Course Code and Course Title	English **SCIN 301 IoT and Innovation** Thai **วทนว ๓๐๑ อินเตอร์เน็ตของสรรพสิ่งและนวัตกรรม**
Number of Credits	3 (2-3-5)
Curriculum and Course Type	Program of Study Bachelor's Degree Program in Science and Technology (International Program, Multidisciplinary Program) Course Type Specific Course
Course Coordinator	Narin Nuttavut, Ph.D Address: School of Bioinnovation and Bio-based Product Intelligent, Faculty of Science, Mahidol University Tel: 0864736529 email: Narin.Nut@mahidol.ac.th
Semester/Year of Study	Academic Year 2020 First Semester (1/2020) / 3rd year -
Prerequisite	-
Co-requisite	-
Day/Time/Study Site Location	Tuesday 13.00-16.00, Mahidol University, Salaya campus
Date of Latest Revision	3 January 2020

Course Learning Outcomes (CLOs)

By the end of the course, students are able to

1) CLO1 Explain fundamentals of IoT, programming for IoT and data analytics
2) CLO2 Complete assigned problems related to IoT.
3) CLO3 Realise impacts of IoT on community and society.

Course Description

(In Thai)

ภาพรวมอินเตอร์เน็ตและอินเทอร์เน็ตของสรรพสิ่ง ข้อมูลดิจิตอลและการจัดการและประมวลผล โครงสร้างในระบบอินเทอร์เน็ตและชั้นต่างในระบบอินเตอร์เน็ต การเขียนโปรแกรมเบื้องต้นสำหรับ IOT การวิเคราะห์ข้อมูลขนาดใหญ่ การประยุกต์ใช้ การคิดสร้างสรรค์และนวัตกรรมสำหรับอินเทอร์เน็ตของสรรพสิ่ง อินเทอร์เน็ตของสรรพสิ่งในการประกอบการ ผลกระทบของอินเทอร์เน็ตของสรรพสิ่ง ต่อชุมชนและสังคม ความปลอดภัยในระบบไซเบอร์

(In English)

Overview of Internet and Internet of Things; Digital data, operation and processing; Structure of Internet and Layers of Internet; Basic programming for IoT; Big data and data analytics; Application; Creative thinking and innovation for IOT; Entrepreneurship in IoT; Impacts of IoT on community, society and Cyber security.

Credit Hours / Trimester

Theory (Hours)	Addition Class (Hours)	Laboratory/Field trip/ Internship (Hours)	Self-study (Hours)
45 Hours/Semester (3 Hours x 15 Weeks)	-	-	**90 Hours/Semester (6 Hours x 15 Weeks)**

Number of Hours per Week for Individual Advice

2 hours per week or student requirement during prescribed date and time

Evaluation of the CLOs

(1) Tool and weight for measurement and evaluation

Course Learning Outcomes	Evaluation		Weight (%)
	Individual assignment	Written exam	
1) CLO1 Explain definition of IoT and data analytics	10%	25%	35%
2) CLO2 Apply fundamental principles of Internet of Things and data analytics to real-world problems	10%	30%	40%
3) CLO3 Realise impacts of IoT on community and society.	5%	20%	25%
Total	**25%**	**75%**	**100%**

Measurement and evaluation

After completion of the evaluation process each student is assigned a criterion-referenced grade (as shown in the table below). Evaluation and achievement will be justifying according to Faculty and University code, conducted by grading system of A, B+, B, C+, C, D and F. To pass this course, student must earn a grade of a least D.

Total Percentage of Evaluation	Below 50	50-54.99	55-59.99	60-64.99	65-69.99	70-74.99	75-79.99	80-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching staff:

Code	Name	Email
NN	Narin Nuttavut	Narinacera200@gmail.com

Teaching Schedule 1st Semester of Academic Year 2020

Tuesday 13.00PM-16.00, Mahidol University, Salaya Campus

Week	Topics/ Details/Date	Number of hours		Teaching method /Media	Instructors
		Classroom sessions	Practice sessions		
1	Overview of Internet and Internet of Things **11 Aug 21**	3	0	**Teaching method**: Interactive lecture, effective questioning, formative assessment, problem solving, problem based activities **Media**: lecture notes, slides, individual assignments	Narin Nuttavut, PhD
2	Digital data, operation and processing **18 Aug 21**	3	0		
3	Structure of Internet and Layers of Internet **25 Aug 21**	3	0		
4	Basic programming for IoT: overview **1 Sep 21**	3	0		
5	Basic programming for IoT: programming software **8 Sep 21**	3	0		
6	Basic programming for IoT: coding **15 Sep 21**	3	0		
7	Basic programming for IoT: programing with IoT **22 Sep 21**	3	0		
8	Basic programming for IoT: Sensors and summary **29 Sep 21**	3	0		
9	(4-8 Sep 21) Midterm examination				
10	Creative thinking **13 Oct 21**	3	0	**Teaching method:** Interactive lecture, effective questioning,	Narin Nuttavut, PhD
11	Innovation for IoT **20 Oct 21**	3	0		
12	Building and developing IoT	3	0		

Week	Topics/ Details/Date	Number of hours		Teaching method /Media	Instructors
		Classroom sessions	Practice sessions		
	27 Oct 21			formative assessment, problem solving, problem based activities **Media:** lecture notes, slides, individual assignments	
13	Entrepreneurship in IoT **3 Nov21**	3	0		
14	Application of IoT **10 Nov 21**	3	0		
15	Impacts of IoT on Community and society **17 Nov 21**	3	0		
16	Introductory cyber security **24 Nov 21**	3	0		
17	Final examination				
	Total	**45**	**0**		