Seven short papers covering each of the 7 main modules of the course will be required. Due dates for homework will be announced and will be due by the beginning of the class. Under extenuating circumstances, you may provide a note from your doctor or advisor. No late homework will be

accepted. All assignments should be done neatly and professionally. Occasionally the instructor will provide reading and writing assignments that involve current relevant literature.

Term project and final presentation: 30%
A term project involving one of the 7 focus areas will be required for completion of this course. This project will include the completion of project-related literature reviews, an oral presentation, and a final written report. A 5-page report (references does not include in the page limit) will be due one week before the last class in the semester. A final presentation (10 min presentation + 5 min Q&A) will be delivered in the last three classes (6-8 students' presentation per one class). Details for the project will be provided mid-semester. *A written report and final presentation will be the final examination.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

1. What Makes a Smart City function?
2. Connected Vehicles: Key actors in IoT
3. Mobility as a service
4. Different approaches to evaluating Connected and Autonomous (CAV) Systems
5. Potential Safety and Operation benefits of Connected and Autonomous Vehicles
6. Evaluate consumer behavior associated with new technology adoption and usage.
7. Current practices and challenges in air quality monitoring
8. Electric vehicles and air quality
9. Sustainable water management
10. Clean energy production from wastewater
11. Designing, Operating and Maintaining a Smart City
12. Technologies for the built infrastructure of the smart city
13. socio-economic development of smart cities
14. Social behavior, civic engagement, and equity in smart communities
15. Smart city financial models
16. Sustainability and eco-cities
17. Smart tourism and smart health

Course Materials and Resources

Required text: No specific text book will be needed.
Lecture notes, Journal papers and other reading material will be distributed to the students.

Reference:

- Big Data Analytics for Connected and Vehicles and Smart Cities, B. McQueen, 2017 Artech House (ISBN 13:978-1-63081-321-5)
- USDOT Smart City Challenge https://www.transportation.gov/smartcity/

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - ENV 5650: Smart Air Quality Monitoring and Air Pollution Control

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College*	College of Engineering and Computer Science
Proposal Type*	Grad Course Addition
Unit / Department / College*	Department of Civil, Environmental, and Construction Engineering

For the Full Title box below, please type the course information in the following format: Prefix Code Name

Full Title*	ENV 5650: Smart Air Quality Monitoring and Air Pollution Control
Approved Graduate Faculty/Scholars:*	Haofei Yu, Fudong Liu
Prefix:*	ENV
Number:*	5650
Course Title:*	Smart Air Quality Monitoring and Air Pollution Control
30 Character Abbreviation:	Smart Air monitor & control

Course Description:*	The objectives of this course are to: Introduce basic scientific and engineering concepts related to air pollution management, measurement and control technologies; Explain current practices and challenges in air pollution control and urban air quality management; Master Emerging technologies that enables “smart” air quality and pollution control, and future developing directions.
Credit Hours:	3
Class Hours:	TBD
Lab and Field Work Hours:	TBD
Contact Hours:	TBD
Variable Credit (1-99):	3
Repeat for credit?	(•) Yes ( ) No
If yes, indicate the total times the course may be used in the degree program.	2
Repeat within same semester?	( ) Yes (•) No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	CGN 5555: Interdisciplinary Introduction to Smart Cities' Applications
Corequisite(s):	None
Graded S/U?	( ) Yes (•) No
Split-Level Class:	( ) Yes (•) No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☐ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?	As one of the core courses for the Smart Cities Track of master's degree in Civil Engineering, this course will introduce current practices and challenges in air pollution monitoring, urban air quality management, and air pollution control. The state-of-the-art technologies on air quality sensing and control will also be presented. Much contents presented in this new course are not taught elsewhere at UCF. The addition of this course will broaden students' knowledge related to air quality, and will prepare students to pursue future careers in the field of air quality consulting, and academic research efforts on air quality.
What majors require or recommend this course for graduation?	None
If not a major requirement, what will be the source of students?	master students in civil engineering, or other master students in CECE
What is the estimated annual enrollment?	10

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	We are not aware of any conflicts or duplications with other departments or college.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	College of Engineering and Computer Science
Course Type	Civil Engineering
Status	○ Inactive-Hidden ◉ Active-Visable

HEADING

ENV 5650: Smart Air Quality Monitoring and Air Pollution Control

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Haofei Yu, PhD; Fudong Liu, PhD	Term:	TBD
Office Location:	ENG2-227 (Yu); R1-212 (Liu)	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-1309 (Yu); 407-823-6219 (Liu)	Class Location:	TBD
Email:	Haofei.Yu@ucf.edu; Fudong.Liu@ucf.edu	Course Modality:	P, RV

Course Description

The objectives of this course are to:

1. Introduce basic scientific and engineering concepts related to air pollution management, measurement and control technologies;
2. Explain current practices and challenges in air pollution control and urban air quality management;
3. Master Emerging technologies that enables "smart" air quality and pollution control, and future developing directions.

Pre-requisite: Interdisciplinary Introduction to Smart Cities' Applications (CGN 5555) with grade of "C" (2.0) or better, or Consent of Instructor

Student Learning Outcomes

By the end of this course, students should be able to:

1. Familiar with basic science and engineering principles related to urban air quality monitoring and air pollution control, including but not limited to: air pollution issues at various scales, environmental fate and transport of contaminants, health and environmental impacts of urban air pollution, and principles of commonly used air pollution measurement/control techniques.
2. Be able to apply basic science and engineering principles such as ideal gas law, reaction kinetics to characterize the transport and partitioning of air pollutants in different environmental compartments.
3. Familiar with current practices in urban air quality management/control and related laws and regulations.
4. Understand the principles and limitations of new and emerging technologies in measuring and controlling air pollution.
5. Demonstrate ability to communicate effectively through written and oral reports.

Grading

The final course grade will be based on the following:

Mid-term exam	30%
Comprehensive Final	30%
Three homework	30%
Essay or project experience	10%

Grading Scale: A = > 90; B = 89.9-80; C = 79.9-70; D = 69.9-60; F = < 59.9.
Plus/minus grades apply.

Material will be covered by lectures, discussion and written homework. Students are expected to attend all scheduled class periods and are responsible for material covered in class and reading assignments. Lectures will not be restricted to the textbook. If you arrive late, leave early, or otherwise need to leave the class during a lecture, please do so quietly. Silence cell phones while in the class room.

Three homework will be assigned in this course. Homework is due at the beginning of the class on the dates indicated and must be done neatly on 8 ½ x 11-inch paper, with multiple pages stapled. Partial credit for wrong answers may be given only if all work is shown and can be followed. Full credit will not be given for correct answers if the solution is not properly shown. Homework must be done in a professional manner.

Students are encouraged to work together on homework in order to help each other learn. However, straight copying of homework is unethical, and will not be tolerated. Late homework will not be accepted unless arranged in advance. Academic dishonesty will not be tolerated and will result in a zero for the assignment.

One mid-term exam and one comprehensive final exam will be given. Exams are close book. You are allowed to bring one page of note with you (one 8 ½ x 11-inch paper, front and back). Only pencils, calculators and the one page note sheet are allowed during an exam. Missed exams may not be made up except when arranged in advance. Academic dishonesty will not be tolerated during an exam. The first offense will result in a zero for that exam. The second will result in an "F" for the course.

In order to received ten percent (10) of the final grades, students can choose to prepare an essay (over 1500 words), or complete a measurement project using low-cost air quality sensors or finish a design project in paper for catalytic technology used in air pollution control. Students can choose to form a group with up to three (3) members to participate in the measurement/design projects. Detailed instructions on the essay, and the measurement/design project will be provided by the instructors at the beginning of the semester.

All students are expected to participate in class by regularly attending, by preparing in advance, and by actively participating in discussions. Up to three (3) class participation credits (count toward final grades) can be gained by cutting out, discussing with the class, and handing in news articles and comics on air quality monitoring ting and air pollution control.

This syllabus may be modified at the discretion of the instructor. Changes will be discussed in class and/or via email

Topics

Module 1: Smart urban air quality management – Yu

1. **Introduction to urban air pollution**

a. Overview of types and sources of urban air pollution
b. Health and environmental impacts of urban air pollution
c. Basic scientific and engineering concepts

2. **Current practices in urban air quality management**
    a. Introduction to regulations related to air quality management
    b. Overview of current air quality management at local and state level
    c. Air quality monitoring and traditional measurement techniques
3. **Emerging "smart" technologies and their role in urban air quality management**
    a. Introduction to low-cost measurement technologies
    b. The new frontier of smart low-cost sensor network
    c. Smart transportation technologies and air quality

Module 2: Smart urban air pollution control – Liu

1. **Stringent emission standards for urban air pollution**
    a. Emission standards for stationary sources of air pollution
    b. Emission standards for mobile sources of air pollution
    c. Air-quality standards for indoor air pollutants
2. **In-depth fundamentals relevant to urban air pollution**
    a. Physical effects of urban air pollution
    b. Atmospheric chemistry related to urban pollution
    c. Analytical tools for urban air pollution
3. **Emerging "smart" technologies for efficient urban air pollution control**
    a. "Smart" physical methodologies for urban air pollution control
    b. "Smart" chemical methodologies (catalysis) for urban air pollution control
    c. "Smart" advanced materials and technologies for cleaner urban communities

Course Materials and Resources

There is no required textbook. Lecture notes, Journal papers and other reading material will be distributed to the students.

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - Intelligent Infrastructure Management

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* Intelligent Infrastructure Management

Approved Graduate Faculty/Scholars:* Dr. Mohamed Abdel-Aty

Prefix:* CGN

Number:* 5550

Course Title:* Intelligent Infrastructure Management

30 Character Abbreviation:

Course Description:*

	The purpose of this course is to provide students with a solid introduction to the mathematical modeling and programming techniques that are useful for civil infrastructure planning, operations, and maintenance with increasing infrastructure connectivity and data availability.
Credit Hours:	3
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	**STA 3032 - Probability and Statistics for Engineers** **CGN 3405 - Applied Numerical Methods for Civil Engineering** **Basic programming skills** **Or consent of the instructor**
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered?	☐ Odd Fall ☐ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as:	◉ Required Course ○ Elective Course

New Field

New Materials and Supply Fees?*	○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?	The future of our city involves increasing conenctivity and data availability, so does the infrastructure systems. Educate our future engineers with relevent decision making techniques to plan, operate, maintain our infrastructure systems within a smart city concept is critical to meet the future job market demands.
What majors require or recommend this course for graduation?	Civil Engineering
If not a major requirement, what will be the source of students?	Smart city track master students;
What is the estimated annual enrollment?	15

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

CGN 5550 Syllabus

CGN 5550: INTELLIGENT INFRASTRUCTURE MANAGEMENT

Department of Civil, Environmental and Construction Engineering

College of Engineering and Computer Science

Number of Credit Hours: 3

Course Information

- Term: Fall, 2020
- Course Number & Section: CGN 5550
- Course Name: Intelligent Infrastructure Management
- Credit Hours: 3
- Class Meeting Days: Tuesday and Thursday
- Class Meeting Time: 9:00 AM – 10:15 AM
- Class Location: Room XXX
- Course Modality: P (face-to-face)

Instructor Information

- Instructor: Dr. Zhaomiao (Walter) Guo
- Office Location: Research 1, 150J
- Office Hours: TR 10:30 AM – 11:45 AM or by e-mail
- Email: **guo@ucf.edu (mailto:guo@ucf.edu)**
- Phone: 407-823-6215

Teaching Assistants

- GTA(s): XXX
- Office Location: XXX
- Office Hours: TR 2:00 PM – 4:00 PM or by e-mail
- Email: XXX@knights.ucf.edu

Enrollment Requirements

Course Prerequisites:

STA 3032 - Probability and Statistics for Engineers

CGN 3405 - Applied Numerical Methods for Civil Engineering

Basic programming skills; Students will be required to write their own computer programs.

Course Co-requisites: NA

Course Description

The purpose of this course is to provide students with a solid introduction to the advanced mathematical modeling and programming techniques that are useful for civil infrastructure planning, operations, and maintenance with increasing infrastructure connectivity and data availability.

Course Materials and Resources

Required Materials/Resources

- Lecture slides/notes will be made available electronically via Webcourses.

Other Reference/Resources

- Hudson W.R., Haas R. and Uddin W., Infrastructure Management, McGraw-Hill, 1997
- Pindyck R. and Rubinfeld D., Econometric Models and Economic Forecasts, McGraw-Hill
- Hillier F. and Lieberman G., Introduction to Operations Research, Edition, McGraw-Hill
- R. Bellman and R. Kalaba, Dynamic Programming and Modern Control Theory, Academic Press, 1965.
- J.R. Birge and Francois Louveaux, Introduction to Stochastic Programming, Springer Verlag, New York, 1997.

Student Learning Outcomes

- Master the basic multi-stage operations research approach approach for planning/operation/maintenance of infrastructure systems
- Develop an operations research foundation for future coursework in civil engineering

Course Activities

- Four problem-oriented homework assignments. The objective of these assignments is to assist in the learning of course material, so discussion of assignments among students is encouraged. But each student is required to submit his/her own written answers/codes before class in the due date.
- One final project, including a writing of a term paper and in-class presentation. The objective of the term paper is to investigate a topic of interest in the area of infrastructure systems management by using the approach learnt in this course. Students may work in groups or individually.

Make-up Exams and Assignments

Per university policy, you are allowed to submit make-up work (or an equivalent, alternate assignment) for university-sponsored events, religious observances, or legal obligations (such as jury duty). If this participation conflicts with your course assignments, I will offer a reasonable opportunity for you to complete missed assignments and/or exams. The make-up assignment and grading scale will be equivalent to the missed assignment and its grading scale. But such requests are strongly discouraged and will be accommodated only when prior permission from the instructor has been sought adequately in advance and/or sufficient evidence has been provided.

Assessment and Grading Procedures

Assignment	Percentage of Grade
Attendance/Participation	5%
Homework	55%
Term Paper	30%
Presentation	10%
Total	100%

I will adopt plus/minus grading system. All grades for the assignments and exams will be posted on webcourses.

Letter Grade	Points
A	93 – 100 points

A-	90 – 92 points
B+	87 – 89 points
B	83 – 86 points
B-	80 – 82 points
C+	77 – 79 points
C	73 – 76 points
C-	70 – 72 points
D+	67 – 69 points
D	63 – 66 points
D-	60 – 62 points
F	59 and below

Course Schedule

Class	**Date**	**Topic**	**Homework**
1	8/21	Course Overview	HW0 Given
2	8/23	Introduction to intelligent infrastructure management in smart cities	
	8/24		**HW0 DUE**

3	8/28	Data collection with connected infrastructure and advanced sensors	
4	8/30	Data forecast with connected infrastructure and advanced sensors	
5	9/4	Fundamentals on Mathematical Programming	HW1 Given
6	9/6	Fundamentals on Methematical Programming	
7	9/11	Fundamentals on Methematical Programming	
8	9/13	Fundamentals on Methematical Programming	
9	**9/18**	Multistage processes and multistage decision making	**HW1 DUE** HW2 Given
10	9/20	Multistage processes and multistage decision making	
11	9/25	Multistage processes and multistage decision making	
12	9/27	Multistage processes and multistage decision making	
13	**10/2**	Distributed decision making in intelligent infrastructure system	**HW2 DUE** HW3 Given
14	10/4	Distributed decision making in intelligent infrastructure system	

15	10/9	Distributed decision making in intelligent infrastructure system	
16	**10/11**	Stochastic modeling methods for decision making under uncertainties	**HW3 DUE** HW4 Given
17	10/16	Stochastic modeling methods for decision making under uncertainties	
18	10/18	Stochastic modeling methods for decision making under uncertainties	
19	**10/23**	Application 1: infrastructure maintenance	**HW4 DUE**
20	10/25	Application 1: infrastructure maintenance	
21	10/30	Application 2: transportation network resilience	
22	11/1	Application 2: transportation network resilience	
23	11/6	Application 3: charging infrastructure competition	
24	11/8	Application 3: charging infrastructure competition	
25	11/13	Application 4: renewable power generator planning	
26	11/15	Application 4: renewable power generator planning	

27	**11/20**	***Presentation and Discussion***	
28	**11/22**	***Presentation and Discussion***	
29	**11/27**	***Presentation and Discussion***	
30	**11/29**	***Presentation and Discussion***	
	12/6	**Term Paper Due** Thursday, December 6, 2018, 7:00 AM – 9:50 AM	

Policy Statements

Federal Aid Policy

All faculty members are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete the following academic activity by the end of the first week of classes, or as soon as possible after adding the course. Failure to do so will result in a delay in the disbursement of your financial aid.

Complete HW0 posted on Webcourses. (Due: Friday Aug. 24, 2018 11:59pm)

Academic Integrity

Students should familiarize themselves with **UCF's Rules of Conduct (http://osc.sdes.ucf.edu/process/roc)** . According to Section 1, "Academic Misconduct," students are prohibited from engaging in:

- *Unauthorized assistance*: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
- *Communication to another through written, visual, electronic, or oral means*: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
- *Commercial Use of Academic Material*: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class

notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
- *Falsifying or misrepresenting* the student's own academic work.
- *Plagiarism*: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
- *Multiple Submissions*: Submitting the same academic work for credit more than once without the express written permission of the instructor.
- *Helping another violate* academic behavior standards.

For more information about Academic Integrity, students may consult **The Center for Academic Integrity (https://academicintegrity.org/)** .

For more information about plagiarism and misuse of sources, see "**Defining and Avoiding Plagiarism: The WPA Statement on Best Practices (http://wpacouncil.org/node/9)** ".

Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, **The Golden Rule. (http://goldenrule.sdes.ucf.edu/docs/goldenrule.pdf)** UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and when necessary respond to academic misconduct. Penalties can include a failing grade in an assignment or in the course, suspension or expulsion from the university, and/or a "Z Designation" on a student's official transcript indicating academic dishonesty, where the final grade for this course will be preceded by the letter Z. For more information about the Z Designation, see **http://goldenrule.sdes.ucf.edu/zgrade (http://goldenrule.sdes.ucf.edu/zgrade)** .

Course Accessibility Statement

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need disability-related access in this course should contact the professor as soon as possible. Students should also connect with **Student Accessibility Services (http://sas.sdes.ucf.edu/)** (Ferrell Commons 185, **sas@ucf.edu (mailto:sas@ucf.edu)** , phone (407) 823-2371). Through Student Accessibility Services, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential access and accommodations that might be reasonable.Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student.

Campus Safety Statement

Emergencies on campus are rare, but if one should arise in our class, everyone needs to work together. Students should be aware of the surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
- Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Please make a note of the guide's physical location and consider reviewing the online version at **http://emergency.ucf.edu/emergency_guide.html (http://emergency.ucf.edu/emergency_guide.html)** .
- Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency.
- If there is a medical emergency during class, we may need to access a first aid kit or AED (Automated External Defibrillator). To learn where those items are located in this building, see **http://www.ehs.ucf.edu/workplacesafety.html (http://www.ehs.ucf.edu/Workplacesafety)** (click on link from menu on left).
- To stay informed about emergency situations, sign up to receive UCF text alerts by going to **my.ucf.edu (http://my.ucf.edu)** and logging in. Click on "Student Self Service" located on the left side of the screen in the tool bar, scroll down to the blue "Personal Information" heading on your Student Center screen, click on "UCF Alert," fill out the information, including your e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- Students with special needs related to emergency situations should speak with their instructors outside of class.
- To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video.
  You CAN Survive an Active Shooter (https://youtu.be/NIKYajEx4pk)

(https://youtu.be/NIKYajEx4pk)

Deployed Active Duty Military Students

If you are a deployed active duty military student and feel that you may need a special accommodation due to that unique status, please contact your instructor to discuss your circumstances.

Copyright

This course may contain copyright protected materials such as audio or video clips, images, text materials, etc. These items are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of

learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

Third-Party Software and FERPA

During this course you might have the opportunity to use public online services and/or software applications sometimes called third-party software such as a blog or wiki. While some of these could be required assignments, you need not make any personally identifying information on a public site. Do not post or provide any private information about yourself or your classmates. Where appropriate you may use a pseudonym or nickname. Some written assignments posted publicly may require personal reflection/comments, but the assignments will not require you to disclose any personally identity-sensitive information. If you have any concerns about this, please contact your instructor.

Grad Course Addition - College of Engineering and Computer Science - Policy Aspects of Smart City Transportation

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* Policy Aspects of Smart City Transportation

Approved Graduate Faculty/Scholars:* Mohamed Abdel-Aty

Prefix:* TTE

Number:* 5252

Course Title:* Policy Aspects of Smart City Transportation

30 Character Abbreviation: Policy Smart City Transport

Course Description:*

Provide a broad overview of the policy aspects of transportation in Smart Cities, including the likely impact of Smart City technologies on transportation. Introduce policy implications of Big Data and Analytics in a Smart City. Policy challenges and opportunities associated with connected and autonomous vehicles.

Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	
Contact Hours:	3
Variable Credit (1-99):	
Repeat for credit?	(•) Yes ( ) No
If yes, indicate the total times the course may be used in the degree program.	2
Repeat within same semester?	( ) Yes (•) No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	CGN 5555 Interdisciplinary Introduction to Smart Cities Applications or Consent of Instructor
Corequisite(s):	
Graded S/U?	( ) Yes (•) No
Split-Level Class:	( ) Yes (•) No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☐ Odd Fall ☐ Even Fall ☐ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course? This course is inteneded for the proposed Smart-city M.S. track in Civil Engineering, M.S. track in Transportation Systems as well as other Engineering disciplines. The course will provide a broad overview of the policy aspects of transportation in Smart Cities, including the likely impact of Smart City technologies on transportation.

What majors require or recommend this course for graduation? Proposed Civil Engineering M.S. track in Smart Cities

If not a major requirement, what will be the source of students? Any Engineering discipline

What is the estimated annual enrollment? 25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☐ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

TTE5252: Policy Aspects of Smart City Transportation

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Abdel-Aty, Ph.D., P.E.	Term:	TBD
Office Location:	ENG2 211	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	3-4535	Class Location:	TBD
Email:	m.aty@ucf.edu	Course Modality:	P, RV

Course Description

Provide a broad overview of the policy aspects of transportation in Smart Cities, including the likely impact of Smart City technologies on transportation. Introduce policy implications of Big Data and Analytics in a Smart City. Policy challenges and opportunities associated with connected and autonomous vehicles.

Student Learning Outcomes

By the end of this course, students should be able to:

1. Evaluate the likely impact of smart city technologies on transportation effectiveness
2. Understand the policy questions that can be addressed by smart city transportation technologies
3. Analyze policy implications of Big Data and Analytics in a Smart City
4. Address policy challenges and opportunities associated with connected and autonomous vehicles.

Grading

1. Assignments: 40%
2. Final Paper: 60%

Topics

Module One – Transportation In A Smart City

5. Overview of smart cities and the importance of transportation
6. Transportation services in a smart city landscape
7. Public and private sector roles in a smart city transportation program
8. Likely impact of smart city technologies on transportation effectiveness

Module Two – Policy Questions to Be Addressed

1. Policy questions that can be addressed by smart city transportation technologies
2. The policy impacts of smart city transportation technologies
3. The development of Use cases taking account of policy
4. How to communicate policy, vision, and intended outcomes to relevant audience types

Module Three – How Smart City Transportation Services Address Policy

1. The relationship between policy and technology
2. How smart city transportation services can address policy objectives
3. Effective planning to ensure that policy objectives are addressed
4. Incorporating the people aspects into smart city planning

Module Four – The Policy Implications of Big Data And Analytics In A Smart City

1. Introduction to big data and transportation analytics
2. Examples of big data sources
3. Policy aspects of big data and analytics
4. Smart data management guided by policy

Module Five – Policy Challenges and Opportunities Associated with Connected And Autonomous Vehicles)

1. Policy challenges
2. Policy opportunities
3. Lessons from the past
4. Policy case studies from around the world

Course Materials and Resources

Big Data Analytics for Connected Vehicles and Smart Cities by Bob McQueen, Artech House Aug 31, 2017. Lecture notes, Journal papers and other reading material will also be distributed to the students.

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - Smart Water and Wastewater Management

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* Smart Water and Wastewater Management

Approved Graduate Faculty/Scholars:* Woo Hyoung Lee

Prefix:* ENV

Number:* 6300

Course Title:* Smart Water and Wastewater Management

30 Character Abbreviation: Smart Water Systems

Course Description:*

This course introduces the concept of smart water systems and how technology and data analytics are being used in the industry. The course illustrates an innovative approach to reduce non-revenue water, enhance information sharing city water-related activities, and insight into the world of smart water and wastewater systems. The course also describes water for energy and how energy production and conversion depend on water availability.

Credit Hours: 3

Class Hours:

Lab and Field Work Hours:

Contact Hours:

Variable Credit (1-99):

Repeat for credit? ○ Yes ◉ No

If yes, indicate the total times the course may be used in the degree program.

Repeat within same semester? ○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s): Environmental Engineering (ENV 3001) with grade of “C” (2.0) or better or Consent of Instructor

Corequisite(s):

Graded S/U? ○ Yes ◉ No

Split-Level Class: ○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☐ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course? Based on the efforts of creating MS Civil Engineering - Smart Cities Track, the instructor is developing a core course related to smart water systems. The objective of the course is to introduce the concept of smart water systems and how technology and data analytics are being used in the industry. Current research and direction on Water-Energy nexus will be highlighted in this class.

What majors require or recommend this course for graduation? Environmental Engineering

If not a major requirement, what will be the source of students? Civil Engineering

What is the estimated annual enrollment? 20

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

ENV 6300: Smart Water and Wastewater Management

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Woo Hyoung Lee, Ph.D., P.E.	Term:	TBD
Office Location:	ENG2-406	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-5304	Class Location:	TBD
Email:	woohyoung.lee@ucf.edu	Course Modality:	P, RV

Course Description

This course introduces the concept of smart water systems and how technology and data analytics are being used in the industry. The course illustrates an innovative approach to reduce non-revenue water, enhance information sharing city water-related activities, and insight into the world of smart water and wastewater systems. The course also describes water for energy and how energy production and conversion depend on water availability. **Pre-requisite:** Interdisciplinary Introduction to Smart Cities' Applications (CGN 5555) and Environmental Engineering (ENV 3001) with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

By the end of this course, students should be able to:

1. Learn what a smart water system is
2. Employ innovative approaches for nonrevenue water
3. Learn water and wastewater network management
4. Learn water quality monitoring
5. Obtain a knowledge of energy management and production from water

Grading

Grading Criteria:

Homework: 10%

Due dates for homework will be announced and will be due by the beginning of the class. Under extenuating circumstances, you may provide a note from your doctor or advisor. No late homework will be accepted. All assignments should be done neatly and professionally. The solution should be developed in a step-by-step procedure and the final answer of each problem should be underlined and provide in units requested. Occasionally the instructor will provide reading and writing assignments

that involve current literature in environmental biotechnology. These assignments may be individual or group assignments.

Two midterm exams: 40%
Each exam will contribute to 20% of the final grade. Exam I is closed book and closed notes. Students are not allowed to bring any reference materials to the test. All necessary information including formula and equations is provided for Exam 1. Students should bring their own calculator. Use of any types of smart phone are not allowed during exams. Exam II is a take home exam.

Term project and final presentation: 50%
A term project involving smart water and wastewater managements and smart water sensing for urban societies will be required for completion of this course. This project will include the completion of project-related literature reviews, an oral presentation, and a final written report. A 5-page report (references does not include in the page limit) will be due on Wed in the week of Thanksgiving and a final presentation (20 min presentation + 5 min Q&A) will be delivered in the last six classes (3 students' presentation per one class). Details for the project will be provided mid-semester (After Exam 1). *A written report and final presentation will be the final examination.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

1. Water network management
2. Wastewater network management
3. Water quality monitoring, smart sensing
4. Water–energy nexus for water supply systems
5. Renewable energy production from water

Course Materials and Resources

Required text: Smart Water Utilities: Complexity Made Simple, P. Ingildsen and G. Olsson, IWA Publishing, 2016 (ISBN 9781780407579)

Reference:

- Smart Water Grids: A Cyber-Physical Systems Approach, 1st Ed. Editors: P. Tsakalides et al., CRC Press, 2018 (ISBN 9781138197930 - CAT# K31323)

- Water and Energy – Threats and Opportunities, G. Olsson, 2nd Ed. IWA Publishing, 2015 (ISBN 9781780406930)
- Smart Water Networks Forum (SWAN: https://www.swan-forum.com/)

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - Transportation Engineering

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College* College of Engineering and Computer Science

Proposal Type* Grad Course Addition

Unit / Department / College* Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title* Transportation Engineering

Approved Graduate Faculty/Scholars:* Mohamed Abdel-Aty

Prefix:* TTE

Number:* 6500

Course Title:* Connected and Autonomous Vehicles

30 Character Abbreviation: Connected Auto Vehicles

Course Description:*

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart transportation. With the rapid progress and development in Connected, Automated and Autonomous vehicles' technologies and current and future applications, this course's objectives is intended to explain and familiarize the students with these technologies and their expected benefits for transportation safety, operation, social and economic, and their potential impact.

Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	
Contact Hours:	3
Variable Credit (1-99):	
Repeat for credit?	○ Yes ◉ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Highway Engineering (TTE3810) or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☐ Odd Fall ☐ Even Fall ☐ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems, various Engineering, Tourism and any relevant field. This course's objective is to expose students to teh evolving and important area of connected, automated and autonomous vehicles which is the backbone of Smart Transortation and thus used in Smart Cities. Special emphasis is given to how to improve transportation and traffic engineering. With the rapid advancement in technology, sensors, software, data and systems addressing Civil and Environmental Engineering practices in cities, it is becoming essential to educate and equip the new generation of Civil and Environmental Engineers with the knowledge and tools to be successful and to contribute to the development of our future transportation and cities.

What majors require or recommend this course for graduation?

Civil Engineering tracks in Smart Cities and Transportation Systems, other relevant Engineering disciplines, tourism

If not a major requirement, what will be the source of students?

What is the estimated annual enrollment?

30

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	The chair of CECE has been in contact with all chairs in CECS, as well as the director of Public Administration, chairs of Statistics and tourism, and most are strongly supportive.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

TTE 6500: Connected and Autonomous Vehicles

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Abdel-Aty, Ph.D., P.E.	Term:	TBD
Office Location:	ENG2-211	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-1374	Class Location:	TBD
Email:	m.aty@ucf.edu	Course Modality:	P, RV

Course Description

This course is intended for the proposed Smart-city M.S. track in Civil Engineering, M.S. in Transportation Systems as well as other Engineering disciplines that are relevant to smart transportation. With the rapid progress and development in Connected, Automated and Autonomous vehicles' technologies and current and future applications, this course's objectives is intended to explain and familiarize the students with these technologies and their expected benefits for transportation safety, operation, social and economic, and their potential impact.

Pre-requisite: Highway Engineering (TTE3810) or Consent of Instructor

Student Learning Outcomes

Students will be able to understand the following 5 major topics (modules):

1. What are Connected, Automated and Autonomous Vehicles (CAV)
2. Data relevant to CAV
3. What technology is needed
4. Travel behavior relevant to CAV
5. Social, Environmental and Economic Impacts of CAV

Grading

Grading Criteria:

Home works: 60%

Homework testing basic data analysis of CAV data, programming and quantitative data analysis using instructor provided data, and life cycle cost calculation of CAV, as well as case study to calculate the economic, social, and environmental impacts, will be required. Due dates for homework will be announced and will be due by the beginning of the class. Under extenuating circumstances, you may provide a note from your doctor or advisor. No late homework will be accepted. All assignments

should be done neatly and professionally. Occasionally the instructor will provide reading and writing assignments that involve current relevant literature.

Term project and final presentation: 40%
A term project involving one of the 5 focus areas will be required for completion of this course. This project will include the completion of project-related literature reviews, an oral presentation, and a final written report. A 5-page report (references does not include in the page limit) will be due one week before the last class in the semester. A final presentation (10 min presentation + 5 min Q&A) will be delivered in the last three classes (6-8 students' presentation per one class). Details for the project will be provided mid-semester. *A written report and final presentation will be the final examination.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

1. Connected vehicles
2. Automated vehicles, ADAS
3. Autonomous Vehicles
4. Active Traffic Management
5. Simulation Applications in CAV
6. Safety implications of CAV
7. Data generated from CAVs
8. Introduction to data science methods for CAV data
9. Applications of CAV data
10. Connectivity Landscape
11. Creating Autonomous Vehicle System
12. CAV Sensing Ecosystem
13. Autonomous Driving Algorithm: Cyber-Physical Approach
14. Travel behavior impacts of AV
15. Transitioning to AV – challenges
16. Mobility as a service in AV world
17. Social, environmental, and economic impacts of CAV
18. Life cycle cost analysis of CAV
19. CAV Policy and Regulations

Course Materials and Resources

Required text: No specific text book will be needed.

Lecture notes, Journal papers and other reading material will be distributed to the students.

Reference:

- Various articles in the ITS Journal and the IEEE Transactions on ITS
- Big Data Analytics for Connected and Vehicles and Smart Cities, B. McQueen, 2017 Artech House (ISBN 13:978-1-63081-321-5)
- USDOT Smart City Challenge https://www.transportation.gov/smartcity/
- World Urbanization Prospects https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - TTE 5020: Active mobility and Technologies: Synergy and Challenges

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College*	College of Engineering and Computer Science
Proposal Type*	Grad Course Addition
Unit / Department / College*	Department of Civil, Environmental, and Construction Engineering

For the **Full Title** box below, please type the course information in the following format: Prefix Code Name

Full Title*	TTE 5020: Active mobility and Technologies: Synergy and Challenges
Approved Graduate Faculty/Scholars:*	Application Pending Approval
Prefix:*	TTE
Number:*	5020
Course Title:*	Active mobility and Technologies: Synergy and Challenges
30 Character Abbreviation:	Active mobility & Technologies

Course Description:*	The shift towards sustainable transportation is shaping the urban landscape of our roadways, yet, characterizing a new set of challenges and innovative mobility solutions. In this course, which is part of the proposed Smart-city M.S. track in Civil Engineering, we will explore issues related to the impact of technologies on sustainable mobility. We also address the main engineering challenges toward the realization of efficient, green transit solutions to urban cities. The course will present methods to measure, predict and evaluate the performance of complete streets. We will discuss technical developments and challenges in the intelligent transportation system (ITS) and connected and autonomous vehicles (CAV) with respect to active mobility. The course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, and presentations. The students will also conduct a comprehensive research project on a specific topic of their interest related to complete streets. Guest lecturers will be invited for presentations to bring practical experience to the classroom, and to promote interactive discussions on the subject.
Credit Hours:	3.0
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	CGN5555 - Interdisciplinary Introduction to Smart Cities' Applications or Consent of Instructor
Corequisite(s):	

Graded S/U? ○ Yes ◉ No

Split-Level Class: ○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☑ Odd Fall ☑ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

Reasons for Introduction of Course. The course is developed to fill a gap in the relationship between transportation technologies and sustainable mobility such as walking and cycling. The course will introduce the latest data collection technologies in assessing the impact of sustainable modes of transportation. It will also discuss the challenges facing the ITS and CAV on active mobility. The course projects will rely on open source available tools and a variety of publicly available data.

The scope of this course is different from other course offered in the civil engineering dept. Also, no course in the college of engineering focuses on the impact of technologies on active mode of transportation.

Demand for the Course. The course will benefit students who would like to get exposed to the transportation facet of smart cities technologies and would like to

improve their skill in using new technologies in their research.

What majors require or recommend this course for graduation?	Proposed Civil Engineering M.S Track in Smart Cities
If not a major requirement, what will be the source of students?	Any Engineering discipline, computer science and tourism
What is the estimated annual enrollment?	25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☐ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

TTE 5020: Active mobility and Technologies: Synergy and Challenges

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Zaki, Ph.D.	Term:	TBD
Office Location:	TBD	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-4824	Class Location:	TBD
Email:	mzaki@ucf.edu	Course Modality:	P, RV

Course Description

The shift towards sustainable transportation is shaping the urban landscape of our roadways, yet, characterizing a new set of challenges and innovative mobility solutions. In this course, which is part of the proposed Smart-city M.S. track in Civil Engineering, we will explore issues related to the impact of technologies on sustainable mobility. We also address the main engineering challenges towards the realization of efficient, green transit solutions to urban cities. The course will present methods to measure, predict and evaluate the performance of complete streets. We will discuss technical developments and challenges in the intelligent transportation system (ITS) and connected and autonomous vehicles (CAV) with respect to active mobility. The course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, and presentations. The students will also conduct a comprehensive research project on a specific topic of their interest related to complete streets. Guest lecturers will be invited for presentations to bring practical experience to the classroom, and to promote interactive discussions on the subject.

Pre-requisite: CGN5555 - Interdisciplinary Introduction to Smart Cities' Applications with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

It is expected that by the end of the course students will be able to:

- Learn about the key challenges and problems facings transportation infrastructure in smart cities and to identify transportation needs for smart cities
- Understand the synergy between transportation technologies and Active mobility
- be able to synthesize research on the development and applications of new technologies for active mobility

- Know about the basic layers that form the ITS systems and how they can serve walking and cycling.

Grading

Grading Criteria:

- Quizzes: Two in-class quizzes at 10 percent each. The quizzes will comprise a combination of design questions, data-set, and short-answer questions.
- Paper Presentations: Each student will give two review presentations at 10 percent each, related to two pre-selected research papers.
- Final Project (written report and oral presentation): Students can choose to work individually or in a group of 2 on a project relevant to the material taught in the class. Relevant software tools and data sets will be provided.
- In-class Participation: Students are expected to attend and participate in class discussion.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

- Active mobility in Smart Cities
- Walking and cycling behavior: the basics
- Infrastructure in smart cities: the case of complete streets
- Health impact of active mobility
- Safety evaluation methods for active mobility
- Data collection technologies for pedestrians and cyclists
- Autonomous vehicles pedestrian detection approaches
- Distraction by technologies: Recent findings and potential remedies
- The Future is Connected[2]

Course Materials and Resources

Required text: No specific text book will be needed.
Course notes and handouts are the main references used in this course. Additional resources are listed below:

Reference:

- Sustainable Transportation Planning: Tools for Creating Vibrant, Healthy, and Resilient Communities. J. Tumlin. ISBN: 978-0-470-54093-0, pp. 320, Wiley, 2012

- Transportation Systems Planning: Methods and Applications. Edited by K. G. Goulias, ISBN: 0849302730, pp. 456, CRC Press, 2002
- Transportation, Traffic Safety and Health, the New Mobility. H. Holst, ISBN: 978-3-662-03409-5, pp. 228, Springer, 1997

Policy Statements

Policy statements will be added once the course is approved.

Grad Course Addition - College of Engineering and Computer Science - TTE 6200: Mobility in Smart Cities: Technologies and Application Areas

2018-2019 Graduate Course New

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course additions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College*	College of Engineering and Computer Science
Proposal Type*	Grad Course Addition
Unit / Department / College*	Department of Civil, Environmental, and Construction Engineering

For the Full Title box below, please type the course information in the following format: Prefix Code Name

Full Title*	TTE 6200: Mobility in Smart Cities: Technologies and Application Areas
Approved Graduate Faculty/Scholars:*	Application Pending Approval
Prefix:*	TTE
Number:*	6200
Course Title:*	Mobility in Smart Cities: Technologies and Application Areas
30 Character Abbreviation:	Mobility in Smart Cities

Course Description:*	This course is part of the proposed Smart-city M.S. track in Civil Engineering which explores smart mobility and its technologies. The course is designed to provide students with the necessary knowledge about research developments in intelligent transportation systems infrastructure with a focus on video-based information technologies and networks connectivity. Bridging the gap between different engineering disciplines, the course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. The course is also suitable for civil engineering students who are specialized in domains other than transportation and would like to learn about the state of the art computer application in civil engineering. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, projects, and presentations.
Credit Hours:	3.0
Class Hours:	
Lab and Field Work Hours:	
Contact Hours:	
Variable Credit (1-99):	
Repeat for credit?	○ Yes ○ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ○ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	CGN5555 - Interdisciplinary Introduction to Smart Cities' Applications or better or Consent of Instructor
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered? ☐ Odd Fall ☐ Even Fall ☑ Odd Spring ☑ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as: ○ Required Course ◉ Elective Course

New Field

New Materials and Supply Fees?* ○ Yes ◉ No

If yes, also complete the 2018-19 Graduate Materials and Supply Fee Request form.

Justification for Course Addition

What is the rationale for adding this course?

Reasons for Introduction of Course. The course is developed to fill a gap in emerging transportation technologies for smart cities. The course will introduce latest technologies adopted for traffic data acquisition and connected mobility. The instructor will focus on topics relevant to his current research including automated video data collection and mobile ad-hoc networks. The course will provide students with practical knowledge on using those technologies to solve urgent transportation issues such as road safety and sustainable mobility. The course projects will rely on open source available tools and a variety of publicly available data.

The scope of this course is different from other course offered in the civil engineering dept. Also, No course in electrical and computer engineering or Computer Science focus on the application of such techniques for urban mobility. \\

Demand for the Course. The course will benefit students who would like to get exposed to the transportation facet of smart cities technologies and would like to improve their skill in using new technologies in their research.

What majors require or recommend this course for graduation?	Proposed Civil Engineering M.S. Track in Smart Cities
If not a major requirement, what will be the source of students?	Any engineering discipline, Computer Science or Tourism
What is the estimated annual enrollment?	25

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☐ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	
Course Type	
Status	○ Inactive-Hidden ○ Active-Visable

HEADING

TTE 6200: Mobility in Smart Cities: Technologies and Application Areas

Department of Civil, Environmental, and Construction Engineering, College of Engineering and Computer Science, University of Central Florida

3 credits

Course Syllabus

Instructor:	Mohamed Zaki, Ph.D.	Term:	TBD
Office Location:	TBD	Class Meeting Days:	TBD
Office Hours:	TBD	Class Meeting Time:	TBD
Phone:	407-823-4824	Class Location:	TBD
Email:	mzaki@ucf.edu	Course Modality:	P, RV

Course Description

This course is part of the proposed Smart-city M.S. track in Civil Engineering which explores smart mobility and its technologies. The course is designed to provide students with necessary knowledge about research developments in intelligent transportation systems infrastructure with a focus on video-based information technologies and networks connectivity. Bridging the gap between different engineering disciplines, the course is designed for transportation engineering students in mind. It is self-contained with preliminary concepts explained in advance during the lectures. The course is also suitable for civil engineering students who are specialized in domains other than transportation and would like to learn about state of the art computer application in civil engineering. Students will interact, collaborate and work on topics relevant to the smart mobility and infrastructure. They will be exposed to the latest relevant research through papers readings, projects, and presentations.

Pre-requisite: CGN5555 - Interdisciplinary Introduction to Smart Cities' Applications with grade of "C" (2.0) or better or Consent of Instructor

Student Learning Outcomes

Lectures are the main designed activities to facilitate the students' learning outcome. The lectures focus on transportation research relating to traffic video analysis and design of mobile ad-hoc networks; as well as on the implications of the research on improving safety and mobility. It is expected that by the end of the course students will be able to:

- Learn about the key challenges and problems facings transportation infrastructure in smart cities and to identify transportation needs for smart cities
- be able to synthesize research on the development and applications of new technologies for transportation
- Know about the underlying layers that form the ITS systems and the integration with road infrastructure planning process

- Acquire the necessary background of computer vision and its applications in traffic data analysis and road safety
- Understand the network foundation of connected transportation systems and its applications in improving safety and mobility.
- Develop their own principled problem-solving strategies and effective techniques for road safety and mobility

Grading

Grading Criteria:

- Quizzes: Two in-class quizzes at 10 percent each. The quizzes will comprise a combination of design questions, data-set, and short-answer questions.
- Paper Presentations: Each student will give two review presentations at 10 percent each, related to two pre-selected research papers.
- Final Project (written report and oral presentation): Students can choose to work individually or in a group of 2 on a project relevant to the material taught in the class. Relevant software tools and data sets will be provided.
- In-class Participation: Students are expected to attend and participate in class discussion.

Grading System: The following is a grading policy (rounding up).

Grade	Scale	Grade	Scale
A	93 – 100	C+	77 – 79
A-	90 – 92	C	70 – 76
B+	87 – 89	D	60 – 69
B	83 – 86	F	0 – 59
B-	80 – 82		

Topics

Part 1: Introduction to Transportation Challenges in Smart Cities

- Smart Cities initiatives and innovations
- ITS Design Issues and Challenges
- Mobility and Safety in Transportation
- Surrogate Safety Measures: Swedish Traffic Conflicts Techniques

Part 2: Connectivity

- Ad-hoc Networks in Transportation
- Network Architecture
- Mobility Models challenges for vehicles and pedestrians
- Simulation models for Ad-hoc Networks and Performance Measures
- Applications: Road-users Mobility Management

Part 3: Data Collection

- computer vision (CV): Theory and algorithms
- Traffic Tracking Technologies

- Automated Traffic Data Collection and Management
- Evaluation Methods and Performance Measures
- Applications: Road Safety Evaluation Programs

Course Materials and Resources

Required text: No specific text book will be needed.
Course notes and handouts are the main references used in this course. Additional resources are listed below:

- Computer Vision and Imaging in Intelligent Transportation Systems. John Wiley & Sons, 2017.
- Handbook of Intelligent Vehicles. Editor: A. Eskandarian. ISBN 978-0-85729-084-7, pp. 1599, Springer, 2012
- Popescu-Zeletin, R., Radusch, I., & Rigani, M. A. (2010). Vehicular-2-X communication: state-of-the-art and research in mobile vehicular ad hoc networks. Springer Science & Business Media.
- Roy, Radhika Ranjan. Handbook of mobile ad hoc networks for mobility models. Springer Science & Business Media, 2010

Policy Statements

Policy statements will be added once the course is approved.

GCC 10-24-18 Courses

Committee	Graduate Curriculum Committee
Notes	
Total Proposals	3

ART - 5280 - Serial Content

2018-2019 Graduate Course Revision

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

2. FILL IN all fields required marked with an *. You will not be able to launch the proposal without completing required fields.

3. LAUNCH proposal by clicking in the top left corner.

Course revisions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College*	College of Arts and Humanities
Proposal Type*	Grad Course Revision
Unit / Department / College*	School of Visual Arts and Design
Prefix*	ART
Code*	5280
Name*	Serial Content

30 Character Abbreviation:	Serial Content
Course Description*	Sequential design, production methods and materials in visual arts.
Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	0
Contact Hours:	3
Repeat for credit?	○ Yes ◉ No
If yes, indicate the total times the course may be used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	Admission to Emerging Media MFA or Digital Media M.A., graduate standing, or C.I.
Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and

complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered?	☐ Odd Fall ☐ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☑ Occasional

Intended Utilization of Course

The course will be used primarily as:	◉ Required Course ○ Elective Course

Justification for Course Revision

What is the rationale for revising this course?	The course description change for ART 5280 aligns with the 7-year APR recommendations to increase studio research and production coursework, reduce required credits hours (from 66cr to 60cr), and streamline advising, scheduling, and the graduate plan of study.
What majors require or recommend this course for graduation?	Emerging Media MFA
If not a major requirement, what will be the source of students?	
What is the estimated annual enrollment?	10

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	None.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership: School of Visual Arts and Design

Course OID 14364

Course Type Art

Status (•) Active-Visible ( ) Inactive-Hidden

ART 5280: Serial Content
School of Visual Arts and Design
College of Arts and Humanities, UCF

COURSE SYLLABUS

Instructor:	Dr. Natalie Underberg-Goode	Term:	Spring 2017
Office:	OTC 500, Room 155	Class Meeting Days:	Wednesday
Phone:	407 823-1140	Class Meeting Hours:	6-8:50pm
E-Mail:	Natalie.Underberg-Goode@ucf.edu	Class Location:	CEM 126
Website:	http://www.svad.cah.ucf.edu	Lab Location:	
Office Hours:	Wednesdays and Thursdays 12-3pm		

Course Overview

Serial Content covers the study of serial content, story forms, interactive narrative theory and practice for art, digital media, and film. It includes the study of traditional and non-traditional forms of visual and interactive storytelling.

Course Objectives

The student will learn:

- How to interpret serial content in visual art
- Principles and techniques for creating sequential art including comics
- How to analyze serial storytelling in film and television
- Principles and techniques for creating serial content for interactive media
- How to interpret serial storytelling in games
- How to create and critique serial content in art, film, and digital media

Course Prerequisites

None

Required Texts and Materials

McCloud, Scott. *Understanding Comics: The Invisible Art.* New York: William Morrow, 1994.

Additional readings are listed in the syllabus and will be made available in PDF form within Webcourses. Additional freely available audiovisual and interactive media may be assigned in this class; consult the professor with any questions regarding how to install or play this media.

Grading

Assessment	Percent of Final Grade
Syllabus quiz	5%
Serial content project	35%
Serial content mini-projects	30%
Readings discussion	30%
Total: 100%	

Grading Scale (%)	
94-100	A
90-93	A-
8*7-89	B+
84-86	B
80-83	B-
77-79	C+
74-76	C
70-73	C-
67-69	D+
64-66	D
60-63	D-
0 - 59	F

Grade Dissemination

Graded materials in this course will normally be returned individually during class meeting times within two weeks of being turned into the instructor.

Course Policies: Grades

Late assignments and incompletes will not be accepted or arranged except in documented medical or family emergencies and after real-time (face-to-face, phone, or IM chat) discussion with the instructor.

Course Policies: Technology and Media

Email: Students can email at any time. Emails typically receive a response within one business day (this does not include weekends or holidays). UCF policy requires you to use your UCF email account to communicate.

Webcourses: This is a face-to-face class. Webcourses will primarily be used for storing additional readings and recording grades, as well as for the syllabus quiz.

Course Policies: Student Expectations

Disability Access: The University of Central Florida is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats upon request. Students who need accommodations must be registered with Student Accessibility Services,

Ferrell Commons Room 185, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, before requesting accommodations from the professor.

Professionalism Policy: Professionalism in conduct is expected at all times. Students who habitually disturb the class by talking, arriving late, etc., and who have been warned may suffer a reduction in their final class grade.

Academic Conduct Policy: Academic dishonesty in any form will not be tolerated. If you are uncertain as to what constitutes academic dishonesty, please consult The Golden Rule, the University of Central Florida's Student Handbook (http://www.goldenrule.sdes.ucf.edu/) for further details. As in all University courses, The Golden Rule Rules of Conduct will be applied. Violations of these rules will result in a record of the infraction being placed in your file and receiving a zero on the work in question AT A MINIMUM. At the instructor's discretion, you may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the University.

Important Dates to Remember*

Syllabus quiz due Friday January 13 5pm

Readings discussion #1 due January 18 6pm

Serial content mini-project #1 due January 25 6pm

Readings discussion #2 due February 8 6pm

Serial content mini-project #2 due February 15 6pm

Mid-term Individual Serial Content Project proposal due February 22 6pm

Readings discussion #3 due March 1 6pm

Serial content mini-project #3 due March 8 6pm

Mid-term Individual Serial Content Project progress report due March 22 6pm

Readings discussion #4 due March 29 6pm

Serial content mini-project #4 due April 5 6pm

Readings discussion #5 due April 12 6pm

Serial content mini project #5 due April 19

Final individual serial content project due April 26 7pm

Class Schedule

Date	Module Title	Lecture and Readings	Assignments and Exams
Wed. January 11	Module 1: What is Serial Content?	Lecture: Introduction to Class and What is Serial Content? Module Topics: Course overview Meanings of "serial content" in art,	• Syllabus Quiz

		film, and digital media	
Wed. January 18-Wed. January 25	Module 2: Serial Content in Visual Art	Lecture: Serial Content in Visual Art Module Topics: Origins of serial art Types of serial art Sequential painting Read: Bochner, "The Serial Attitude" (PDF); Bonesteel, "Henry Darger's Search for the Grail in the Guise of a Celestial Child" (PDF); excerpt from Hanna, *Women Framing Hair: Serial Strategies in Contemporary Art* (PDF)	Serial content mini-project #1 Readings discussion #1
Wed. February 1-Wed. February 15	Module 3: Comics	Lecture: Comics Module Topics: Comics Graphic novel Read: McCloud (whole book); excerpt from Spiegelman, *Maus*	Serial content mini-project #2 Readings discussion #2
Wed. February 22-Wed. March 8	Module 4: Serial Content in Film and Television	Lecture: Serial Content in Film/Television Module Topics: Serial content in film Serial content in television Serial distribution and storytelling form Read: Marshall, "Seriality and Persona" (http://www.journal.media-culture.org.au/index.php/mcjournal/article/viewArticle/802; Mittel, "All in the Game: *The Wire*, Serial Storytelling, and Procedural Logic" (PDF)	Serial content mini-project #3 Readings discussion #3 Individual Serial Content project proposal
Wed. March 22-Wed. April 5	Module 5: Serial Storytelling Online	Lecture: Serial Storytelling Online Module Topics: Web serials Social media serials Read: Page, "Seriality and Storytelling in Social Media" (PDF); "Zola's" Twitter story (http://imgur.com/a/WDwyW)	Serial content mini-project #4 Readings discussion #4 Mid-term Individual Serial Content Project progress report

Wed. April 12-Wed. April 19 and final exam (April 26, 7-9:50pm)	Module 6: Serial Content in Transmedia Storytelling and Games	Lecture: Serial Content in Transmedia Storytelling and Games Module Topics: Serial content in transmedia storytelling Serial content in games Read: Adcox, "The Serialized Video Game" (http://www.playthepast.org/?p=4841); Higgins, "Seriality's Ludic Promise: Film Serials and the Pre-History of Digital Gaming"	Serial content mini-project #5 Readings discussion #5 Final individual serial content project

*Note: The Schedule is subject to revision

Essay/Project Assignments

Syllabus Quiz:

Due Date: FRIDAY January 13 5pm

As of Fall 2014, all faculty members are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete the following academic activity by the end of the first week of classes, or as soon as possible after adding the course, but no later than January 13. Failure to do so will result in a delay in the disbursement of your financial aid.

For this class, you are required to complete a short syllabus quiz. Access your Webcourses@UCF (Canvas) course site following the directions below:

- Go to the myUCF portal (https://my.ucf.edu) and select the Webcourses@UCF button on the left side of the screen.
- Log in with your NID and NID password, then access each course by selecting it in the "Courses" dropdown menu at the top of the page.
- Find the "Syllabus Quiz" under quizzes and complete all questions.

Serial Content Mini-Projects

Due Date: see course calendar/important dates to remember

Students will complete five mini-projects related to the course module topic. These mini-projects are designed to give students an opportunity to apply ideas from the course and to gain experience in serial content creation and analysis. Students will present and discuss their mini-projects in class on the due date for each assignment, and this will factor into the final evaluation of the project.

Readings Discussions

Due Date: see course calendar/important dates to remember

Students will take turns leading discussion of class readings. This will involve briefly summarizing the readings, posing thoughtful questions, and facilitating class reflection on the readings. Students are encouraged to keep a journal of notes on readings and bring in relevant examples of serial content in the art, film, or digital media field to augment the discussion. All students will participate as both discussion leaders and discussion participants over the course of the class, and both leading and participating in readings discussion will factor into the evaluation of the readings discussion.

Serial Content Project

Due Date: April 26 (during class, by 7pm)

Students will create their own serial content project during the course of the class, focusing on a medium of their choice. The project topic and medium(s) are open, but the project should clearly demonstrate application of serial content and storytelling ideas into the design and execution, and students are expected to discuss their work within the context of a critique. In addition to the final assignment, students will be expected to create and will be evaluated on project proposals and progress reports, and we may devote class time throughout the semester to working on the projects—so students are expected to come to class prepared to discuss or work on their project in whatever way is feasible every week. The final project, project proposal, progress report, and ability to discuss/demo etc. the project during class meetings will factor into the evaluation of the serial content project.

ECO - 6403 - Mathematical Economics I

2018-2019 Graduate Course Revision

General Catalog Information

Read before you begin

1. TURN ON help text before starting this proposal by clicking in the top right corner of the heading.

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3. LAUNCH proposal by clicking in the top left corner.

Course revisions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

College / Department*	Department of Economics
Prefix*	ECO
Code*	6403
Name*	Mathematical Economics I
30 Character Abbreviation:	Math Econ I
Course Description*	Covers the foundations of economic theory with particular focus on the mathematical methods that are indispensable for proper understanding of the economic literature.
Credit Hours:	3
Class Hours:	3
Lab and Field Work Hours:	0
Contact Hours:	3
Repeat for credit?	○ Yes ◉ No
If yes, indicate the total times the course may be	

used in the degree program.	
Repeat within same semester?	○ Yes ◉ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s):	ECO 3101 (or equivalent), ECO 3410 (or equivalent), and ECO 6118 (co-requisite), or C.I.
Corequisite(s):	
Prerequisite(s) or Corequisite(s):	
Graded S/U?	○ Yes ◉ No
Graded S/U:	
Split-Level Class:	○ Yes ◉ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course:	

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered?	☑ Odd Fall ☑ Even Fall ☐ Odd Spring ☐ Even Spring ☐ Odd Summer ☐ Even Summer ☐ Every Semester ☐ Occasional

Intended Utilization of Course

The course will be used primarily as:	◉ Required Course ○ Elective Course

Justification for Course Revision

What is the rationale for revising this course?	Changing title to Mathematical Economics I because an additonal course will be added entitled Mathematical Economics II.
What majors require or recommend this course for graduation?	Masters of Science in Economics
If not a major requirement, what will be the source of students?	
What is the estimated annual enrollment?	20

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

Detail Discussion	Because this is a trivial renaming of an already-approved course, no such discussions were needed.

Attachment List

Please attach any required files by navigating to the Proposal Toolbox and clicking in the top right corner.

Check	☑ I have completed all relevant parts of the form.
Attached	☑ I have attached a course syllabus and rationale.

Administration Use Only

Catalog Ownership:	Department of Economics
Course OID	14813
Course Type	Economics
Status	◉ Active-Visible ○ Inactive-Hidden

Department of Economics
University of Central Florida

ECO 6403
Professor

Fall 2019

MATHEMATICAL ECONOMICS I

This is an introductory graduate course in mathematical economics designed to prepare you for the other courses that you will take in the M.S. degree program in economics and business analytics. Topics include, but are not limited to, set theory, unconstrained optimization theory, concave functions, linear algebra and quadratic forms, equality and inequality constrained optimization theory, and integration. These are the essential mathematical tools required for successful graduate work in the aforesaid program.

Required Book

James Bergin (2015), *Mathematics for Economists with Applications*, Routledge, New York, NY.

Everyone must purchase this textbook, in as much as simply reading it at the library will not, in general, be sufficient for a sound understanding of the material presented in class. This follows from a basic axiom about reading and learning material written by others, to wit, one must read the material *more than a few times* to fully understand and internalize it. My lectures will be based, in part, on this textbook, but will also adhere, at times, to the lecture notes that I will pass out. Accordingly, you should bring the book and lecture notes to every class. This way you may avoid taking notes in class and thus listen more actively to what I am saying. Such a strategy will provide you with an enhanced ability to follow the lectures, thereby enabling you to extract more information from them. If I cover material not in the book or lecture notes, then I will let you know so that you can take notes on it.

Prerequisites

ECO 3410 (*Mathematical Economics*) and a three-semester calculus sequence are the ideal prerequisites for ECO 6403. At a minimum, you should have taken one or the other. I will not provide a review of differential calculus for functions of one variable, save for Taylor's theorem. If you are uncomfortable with any of the prerequisite material then you should start reviewing it now. Please do not wait to begin such a review, as this course builds upon the prerequisite material and itself.

Grading

$$\text{Overall Score} = 0.40\,(10\ \textit{best quizzes}) + 0.60\,\textit{Final}$$

There will be a cumulative final examination at the regularly scheduled time, at least 10 unannounced quizzes, and several ungraded homework assignments. The quizzes are of the open-book and open-notes variety, cover the material that was discussed in the current and any prior class, and will typically (though not always) be no more than 20 minutes in length. The examination is of the closed-book and closed-notes variety. You are, however, permitted to bring a one page "cheat-sheet" to the examination so as to minimize memorizing tedious formula and the like. Calculators of any kind are not permitted on the exam.

The final examination will take place on

In order for you to internalize the material presented in class you must work many problems of varying degrees of difficulty, hence the numerous homework assignments. Note that just because a problem was not assigned for homework does not mean that you should not attempt it. In fact, as a general rule, you should attempt most of the questions at the end of each section of Bergin's textbook and the lecture notes.

I have a strict grading policy: your grade will be based upon the extent to which you meet *my* expectations in the course. Moreover, I do *not* curve the exams, i.e., *I do not grade on a curve.* You are not here to compete against your classmates for a limited number of A's, you are in competition only with yourself to master the material. I have no problem handing out all A's if everyone performs at that level, something that can never happen when grading on the curve. In addition, anyone who receives a score of 100 on the Final Exam will receive an A in the course regardless of the scores received on the other assignments. This serves as a strong incentive to work hard until the end of the course.

The grades will be assigned as follows:

A+	97.0-100.0	spectacular performance, showing a deep understanding of the material
A	94.0-96.9	outstanding performance, showing a complete grasp of the material
A–	90.0-93.9	excellent performance, with only minor errors throughout
B+	87.0-89.9	very good performance, with numerous minor errors or a few substantial ones
B	84.0-86.9	good performance, but with more of both types of the aforementioned errors
B–	80.0-83.9	pretty good performance, with serious errors becoming more common
C+	77.0-79.9	fair performance, numerous errors of substance
C	74.0-76.9	fair performance, but even more serious errors of substance
C–	70.0-73.9	weak performance, with major problems appearing
D+	67.0-69.9	poor performance, substantial problems appearing regularly
D	64.0-66.9	more of the same, but even worse
D–	60.0-63.9	awful performance, a serious lack of understanding of even the basics
F	00.0-59.9	no comment

Rules of the Course (Please read these carefully, especially before you decide to take the course)

(1) *No make-up exams, early exams, or late exams will be given.* All of the exams will be taken at the scheduled time, including the final. If you miss the midterm examination *and* provide a valid excuse for your absence (the validity of which is determined by me), the weight of the midterm exam will be shifted to the final exam. The valid excuse must be given to me within one week of the missed midterm exam—no exceptions. A missed final examination receives a grade of zero.

(2) *Late homework will not be accepted, period.* Homework is due by the end of the class period in which you were requested to turn it in. You will have approximately one week to do every problem set, so this will afford you the opportunity to get it done on time. This will also allow you to put into practice some basic microeconomic theory concerning the allocation of your limited time to meet your desired ends. Everybody is busy with other classes, work, committees, socializing, etc., so these are not valid reasons for late homework.

(3) *Questions as to what material will be on the exams, the number of questions on the exam, the types of questions on the exam, and so on, will not be taken during class time.* All required reading, practice questions, questions in Simon and Blume's textbook, questions in my lecture notes, and topics covered during the lecture are fair game for exam questions.

(4) *The purpose of office hours is to complement the lectures and your own studying of the material.* In particular, office hours are *not* designed to be a substitute for your absence from the lectures. In other words, office hours are not a private tutorial on the material from a class you missed.

(5) *Anyone caught cheating on an exam will receive a numerical score of zero on that exam and be punished to the fullest extent possible under university regulations.* I am absolutely serious about this!

(6) *The only reason that your final grade in the course may be changed is due to a "clerical error" in grading, e.g., the total points you earned in the course were added incorrectly.* I will not reevaluate coursework after the term is competed.

(7) *A grade of* "I" (incomplete) *may be assigned by the instructor when a student is unable to complete a course due to extenuating circumstances, and when all requirements can be completed in a short time following the end of the term. The student is responsible to arrange with the instructor for the completion of the requirements of the course.* Documentation of the extenuating circumstance is required before an incomplete grade is assigned. Moreover, the grade of incomplete is not automatic.

(8) *I do not offer extra credit work, so please do not ask for some.*

(9) *The use of electronic devices is forbidden during class.* If you take notes directly on your laptop, please approach me at the end of the first day of class so that I can take note of that fact.

(10) *Students are expected to be familiar with the University's standards regarding academic integrity and academic misconduct, as well as the course of action that will be taken if a violation occurs*—these links http://goldenrule.sdes.ucf.edu/ and http://osc.sdes.ucf.edu provide such information. Information on accommodations for students with a disability may be found at http://sds.sdes.ucf.edu/.

(11) *Grades are not negotiable.*

Office Hours

Feel free to stop by and see me during my office hours, or make an appointment with me if they are not at a convenient time for you. I prefer that you e-mail me ahead of time and propose a time to meet if you would like to see me outside of my regular office hours. Please respect my office hours, as I have other obligations than this course.

Course Philosophy

This is a course in mathematical economics with some applications to economic theory and econometrics, and as such, much of the material will be conceptual and theoretical. Moreover, a full and deep understanding of applied economic problems and econometrics requires, as a prerequisite, a sound grasp of the underlying optimization theory and linear algebra.

Course Outline

All readings are required. Note also that this is the material I *expect* to cover, and as you know from your statistics courses, expectation doesn't necessarily equal the realization.

I. *Elementary Set Theory (2 lectures)*

Paarsch: Section 1

II. *Sequences and Series (1 lecture)*

Paarsch: Sections 2 and 3

III. *The Mean Value Theorem and Taylor's Theorem (2 lectures)*

Bergin: Chapter 8

IV. *Quadratic Forms (2 lectures)*

Bergin: Chapter 10

V. *Unconstrained Optimization Theory (5 lectures)*

Bergin: Chapters 5 (for your own review), 6 (mostly for your own review), and 11
Caputo: Section 5

VI. *Linear Algebra (4 lectures)*

Bergin: Chapters 2, 9, and 15

VII. *Equality Constrained Optimization Theory (4 lectures)*

Bergin: Chapter 12
Caputo: Section 10

VIII. *Karush-Kuhn-Tucker Theory (4 lectures)*

Bergin: Chapter 13
Caputo: Section 15

IX. *Integration (3 lectures)*

Bergin: Chapter 14