Chair: Tracy Christofero | **GC#6: Course Addition**

Request for Graduate Course Addition

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. ***The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.***

College: CITE | Dept/Division: Computer Science | Alpha Designator/Number: CS/601 | (●) Graded ( ) CR/NC

Contact Person: Wook-Sung Yoo | Phone: x5452

NEW COURSE DATA:

New Course Title: The Internet of Things

Alpha Designator/Number: C S / 6 0 1

Title Abbreviation: T h e I n t e r n e t o f T h i n g s

(Limit of 25 characters and spaces)

Course Catalog Description: (Limit of 30 words)

This course covers advanced topics of the Internet of Things Technologies (IoT) including wireless networking technologies, mobile networks, software and hardware design, and cybersecurity for IoT applications and systems.

Co-requisite(s): None | First Term to be Offered: Fall 2019

Prerequisite(s): Graduate Status | Credit Hours: 3

Course(s) being deleted in place of this addition (*must submit course deletion form*): N/A

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head _____	Date _____
Registrar _____	Date _____
College Curriculum Chair _____	Date _____
Graduate Council Chair _____	Date _____

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College: CITE | Department/Division: Computer Science | Alpha Designator/Number: CS/601

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

Wook-Sung Yoo, Ph.D. (primary)
Edward Aractingi, Ph.D. (secondary)
Husnu Narman, Ph.D. (secondary)

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "***Not Applicable***" if not applicable.

Not Applicable

3. REQUIRED COURSE: If this course will be required by another deparment(s), identify it/them by name. Enter "***Not Applicable***" if not applicable.

Not Applicable

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "***Not Applicable***" if not applicable.

Not Applicable

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "***Not Applicable***" if not applicable.

Not Applicable

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Please refer to the attached syllabus

7. COURSE OUTLINE (May be submitted as a separate document)

Please refer to the attached syllabus

8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

Arshdeep Bahga and Vijay Madisetti, Internet of Things (A Hands-on-Approach), 1st Edition, VPT, 2014, ISBN 978-0-99-602551-5

9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

Lecture
Lab
Discussion Boards

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10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Midterm and Final Exam
Homework
Term Project

11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

Not Applicable

12. PROVIDE COMPLETE BIBLIOGRAPHY (May be submitted as a separate document)

Arshdeep Bahga and Vijay Madisetti, Internet of Things (A Hands-on-Approach), 1st Edition, VPT, 2014, ISBN 978-0-99-602551-5

Hakim Chaouchi, Internet of Things: Connecting Objects, 1st Edition, Wiley-ISTE, 2010, ISBN 978-1-84-821140-7

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Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:
Course Number and Title:
Catalog Description:
Prerequisites:
First Term Offered:
Credit Hours:

Department: Computer Science
Course Number and Title: CS 601 The Internet of Things
Catalog Description: This course covers advanced topics of the Internet of Things Technologies (IoT) including wireless networking technologies, mobile networks, software and hardware design, and cybersecurity for IoT applications and systems.
Prerequisite: Graduate status
First year offered: Fall 2019
Credit Hours: 3

CS601 The Internet of Things

Course Title/Number	The Internet of Things/601
Semester/Year	Fall/2019
Days/Time	W/4:30pm - 6:50pm
Location	Weisberg Applied Engineering Complex
Instructor	Wook-Sung Yoo, PhD.
Office	WAEC 3101A
Phone	x5452
E-Mail	yoow@marshall.edu
Office Hours	by appointment

University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Course Description

This course covers advanced topics of the Internet of Things Technologies (IoT) including wireless networking technologies, mobile networks, software and hardware design, and cybersecurity for IoT applications and systems.

Course Student Learning Outcomes

Upon successful completion of the course, students will be able to

- OC1: have a better understanding of IoT taxonomy and its underlying technologies
- OC2: experience with IoT development tools, to become more experienced in using cloud services and small devices like Arduino and Raspberry PI with different kind of sensors
- OC3: work as a team to design and develop IoT project using IoT development tools with security and privacy aware features

Course Student Learning Outcomes	How students will practice each outcome	How student achievement of each outcome will be assessed in this course
OC1: have a better understanding of IoT taxonomy and its underlying technologies	Lecture Graded homework problems	Graded homework problems

OC2: experience with IoT development tools, to become more experienced in using cloud services and small devices like Arduino and Raspberry PI with different kind of sensors	Lab exercises Graded homework problems Graded term projects	Graded term projects Graded homework problems
OC3: work as a team to design and develop IoT project using IoT development tools with security and privacy aware features	In-class activities Graded term projects	Graded exam problems Graded term projects

Required Texts, Additional Reading, and Other Materials

Required Text

Arshdeep Bahga and Vijay Madisetti, *Internet of Things (A Hands-on-Approach), 1st Edition*, VPT, 2014, ISBN 978-0-99-602551-5

Suggested Supplemental Reading

Hakim Chaouchi, *Internet of Things: Connecting Objects, 1st Edition*, Wiley-ISTE, 2010, ISBN 978-1-84-821140-7

Additional Reading

None

Course Requirements/Due Dates

Homeworks	There will be homework assignments every
Midterm Exam	There will be two interim exams. Part A of each exam will consist of questions from the quizzes. Part B will have questions similar to the homework problems.
Final Exam	The final exam will follow the same format and will include some problems similar to those in the first two exams.

Additional Activities

Reading Assignments	These assignments will be from the course textbook.

Grading Policy

Activity	**Weight**
Attendance and Participation	10%
Homework	20%
Term Project	20%
Midterm	25%
Final Exam	25%

Course grades are based on the following scheme:

Score	**Letter Grade**
≥ 90	A

≥ 80 & < 90	B
≥ 70 & < 80	C
≥ 60 & < 70	D
< 60	F

Attendance Policy

Attendance is required. Only University Excused Absences will be accepted. Attendance and participation counts for 10% of the overall course grade.

If #of missing class > 3, lose 10 points, except for university excused absences (student affairs).

Other Policies

Cellphone use: students should turn off/mute their cellphones during class and exams.

Computer use: students can use computers/laptops for calculations, completing lab exercises and/or homework problems, course materials downloading, assignment uploading, and searching course related contents. Browsing news or using social media during class is not permitted.

Deadlines and Dues: the deadlines for homework assignments, labs, and projects are hard deadlines. There will be no extensions.

Course Schedule

If there are changes an updated schedule will be posted on the Blackboard course shell.

Week	Subject
1	Aug 22: Introduction to Internet of Things
2	Aug 29: Use Cases, domain, challenges
3	Sep 5: Architecture, protocols, python
4	Sep 12: Devices, connectivity, Cloud
5	Sep 11: Amazon, Azure and IBM Bluemix
6	Sep 26: Project Specifications, planning and configuration
7	Oct 3: introduction to IoT security and privacy
8	Oct. 10 Midterm Exam
9	Oct. 17 Cybersecurity Overview
10	Oct. 24 Term Project Proposal Presentation (Proposal Due)
11	Oct. 31: Security and Privacy Issues in IoT
12	Nov. 07: Privacy-Aware Computing
13	Nov. 14: Domain Specific Topic: Home Automation Systems
14	Nov. 21: NO CLASS
15	Nov. 28: Domain Specific Topic: Smart Grid Systems

16	Dec. 05: “Deadweek” Term Project Presentations and Evaluation
17	Dec. 12: Final Exam

The final exam is scheduled on Wednesday, December 12, 2017, from 4:30pm to 6:50pm.