Course Syllabus

Course Code and Course Title	English SCIN 295 Basic Engineering for Innovator Thai วทนว ๒๙๕ วิศวกรรมพื้นฐานสำหรับนวัตกร
Number of Credits	3 (2-2-5)
Curriculum and Course Type	Program of Study Bachelor's Degree Program in Bioinnovation (International Program, Multidisciplinary Program) Course Type Elective Courses
Course Coordinator	Associate Professor Jirarut Wongkongkatep, D.Eng. Address: Department of Biotechnology, Faculty of Science, Mahidol University Tel: 02 201 5302 Email: jirarut.chu@mahidol.ac.th
Semester/Year of Study	Second Semester / Academic Year 2025
Prerequisite	None
Co-requisite	None
Day/Time/Study Site Location	Monday / 12.30-16.30 hr. at Phayathai campus
Date of Latest Revision	7 December 2025

Course Learning Outcomes (CLOs)

After successful completion of this course, students be able to:

1. Exhibit code of ethics for engineers, especially holding paramount the safety, health, and welfare of the public, in classroom and during practice.
2. Describe basic theories of engineering as well as fundamentals and tools related to engineering drawing and prototype production.
3. Perform basic technical skills in engineering drawing manually and using computer software, and in prototype production using 3D printer with correct scale, measurement, and dimension.

Course Description

An introduction to engineering and its relationship with science; code of ethics for engineers; basic engineering drawing; the 2-dimension computer-aided design; the 3-dimension computer-aided and AI-assisted design

Credit Hours / Semester

Theory (Hours)	Addition Class (Hours)	Laboratory/Field trip/ Internship (Hours)	Self-study (Hours)
28 Hours/Semester (2 Hours x 14 Weeks)	None	28 Hours/Semester (2 Hours x 14 Weeks)	70 Hours/Semester (5 Hours x 14 Weeks)

Number of Hours per Week for Individual Advice

1 hour / week or student requirement during prescribed date and time

Evaluation of the CLOs

Course Learning Outcomes		Measurement Method			Weight (%)
		Attendance, participation and attitude	Written Exam	Class Project/Reports	
CLO1	Exhibit code of ethics for engineers, especially holding paramount the safety, health, and welfare of the public, in classroom and during practice	10%	-	10%	20%
CLO2	Describe basic theories of engineering as well as fundamentals and tools related to engineering drawing and prototype production	-	40%	-	40%
CLO3	Perform basic technical skills in engineering drawing manually and using computer software, and in proto-type production using 3D printer with correct scale, measurement, and dimension	-	-	40%	40%
	Total	**10%**	**40%**	**50%**	**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 50.0	50.0-54.9	55.0-59.9	60.0-64.9	65.0-69.9	70.0-74.9	75.0-79.9	80.0-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching staffs:

Code	Name	Email
JW	Jirarut Wongkongkatep Department of Biotechnology, Faculty of Science, Mahidol University, Room BT 110 Tel. 0-2201-5302	jirarut.chu@mahidol.ac.th
AR	Annop Ruangwiset Department of Mechanical Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi (KMUTT) Tel. 081-984-6009	annop.rua@kmutt.ac.th
NN	Narin Nuttavut	narin.nut@mahidol.ac.th

	Department of Physics, Faculty of Science, Mahidol University, Room P412B Tel. 0-2201-5736	
TK	Thitisilp Kijchavengkul WHOLESOME LAB Co., Ltd. Tel: 090-986-5764	-

Teaching Schedule Second Semester of Academic Year 2025

Week	Date	Topic	Number of hours		Instructor
			Lecture	Laboratory	
1	Jan 5	Basic Engineering skills	2	2	JW
2	Jan 12	Orthographic projection	2	2	JW
3	Jan 19	Dimensioning	2	2	JW
4	Jan 26	Isometric and perspective view	2	2	JW
5	Feb 2	Review and Individual exam	2	2	JW
6	Feb 9	Cross-sectioning	2	2	AR
7	Feb 16	Assembly drawings	2	2	AR
8	Feb 23 (Muses403)	Computer-assisted engineering drawing	2	2	AR
9	Mar 9 (Muses403)	AI-assisted design and 3D printing	2	2	NN/JW
10	To be confirmed (10-13 Mar)	3D printing	2	2	NN: Std. No. 1-13 TK/JW: Std. No. 14-25
11	Mar 16	Tolerancing	2	2	AR
12	Mar 23	Review and Individual exam	2	2	AR/JW
13	Mar 30	Construction drawings	2	2	JW
14	Apr 20	Review and group assessment	2	2	JW