



<b>Course Code and Course Title</b>	English SCIN 301 IoT and Innovation Thai วิชา ๓๐๑ อินเทอร์เน็ตของสรรพสิ่งและนวัตกรรม
<b>Number of Credits</b>	3 (2-3-5)
<b>Curriculum and Course Type</b>	Program of Study Bachelor's Degree Program in Science and Technology (International Program, Multidisciplinary Program) Course Type Specific Course
<b>Course Coordinator</b>	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
<b>Semester/Year of Study</b>	Academic Year 2023 First Semester (1/2022) / 3 <sup>rd</sup> year -
<b>Prerequisite</b>	-
<b>Co-requisite</b>	-
<b>Day/Time/Study Site Location</b>	Tuesday 13.00-16.00, Mahidol University, Salaya campus
<b>Date of Latest Revision</b>	1 JULY 2023

### 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)

ภาพรวมอินเทอร์เน็ตและอินเทอร์เน็ตของสรรพสิ่ง ข้อมูลดิจิทัลและการจัดการและประมวลผล โครงสร้างในระบบอินเทอร์เน็ตและชั้นต่างในระบบอินเทอร์เน็ต การเขียนโปรแกรมเบื้องต้นสำหรับ IOT การวิเคราะห์ข้อมูลขนาดใหญ่ การประยุกต์ใช้ การคิดสร้างสรรค์และนวัตกรรมสำหรับอินเทอร์เน็ตของสรรพสิ่ง อินเทอร์เน็ตของสรรพสิ่งในการประกอบการผลกระทบของอินเทอร์เน็ตของสรรพสิ่ง 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.



School of Bioinnovation and Bio-based Product Intelligence (SCIN)  
 Program in Bioinnovation (International Program, Multidisciplinary Program)

Degree  Bachelor  Master  Doctoral  
 Faculty of Science

Course: SCIN 301 IoT and Innovation

**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%
<b>Total</b>	<b>25%</b>	<b>75%</b>	<b>100%</b>

**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



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**Teaching Schedule 1<sup>st</sup> Semester of Academic Year 2023**

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 8/08/23	3	0	<b>Teaching method:</b> Interactive lecture, effective questioning, formative assessment, problem solving, problem based activities  <b>Media:</b> lecture notes, slides, individual assignments	Narin Nuttavut, PhD
2	Digital data, operation and processing 15/08/23	3	0		
3	Structure of Internet and Layers of Internet 22/08/23	3	0		
4	Basic programming for IoT: overview 29/08/23	3	0		
5	Basic programming for IoT: programming software 5/09/23	3	0		
6	Basic programming for IoT: coding 12/09/23	3	0		
7	Basic programming for IoT: programing with IoT 19/09/23	3	0		
8	Basic programming for IoT: Sensors and summary 26/09/23	3	0		
Midterm examination					
9	Creative thinking 17/10/23	3	0	<b>Teaching method:</b> Interactive lecture, effective questioning,	
10	Innovation for IoT 24/10/23	3	0		



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Week	Topics/ Details/Date	Number of hours		Teaching method /Media	Instructors
		Classroom sessions	Practice sessions		
11	Building and developing IoT 31/10/23	3	0	formative assessment, problem solving, problem based activities  <b>Media:</b> lecture notes, slides, individual assignments	Narin Nuttavut, PhD
12	Entrepreneurship in IoT 7/12/23	3	0		
13	Application of IoT 14/12/23	3	0		
14	Impacts of IoT on Community and society 21/12/23	3	0		
15	Introductory cyber security 28/12/23	3	0		
Final examination					
<b>Total</b>		<b>45</b>	<b>0</b>		

#### References

- <https://www.w3schools.com/>
- <https://www.arduino.cc/>
- <https://mblock.makeblock.com/en-us/>

#### Evaluation

Standard grading scheme, A to F