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 2022 First Semester (1/2022) / 3rd year -
Prerequisite	-
Co-requisite	-
Day/Time/Study Site Location	Tuesday 13.00-16.00, Mahidol University, Salaya campus
Date of Latest Revision	3 JULY 2022

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   โครงสร้างในระบบอินเทอร์เน็ตและชั้นต่างในระบบอินเทอร์เน็ต 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

School of Bioinnovation and Bio-based Product Intelligence (SCIN)　　Degree ☑ Bachelor ☐ Master ☐ Doctoral

Program in Bioinnovation (International Program, Multidisciplinary Program)　　Faculty of Science

Course: SCIN 301 **IoT and Innovation**

Teaching Schedule 1ˢᵗ Semester of Academic Year 2022

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 9/8/22	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 16/8/22	3	0		
3	Structure of Internet and Layers of Internet 23/8/22	3	0		
4	Basic programming for IoT: overview 30/8/22	3	0		
5	Basic programming for IoT: programming software 6/9/22	3	0		
6	Basic programming for IoT: coding 13/9/22	3	0		
7	Basic programming for IoT: programing with IoT 20/9/22	3	0		
8	Basic programming for IoT: Sensors and summary 27/9/22	3	0		
9	Midterm examination				
10	Creative thinking 11/10/22	3	0	**Teaching method:** Interactive lecture, effective questioning, formative assessment, problem solving, problem based activities **Media:** lecture notes, slides, individual assignments	Narin Nuttavut, PhD
11	Innovation for IoT 18/10/22	3	0		
12	Building and developing IoT 25/10/22	3	0		
13	Entrepreneurship in IoT 1/11/22	3	0		
14	Application of IoT 8/11/22	3	0		
15	Impacts of IoT on Community and society 15/11/22	3	0		
16	Introductory cyber security 22/11/22	3	0		
17	Final examination				

Week	Topics/ Details/Date	Number of hours		Teaching method /Media	Instructors
		Classroom sessions	Practice sessions		
	Total	45	0		

References

https://www.w3schools.com/

https://www.arduino.cc/

https://mblock.makeblock.com/en-us/

Evaluation

Standard grading scheme A to F