VIETNAM NATIONAL UNIVERSITY – HCMC

INTERNATIONAL UNIVERSITY

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

PROGRAM SPECIFICATION

PROGRAM LEVEL

BACHELOR OF ENGINEERING

IN INDUSTRIAL AND SYSTEMS ENGINEERING

2017

VIETNAM NATIONAL UNIVERSITY - HCMC
INTERNATIONAL UNIVERSITY
Department of Industrial & Systems Engineering

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PREFACE

The ISE program was found in 2014 and has been reviewed annually. In 2015-2016 and 2016-2017 years, there were minor revisions of the program curriculum such as changing prerequisite courses, switching between elective and compulsory courses and the semester of study. Since then, the ISE program has remained unchanged to date. Information of the program specification has been made known to students via the Department website and student handbooks published every new academic year. In order to reach more interested stakeholders and also comply with the recommended practice of AUN accreditation, this Program Specification book was published in June 2019 with a more complete information of the program and is applicable for Batch 2017- 2018.

PROGRAM SPECIFICATION

1. Introduction to Department of Industrial and Systems Engineering

Vision

Take leadership role in education and research in the field of Industrial and Systems Engineering in Vietnam.

Mission

- Offering high-quality graduate and undergraduate education in the field of Industrial and Systems Engineering.
- Offering excellent research including basic and applied research in the field of Industrial and Systems Engineering to meet the needs of industry, local provinces and society.
- Taking the pioneer role in developing the Industrial and Systems Engineering field in Vietnam by promoting the application of Industrial and Systems Engineering in a variety of production and service sectors in Vietnam.

Objectives

The Department of Industrial and Systems Engineering views itself as a system in which students are both important input and output. Therefore, students are the main driver for all activities. In particular, its objectives are to:

- Maintain an excellent quality of teaching and learning
- Recruit and retain highly qualified faculty and staff to support the teaching, research, and service mission in the Department of Industrial and Systems Engineering
- Enhance the learning environment to support the teaching and research activities
- Attract excellent local and international students
- Enhance the **collaboration with industry** and other **prestigious educational institutions**

The ISE Department currently offers three programs: (1) Bachelor of Engineering in Industrial and Systems Engineering, (2) Master of Engineering in Industrial and Systems Engineering, and (3) Bachelor of Engineering in Industrial and Systems Engineering.

Program

- ***Language:*** English is the official language used in all teaching and research activities.
- ***Types of Program:*** The Industrial and Systems Engineering program is fully conducted at IU-VNU. Students are awarded the IU-VNU degree once completed the program. (IU program)

Qualification

- ***The Bachelor Degrees are awarded by IU-VNU***
- ***Degree title:*** "Bachelor of Engineering in Industrial and Systems Engineering"

2. Program Learning Outcomes

a) Originally following the ABET Quality Assessment, the ISE Department constructed the PLO based on ABET criteria of a graduate engineer, whom at the end of their study, will have:

a. An ability to apply knowledge of mathematics, science and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function in multidisciplinary teams
e. An ability to identify, formulate, model and simulate and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. A recognition of the need for, and an ability to engage in life-long learning
j. A knowledge of contemporary issues and ability to self-update
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

b) Program Learning Outcomes is constructed based on the society demand at the time the program is opened in 2009 (PLO Survey when constructing)

Modification is made annually based on surveys from students, alumni, and industry.

From industry:

- 2017-2018:

  Exh.10.02.labour market feedback 2017 - 2018.pdf

  Exh.10.02.the result of labour markets feedback on a cedemic program 2017 - 2018.pdf

- 2018-2019:

  Exh.10.02.labour market feedback 2018 - 2019.pdf

  Exh.10.02.the result of labour markets feedback on a cedemic program 2018 - 2019.pdf

From Students

Exh. 1.13 - Report of feedback of ELOs from Students.pdf

Exh.1.13 Samples of feedback of ELOs from Students .pdf

From Alumni

Exh.10.03 Feedback from Alumni.pdf

From Faculty

3. The Program Objective

The current set of the ISE Program Objectives is posted on the ISE Department website as listed below:

Within 3-5 years of graduation, graduates of the Bachelor of Engineering in Industrial Systems Engineering Program are

1. practicing engineers in the field of Industrial and Systems Engineering, who
(i) Design or redesign Industrial Systems Engineering system
(ii) Operate and manage Industrial Systems Engineering system
(iii) Improve the existing Industrial Systems Engineering system
(iv) Support for wise decision making
2. Engaging in lifelong learning to maintain and enhance professional skills
3. Working effectively with people and demonstrate leadership, professional skills and ethical behavior in the workplace
4. Fulfilling the needs of the community and industrial sector of Vietnam in solving Industrial System Engineering problems using industrial and systems engineering principles, tools and techniques.

The program objectives of the ISE program were determined by the program faculty with a consultation and analysis of visions and missions of the university and the needs of stakeholders. PO#1 refers to key abilities of ISE engineers, which requires the graduates as an engineer not only able to operate and manage an existing system, but also able to design a new system or improve it. The "design" ability is traditionally and internationally recognized a requirement of engineering, which distinguishes an engineering program to a business program. PO#2, lifelong learning and PO#3, human skills are requirements of all stakeholders. Thus, PO#1 and #2 satisfy the first mission of IU to offer high-quality graduate and undergraduate multidisciplinary education in general and in the field of Industrial System Engineering in particular. PO#1 and PO#4 also imply the capability of doing research and service for community and society, the second mission of the university. PO#4 contributes to promoting the application of Industrial System Engineering in a variety of production and service sectors in Vietnam, which is relevant to the third mission of the university. The POs of the ISE program are consistent with the missions of the institution as shown in the Table below

Consistency of the POs with the Missions of the Institution

University Missions	**ISE Program Objectives**			
	PO #1	**PO #2**	**PO #3**	**PO #4**
Offering high-quality graduate and undergraduate multi-disciplinary education, striving for all educational programs to be internationally recognized and accredited (AUN and ABET).	**X**	**X**	**X**	
Offering excellent research including basic and applied research to meet the needs of industry, local provinces and society.	**X**			**X**

Taking the pioneer role in Vietnam by practicing management excellence, inspiring and assisting other VNU members in the advancement toward the development of Vietnam National University – HCMC as a whole.		**X**	**X**	

4. Job opportunities

ISE engineers can take on and perform excellently tasks in various fields, namely INDUSTRIAL SYSTEM ENGINEERING, Procurement Management, Project Management, Inventory Management, Quality Management, Production Management, Optimization in Production and Service, developing an integrated solution to reduce the operation cost, etc. Qualified graduated engineers can achieve the top-level positions in organizations such as Production Director and Chief Executive Officer.

5. Program offering

- **Awarding body/institution:** International University HCMC
- **Teaching institution:** Department of Industrial and Systems Engineering, International University HCMC
- **Accreditation:** MOET standard, 2014
- **Name of the final award:** Bachelor of Engineering in Industrial System and Engineering
- **Program Title:** Bachelor of Engineering in Industrial System and Engineering
- **Admission criteria of the program:**
    - Admission via the National High School Achievement Exam
    - Admission based on Academic Records of the Candidates at the 10th, 11th and 12th Grades of Designated High Schools
    - Admission for candidates with national and international awards
    - Admission via Scholastic Aptitude Exam held by IU
    - Admission via Scholastic Aptitude Exam held by VNU
- **Course Assessment:**

According to the Academic Regulations of IU-VNU, the assessments fall into three categories as follows:

- Final exam: 35% - 60%
- Mid-term exam: 20% - 40%
- Others (homework, assignment, project): 10% -

30% The final grade of a laboratory course includes:

- Laboratory assignment: 70% - 80%
- Laboratory final exam: 20% - 30%

6. Teaching and learning Approach

6.1 The educational philosophy is well articulated and communicated to all stakeholders

The department follows the university educational philosophy which is published on the university website. The recent educational philosophy has been announced in 2018 in a university retreat for school and department representatives. IU educational philosophy can be summarized as comprehensive, liberal and global.

Comprehensive: IU offers multiple programs in diverse disciplines, ranging from science and technology to social sciences and the humanities and aims at training all-round individuals

Liberal: aims at developing each student's potential to the fullest and equipping them with necessary knowledge and skills, getting them ready for a complex, diverse and changing world.

- Students are encouraged to develop their free and critical thinking.
- Students are equipped with not only specific professional knowledge but also a broad knowledge base, not only professional expertise but also necessary soft skills such as rhetoric, critical thinking, independent learning, teamwork, leadership, etc.
- Free and critical thinking goes hand in hand with a sense of responsibility (for themselves and the community).

Global: IU aims at building an internationally oriented community of scholarship, aligned with the global integration policy initiated by the Vietnamese national government.

6.2 Teaching and learning activities are constructively aligned to the achievement of the expected learning outcomes.

The lecturers are to develop expected learning outcomes of the courses they are in charge of, teaching and learning activities to achieve the learning outcomes and assessment scheme. In the ISE program, the following teaching and learning activities are highlighted.

Student oriented

While different lecturers may employ different teaching and learning strategies, the ultimate goal is always to bring the most to students, i.e. what the students need. Thus, at the beginning of each semester, all the students receive individual counseling from their assigned advisors on the subjects to be taken, which suit their individual ability and needs. At the beginning of the course, course objectives and syllabus are introduced to the students in order to help them become aware and appreciate the role of the course in the whole designed curriculum as well as how it is relevant to their future job. These objectives are repeated and highlighted in each lesson to strengthen students' motivation throughout the course. In addition, students are encouraged to actively get involved in the lesson through discussion, problem solving, games, and assigned reading in advance. These activities are to assure students can remember, understand and apply what they learned.

Collaborative learning

Group work in assignments, projects, laboratory experiments are common in most of ISE courses. Thus, students can learn how to work cooperatively and support each other, develop effective teamwork and communication, assimilate multiple views to deepen knowledge and promote critical thinking. These are also directly linked with the ILOs (d) and (e). Lecturers use different approaches in forming teams, promoting interdependence and individual accountability to assure the benefit of cooperative learning.

Integration of theories and practices

Integration of theories and practices is emphasized in the ISE Program. The ISE department is equipped with simulation lab, work design & ergonomic lab, human machine interface lab, product design and development lab and FMS lab, which allows students to improve professional software, running simulation, doing experiments and get familiar with common equipment used in the industry. Junior students can start to get hands-on experience right in their early years in the program by participating in different projects in the Introduction to ISE course. Students are encouraged to spend time in the lab working with each other on class assignments and projects. Labs are opened 24/24 for students doing projects upon request.

Students learn to correlate their acquired knowledge in school with industry practice in many ways. Each student experiences two internships and several field trips throughout their study in the ISE program. The first internship prepares junior students hand-on experience in advance, which will benefit them later when they learn related courses in their senior years. The second internship provides senior students opportunities to apply learned knowledge and practice their analysis skill and creativity in real cases. In addition, speakers from industry are also invited to share their experiences in relevant topics taught in different courses of the program.

Experiential learning

The teaching strategy also provides students with experiential learning which develops through the activities such as simulation & modeling, focused imaging (case studies, video), games, experiment. Through these activities, lecturers encourage students to observe, analyze and draw lessons for themselves.

Utilization of IT

Each classroom is well-equipped with a computer, projector and board. Blackboard system supports lecturers in providing course materials, making announcements to class. Lecturers can use professional software (Turnitin Originality Check) to teach students proper citation methods as well as to safeguard against potential plagiarism. Discussions between teachers and students are not limited to class hours; students can consult lecturers via emails, facebook or in the office.

6.3 The teaching and learning activities enhances life long learning

The fact that all classes are conducted in English helps students practice and improve their English competency, an important skill for life-long learning. Group projects help students to develop problem solving skills, critical thinking skills and teamwork ability. Students also learn by searching references, correlating their acquired knowledge with the real problems. The ISE students are also particularly strong in IT skills because they have to apply programming and advanced software to solve real problems of large scale.

7. Student Assessment

7.1 The student assessment is constructively aligned to the achievement of the expected learning outcomes

Course assessment

Lecturers in charge of specific courses have to develop course learning outcomes which can be related to the program ILOs. The relation between course learning outcomes and program ILOs are made explicit in the course syllabus. Based on the course learning outcomes and course contents, lecturers design quiz, assignments, midterm, final exams and projects. Different forms of assessment are utilized to be able to assess students' acquired knowledge and skills at different levels of Bloom taxonomy. Direct assessment includes quizzes, assignments, midterm exam and final exam. These assessments use different kinds of questions such as multiple choice, essays, or written tests.

Internship assessment

Students' soft skills, attitudes and abilities of applying learned knowledge and solving problems are evaluated through internship.

Thesis assessment

Thesis is the final assessment of the program. It often takes one semester for students to complete their theses. Lecturers provide a list of thesis topics or their interest research areas. Students are encouraged to choose a thesis topic that is related to the existing problems of their intern companies. Thus, the thesis is considered an overall assessment of students' ability to apply their learned knowledge and skills to solve real problems.

7.2 The student assessments including timelines, methods, regulations, weight distribution, rubrics and grading are explicit and communicated to students

Course assessment

Regulation of course grading and classification is stated clearly in the Academic regulation and made known to students via student handbook and website The criteria to assess students' performance are clearly stated in the assessment plans of each course syllabus. At the beginning of the course, the instructor informs students of assessment criteria for the student progress towards course outcomes.

Internship assessment

Internship evaluation criteria are stated in the internship syllabus and made known to students at the beginning of the internship.

Thesis assessment

Regulation of thesis assessment is made known to students via student handbook and website. Thesis assessment process is announced to the students at the beginning of the semester. The thesis is evaluated throughout three stages: thesis proposal, midway defense, and final thesis defense. Guidelines of thesis proposal, final report format, evaluation rubrics, are also made known to students. After completing the thesis report, the students are required to defend their works before the thesis committee, which includes the department faculties and outside reviewers. Before presenting in front of the thesis examination committee, the student must obtain a positive recommendation from his/her thesis advisor. If there are disagreements between them, the Chair of Thesis Committee will be consulted to find a solution. If a student fails at the thesis presentation, he/she can ask for a prolongation or to change the thesis advisor or thesis topic. In any case, the

duration of the entire study cannot exceed the permitted time, which is 6 years, determined by IU.

7.3 Methods including assessment rubrics and marking schemes are used to ensure validity, reliability and fairness of student as assessment

Lecturers use assessment rubrics and marking schemes to grade different types of student work. School internship advisors and company internship supervisors evaluate the student performance based on criteria in the internship evaluation forms.

Evaluation forms for thesis advisor, thesis reviewers and thesis committee are used to assess students' thesis performance.

7.4 Feedback of student assessment is timely and help to improve learning

Student academic performance of each semester is recorded in Edusoft and accessible to student advisors. Thus, the advisors monitor their student progress through Edusoft and schedule a meeting to discuss any problems faced by the students that may influence their academic performances.

For a specific course, results of course examinations are given to the students no later than 2 weeks after the exam. Assignment, midterm grades are given timely to help the students evaluate and improve their performance toward the final exam.

7.5 Students have already access to appeal procedure

If a student is not satisfied with the assessment results, he/she can ask for a re-assessment. The department administrative staff assists students in these academic issues. The lecturer who is in charge of the course has to review the paper again and report the new result to the school. Nevertheless, if a student is still not happy with the new result, they can appeal again. This time, another lecturer will be assigned. Students will be announced if there is any change in their score as well as the reason.

As for the thesis, before presenting in front of the thesis examination committee, a student must obtain a positive recommendation from his/her thesis advisor and thesis reviewers. If there are disagreements between them, the Chair of Thesis Committee will be consulted to find a solution.

8. Program structure

Program Structure

CURRICULUM STRUCTURE	CREDITS	ECTS	PERCENTAGE
General knowledge	**50**	**79.6**	**34.25%**
Political education	10	16.2	6.85%
Humanity and Social Science	6	10	4.11%
Academic English	10	15.5	6.85%
Physical Training	0	0	0.00%
Mathematic, Physic, Chemical	24	37.9	16.44%
Core knowledge	**13**	**21.1**	**8.90%**
Specialization knowledge	**65**	**108.1**	**44.52%**
Internship and Thesis	**18**	**31.4**	**12.33%**
TOTAL	**146**	**240.3**	**100.00%**

9. Industrial System Engineering Program

9.1 Standard curriculum for students of English entry level 1 (AE1 – TOEFL score > 500)

Total credits: 146 (not included credits for Physical Training)

Length of study: 4 years

Freshman Year			
Semester 1		**Crds**	**ECTS**
EN007IU	Writing AE1	2	3.1
EN008IU	Listening AE1	2	3.1
MA001IU	Calculus 1	4	6.2
PH013IU	Physics 1	2	3.1
PH014IU	Physics 2	2	3.1
PT001IU	Physical Training 1	3	5.0
CH011IU	Chemistry for Engineers	3	5.0
	Total Credits	**15**	**23.6**

Semester 2		**Crds**	**ECTS**
EN011IU	Writing AE2	2	3.1
EN012IU	Speaking AE2	2	3.1
MA003IU	Calculus 2	4	6.2
PE008IU	Critical Thinking	3	5.0
PT002IU	Physical Training 2	3	5.0
IS001IU	Introduction to Industrial Engineering	1	1.8
IS054IU	Engineering Drawing	3	5.0
PH015IU	Physics 3	3	5.0
	Total Credits	**18**	**29.2**

Summer Semester		**Crds**	**ECTS**
PE011IU	Principles of Marxism	5	8.1
	Total Credits	**5**	**8.1**

Sophomore Year			
Semester 3		**Crds**	**ECTS**
MA027IU	Applied Linear Algebra	2	3.1
IS019IU	Production Management	3	5.0
IS076IU	Introduction to Computing-Matlab	3	5.0
IS004IU	Engineering Probability & Statistics	4	6.2
MA023IU	Calculus 3	4	6.2
PE012IU	HCM’ s thoughts	2	3.1
IS016IU	Engineering Mechanics – Dynamics	3	5.0
	Total Credits	**21**	**33.6**

Semester 4		**Crds**	**ECTS**
IS077IU	Introduction to Programming – C++/C# , Python	2	3.1
IS020IU	Engineering Economy	3	5.0
IS081IU	Deterministic models in OR	4	6.2
IS017IU	Work design & Ergonomics + Lab	4	6.9
IS034IU	Product Design & Development	3	5.0
PE013IU	Revolutionary Lines of Vietnamese Communist Party	3	5.0
MA029IU	Differential Equation	2	3.1
	Total Credits	**21**	**34.3**

Summer Semester		**Crds**	**ECTS**
IS052IU	Internship 1	2	4.0
	Military Training		
	Total Credits	**2**	**4.0**

Junior Year			
Semester 5		**Crds**	**ECTS**
IS040IU	Management Information System	3	5.0
PE014IU	Environmental Science	3	5.0
IS025IU	Quality Management	3	5.0
IS026IU	Project Management	3	5.0
IS024IU	Probabilistic Models in OR	3	5.0
IS___IU	**ISE Elective Course (choose 1 course)**	**3**	**5.0**
IS031IU	Experimental Design	3	5.0
IS018IU	CAD/CAM	3	5.0
IS058IU	Time series & forecasting technique	3	5.0
	Total Credits	**18**	**30.0**

Semester 6		**Crds**	**ECTS**
IS079IU	Scientific Writing	2	3.1
IS028IU	Simulation Models in IE	4	6.9
IS027IU	Scheduling & Sequencing	3	5.0
IS041IU	Lean Production	3	5.0
IS078IU	Logistics engineering & supply chain design	3	5.0
	Total Credits	**15**	**25.0**

Summer Semester		**Crds**	**ECTS**
IS053IU	Internship 2	3	6.0
	Total Credits	**3**	**6.0**

Senior Year			
Semester 7		**Crds**	**ECTS**
IS083IU	Capstone Design	3	5.0
IS033IU	Multi-Criteria Decision Making	3	5.0
IS032IU	Facility Layout	3	5.0
IS___IU	**ISE Elective Course (choose 3 courses)**	**9**	**15.0**
IS080IU	Creative Thinking	3	5.0
IS035IU	Systems Engineering	3	5.0
IS043IU	Flexible Manufacturing Systems	3	5.0
IS045IU	Leadership	3	5.0
IS023IU	Inventory Management	3	5.0
IS082IU	Retail Management	3	5.0
IS067IU	International Transportation & Logistics	3	5.0
IS062IU	E-Logistics in Supply Chain Management	3	5.0
	Total Credits	**18**	**30.0**

Semester 8		**Crds**	**ECTS**
IS048IU	Thesis research	10	16.4
	Total Credits	**10**	**16.4**

9.2 Curriculum for students of English entry level 2 (IE2 – TOEFL score of 430 -500)

Total credits: 164 (additional 16 credits of Intensive English)

Length of study: 4 years

Freshman Year			
Semester 1		**Crds**	**ECTS**
EN074IU	Reading & writing IE2	8	8.1
EN075IU	Listening & speaking IE2	8	8.1
PT001IU	Physical Training 1	3	5.0
PH013IU	Physics 1	2	3.1
MA001IU	Calculus 1	4	6.2
	Total credits	**22**	**25.5**

Semester 2		**Crds**	**ECTS**
EN007IU	Writing AE1	2	3.1
EN008IU	Listening AE1	2	3.1
CH011IU	Chemistry for Engineers	3	6.2
PH014IU	Physics 2	2	5.0
PT002IU	Physical Training 2	3	5.0
MA003IU	Calculus 2	4	1.8
IS001IU	Introduction to Industrial Engineering	1	5.0
IS054IU	Engineering Drawing	3	5.0
PH013IU	Physics 1	2	3.1
	Total credits	**19**	**32.3**

Summer semester		**Crds**	**ECTS**
PE011IU	Principles of Marxism	5	8.1
	Total credits	**5**	**8.1**

Sophomore Year			
Semester 3		**Crds**	**ECTS**
MA027IU	Applied Linear Algebra	2	3.1
IS019IU	Production Management	3	5.0
IS076IU	Introduction to Computing-Matlab	3	5.0
IS004IU	Engineering Probability & Statistics	4	6.2
IS016IU	Engineering Mechanics – Dynamics	3	6.2
EN011IU	Writing AE2	2	3.1
EN012IU	Speaking AE2	2	5.0
MA023IU	Calculus 3	4	6.2
	Total credits	**23**	**39.8**

Semester 4		**Crds**	**ECTS**
IS077IU	Introduction to Programming – $C^{++}/C^{\#}$, Python	2	3.1
IS020IU	Engineering Economy	3	5.0
IS081IU	Deterministic models in OR	4	6.2
IS017IU	Work design & Ergonomics + Lab	4	6.9
IS034IU	Product Design & Development	3	5.0
PE008IU	Critical Thinking	3	5.0
MA029IU	Differential Equation	2	3.1
	Total credits	**21**	**34.3**

Summer semester		**Crds**	**ECTS**
IS052IU	Internship 1	2	4.0
	Military Training		
	Total credits	**2**	**4.0**

Junior Year			
Semester 5		**Crds**	**ECTS**
PH015IU	Physics 3	3	5.0
IS040IU	Management Information System	3	5.0
PE014IU	Environmental Science	3	5.0
IS025IU	Quality Management	3	5.0
IS026IU	Project Management	3	5.0
IS024IU	Probabilistic Models in OR	3	**5.0**
IS___IU	**ISE Elective Course (choose 1 course below)**	**3**	5.0
IS031IU	Experimental Design	3	5.0
IS018IU	CAD/CAM	3	5.0
IS058IU	Time series & forecasting technique	3	5.0
	Total credits	**21**	**35.0**

Semester 6		**Crds**	**ECTS**
IS079IU	Scientific Writing	2	3.1
IS028IU	Simulation Models in IE	4	6.9
IS027IU	Scheduling & Sequencing	3	5.0
IS078IU	Logistics engineering & supply chain design	3	5.0
PE012IU	HCM' s thoughts	2	5.0
PE013IU	Revolutionary Lines of Vietnamese Communist Party	3	5.0
IS041IU	Lean Production	3	5.0
	Total credits	**20**	**35.0**

Summer semester		**Crds**	**ECTS**
IS053IU	Internship 2	3	6.0
	Total credits	**3**	**6.0**

Senior Year			
Semester 7		**Crds**	**ECTS**
IS083IU	Capstone Design	3	5.0
IS033IU	Multi-Criteria Decision Making	3	5.0
IS032IU	Facility Layout	3	5.0
IS___IU	**ISE Elective Course (choose 3 courses below)**	**9**	**15.0**
IS080IU	Creative Thinking	3	5.0
IS035IU	Systems Engineering	3	5.0
IS043IU	Flexible Manufacturing Systems	3	5.0
IS045IU	Leadership	3	5.0
IS023IU	Inventory Management	3	5.0
IS082IU	Retail Management	3	5.0
IS067IU	International Transportation & Logistics	3	5.0
IS062IU	E-Logistics in Supply Chain Management	3	5.0
	Total credits	**18**	**30.0**

Semester 8		**Crds**	**ECTS**
IS048IU	Thesis research	10	16.4
	Total credits	**10**	**16.4**

9.3 Curriculum for students of English entry level 3 (IE1 – TOEFL score < 430)

Total credits: 181 (additional 38 credits of Intensive English)

Length of study: 4.5 years

Freshman Year			
Semester 1		**Crds**	**ECTS**
EN072IU	Reading & Writing IE1	11	13.1
EN073IU	Listening & Speaking IE1	11	13.1
PT001IU	Physical Training 1	3	5.0
	Total credits	**25**	**31.2**

Semester 2		**Crds**	**ECTS**
EN074IU	Reading & writing IE2	8	8.1
EN075IU	Listening & speaking IE2	8	8.1
PT002IU	Physical Training 2	3	5.0
IS001IU	Introduction to Industrial Engineering	1	1.8
MA001IU	Calculus 1	4	6.2
	Total credits	**24**	**29.2**

Summer semester		**Crds**	**ECTS**
PE011IU	Principles of Marxism	5	8.1
	Total credits	**5**	**8.1**

Sophomore Year			
Semester 3		**Crds**	**ECTS**
MA027IU	Applied Linear Algebra	2	3.1
EN007IU	Writing AE1	2	3.1
EN008IU	Listening AE1	2	3.1
IS004IU	Engineering Probability & Statistics	4	6.2
PH013IU	Physics 1	2	3.1
PH014IU	Physics 2	2	3.1
PE008IU	Critical Thinking	3	5.0
MA003IU	Calculus 2	4	6.2
	Total credits	**21**	**32.9**

Semester 4		**Crds**	**ECTS**
CH011IU	Chemistry for Engineers	3	3.1
IS081IU	Deterministic models in OR	4	6.2
EN011IU	Writing AE2	2	3.1
EN012IU	Speaking AE2	2	3.1
IS054IU	Engineering Drawing	3	5.0
PE012IU	HCM’ s thoughts	2	3.1
MA023IU	Calculus 3	4	6.2
	Total credits	**20**	**29.8**

Summer semester		**Crds**	**ECTS**
IS052IU	Internship 1	2	4.0
	Military Training		
	Total credits	**2**	**4.0**

Junior Year			
Semester 5		**Crds**	**ECTS**
PH015IU	Physics 3	3	5.0
PE014IU	Environmental Science	3	5.0
IS019IU	Production Management	3	5.0
IS077IU	Introduction to Programming – $C^{++}/C^{\#}$, Python	2	3.1
IS040IU	Management Information System	3	5.0
IS025IU	Quality Management	3	5.0
IS016IU	Engineering Mechanics – Dynamics	3	5.0
IS___IU	**ISE Elective Course (choose 1 course below)**	**3**	**5.0**
IS031IU	Experimental Design	3	5.0
IS018IU	CAD/CAM	3	5.0
IS058IU	Time series & forecasting technique	3	5.0
	Total credits	**23**	**38.1**

Semester 6		**Crds**	**ECTS**
IS076IU	Introduction to Computing-Matlab	3	5.0
IS020IU	Engineering Economy	3	5.0
IS017IU	Work design & Ergonomics + Lab	4	6.9
IS034IU	Product Design & Development	3	5.0
IS041IU	Lean Production	3	5.0
PE013IU	Revolutionary Lines of Vietnamese Communist Party	3	5.0
MA029IU	Differential Equation	2	3.1
	Total credits	**18**	**35.0**

Summer semester		**Crds**	**ECTS**
IS053IU	Internship 2	3	6.0
	Total credits	**3**	**6.0**

Senior Year			
Semester 7		**Crds**	**ECTS**
IS083IU	Capstone Design	3	5.0
IS033IU	Multi-Criteria Decision Making	3	5.0
IS026IU	Project Management	3	5.0
IS024IU	Probabilistic Models in OR	3	5.0
IS___IU	**ISE Elective Course (choose 3 courses below)**	**9**	**15.0**
IS080IU	Creative Thinking	3	5.0
IS035IU	Systems Engineering	3	5.0
IS043IU	Flexible Manufacturing Systems	3	5.0
IS045IU	Leadership	3	5.0
IS023IU	Inventory Management	3	5.0
IS082IU	Retail Management	3	5.0
IS067IU	International Transportation & Logistics	3	5.0
IS062IU	E-Logistics in Supply Chain Management	3	5.0
	Total credits	**21**	**35.0**

Semester 8		**Crds**	**ECTS**
IS028IU	Simulation Models in IE	4	6.9
IS027IU	Scheduling & Sequencing	3	5.0
IS032IU	Facility Layout	3	5.0
IS078IU	Logistics engineering & supply chain design	3	5.0
IS079IU	Scientific Writing	2	3.1
	Total credits	**15**	25.0

Senior Year			
Semester 9		**Crds**	**ECTS**
IS048IU	Thesis research	10	16.4
	Total credits	**10**	**16.4**

10. Relation of Program ELOs and Courses

a. An ability to apply knowledge of mathematics, science and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function in multidisciplinary teams
e. An ability to identify, formulate, model and simulate and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. A recognition of the need for, and an ability to engage in life-long learning
j. A knowledge of contemporary issues and ability to self-update
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

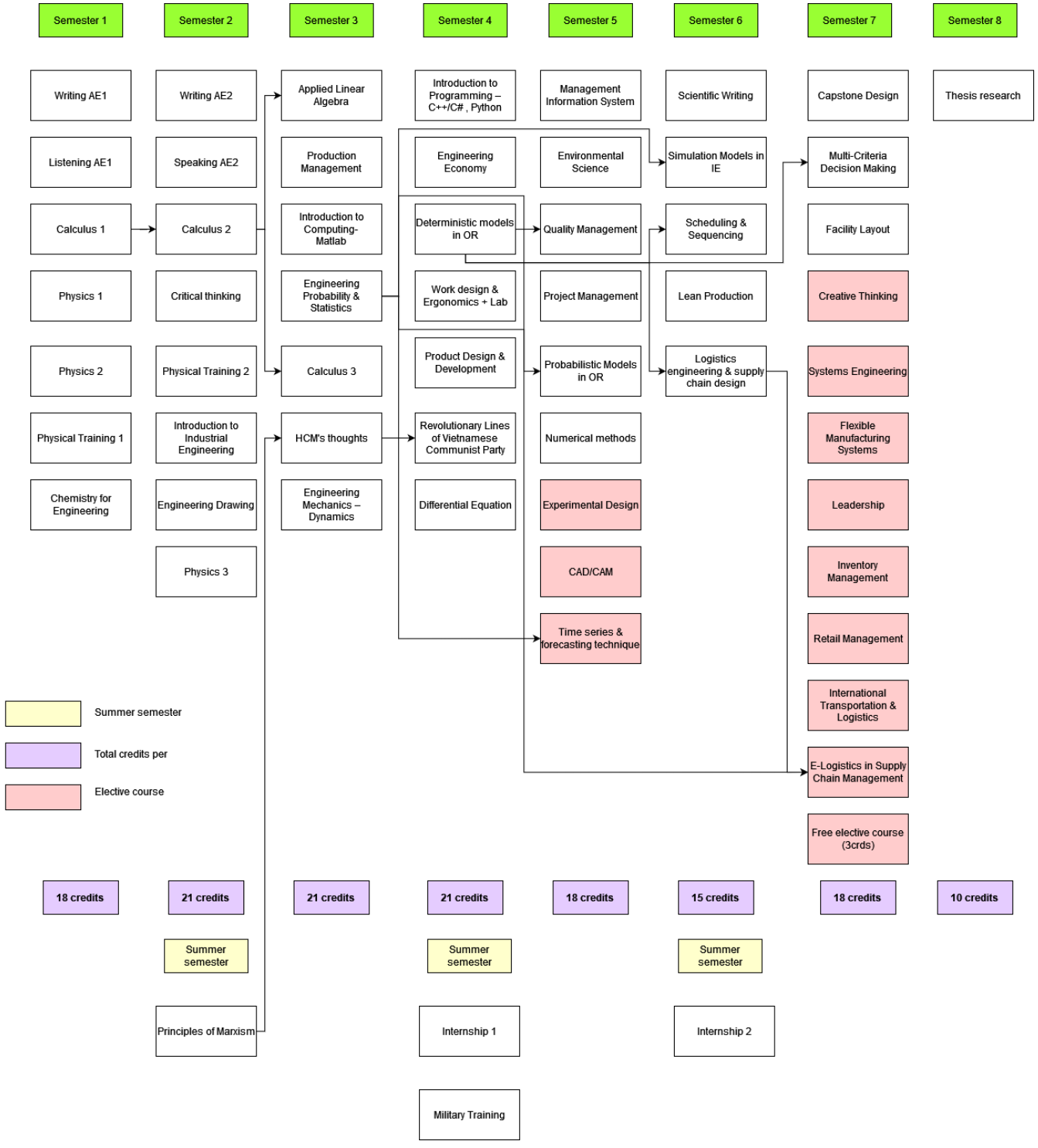
(While each course may relate to all the ELOs at different degrees, only the most significant correlation is shown in the table)

			Program ELOs										
	Course ID	**Course name**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
General Knowledge	PE011IU	Principles of Marxism						5	4	5			
	PE012IU	HCM' s thoughts						5	4	5			
	PE013IU	Revolutionary Lines of Vietnamese Communist Party						5	4	5			
	PE008IU	Critical Thinking				3			3		5	5	
	EN007IU	Writing AE1									4	4	
	EN008IU	Listening AE1									4	4	
	EN011IU	Writing AE2									4	4	
	EN012IU	Speaking AE2									4	4	
	IS079IU	Scientific Writing									5	5	
	MA001IU	Calculus 1	5	3			5				3	3	5
	MA003IU	Calculus 2	5	3			5				3	3	5
	MA023IU	Calculus 3	5	3			5				3	3	5
	PH013IU	Physics 1	5	3			5				3	3	5
	PH014IU	Physics 2	5	3			5				3	3	5
	PH015IU	Physics 3	5	3			5				3	3	5
	MA027IU	Applied Linear Algebra	5	3			5				3	3	5
	CH011IU	Chemistry for Engineers	5	3			5				3	3	5
	PE014IU	Environmental Science	1	3	3	3	1	5		5	4	4	1

Core knowledge	IS001IU	Introduction to Industrial Engineering				4			4		4	4	
	IS076IU	Introduction to Computing - Matlab	3	5	4		3						3
	IS077IU	Introduction to Programming - C++/C#,Python	3	5	4		3						3
	IS004IU	Engineering Probability & Statistics	5	5			5						5
	IS020IU	Engineering Economy		3	4			2		2			
Specialized Knowledge (Compulsory)	IS019IU	Production management		4	5			2		2			
	IS081IU	Deterministic models in Operations Research	5	4	5		5						5
	IS016IU	Engineering Mechanics – Dynamics	4	4	5	2	4	2	2	2			4
	IS017IU	Work design & Ergonomics + Lab	4	3	5		4						4
	IS034IU	Product Design & Development	4	4	5	2	4	2	2	2			4
	IS040IU	Management Information System	4	4	5	2	4	2	2	2			4
	IS032IU	Facility Layout	4	4	5	2	4	2	2	2			4
	IS025IU	Quality Management	5	3	4		5	2	2	2	2	2	5
	IS026IU	Project Management		3	4			2		2			
	IS078IU	Logistics Engineering & Supply chain Design	5	3	5	2	5	2	3	2	3	3	5
	IS024IU	Probabilistic Models in Operations Research	5	5			5						5
	IS028IU	Simulation Models in Industrial Engineering	4	4	5	2	4		3				4
	IS027IU	Scheduling & Sequencing	5	5			5						5
	IS041IU	Lean Production	5	3	5	2	5	2	3	2	3	3	5
	IS054IU	Engineering Drawing	3	3	3		3	2		2			3
	MA029IU	Differential Equation	3	5			3						3
	IS033IU	Multi-criteria Decision Making	5	4	5		5						5
Specialized Knowledge (Elective)	IS062IU	E-Logistics in Supply Chain Management	5	3	5	2	5	2	3	2	3	3	5
	IS058IU	Time Series & Forecasting Techniques	4	4			4				3	3	4
	IS035IU	Systems Engineering	4	4	5	2	4	2	2	2			4
	IS045IU	Leadership	1	3	2	5	1	5	5	5	4	4	1
	IS023IU	Inventory Management	5	3	5	2	5	2	3	2	3	3	5
	IS082IU	Retail Management			3	3		3		3	4	4	
	IS031IU	Experimental Design		5									
	IS018IU	CAD/CAM	3	3			3	3		3			3
	IS043IU	Flexible Manufacturing Systems	3	4			3	3		3			3
	IS067IU	International Transportation & Logistics	3	3	4	3	3						3
	IS080IU	Creative Thinking	2			4	2	5		5	5	5	2
Internship, Capstone and Thesis	IS052IU	Internship 1	3	4			3	5		5	5	5	3
	IS053IU	Internship 2	4	4	4	5	4				5	5	4
	IS083IU	Capstone Design	5	5	4	4	5	5	4	5	5	5	5
	IS048IU	Thesis research	5	5	4	4	5	5	4	5	5	5	5

11. Curriculum Mapping

(Standard curriculum for students of English entrance level 1)



12. Course description

PE011IU Principles of Marxism 5 credits

An introduction to fundamental concepts of Marxism – Leninism. This course presents the world methodology, and economic theory on capitalist production of Marxism-Leninism. It also provide basics of Marxism – Leninism's theories on socialism and socialist realism.

PE012IU Ho Chi Minh's Thoughts 2 credits

This course introduces students to the fundamentals of Ho Chi Minh's thought. Students learn about the formation and development of Ho Chi Minh ideology as well as other basic contents of Ho Chi Minh Thought based on course objectives.

PE013IU Revolutionary Lines of Vietnamese Communist Party 3 credits

This course provides students with a basic understanding of the Party's policies, especially the way in the renovation process. It is organized into topics: The birth of the Communist Party of Vietnam and the first political platform of the Party, the way to Fight the Government (1930- 1945), resistance against French colonists and American invaders (1945-1975), industrialization, and the ways to build a socialist-oriented market economy, the political system, culture, foreign policy and to solve social problems.

PE008IU Critical Thinking 3 credits

This course aims to introduce to you the fundamentals of critical thinking. Its course integrates basic critical thinking, persuasive communication, and related errors in thinking lessons with examination of arguments from several sources, including literature, politics, commercials, and the media.

The primary focus of this course is the development of critical skills. To this end, you will learn to identify common fallacies, reflect on the use of language for the purpose of presentation, and think critically about ethical judgments, advertisement, TV and film, magazines and newspapers.

EN007IU Writing AE1 2 credits

This course provides students with instruction and practice in essay writing, including transforming ideas into different functions of writing such as definitions, classifications, cause – effects, arguments. Through reading a few representative university-level texts, students will develop the ability to read critically and write accurately, coherently, and in appropriate academic style in response to those texts. They will also practice necessary skills to write a research report.

EN008IU Listening AE1 2 credits

To provide students with the study skills needed to listen to academic lectures, take effective notes and prepare for examinations.

EN011IU Writing AE2 2 credits

This course provides an overview of the organizational format for a research paper and assists students in completing research projects in any content area course by providing assistance in writing effective research papers using a step-by-step process approach. Course content includes the components of a research paper, and techniques of selecting and narrowing topics; writing argumentative thesis statements; outlining; locating and documenting sources; and taking notes. Students also have to read extensively about a chosen topic to explore different ideas of multiple authors about that topic. Students work with projects relating to their content area courses.

Prerequisite: *EN007 & EN008 (Academic English 1)*

EN012IU Speaking AE2 2 credits

Students are provided with practical strategies for effective presentations. They also have a chance to practice giving presentations in class and receive feedback.

Prerequisite: *EN007 & EN008 (Academic English 1)*

IS079IU Scientific Writing 2 credits

This course is offered for undergraduate students at School of IEM, IU. It aims to improve students' academic and scientific writing in English, and helps them successfully complete course reports, thesis, dissertations, and articles for publication as well as doing a proper presentation, etc. Upon completion of the course, we hope our students become more effective, more efficient, and more confident writers.

MA001IU Calculus 1 **4 credits**

Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of Basic Elementary Functions, Differentiation Rules; Applications of Differentiation: L'Hôpital's Rule, Optimization, Newton's Method; Anti-derivatives; Indefinite Integrals, Definite Integrals, Fundamental Theorem of Calculus; Techniques of Integration; Improper Integrals; Applications of Integration.

MA003IU Calculus 2 **4 credits**

Sequence and Series; Convergence Tests; Power Series; Taylor and Maclaurin Series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Parametric Surfaces; Functions of Several Variables; Limits, Continuity, Partial Derivatives, Tangent Planes; Gradient Vectors; Extrema; Lagrange Multipliers; Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration; Vector Fields, Line Integrals, Surface Integrals.

Prerequisite: *MA001 (Calculus 1)*

MA023IU Calculus 3 **4 credits**

Complex numbers, complex series, complex functions, complex derivatives; Laplace transform, z-transform, Fourier series, Fourier transform, the inverse transform, transforms of derivatives and integrals, first-order differential equations, second-order differential equations, difference equations, applications to electrical circuits and signal processing.

Prerequisite: *MA003 (Calculus 2*

PH013IU Physics 1 **2 credits**

An introduction to mechanics including planar forces, free body diagrams, planar equilibrium of rigid bodies, friction, distributed forces, shear force and bending moment diagrams, simple stress and strain and associated material properties, kinematics and kinetic of particles, work and energy, motion of rigid bodies in a plane.

PH014IU Physics 2 **2 credits**

This course provides students basic knowledge about fluid mechanics; macroscopic description of gasses; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gasses and the kinetic theory of gasses.

PH015IU Physics 3 **3 credits**

To provide a thorough introduction to the basic principles of physics to physics and engineering students in order to prepare them for further study in physics and to support their understanding and design of practical applications in their fields. Content: Electrostatics, particles in electric and magnetic fields, electromagnetism, circuits, Maxwell's equations, electromagnetic radiation.

Co-requisite*: PH016 (Physic 3 Laboratory)*

MA027IU Applied Linear Algebra **2 credits**

The course provides the student with basic knowledge in linear algebra with applications, in particular the skill of solving linear systems of equations using Gauss elimination method.

Prerequisite: *None*

CH011IU Chemistry for Engineers **3 credits**

This course is designed for non-chemistry majors, as it is intended for students pursuing a degree in information technology, electronic and telecommunication. The course is designed to provide a strong background in the fundamentals of chemistry, preparing students for further study in their major field. Topics include important principles, theories, concepts of chemistry, and chemical calculations necessary for a comprehension of the structure of matter, the chemical actions of the common elements and compounds. The impact of chemistry on everyday life and on the environment is also introduced wherever possible.

PE014IU Environmental Science **3 credits**

This course provides the basic knowledge of environmental science that includes general issues, ecology, and the impact of human activities to natural resources and environment and sustainable development. The course provides information about all general current issues; ecology; all facts of

environmental science; knowledge how human activities impact on environment and its feedback; and suggest some sustainable solution to solve the issues.

IS001IU Introduction to Industrial Engineering 1 credit

This course will provide the students with an introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. Case studies are presented and analyzed. Students will work on interdisciplinary projects which corresponding to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields.

IS076IU Introduction to Computing - MATLAB 3 credits

Introduction to MATLAB, a powerful programming package for engineers and scientists. Students will learn the fundamentals of MATLAB, how to write programs in MATLAB, and how to solve engineering problems using MATLAB. Emphasis on problem-solving skills and mathematical tools of importance in engineering.

IS077IU Introduction to Programming – C++/C#, Python 2 credits

Introduction to programming in C++. Operators and the C++ system; fundamental data types; flow of control; functions; arrays, pointers, and strings; application of C++ for solving engineering problems and numerical analyses.

IS004IU Engineering Probability & Statistics 4 credits

The aim of this course is to examine various concepts in probability and statistics. This course also discusses various statistical techniques and the use of them in practical situations. Key topics of this course include descriptive statistics, discrete and continuous random variables, sampling and sampling distributions, confidence intervals, hypothesis testing, analysis of variance, simple linear and multiple regressions.

IS020IU Engineering Economy 3 credits

Economic decisions involving engineering alternatives; annual cost, present worth, rate of return, and benefit-to-cost; before and after-tax replacement economy; organizational financing; break-even charts; unit and minimum-cost public sector studies.

IS019IU Production management 3 credits

Introduction to production systems. Production planning and control in decision making. Forecasting. Aggregate production planning. Capacity planning. Materials requirement planning. Scheduling. Advanced techniques and approaches in modern production planning and control for designing manufacturing and service systems.

IS081IU Deterministic models in Operations Research 4 credits

Elements of problem solving and algorithmic design. Use of numerical analysis and linear algebra to solve industrial engineering problems. Topics to be covered include problem formulations, simplex method in tableau form, duality theory, an introduction to the geometry of the simplex method, sensitivity analysis, transportation and network flow problems, optimality conditions and basic numerical methods for nonlinear programs.

IS090IU Engineering Mechanics – Dynamics 2 credits

This course helps students understand the kinematics of particles to rigid bodies, rotation of a rigid body, plane motion of a rigid body, relative motion, the principles of work and energy, impulse and momentum, impact.

IS017IU Work design & Ergonomics + Lab 4 credits

Problem solving tools (recording and analysis tools, activity charts, line balancing). Operation analysis, manual work design (principles of motion economy, motion study). Time study (performance rating and allowances). Work sampling, predetermined time systems. Work environment design.

IS034IU Product Design & Development 3 credits

Product Design and Development course introduces to the students the role of multiple functions in creating a new product (*e.g.* marketing, finance, industrial design, engineering, production) as well as tools and methods for product design and development. Highlight of the course is the project in which

the students will design a new product and produce a prototype version of it. Throughout the project, the students will apply their learned principles and methods of product development in a realistic context. The course also enables the students to coordinate interdisciplinary tasks in order to achieve a common objective.

IS040IU Management Information System 3 credits

Integrates topics of management and organization theory, information and communication theory, and systems theory relevant to managing an organization's information resources.

Includes computer hardware and software, telecommunications, and database concepts and emphasizes the e-commerce and Internet based business models to get a competitiveness of global based business environments. This course meets the requirements for a Technology Intensive course.

IS032IU Facility Layout 3 credits

This course focuses on the fundamentals of the design, layout, and location of industrial and nonmanufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory

IS025IU Quality Management 3 credits

This course introduces the principles of quality management, with an emphasis on cross- functional problem solving. It provides methods for quality planning, improvement and control with applications in manufacturing and service. The students also gain a basic understanding of the philosophy, conceptual frameworks and the tools of Total Quality Management.

IS026IU Project Management 3 credits

Project management" course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). The course emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.

In addition, this course also provides computer aid for project management by introducing the application of Microsoft Project and project scheduling.

IS078IU Logistics Engineering & Supply chain Design 3 credits

Logistics and Supply chain management involves a number of decisions that benefit by quantitative techniques of analysis and design. The course will explore modeling, computation implementation of solutions in some areas of Logistics and Supply Chain Management. The content also includes material flow management across the supply chain, value management and analysis of total supply chain costs, robust design of supply chains, coordination of supply chain decisions and handling of uncertainties in supply chain management.

IS024IU Probabilistic Models in Operations Reseach 3 credits

To introduce the student into basic topics of mathematical modeling process of decision problems in complex stochastic industrial environments. This course covers stochastic operations research models, algorithms, and applications. Markov chains and queuing models are discussed. Renewal theory, reliability theory, and stochastic models for manufacturing systems are also taken into consideration. Students will acquire in this course the basis for the study of other probabilistic topics in their curriculum.

IS028IU Simulation Models in Industrial Engineering 4 credits

Systems modeling and simulation techniques find applications in fields as diverse as physics, chemistry, biology, economics, medicine, computer science, and engineering. The purpose of this course is to introduce fundamental principles and concepts in the general area of systems modeling and simulation. Topics to be covered in this course include basics of discrete-event system simulation, mathematical and statistical models.

IS027IU Scheduling & Sequencing 3 credits

This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel

machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.

IS041IU Lean Production 3 credits

This course will help students to understand the concepts and philosophies of lean, get familiar with lean tools/techniques, especially the concepts behind the tools/techniques used, and develop analytical, problem solving skills. Therefore, the students will be able to join well in most of foreign-invested enterprises or large organizations in Vietnam after graduation. Ultimately, they will be able to apply lean philosophy creatively in each unique practical situation.

IS054IU Engineering Drawing 3 credits

This course provides students skills to present and interpret spatial models on planar models, and present engineering drawings according to international standards (ISO). Methods of presenting models: orthogonal projection, isometric projection, oblique projection… Apply the projections to present objects in the drawings.

MA029IU Differential Equation 4 credits

First-order differential equations, second-order linear differential equations, undetermined coefficients, variation of parameters, applications, higher-order linear differential equations, systems of first-order linear equations, elementary partial differential equations and the method of separation of variables.

IS033IU Multi-Criteria Decision Making 3 credits

Decision making is one of the important parts in operation research or management science. Decision making techniques help management to choose the best alternative based on quantitative criteria. This course provides students with basic knowledge about decision model formulation, so that they can make decisions based on the results of the models. This course also provides students with specific techniques for practical applications in production and services.

IS062IU E-Logistics in Supply Chain Management 3 credits

Comprehensive inquiry into the role of e-commerce in collaborative distribution and logistics relationships. Special attention is afforded to resource and technology interdependencies, exchange governance mechanisms and relationship management bench-marking. Emphasis is given to the tools for creating value in the supply chain.

IS058IU Time Series & Forecasting Techniques 3 credits

The simplest definition of economic forecasting is that it is a process that has as its objective the prediction of future events or conditions to reduce that uncertainty so that our decisions will be better ones.

Specific objectives are to instruct you in:

1. The formulation and specification of forecasting models;
2. Data collection, interpretation, organization, and analysis for building forecasting models;
3. Fundamental statistical and probability concepts used in forecasting;
4. The existence of a hierarchy of forecasting models;
5. The use of econometric software in a lab setting.

IS035IU Systems Engineering 3 credits

Systems Science is the course of methods to develop and analyze the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.

IS045IU Leadership 3 credits

Organizational development and learning; leading learning organizations; leadership theories and perspectives, followership, leadership development; coaching and mentoring; leading groups and teams, leadership and diversity.

IS023IU Inventory Management 3 credits

Every organization holds stocks of materials to allow for variations and uncertainty in supply and demand. Stocks are replenished by deliveries from suppliers and reduced to meet demands from customers. Inventory management is responsible for all aspects of stock control. High stock buffer comes at a high price and organizations are continually looking for ways of reducing their inventory costs without affecting service.

This course provides students with an understanding of the principles, processes and methods for the effective management of inventory in relation to other activities in the supply chain. The course examines both the independent demand and dependent demand methods. Attention is given to the information needed to support these methods, including information from the inventory management information system, forecasts of demand and planned operations.

IS082IU Retail Management 3 credits

This course provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.

IS031IU Experimental Design 3 credits

Statistical design of experiments refers to the process of planning the experiment so that appropriate data will be collected and analyzed by statistical methods, resulting in valid and objective conclusions. A well-designed experiment not only reveals. important information of a process or system but is also cost efficient. This applied statistic course benefits tremendously for both engineers and researchers in many activities such as new product design, manufacturing process development and process improvement. Coverage includes factorial, fractional factorial experimental designs, blocking and confounding factors, regression modeling and response surface methodology.

IS018IU CAD/CAM 3 credits

This subject will provide design parts or mechanical products by CAD/CAM software. The students are studied geometric transformations, geometric modeling, mathematical representations of curves, Wire frame modeling, surface and solid modeling. Numerical control systems and machine tools. Manual part programming, computerized part programming, CAD/CAM/CNC systems integration.

IS043IU Flexible Manufacturing Systems 3 credits

This subject will provide the concept and method of flexible manufacturing system planning and control. The study covers: FMS technology, component, performance evaluation, and configuration planning.

IS067IU International Transportation & Logistics 3 credits

Students learn the significance of international traffic and transport logistics. Students will learn basic methods and applications of operations research to implement, operate and optimize overall company material flow technical networks. This applies in particular to the subject of the optimal arrangement of sources and outflows and their dimension as well as their optimal interconnection from a transport technology point of view.

Topics include: requirements for logistics companies; active in road freight, rail, air and sea transport; competition in international transport; competition in international transport; cost accounting for freight forwarding; price setting in road freight, rail, air and sea transport; information management in freight forwarding.

IS080IU Creative Thinking 3 credits

The art of Creative Thinking is crucial for many individuals in different fields, whether it's school, job or personal use, everyone should learn how to think creatively. This course will help you understand the role of creativity and innovation in your own work and in other disciplines. It will challenge you to move outside of your existing comfort zone and to recognize the value of that exploration. This course will help you understand the importance of diverse ideas, and to convey that understanding to others.

IS052IU Internship 1 2 credits

This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.
Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor).
Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.

IS053IU Internship 2 3 credits

This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.
Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 320 working hours or 40 working days is required. Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.
Students should be both supported and challenged and encouraged to take initiative and develop life-long learning skills. Each intern works under a site supervisor at the host organization and an advisor from IU (ISE's lecturer). The role of the site supervisor (or advisor) is to oversee the students and provide mentorship throughout the internship. The site supervisor and advisor will complete a performance evaluation form at the conclusion of the internship. Students will discuss their experiences through weekly reports and online discussions.

IS083IU Capstone Design 3 credits

This subject is a preparation step for thesis and helps student to review their jobs after internship 2. It also helps students know how to identify the problem, review related literatures, and develop initial system for solving the current problem of a case.

IS048IU Thesis research 10 credits

Thesis project is a semester-long, individual study taken at the last semester of the senior year. Students are required to solve a large-scale problem by designing a new system or developing a comprehensive solution to improve the current system. The new design or solution for improvement must take into account realistic constraints such as economic, social and environmental conditions.

13. Academic Regulation

Summer Internship Registration

Students are allowed to register for summer internship before the academic year when they aim to apply for a thesis.

❖ **Objectives:**

- To develop skills in the application of theory to practical work situations;
- To develop skills and techniques directly applicable to their careers;
- To provide students the opportunity to get involved with industry before graduation.

❖ **Internship duration: two internships are requirement**

- Internship ***1:*** Minimum 4 weeks
- Internship ***2:*** minimum 8 weeks to 12 weeks (full-time working)

Thesis Registration

❖ **Criteria:**

- Successfully accumulate at least 95% of total required credits (not including 10 credits of the thesis course)
- Do not under any academic admonishment.

❖ **Duration:** minimum 12 weeks

Graduation Criteria

- Students have to complete all of the following requirements for graduation:
- Successfully complete the academic curriculum (143 credits) with GPA ≥ 50
- Meet the minimum English requirement of 61 TOEFL iBT, 6.0 IELTS.
- Military Education Certification
- Meet other requirements in accordance with the regulations for graduation set by the IU.

Scholarship Information

❖ **University Scholarship (Decision No. 99 & 100/ĐHQT-ĐT)**

Each semester, top 10% of students with highest GPA will receive scholarship from the IU. 4% of students will receive full scholarship (12.000.000 VND for Fall/Spring semester or 6.00.00 VND for Summer semester) and 6% of students will receive half scholarship (6.000.000 VND for Fall/Spring semester or 3.000.000 for summer semester).

- ***Minimum requirements:***
  - Complete the Academic English 1 (AE1).
  - Register at least 12 credits for Fall/Spring semester or 6 credits for Summer semester;
  - Semester GPA ≥ 70 (with no course fails in that semester)
- **Admission Scholarship 2012** ***Full scholarship*** (full tuition exemption for 4 years – equivalent to 120.000.000 VND): Students have entrance examination scores ≥ 24.
- ***Partial scholarship*** (half tuition exemption for 4 years – equivalent to 60.000.000

VND): Students have entrance examination scores ≥ 23.

- ***Condition to maintain Scholarships:*** Students must have GPA each semester ≥ 70 and the score of every subject ≥50.

Course Registration

Course registration aims at helping students gain full success in building their own training plan, selecting appropriate subjects for every semester in such a way that can meet his or her own personal capacity and conditions for the highest achievement.

- Students should register a minimum of 12 credits, except for the last semester.
- Students should register a maximum of 24 credits in one semester, except for the last semester, for those who have cumulative GPA ≥65
- The subject registration form must be approved by the academic advisors.
- For exceptional cases, students must file for the consideration of the Head of Department.
- Students do online course registration on the website: https://hcmiu.edu.vn/edusoftweb/ (username and password for student will be created by the university).
- The registration time will be informed by the Department.

Adjusting Student Timetable

When receiving the timetables, students must check the information including the number of registered courses, tuition fees, etc… If there should be any errors, students must report to the Department within three days of the timetable announcement.

The Department must check (through the academic advisors) and give their opinions on the students' file of documents, and then send them to the Office of Undergraduate Academic Affairs for settlement.

Adding and Dropping Courses

In the first week of teaching, based on their timetables, ability and learning conditions, students can file for adding and dropping courses.

Academic Probation

The University Academic Committee will consider to settle the academic matters after the first and summer semester annually. The result of the summer semester will be added to that of the second semester of the corresponding year upon academic settling.

Student violating the below regulation will be admonished academically:

- Those who acquire insufficient credits as required by the specialization in one semester;
- Cumulative GPA < 35
- Having two consecutive cumulative GPA < 50

The duration for academic probation will last in the succeeding formal semester.

Academic suspension

Students violating one of the below regulation will be suspended academically:

- The ultimate time for studying has finished;
- To drop out of university more than one semester without approval of IU;
- Students are warned more than 2 times;
- Do not register courses for each semester;
- Do not finish tuition fees in the prescribed time.

Academic Information

- Students can see all studying results in each semester and training results at the Department of Industrial and Systems Engineering
- In the studying process, students can ask for a student's transcript at the Office of Undergraduate Academic Affairs.
- For students who are warned or suspended, the university will send the information to the student's family.

Grading Criteria

Classification	**Scale 0 of 100**	**Scale 0 of 4**	**Letter grade**
PASS			
Excellent	85 <= GPA <= 100	4.0	A
Very Good	75 <= GPA < 85	3.75	A-
Good	65 <= GPA < 75	3.5	B+
Fairly good	60 <= GPA < 65	3.0	B
Fair	55 <= GPA < 60	2.5	C+
Average	55 <= GPA < 60	2.0	C
FAIL			
Weak	30 <= GPA <= 50	1.3	D+
Rather weak	10 <= GPA <= 30	1.0	D
Too weak	GPA <= 10	0	F

COURSE SPECIFICATION

A. Course Syllabus

SYLLABUS OF GENERAL COURSES

Principles of Marxism

1. General Information

Course Title:

- Vietnamese: Những nguyên lý cơ bản của chủ nghĩa Mác-Lênin
- English: Principles of Marxism

2. Course ID: PE011IU

3. Course Type:

☒ General ☐ Fundamental

☐ Specialization (required) ☐ Specialization (elective)

☐ Project/Internship/Thesis ☐ Others: ……

4. Number of credits: 5

5. Prerequisites: None

6. Course Description

An introduction to fundamental concepts of Marxism – Leninism. This course presents the worldview, methodology, and economic theory on capitalist production of Marxism-Leninism. It also provides the basics of Marxism – Leninism's theories on socialism and socialist realism.

7. Textbooks and references

Textbooks

- Ministry of Education and Training, Basic principles of Marxism – Leninism, National Political Publishing House.

References

- Ministry of Education and Training; Marxist-Leninist Philosophy, Marxist-Leninist Political Science and Social Science Social Sciences, National Political Publishing House, 2007.

8. Course Objectives

- Know the most basic rationale of socialist theories
- Establish the world view, the humanities and the most general methodology to approach the specialized sciences

9. Learning Outcomes

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Know the most basic rationale of socialist theories	c, f, i

G2	Establish the world view, the humanities and the most general methodology to approach the specialized sciences	c, d, f, i

10. Course Assessment

Assessment component (1)	Assessment form (2)	Percentage % (3)
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
	A3.1 Full Semester Project	15%
A3. Final assessment	A3.2 Final exam	40%

11. Course Policy

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

Ho Chi Minh's Thoughts

1. **General Information**

Course Title

- Vietnamese: Tư tưởng Hồ Chí Minh
- English: Ho Chi Minh's Thoughts

2. **Course ID:** PE012IU
3. **Course Type:**

☒ General ☐ Fundamental

☐ Specialization (required) ☐ Specialization (elective)

☐ Project/Internship/Thesis ☐ Others: ……

4. **Number of credits: 2**
5. **Prerequisites:** Principles of Marxism
6. **Course Description**

This course introduces students to the fundamentals of Ho Chi Minh's thought. Students learn about the formation and development of Ho Chi Minh ideology as well as other basic contents of Ho Chi Minh Thought based on course objectives.

7. **Textbooks and references**

Textbooks

- Ministry of Education and Training, The Ho Chi Minh ideology, National Political Publishing House.
- The Central Council, The Ho Chi Minh Thought.

References

- The Central Propaganda Department, study guides of Ho Chi Minh Thought.
- Resolutions and documents of the Vietnamese Communist Party.

8. **Course Objectives**

- Providing a systematic understanding of thought, morals, cultural values, Ho Chi Minh.
- Continue to provide basic knowledge about Marxism-Leninism.
- Along with the subject, the basic principles of Marxism-Leninism provide insights into the foundations of thought, the guiding principles of the Party and the revolution.
- Contribute to building a new human moral foundation

9. Learning Outcomes

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Systematic understanding of thought, morals, cultural values, Ho Chi Minh	c, f, i
G2	The basic principles of Marxism-Leninism provide insights into the foundations of thought, the guiding principles of the Party and the revolution	c, d, f, i

10. Course Assessment

Assessment component (1)	Assessment form (2)	Percentage % (3)
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
	A3.1 Full Semester Project	15%
A3. Final assessment	A3.2 Final exam	40%

11. Course Policy

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

Revolutionary Lines of Vietnamese Communist Party

1. **General Information**

Course Title

- Vietnamese: Đường lối cách mạng của Đảng Cộng sản Việt Nam
- English: Revolutionary Lines of Vietnamese Communist Party

2. **Course ID:** PE013IU
3. **Course Type:**

☒ General ☐ Fundamental

☐ Specialization (required) ☐ Specialization (elective)

☐ Project/Internship/Thesis ☐ Others: ……

4. **Number of credits: 3**
5. **Prerequisites:** Principles of Marxism, Ho Chi Minh's thoughts
6. **Course Description**

This course provides students with a basic understanding of the Party's policies, especially the way in the renovation process. It is organized into topics: The birth of the Communist Party of Vietnam and the first political platform of the Party, the way to Fight the Government (1930-1945), resistance against French colonists and American invaders (1945-1975), industrialization, and the ways to build a socialist- oriented market economy, the political system, culture, foreign policy and to solve social problems.

7. **Textbooks and references**

Textbooks

- Ministry of Education and Training, The Communist Party of Vietnam's revolutionary guidelines, National Political Publishing House.
- The Central Council, History textbook of the Communist Party of Vietnam.

References

- Documents and Resolutions of the Vietnamese Communist Party.

8. **Course Objectives**

- To provide students the basics of the revolutionary lines of the Vietnamese Communist Party.
- To help students apply their specialized knowledge in order to solve economic, political, cultural and social problems in accordance with the Party's and State's lines, policies and laws.

9. **Learning Outcomes**

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Understanding the basics of the revolutionary lines of the Vietnamese Communist Party	c, f, i
G2	Applying their specialized knowledge in order to solve economic, political, cultural and social problems in accordance with the Party's and State's lines, policies and laws.	c, d, f, i

10. Course Assessment

Assessment component (1)	Assessment form (2)	Percentage % (3)
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
	A3.1 Full Semester Project	15%
A3. Final assessment	A3.2 Final exam	40%

11. Course Policy

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

CRITICAL THINKING

1. **General Information**

   - Course Title: CRITICAL THINKING *(Tư duy phân tích)*
   - Course Code: PE008IU
   - Semester: 2
   - Course Coordinator/Lecturer: Dr. Pham Huynh Tram
     phtram@hcmiu.edu.vn

2. **Number of credits: 3** credits

3. **Prerequisites**: None

4. **Course description**

   Critical Thinking studies a process which is indispensable to all educated persons--the process by which we develop and support our beliefs and evaluate the strength of arguments made by others in real-life situations. It includes practice in inductive and deductive reasoning, presentation of arguments in oral and written form, and analysis of the use of language to influence thought. The course also applies the reasoning process to other fields such as business, science, law, social science, ethics, and the arts.
   Number of Credits: 3
   Lectures: 45 hours
   Assignments & Presentations: Yes

5. **Textbooks and Other Required Materials**

   [1] *Critical Thinking: A Student's Introduction*, 2nd ed. (Bassham, Irwin, Nardone, and Wallace).
   and Reference:
   [2] *Critical Thinking*, 9 th ed. (B. N. More, R. Parker)
   Web:http://highered.mcgrawhill.com/sites/0072879599/student_view0/chapter1/multiple_choice_quiz.html

6. **Course objectives/Course learning outcomes**

No.	Course Objectives	Program Learning outcomes
1	Apply the standards of critical thinking to evaluate arguments.	(d) an ability to function on multidisciplinary teams (g) an ability to communicate effectively (i) a recognition of the need for, and an ability to engage in life-long learning
2	Understand the barriers to critical thinking and apply deductive and inductive reasoning	
3	Understand the various types of fallacies	

7. Course Outline

Class	Content	Activities
1	- Discuss Syllabus and Course - Introductions of Students and Teachers - What'sThinking: creative thinking, critical thinking. - What is critical thinking - Critical thinking standards Clarity Precision Accuracy Relevance Consistency Logical correctness Completeness Fairness - The benefits of critical thinking	Read Chapter 1 - Lecture
2	- Barriers to critical thinking Egocentrism Sociocentrism Unwarranted assumption and stereotypes Relativistic thinking Wishful thinking - Characteristics of a critical thinker	Chapter 1 - Discussion
3	ReadRecognizing arguments - What is an argument? - Identifying premises and conclusions - What is not an argument? Report Unsupported Assertions Conditional Statements Illustrations Explanations	Read Chapter 2/Lecture
4	Basic logical concepts Deduction and Induction How can we tell whether an argument is deductive or inductive? Common patterns of deductive reasoning Common patterns of inductive reasoning	Read Chapter 3/Lecture
5	Deductive validity	Chapter 3

Class	Content	Activities
	Inductive strength	Discussion - Lecture
6	Categorical logic Categorical statements Translating into standard categorical form Categorical syllogism	Read Chapter 9/Lecture/Quiz
7	Propositional logic Conjunction Conjunction and validity Negation Disjunctions Conditional statements	Read Chapter 10/Lecture & Quiz
Midterm Exam		
8	Language Finding the right words: the next for precision The important of precise definitions + Exercise	Chapter 4 - Lecture
9	Logical fallacies I The concept of relevance Personal attack Attacking the motive Look who's talking Two wrongs make a right Scare tactics Appeal to pity Bandwagon Argument Straw man Red herring Equivocation Begging the question	Chapter 5 – Lecture & Discussion

10	Logical fallacies Fallacies of insufficient evidence Inappropriate appeal to authority Appeal to ignorance False Alternatives Loaded question Questionable cause Hasty generalization Slippery slope	Chapter 6 – Lecture/Quiz

Class	Content	Activities
	Weak analogy Inconsistency	
11	Analyzing arguments Diagram short arguments Summarizing longer arguments	Chapter 7 – Lecture
12	Evaluating arguments and truth claims: What is an argument, a good one? When is it reasonable to accept a premise? Refuting arguments Sample critical essay	Chapter 8 – Lecture
13	Inductive reasoning Introduction to induction Inductive generalization Statistics arguments Induction analogy Induction and causal arguments A few words about probability	Chapter 11 – Lecture & Discussion
14	Finding, Evaluating, and Using sources Finding sources Evaluating sources Taking notes Using sources	Chapter 12 – Lecture & Quiz
15	Review	
Final exam		

8. Course Assessment Policy

► Mid-term exam:	30%
► Assignments:	30%
► Final Exam:	40%
Total:	100%

9. Course general requirements

Students are expected to spend at least **8 hours** per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.

WRITING AE1

1. **General Information**
   - Course Title: Writing AE1 (Tiếng Anh chuyên ngành 1: Kỹ năng viết)
   - Course Code: EN007IU
   - Semester: 1
   - Course Coordinator/Lecturer: Dept. of English
2. **Prerequisites**: Writing IE2 completion
3. **Course description**

   This course provides students with comprehensive instructions and practice in essay writing, including transforming ideas into different functions of writing such as process description, cause-effect, comparison-contrast, argumentative, and paraphrase-summary essays. Throughout the whole course, students are required to read university-level texts to develop the ability to read critically and to respond accurately, coherently and academically in writing. Through providing them with crucial writing skills such as brainstorming, proofreading, documentation and editing, this course prepares the students for research paper writing in the next level of AE2 writing.
4. **Textbooks and Other Required Materials**

   Textbook:

   Oshima, A., & Hogue, A. (2006). *Writing academic English* (4rd ed.) White Plains, NY: Pearson Longman.

   Reference:

   Jordan, R. R. (1999). *Academic writing course* (3rd ed.). London: Collins.

   Hamp-Lyons, L., & Heasley, B. (2006). *Study writing: A course in writing skills for academic purposes* (2nd ed.). Cambridge: University Press.
5. **Course Expected Learning Outcomes**

After successfully completing this course, students should be able to:

No.	Course Objectives	Program Learning outcomes
1	Understand and follow different steps in the writing process to produce a complete essay	(i) a recognition of the need for, and an ability to engage in life-long learning
2	Improve their writing through self-assessment, peer's feedback and teacher's comments	
3	Use different functions of writing to successfully communicate their purposes to the audience (process description, cause-effect, comparison-	

No.	Course Objectives	Program Learning outcomes
	contrast, argumentative, and paraphrase-summary essays	
4	Read and respond critically in writing, analyze and annotate an academic text.	

6. Course outline

Week	No. of periods	Coursebook		Assignments
		Chapter	***Pages***	
1	2	**The process of Academic Writing** Step 1: Creating (Prewriting) Step 2: Planning (Outlining) Step 3: Writing Step 4: Polishing	265-277	Editing Practice
2	2	**From Paragraph to Essay** The introductory paragraph Body paragraphs The concluding paragraph		
3	2	**From Paragraph to Essay (Cont'd)** Essay outlining Review Writing Practice Reading (Questions & Suggestions for Discussion or Writing)	56 - 80	
4	2	**Process Essays** Thesis statements for process essay Transitional signals Writing Practice		*Sentence Structure* (**P. 179-193**) *Making an outline*
5	2	**Process Essays (Cont'd)** Review/ Correction Reading 2 (Questions & Suggestions for Discussion or Writing)	81-93	***In-class Assignment*** **Reading 1** (Questions & Suggestions for Writing **P.89-91**)

6	2	**Cause – Effect Essays** Organization Signal words and phrases Writing Practice	94-110	
7	2	**Cause – Effect Essays (Cont'd)** Review/ Correction Reading (Questions & Suggestions for Discussion or Writing)		
MID-TERM EXAMINATION				
8	2	**Comparison – Contrast Essays** Organization Signal words Writing Practice	111 - 126	
9	2	**Comparison – Contrast Essays (Cont'd)** Review Peer correction/ Self assessment		***Home Assignment*** **Reading** (Questions & Suggestions for Writing **P. 124-126**)
10	2	***Paraphrase and Summary*** Paraphrasing Plagiarism and How to avoid Plagiarism	127 – 141	*Paraphrasing Practice*
11		***Paraphrase and Summary (Cont'd)*** Review/ Correction Summarizing		*Summarizing Practice*
12	2	**Argumentative Essays** Organization The introductory paragraph Writing Practice	142-160	
13	2	**Argumentative Essays (Cont'd)** Review/Correction Topic 1 – Reading 1 & 2 (Questions)		***Writing Project*** **(home assignment)** Paraphrasing & Argumentative Essay Writing
14		**Argumentative Essays** **Project Presentation**		**Discussion**
15		**Review**		

FINAL EXAMINATION

7. Course Assessment Policy

Assessment Summary

► Mid-term exam:	30%
► Assignments:	30%
► Final Exam:	40%
Total:	100%

Writing Project: Students are asked to work in a small group (up to 5 students), and are supposed to search for one argumentative article, then paraphrase, and write one counter-argumentative essay. The project should be at least 5-page long including the front cover page (students' names & IDs, instructor's name, title), original article, paraphrasing, the counter-argument, and the back cover page (including source).

Bonus points *for students' participation and homework completion: From 1 to 5 pts added to the assignments score.*

For example: Student A has got a 78 for his assignments and he participated fully in all activities, then the instructor can decide to give him a bonus 5. As a result, he may gain an 83 (78+5) score for the No.1 assessment task.

Passing Grade: 50%

8. Course general requirements

Attendance

Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

Missed Tests

Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may retake the examination.

Class Behaviors

Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE1 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below:

- Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.

- Participate fully and constructively in all course activities and discussions (if any).

  Display appropriate courtesy to all involved in the class.

- Provide constructive feedback to faculty members regarding their performance.

Plagiarism

Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination.

Writing Center (Room 509)

Students are encouraged to visit the Writing Center to schedule an appointment for additional help with essay writing.

LISTENING AE1

1. **General Information**
   - Course Title: Listening AE1 *(Tiếng Anh chuyên ngành 1: Kỹ năng nghe)*
   - Course Code: EN008IU
   - Semester: 1
   - Course Coordinator/Lecturer: Dept. of English
2. **Prerequisites**: TOEFL iBT $\geq$ 61
3. **Number of credits: 2 credits**
4. **Course description**

   The course is designed to prepare students for effective listening and note-taking skills, so that they can pursue the courses in their majors without considerable difficulty. The course is therefore lecture-based in that the teaching and learning procedure is built up on lectures on a variety of topics such as business, science, and humanities.

5. **Textbooks and Other Required Materials**

   Textbook:

   Lecture Ready 3 – Laurie Frazie, Shalle Leming, Oxford University Press, 2007

   Reference:

   Lecture Ready1, 2f;a – Laurie Frazie, Shalle Leming, Oxford University Press

6. **Course objectives/Course learning outcomes:** Upon completion of the course, students are able to:

No.	Course Objectives	Program Learning outcomes
1	Respond to academic lectures with appropriate strategies and confidence;	(i) A recognition of the need for, and an ability to engage in life-long learning
2	Improve their specialized knowledge of academic lectures;	
3	Communicate effectively with their classmates and professors.	

7. **Course outline**

WEEK	P.	Chapter	Listening oriented activities	Speaking oriented activities
WEEK 1	2	ORIENTATION		
WEEK 2	2	**Unit 1** **New Trends in Marketing Research**	Recognizing topic introducing and lecture plan presenting expressions Organizing ideas by outlining	Expressing ideas during a discussion
WEEK 3	2	**Unit 2** **Business Ethics**	Recognizing transition expressions Using symbols and abbreviations	Asking for clarification and elaboration during a discussion
WEEK 4	2	**Unit 3** **Trends in Children's Media Use**	Recognizing generalization and support expressions	Giving opinions and asking for opinions during a discussion
WEEK 5	2	WRAP-UP AND REVIEW		
WEEK 6	2	**Unit 4** **The Changing Music Industry**	Recognizing expressions for clarification or emphasis Organizing notes by using a split-page format	Expressing interest and asking for elaboration during a discussion
WEEK 7	2	**Unit 5** **The Placebo Effect**	Recognizing cause and effect expressions Noting causes and effects	Agreeing and disagreeing during a discussion
WEEK 8	2	WRAP-UP AND REVIEW		
MID-TERM EXAMINATION				

WEEK 9	2	**Unit 6** **Intelligent Machines**	Recognizing expressions used to predict causes and effects Using arrows to show the relationship between causes and effects	Learning to compromise and reach a consensus during a discussion
WEEK 10	2	**Unit 7** **Sibling Relationships**	Recognizing expressions of comparison and contrast Noting comparison and contrast	Expanding on ideas during a discussion
WEEK 11	2	**Unit 8** **Multiple Intelligences**	Recognizing non-verbal signals indicating important information Representing information in list form	Keeping the discussion on topic
WEEK 12	2	WRAP-UP AND REVIEW		
WEEK 13	2	**Unit 9** **The Art of Graffiti**	Recognizing expressions of definition Reviewing and practicing all note taking strategies	Indicating to other when preparing to speak or pausing to collect thoughts
WEEK 14	2	**Unit 10** **Design Basics**	Recognizing expressions of citations: paraphrases and quotations Reviewing and practicing all note taking strategies	Supporting ideas through paraphrasing and quoting others
WEEK 15	2	WRAP-UP AND REVIEW		
FINAL EXAMINATION				

8. Course Assessment Policy

No.	*Assessment Task*	*Scoring*	*Weighting*
1	Class participation (individual work, group work, presentations, etc)	Out of 100	20%
2	In-class ongoing assessment	Out of 100	40%
3	Final Exam	Out of 100	40%

Studying activity organization:

(a) Preparation activities: aim to activate students' current knowledge of the topic, and to provide them with lecture language and effective strategies in listening and note-taking to prepare themselves for the coming lecture. These activities include reading, discussing and reviewing what they have learned from the reading.

(b) While-and post-listening activities: are intended to enable students to put their newly activated knowledge and the acquired strategies into work by taking notes on the lecture, using the outline given by the teacher or prepared by themselves. They are later on asked to assess their understanding based on their notes and discuss them with their classmates. Finally, as an optional activity, depending on time and students' needs, students are asked to summarize the lecture.

(c) Follow-up activities: students are required to discuss the lecture topic and to prepare arguments for or against the topic in the debate. The purpose is to enhance students' comprehension of the lecture, and to allow them to put their acquired academic language into practice, and to experience the atmosphere of a university lecture class.

(d) Wrap-up and review week: After two or three weeks, there is a wrap-up and review week in which instructors and students will review the foci of the previous units and work on their residue.

9. Course general requirements

Attendance

Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

Missed Tests

Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may retake the examination.

Class Behaviors

Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE1 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below:

- Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.
- Participate fully and constructively in all course activities and discussions (if any).
- Display appropriate courtesy to all involved in the class.
- Provide constructive feedback to faculty members regarding their performance.

WRITING AE2

1. **General Information**

   - Course Title: Writing AE2 (Tiếng Anh chuyên ngành 2: Kỹ năng viết)
   - Course Code: EN011IU
   - Semester: 2
   - Course Coordinator/Lecturer: Dept. of English

2. **Prerequisites**: Writing AE1

3. **Number of credits: 2** credits

4. **Course description**

   This course introduces basic concepts in research paper writing, especially the role of generalizations, definitions, classifications, and the structure of a research paper to students who attend English- medium college or university. It also provides them with methods of developing and presenting an argument, a comparison or a contrast. Students are required to work on the tasks selected to maximize their exposure to written communication and are expected to become competent writers in the particular genre: the research paper.

   As writing is part of an integrated skill of reading and writing where reading serves as input to trigger writing, this course is designed to familiarize non-native students with academic literature in their major study by having them read and critically respond to texts of a variety of topics ranging from natural sciences such as biology to social sciences and humanities like education, linguistics and psychology.

5. **Textbooks and Other Required Materials**

   Textbook:

   Hamp-Lyons, L. and B. Heasley (2006). Study Writing. Cambridge, UK: Cambridge University Press.

   Reference:

   Keezer, S. (ed) (2003). *Write your research report. A real-time guide*. New Jersey: Pearson Learning Group.

   Articles and Essays taken from *The Allyn and Bacon Guide to Writing* by Ramage et al (2009), Pearson Longman.

6. **Course objectives/Course learning outcomes**

No.	Course Objectives	Program Learning outcomes

	To employ the research writing skills obtained to work on their own paper in their major study.	(i) A recognition of the need for, and an ability to engage in life-long learning

7. Course outline

WEEK	CONTENT—SUGGESTED TASKS (SMALL GROUPS)	ASSIGNMENT/ HOMEWORK
1	**Orientation of the Course** **Unit 1: The Academic Writing Process** **Introduction**	
2	**Unit 1: The Academic Writing Process (Cont.)** Thinking about writing processes Distinguishing between academic and personal styles of writing Grammar of academic discourse	HW: Task 10
3	**Unit 2: Researching and Writing** Recognizing categories and classification The language of classification The structure of a research paper	HW: Task 17
4	**Unit 3: Fundamentals & Feedback** Exploring comparison and contrast structures The language of comparison and contrast Using comparisons and contrasts to evaluate and recommend	HW: Task 12
5	**Unit 3: Fundamentals & Feedback (Cont.)** The research paper Identifying a research gap The writing process	**Assignment 1:** **Task 20**
6	**Unit 4: Definitions, Vocabulary & Clarity** The clarity principle The language of definition The place of definition The writing process	HW: Task 15
7	**Unit 5: Generalizations, Facts and Honesty** Honesty principle The language of generalization	HW: Task 13
MID-TERM EXAMINATION		

8	**Unit 5: Generalizations, Facts and Honesty (Cont.)** Writing a literature review The writing process	HW: Task 15
	Brainstorming and clustering	
9	**Unit 6: Seeing Ideas and Sharing Texts** Writing about events in time Connecting events Learning about peer reviews	HW: Tasks 12 & 13
10	**Unit 7: Description, Methods & Reality** Describing processes and products The language for writing about processes Writing the Methods section Giving and getting formal peer feedback	HW: Tasks 9 & 11
11	**Unit 8: Results, Discussion & Relevance** What is an argument? The language of argument The Results and Discussion sections Finding an academic voice	HW: Task 9
12	**Unit 9: The Whole Academic Text** S-P-S-E: Focus on structure S-P-S-E in the introduction The language of coherence and connection Teacher evaluation	HW: Task 9
13	**Unit 10: Creating the Whole Text** Structure of the research paper Creating your own research	**Assignment 2: Tasks 11 &12**
14	**Unit 10: Creating the Whole Text** Plagiarism Creating citations Paraphrase and summary Authorial identity	
15	**Course Review**	
FINAL EXAM		

8. Course Assessment Policy

Regular on-time attendance in these courses is expected. Students may miss only 4 classes without penalty. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

► Mid-term exam:	25%
► Assignments:	25%
► Final Exam:	50%
Total:	100%

9. Course general requirements

Attendance

Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

Missed Tests

Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may retake the examination.

Class Behaviors

Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE1 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below:

- Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.
- Participate fully and constructively in all course activities and discussions (if any).
- Display appropriate courtesy to all involved in the class.
- Provide constructive feedback to faculty members regarding their performance.

Plagiarism

Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination.

Writing Center (Room 509)

Students are encouraged to visit the Writing Center to schedule an appointment for additional help with essay writing.

SPEAKING AE2

1. **General Information**
   - Course Title: Speaking AE2 (Tiếng Anh chuyên ngành 2: Kỹ năng nói)
   - Course Code: EN012IU
   - Semester: 2
   - Course Coordinator/Lecturer: Dept. of English
2. **Prerequisites**: Placement into Speaking AE2 is by TOEFL iBT score (above 60)
3. **Number of credits: 2** credits
4. **Course description**

   Giving presentations today becomes a vital skill for students to succeed not only in university but also at work in the future. However, this may be seen as a nerve-racking task, especially when presented in a foreign language. Speaking AE2 provides the students with the knowledge and skills needed to deliver effective presentations. To do this, the course covers many aspects of giving a presentation: preparing and planning, using the appropriate language, applying effective visual aids, building up confidence, performing body language, dealing with questions and responding, etc.
5. **Textbooks and Other Required Materials**

   Textbook:

   Effective Presentations - Jeremy Comfort, Oxford University Press, 1997

   Reference:

   Study Speaking: a course in spoken English for academic purposes - By Kenneth Anderson, Joan Maclean, Tony Lynch - Cambridge University Press (2004)
6. **Course objectives/Course learning outcomes**

No.	Course Objectives	Program Learning outcomes
	To prepare and deliver effective, formal, structured presentations that are appropriate to the specific environment and audience.	(i) A recognition of the need for, and an ability to engage in life-long learning

7. **Course outline**

WEEK	MATERIAL COVERED	ACTIVITY

WEEK 1	ORIENTATION & INTRODUCTION	Students will receive an introduction to Effective Public Speaking. Students will select a topic for Mid-term examination.
WEEK 2	BUILDING UP CONFIDENCE	Student will give a short speech about themselves to help them overcome initial shyness of standing up and speaking in public
	EFFECTIVE PRESENTATIONS **Unit 1: What is the Point?** Pages 6-11 Video clip Handouts: - Pages 32-34 (Teacher's book) - Page 11 (Student book)	Students will watch and discuss a poor presentation and will practice giving presentations in groups of four. Time permitting selected students will present to the class.
	EFFECTIVE PRESENTATIONS **Unit 2: Making a Start** Pages 12-17 Video clip Handouts: - Page 35 (Teacher's book) - Page 17 (Student book)	Students will see and discuss a video of poor and good versions of an introduction, and will practice giving introductions to speeches in groups of four.
	EFFECTIVE PRESENTATIONS **Unit 3: Linking the Parts** Pages 18-23 Video clip Handouts: - Pages 36-37 (Teacher's book) - Page 22 (Student book)	Students will watch and discuss a video of poor and good versions of transitions, and practice giving short speeches in groups of six. Time permitting selected students will present to the class.

	EFFECTIVE PRESENTATIONS **Unit 7: Finishing Off** Pages 40-43 Video clip Handouts: - Pages 44-45(Teacher's book)	Students will watch and discuss a video showing good and poor closings and will practice giving endings to presentations in groups of three. Time permitting students will also practice their mid-term presentation in their groups
WEEK 7	PRACTICE PRESENTATIONS 1	Students will prepare and deliver a short presentation on one of the topics chosen by the instructor. Time permitting selected students will present to the class.
MIDTERM EXAMINATION Students will give a five to six minute informative presentation to be determined.		
	EFFECTIVE PRESENTATIONS **Unit 4: The Right Kind of Language** Pages 24-29 Video clip Handouts: - Pages 38-39(Teacher's book) - Pages 74-74 (Student book)	Students will watch and discuss a video of an individual reading a research report and giving a presentation, will discuss advantages and disadvantages of reading a speech, and will learn how to analyze text to determine complexity level. Time permitting students will work change text to more natural form (Teacher book 38,39
WEEK 9	EFFECTIVE PRESENTATIONS **Unit 5: Visual Aids** Pages 30-35 Video clip Handouts: - Pages 40-42 (Teacher's book) - Page 35 (Student book)	Students will view and discuss a video showing use of good and poor visual aids, and practice giving presentations using visual aids in groups of four. Time permitting selected students will present to the class.

WEEK 10	REPORTING CHANGE	Students will practice using the vocabulary to describe reporting changes in organizations (profit, sales, revenue, cost) and explaining why these changes occurred. Students will practice giving presentations in groups of eight. Time permitting selected students will present to the class.
WEEK 11	EFFECTIVE PRESENTATIONS **Unit 6: Body Language** Pages 36-39 Video clip Handouts: - Page 43(Teacher's book)	Students will view and discuss a video showing use of good and poor body language, and practice giving presentations in groups of four. Time permitting selected students will present to the class.
WEEK 12	EFFECTIVE PRESENTATIONS **Unit 8: Questions Time** Pages 44-49 Video clip Handouts: - Pages 46-48(Teacher's book) - Page 49 (Student book)	Students will view and discuss a video showing use of appropriate and inappropriate answering of questions, and practice giving answering questions in groups of three. Time permitting selected students will present to the class.
WEEK 13	EFFECTIVE PRESENTATIONS **Unit 9: Finishing Up** Pages 44-49 Video clip Unit 1 & Unit 9	Students will view and discuss a video showing use of good and bad presentations, and then practice giving their final presentations in their groups
WEEK 14	EXTRA SPEAKING ACTIVITIES	Example: Public debating lecture & students will debate in groups.
WEEK 15	PRACTICE PRESENTATIONS 2	Students will practice their presentation in class and be evaluated by peers

FINAL EXAMINATION
Students will deliver a seven to eight minute persuasive presentation on a topic to be determined

8. Course Assessment Policy

Regular on-time attendance in these courses is expected. Students may miss only 4 classes without penalty. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

Assessment Summary

No.	*Assessment Task*	*Scoring*	*Weighting*
1	Extra Speaking Activities (debate, discussion, group presentation, etc.)	Out of 100	30%
3	Mid-term Exam (Students will give a five to six minute informative presentation to be determined.)	Out of 100	30%
4	Final Exam (Students will deliver a seven to eight minute persuasive presentation on a topic to be determined.)	Out of 100	40%

9. Course general requirements

Attendance

Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.

Missed Tests

Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may retake the examination.

Class Behaviors

Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Speaking AE2 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below:

- Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.
- Participate fully and constructively in all course activities and discussions (if any).
- Display appropriate courtesy to all involved in the class.

Provide constructive feedback to faculty members regarding their performance.

Plagiarism

- Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination.

SCIENTIFIC WRITING

Instructor: Dr. Dao Vu Truong Son

1. **Name of course**: SCIENTIFIC WRITING
2. **Course code:** IS079IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☒ Requirement
   - ☐ Elective
4. **Number of credits:** 2 credits
   - Theory: 3 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: It aims to improve students' academic and scientific writing in English, and helps them successfully complete course reports, thesis, dissertations, and articles for publication as well as doing a proper presentation, etc. Upon completion of the course, we hope our students become more effective, more efficient, and more confident writers.
8. **Course objectives:** The course provides students with different concepts and requirements regarding scientific writing fields. After the course, students will be able to effectively write different components of a scientific paper, technical writing report, and students will be able to effectively communicate in both professional and academic settings.
9. **Textbooks and references:**

   Textbooks:

   - L.A. Krishnan, Engineering your report – from start to finish (Prentice Hall, 2003).

   References: William Strunk, The elements of style (Pearson, 2010).
10. **Course Learning Outcomes**

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Understand the fundamentals and concepts related to scientific paper, technical report writing, etc.	(i) a recognition of the need for, and an ability to engage in life-long learning

	2. Understand and apply knowledge to iterative writing different components of a scientific paper or technical report writing such as abstract, literature review, describing methods, materials and process, findings and results, and finally the conclusion.	
Skill	3. Develop poster and oral presentation skills in professional and academic settings	
Attitude	6. To develop a life-long learning attitude.	

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topic
1	**Introduction to scientific paper, technical report writing** - What makes good writing? - Principles of effective writing
2	**Introducing your work** - Role of introduction - How to organize the introduction section - How to write suitable background to the study, suitable objective statement, expand the objectives and state the scope of work
3	**Literature review** - Guidelines on how to gather and collate information - What is plagiarism? How to avoid unintentional plagiarism and write the literature review successfully - How to use software for reference management

4	**Describing your method** - What are primary sources of data? - How different methods can be used for the collection of data from primary sources. - Precise methodology to allow other researchers to replicate the research as well as to establish the validity of the research
5	**Describing materials and processes** - Detailed description of equipment of your experiment (materials) and process involved in the operation of this equipment (process).
6	**Presenting your findings visually** - What are general formats for tables, figures, drawings, etc. - Guidelines for selecting, preparing and presenting illustrations effectively
7	Review
8	**Presenting your results** - How to report your findings. - Discuss your findings with respect to previous works.
9	**Writing your abstract** - Provide a preview of the report, it presents the most salient information from the different sections of a report.
10	**Writing your conclusion** - State whether or not the objective of the study has been met. - What can be improved in the future?
11	**Poster presentations** - Organization and formats for posters - Using Microsoft Powerpoint
12	**Oral presentation** - Designing and preparing slides for an oral presentation - Importing tables, charts and graphs from Excel - Visual aids design
13	**Review**

13. Course Assessment

13.1. Grading

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	Homeworks Group Project	Identify and discuss a topic in IE. Provide literature review. Find possible ways to collect and analyze data.		x	x		x	x						x	30
2	**- Midterm exam**	Understand the steps of classes of scientific writing principles and practices by getting more than 50% points of the test.	x			x	x		x						30
3	**- Final exam**	Understand the steps of classes of scientific writing principles and practices by getting more than 50% points of the test.	x	x		x	x		x	x			x		40
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

CALCULUS 1

Instructor: Dept. of Mathematics

1. **General Information**

   - Course Title: Calculus 1 *(Giải tích 1)*
   - Course Code: MA001IU
   - Semester: 1
   - Course Coordinator/Lecturer: Dept. of Mathematics

2. **Prerequisites**: None

3. **Number of credits: 4** credits

4. **Course description**

   Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of Basic Elementary Functions, Differentiation Rules; Applications of Differentiation: l'Hôpital's Rule, Optimization, Newton's Method; Anti-derivatives; Indefinite Integrals, Definite Integrals, Fundamental Theorem of Calculus; Techniques of Integration; Improper Integrals; Applications of Integration.

   Number of Credits: 4 *(Lecture: 3 ; Assignment:1 ; Lab: 0)*

   Lectures: 60 hours

   Assignments & Presentations: Yes

5. **Textbooks and Other Required Materials**

   J. Stewart, *Calculus. Concepts and Contexts*, 5th ed., Thomson Learning, 2005.

   Other textbook:

   J. Rogawski, *Calculus, Early Transcendentals*, W.H. Freeman, 2008.

6. **Course objectives/Course learning outcomes**

No.	Course Objectives	Program Learning outcomes
1	◆To provide the main ideas and techniques of calculus, concerning limits, continuity, differentiation and integration.	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and
2	◆ To provide an understanding of the practical meaning, significance and applications of these ideas and techniques,	

	through practical examples taken from many areas of engineering, business and life science.	interpret data (e) an ability to identify, formulate, model and simulate and solve industrial and systems problems (i) a recognition of the need for, and an ability to engage in life-long learning
3	◆ To develop skills in mathematical modeling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations	
4	◆To develop confidence and fluency in discussing mathematics in English.	

7. Course Outline

Class	**Content**	**Activities**
1	1.1 What is Calculus? 1.2 Straight Lines. Equations of Lines 1.3 Functions and Graphs 1.4 New Functions from Old Functions. Inverse Functions	Lecture
2	1.5 Parametric Curves 1.6 Definition of a Limit. One-sided Limits 1.7 Laws of Limits. Evaluating Limits. The Squeeze Theorem	Lecture/Homework
3	1.8 Continuity 1.9 The Intermediate Value Theorem 1.10 Limits Involving Infinity	Lectures/Homework
4	2.1 The Tangent and Velocity Problems. Rates of Change 2.2 The Derivative. Higher-Order Derivatives 2.3 Rules of Differentiation. Finding Derivatives using Maple	Lecture/Homework
5	2.4 Rates of Change in the Natural and Social Sciences 2.5 Implicit Differentiation	Lecture/Quiz
6	2.6 Differentiation of Inverse Functions 2.7 Linear Approximations. Differentials	Lecture/Homework
7	3.1 Related Rates 3.2 Maxima and Minima. Critical Points	Lecture/Quiz

	3.3 The Mean Value Theorem. The First Derivative Test. Concavity. Shapes of Curves.	
Midterm Exam		
8	3.4 Curve Sketching. Graphing with Calculus and Computers using Maple 3.5 Indeterminate Forms and l'Hôpital's Rules Maxima and Minima Problems	Lecture/Homework
9	3.1 Newton's Method Antiderivatives and Indefinite Integrals	Lecture/Homework
10	4.1 Areas under Curves and Distances 4.2 The Definite Integral 4.3 Properties of the Definite Integral. 4.4 The Fundamental Theorem of Calculus	Lecture/Homework
11	4.5 Integration by Substitution 4.6 Integration by Parts 4.7 Additional Techniques of Integration. Partial Fractions	Lecture/Homework
12	4.8 Integration Using Bångs and Computer Algebra Systems 4.9 Numerical Integration 4.10 Improper Integrals	Lecture
13	5.1 Areas between Curves 5.2 Areas Enclosed by Parametric Curves 5.3 Volumes	
14	5.4 Arc Length 5.5 Average Value of a Function	Lecture/Homework
15	5.6 Applications to Engineering, Economics and Science	Lecture/Homework
Final Examination		

8. Course Assessment Policy

- ► Mid-term exam: 30%
- ► Assignments: 30%
- ► Final Exam: 40%

Total: 100%

9. Course general requirements

Students are expected to spend at least **8 hours** per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.

CALCULUS 2

Instructor: Dept. of Mathematics

1. **General Information**

   - Course Title: Calculus 2 *(Giải tích 2)*
   - Course Code: MA003IU
   - Semester: 2
   - Course Coordinator/Lecturer: Dept. of Mathematics

2. **Prerequisites**: None

3. **Number of credits: 4** credits

4. **Course description**

   Sequence and Series; Convergence Tests; Power Series; Taylor and Maclaurin Series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Parametric Surfaces; Functions of Several Variables; Limits, Continuity, Partial Derivatives, Tangent Planes; Gradient Vectors; Extrema; Lagrange Multipliers; Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration; Vector Fields, Line Integrals, Surface Integrals.

   Number of

   Credits: 4

   Lectures: 60

   hours

   Assignments & Presentations: Yes

5. **Textbooks and Other Required Materials**

   Main documents:

   1. J. Rogawski, *Calculus, Early Transcendentals*, W. H. Freeman, 2008.

   2. J. Stewart, *Calculus. Concepts and Contexts*,Thomson Learning, 5fth edition,

   2005. References:

   1. R. Adams, Calculus. A Complete Course, Addison-Wesley, 1991.

   2. R.N. Greenwell, N.P. Ritchey, and M.L. Lial, Calculus with Applications

      for the Life Science, Addition Wesley, 2002.

   3. M.L. Lial, R.N. Greenwell, and A.D. Miller, Calculus with

   Applications, Addition Wesley, 1998.

6. Course objectives/Course learning outcomes

No.	Course Objectives	Program Learning outcomes
	To provide the main notions and techniques of calculus of functions of several variables concerning limits, continuity, differentiation and integration; basic skills of computing the sum of series. Many applications explain how to use these notions and techniques in practical situations.	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (e) an ability to identify, formulate, model and simulate and solve industrial and systems problems (i) a recognition of the need for, and an ability to engage in life-long learning

7. Course Outline

Class	Content	Activities
1	1.1 Sequences 1.2 Series 1.3 The Integral and Comparison Tests; Estimating Sums	Lecture
2	1.4 Other Convergence Tests 1.5 Power Series 1.6 Representations of Functions as Power Series	Lecture/Homework
3	1.7 Taylor & Maclaurin Series 1.8 Applications of Taylor Polynomials	Lectures/Homework
4	2.1 Euclidean n-Space and Cartesian Coordinates 2.2 Vectors in 3-Spaces 2.3 The Dot Product and Applications 2.4 The Cross Product and Applications	Lecture/Homework
5	2.5 Lines, Planes, and Surfaces 2.6 Cylindrical & Spherical Coordinate Systems	Lecture/Quiz

Class	Content	Activities
6	2.7 Vector Functions and Space Curves 2.8 Parametric Surfaces	Lecture/Homework
7	3.1 Functions of Several Variables 3.2 Limits and Continuity	Lecture/Quiz
Midterm Exam		
8	3.3 Partial Derivatives 3.4 Tangent Planes and Linear Approximations 3.5 The Chain Rule	Lecture/Homework
9	3.6 Directional Derivatives and Gradient Vectors 3.7 Maximum and Minimum Values 3.8 Lagrange Multipliers	Lecture/Homework
10	4.1 Double Integrals over Rectangular Regions 4.2 Iterated Integrals 4.3 Double Integrals over General Regions	Lecture/Homework
11	4.4 Double Integrals in Polar Coordinates 4.5 Applications of Double Integrals 4.6 Surface Area	Lecture/Homework
12	4.7 Triple Integrals 4.8 Triple Integrals in Cylindrical and Spherical Coordinates	Lecture
13	5.1 Vector Fields 5.2 Line Integrals 5.3 The Fundamental Theorem of Line Integrals	
14	5.4 Green's Theorem 5.5 Curl and Divergence	Lecture/Homework
15	5.6 Surface Integrals 5.7 Stokes' Theorem and Divergence Theorem	Lecture/Homework
Final Examination		

8. Course Assessment Policy

► Mid-term exam:	20%
► Assignments:	20%
► Final Exam:	60%
Total:	100%

9. Course general requirements

Students are expected to spend at least **8 hours** per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.

PHYSICS 1

Course Coordinator/Lecturer: Dept. of Physics

1. **General Information**

   - Course Title: PHYSICS 1 *(Vật lý 1)*
   - Course Code: PH013IU
   - Semester: 1
   - Course Coordinator/Lecturer: Dept. of Physics

2. **Number of credits: 2** credits

3. **Prerequisites**: None

4. **Course description**

   Survey kinetics, dynamics, energetics of motion of the solid substance and point. Survey fluid dynamics and characteristics of an ideal gas, and the principles of thermodynamics.
   Number of Credits: 2
   Lectures: 30 hours
   Assignments & Presentations: Yes

5. **Textbooks and Other Required Materials**

   Halliday D., Resnick R. and Merrill, J. (1988). Fundamentals of Physics.Extended third edition.John Willey and Sons, Inc.

   Alonso M. and Finn E.J. (1992).Physics. Addison-Wesley Publishing

   Company Hecht, E. (2000). Physics.Calculus.Second Edition.Brooks/Cole.

   Faughn/Serway (2006). Serway's College Physics. Thomson Brooks/Cole.

6. **Course objectives/Course learning outcomes**

No.	Course Objectives	Program Learning outcomes
1	● Know and understand basic physical processes and phenomena.	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (e) an ability to identify, formulate, model and simulate and solve industrial and systems problems
2	● Solve basic physics problems by applying both theoretical and experimental techniques.	
3	● Understand and acquire skills	

No.	Course Objectives	Program Learning outcomes
	Needed to use physical laws governing real processes and to solve them in the engineering environment.	(i) a recognition of the need for, and an ability to engage in life-long learning

7. Course Outline

Class	Topic	Activities
1	**Bases of Kinematics** **● Motion in One Dimension** Position, Velocity, and Acceleration One-Dimensional Motion with Constant Acceleration Freely Falling Objects	**Read Chapter 1 - Lecture**
2	**● Motion in Two Dimensions** The Position, Velocity, and Acceleration Vectors Two-Dimensional Motion with Constant Acceleration. Projectile Motion Circular Motion. Tangential and Radial Acceleration Relative Velocity and Relative Acceleration	**Chapter 1 – Lecture/Homework**
3	**The Law of Motion** Newton's First Law and Inertial Frames Newton's Second Law Newton's Third Law	**Read Chapter 2**
4	**The Law of Motion** Some Applications of Newton's Laws The Gravitational Force and Weight Forces of Friction Uniform Circular Motion and Nonuniform Circular Motion Motion in the Presence of Resistive Forces Motion in Accelerated Frames	**Chapter 2 – Lecture/Quiz**

Class	Topic	Activities
5	**Work and Mechanical Energy** Work Done by Force. Power Kinetic Energy and Work. Kinetic Energy Theorem	**Read Chapter 3**
6	**Work and Mechanical Energy** Potential Energy of a System Conservation of Mechanical Energy Conservative and Non-conservative Forces	**Chapter 3 – Lecture/Homework**
7	**Work and Mechanical Energy** Changes in Mechanical Energy for Non-conservative Forces Relationship Between Conservative Forces and Potential Energy	**Chapter 3-Lecture/Quiz**
Midterm Exam		
8	**Linear Momentum and Collisions** Linear Momentum and Its Conservation Impulse and Momentum Collisions in One Dimension and Two-Dimensional Collisions	**Read Chapter 4**
9	**Linear Momentum and Collisions** The Center of Mass. Motion of a System of Particles Rocket Propulsion	**Chapter 4 – Lecture**
10	**Rotation of a Rigid Object About a Fixed Axis** Rotational Kinematics: Rotational Motion with Constant Angular Acceleration Torque and Angular Acceleration Moments of Inertia	**Read Chapter 5**
11	**Rotation of a Rigid Object About a Fixed Axis** Rotational Kinetic Energy Rolling Motion of a Rigid Object Angular Momentum of a Rotating Rigid Object Conservation of Angular Momentum	**Chapter 5 – Lecture/Homework**
12	**Static Equilibrium** The Conditions for Equilibrium	**Read Chapter 6**

Class	Topic	Activities
13	**Static Equilibrium** The Center of Gravity	**Chapter 6 Lecture/Quiz**
14	**Universal Gravitation** Newton's Law of Universal Gravitation Kepler's Laws and the Motion of Planets	**Chapter 7 – Lecture**
15	**Universal Gravitation** The Gravitational Field and Gravitational Potential Energy	**Chapter 7 – Lecture/Homework**
Final Exam		

8. Course Assessment Policy

► Mid-term exam:	30%
► Assignments:	30%
► Final Exam:	40%
Total:	100%

9. Course general requirements

Students are expected to spend at least **8 hours** per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.

PHYSICS 2

Course Coordinator/Lecturer: Dept. of Physics

1. **Name of course**: PHYSICS 2 (FLUID MECHANICS AND THERMAL PHYSICS)
2. **Course code:** PH014IU
3. **Course type:**

   General ☒

   Requirement ☐

   Course ☐

   Elective Course ☐
4. **Number of credits:** 2 credits
   - Theory: 2 credits
   - Practice: 0 credit
5. **Prerequisite:** No
6. **Parallel teaching in the course:** No
7. **Course Description:**

This course provides students with basic knowledge of fluid mechanics; macroscopic description of gasses; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gasses and the kinetic theory of gasses.

8. **Course objectives/Course learning outcomes:**

No.	Course Objectives	Program Learning outcomes
1	Construct the basic knowledge of Fluid Mechanics and Thermal Physics	(a) An ability to apply knowledge of mathematics, science, and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret (e) An ability to identify, formulate, model and simulate and solve engineering (i) a recognition of the need for, and an ability to engage in life-long learning
2	Solve problems in engineering environment by applying both theoretical and experimental techniques	

3	Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment	
4	Develop confidence and fluency in discussing Physics in English.	

9. Textbooks and references:

Textbooks :

- Halliday D., Resnick R. and Walker, J. (2011) *Fundamentals of Physics*, 9th edition, John Willey and Sons, Inc.

References:

- Alonso M. and Finn E.J. (1992) *Physics*, Addison-Wesley Publishing Company.
- Hecht, E. (2000) *Physics: Calculus,* 2nd edition, Brooks/Cole.
- Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

10. Course implementation

Time: 15 Weeks; 2 Periods per week

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Assignment

11. Course outline

Week	Topics	Chapter
1	- Variation of Pressure with Depth	**Chapter 1: Fluid Mechanics**
2	- Fluid Dynamics - Bernoulli's Equation	
3	- Temperature and the Zeroth Law of Thermodynamics - Ideal Gas	**Chapter 2: Macroscopic Description of An Ideal Gas**
4	- Experimental Laws of an Ideal Gas	
5	- Equation of State for an Ideal Gas	
6	- Thermal Expansion of Solids and Liquids. - Heat and Internal Energy	**Chapter 3: Heat and The First Law of Thermodynamics**
7	- Heat Capacity and Specific Heat. Phase	

	Change. Latent Heat - Heat Transfer : Convection, Conduction, and Radiation	
8	- Work and Heat in Thermodynamic Processes - The First Law of Thermodynamics. Some Applications.	
9	- Reversible and Irreversible Processes	**Chapter 4: Heat Engines and the Second Law of Thermodynamics**
10	- The Carnot Engine	
11	- Entropy. Entropy Changes in Irreversible Processes	
12	- Molecular Model of an Ideal Gas - Molar Specific Heat of an Ideal Gas	**Chapter 5: The Kinetic Theory of Gasses**
13	- Adiabatic Processes for an Ideal Gas - The Equipartition of Energy	
14	- The Boltzmann Distribution Law - Distribution of Molecular Speeds	
15	- Mean Free Path - Entropy on a Microscopic Scale	

12. Course Assessment:

Grading:

- Assignment: 20%
- Midterm Test: 20%
- Final Exam: 60%

13. Policies:

- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

PHYSICS 3

Course Coordinator/Lecturer: Dept. of Physics

1. **Name of course**: PHYSICS 3 (ELECTRICITY AND MAGNETISM)
2. **Course code:** PH015IU
3. **Course type:**

   General ☒

   Requirement

   Course

   Elective Course
4. **Number of credits:** 3 credits
   - Theory: 3 credits
   - Practice: 0 credit
5. **Prerequisite:** Basic Mathematical Analytics, Physics 1, High school Physics
6. **Parallel teaching in the course:** No
7. **Course Description:**

This course provides students with basic knowledge of electricity and magnetism.

8. **Course objectives/Course learning outcomes:**

No.	Course Objectives	Program Learning outcomes
1	Construct the basic knowledge of electricity and magnetism such as electric charge, electric potential, magnetic fields, electromagnetic waves,…	a) An ability to apply knowledge of mathematics, science, and engineering
2	Solve problems in engineering environment by applying both theoretical and experimental techniques	(b) an ability to design and conduct experiments, as well as to analyze and interpret
3	Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment	(e) An ability to identify, formulate, model and simulate and solve engineering
4	Develop confidence and fluency in discussing physics in English.	(i) a recognition of the need for, and an ability to engage in life-long learning

9. Textbooks and references:

- Halliday D., Resnick R. and Walker, J. (2011) *Fundamentals of Physics*, 9th edition, John Willey and Sons, Inc.
- Alonso M. and Finn E.J. (1992) *Physics*, Addison-Wesley Publishing Company.
- Hecht, E. (2000) *Physics: Calculus*, 2nd edition, Brooks/Cole.
- Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

10. Course implementation

Time: 45 Weeks; 2 Periods per week

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Assignment

11. Course outline

Week	Topics	Chapter
1	- Properties of Electric Charges - Conductors and Insulators - Coulomb's Law	**Chapter 1: Electric Fields**
2	- The Electric Field. Electric Field Lines - Electric Field of a Continuous Charge Distribution - Electric Flux. Gauss' Law	
3	- Conductors in Electrostatic Equilibrium - Motion of Charged Particles in a Uniform Electric Field	
4	- Potential Difference and Electric Potential - Potential Difference in a Uniform Electric Field - Electric Potential and Potential Energy Due to Point Charges - Electric Potential Due to Continuous Charge Distributions	**Chapter 2: Electric Energy and Capacitance**
5	- Electric Potential of a Charged Isolated Conductor - Capacitance. Combinations of Capacitors	

	- Energy Stored in a Charged Capacitor - Capacitors with Dielectrics	
6	- Electric Current - Resistance and Ohm's Law - A Model for Electrical Conduction	**Chapter 3 Current and Resistance. Direct Current Circuits**
7	- Resistance and Temperature - Superconductors - Electrical Energy and Power	
8	- Electromotive Force - Resistors in Series and in Parallel - Kirchhoff's Rules - *RC* Circuits	
9	- The Magnetic Field - Magnetic Force Acting on a Current-Carrying Conductor - Torque on a Current Loop in a Uniform Magnetic Field - Motion of a Charged Particle in a Uniform Magnetic Field - The Hall Effect - The Biot–Savart Law - Ampère's Law	**Chapter 4: Magnetism**
10	- The Magnetic Field of a Solenoid - Magnetic Flux. Gauss's Law in Magnetism - Displacement Current and the General Form of Ampère's Law - Magnetism in Matter - The Magnetic Field of the Earth - Motional emf - Lenz's Law	
11	- Faraday's Law of Induction - Induced emf and Electric Fields - Self-Inductance	**Chapter 5: Electromagnetic Induction**
12	- *RL* Circuits - Energy in a Magnetic Field - Mutual Inductance	
13	- AC Sources and Phasors	**Chapter 6: Alternating-**

	- Resistors in an AC Circuit - Inductors in an AC Circuit - Capacitors in an AC Circuit	**Current Circuits**
14	- The *RLC* Series Circuit - Power in an ac Circuit - Resonance in a Series RLC Circuit - The Transformer and Power Transmission	
15	- Maxwell's Equations and Hertz's Discoveries - Plane Electromagnetic Waves - Energy Carried by Electromagnetic Waves - Momentum and Radiation Pressure - Production of Electromagnetic Waves by an Antenna - The Spectrum of Electromagnetic Waves	**Chapter 7: Electromagnetic Waves**

12. Course Assessment:

Grading:

- Assignment: 20%
- Midterm Test: 20%
- Final Exam: 60%

13. Policies:

Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.

Student responsibility: Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.

Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

APPLIED LINEAR ALGEBRA

Course Code: **No. of Credits: 2**

Instructor: ***Prof. D.Sc. Phan Quoc Khanh, Dr. Mai Duc Thanh***

A. COURSE OVERVIEW:

1. **Course Objective**: The course provides the student with basic knowledge in linear algebra with applications, in particular the skill of solving linear systems of equations using Gauss elimination method.
2. **Prerequisite**: None
3. **Major Contents:** Systems of linear equations, Matrices in echelon form, Gauss elimination method, Algebra of matrices, Determinants and their properties, Vector Spaces, Linear independence, Basis, Rank of a matrix, Linear transformation, Inner product spaces, Eigenvalues and Eigenvectors.
4. **Assessment**

   Assignment and Class Attendance: 20%

   Midterm Test: 20%

   Final Exam: 60%

5. **Textbook**

1. R.O. Hill, Elementary linear algebra with applications, 3rd edition, Thomson, 2006.
2. E. Kreyszig, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons, 2006.

B. A DETAILED OUTLINE:

Name of Chapter	Descriptions
Chapter 1. Introduction to linear equations and matrices	1.1. Introduction to linear systems and matrices 1.2. Gauss elimination 1.3. The algebra of matrices 1.4. Inverse matrices 1.5. Transpose and symmetric matrices
Chapter 2. Determinants	2.1 The Determinant of a Matrix 2.2 Evaluation of a Determinant using Elementary Operations 2.3 Properties of Determinants 2.4 Cramer's Rule

Chapter 3. Vector spaces	3.1 Euclidean n-spaces 3.2 General vector spaces 3.3 Subspaces, span, null spaces 3.4 Linear independence 3.5 Basis and Dimension 3.6 Rank of a matrix
Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors	4.1 Linear transformation 4.2 Inner product spaces 4.3 Eigenvalues and eigenvectors 4.4 Diagonalization

CHEMISTRY FOR ENGINEERS

Instructor: School of Biotechnology

1. General Information

- Course Title: CHEMISTRY FOR ENGINEERS *(Hóa học cho kỹ sư)*
- Course Code: CH011IU
- Semester: 1
- Course Coordinator/Lecturer: Dept. of Chemistry

2. Number of credits: 3 credits

3. Prerequisites: None

4. Course description

This course is designed for non-chemistry majors, as it is intended for students pursuing a degree in information technology, electronic and telecommunication. The course is designed to provide a strong background in the fundamentals of chemistry, preparing students for further study in their major field. Topics include important principles, theories, concepts of chemistry, and chemical calculations necessary for a comprehension of the structure of matter, the chemical actions of the common elements and compounds.. The impact of chemistry on everyday life and on the environment is also introduced wherever possible.

Number of Credits: 3 + 1

Lectures: 45 hours

Assignments & Presentations: Yes

5. Textbooks and Other Required Materials

- ✓ Petrucci, RH, WS Harwood, FG Herring, & Madura. General chemistry: Principles and Modern Applications. 9th ed. Upper Saddle River, NJ: Prentice Hall, 2007.
- ✓ Masterton and Hurley. Chemistry, Principles and Reactions. Saunders College Publishing, 2007.
- ✓ D.W. Oxtoby, W.A. Freeman, and T.F. Block, Chemistry : Science of Change, Saunders College Publishing, 2003.
- ✓ Steven S. Zumdahl, Chemical Principles, 5th Ed., Houghton Mifflin Company, 2005.
- ✓ World Wide Web access

6. Course objectives/Course learning outcomes

No.	Course Objectives	Program Learning outcomes
1	▪ be able to demonstrate basic knowledge of the role of chemistry for engineers	a) An ability to apply knowledge of

No.	Course Objectives	Program Learning outcomes
2	▪ To provide a thorough introduction to the basic principles of physics to physics and engineering students in order to prepare for further study in physics and to support understanding and design of practical applications in the fields such as Nature of chemistry; Matter and state of matter; Structure of atoms, molecules and ions; Chemical bonds and types of compounds; Name chemical compounds; Stoichiometric calculations; Measurements in chemistry…	mathematics, science, and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret (e) An ability to identify, formulate, model and simulate and solve engineering (i) a recognition of the need for, and an ability to engage in life-long learning

7. Course Outline

Class	Content	Activities
1	**Chapter 1: INTRODUCTION TO GENERAL CHEMISTRY FOR ENGINEERS** - The role of general chemistry for engineers - Chapter outline	Lecture
	Chapter 2: INTRODUCTION TO MATTER - Matter and state of matter (gas, liquid, solid and plasma) -General concepts of mass and energy -Matter and change: chemical change and physical change -Classification of matter: element, compound and mixture (homogeneous and heterogeneous)	
2	Chapter 3: ATOMS, MOLECULES AND IONS - Atoms and their structure, model of an tom - Nucleus of an atom - Electron cloud of an atom - Chemical symbols	Lectures/Homework

Class	Content	Activities
	- Isotopes - Rules about electrons - Molecular compounds - Communicating molecular structure - Ions and ionic compounds - Monatomic ions and polyatomic ions - Hydrates - Chemical nomenclature	
3	**Chapter 4: CHEMICAL BONDS** - The concepts of chemical bonds - Classification of chemical bonds - Ionic bonds - Covalent bonds - Metallic bonds - Valence electrons - Bond and lone pairs - Molecular geometry, the VSEPR model and structure determination by VSEPR - Bond polarity - Polar and nonpolar molecules - Electronegativity and chemical bonds - Bond lengths and bond strengths	Lecture/Homework
4	**Chapter 5: MEASUREMENTS IN CHEMISTRY** -Physical quantities: number and unit - Measurement and significant figures - Scientific notation - Measuring mass - Measuring length and volume - Density - Measuring temperature - Rounding off numbers - Converting a quantity from one unit to another	Lecture/Quiz
5	**Chapter 6: PERIODICITY** - Classification of the elements - General periodic trends	Lecture/Homework

Class	Content	Activities
	- Atomic size and trends in atomic size - Ionization energy - The first ionization energy with atomic number - Electron affinity - Electronegativity	
6	**Chapter 7: CHEMICAL REACTIONS** - Chemical change - Chemical equation - Types of reactions	Lecture/Quiz
7	**Chapter 8: CHEMICAL EQUILIBRIUM** - The concepts of chemical equilibrium - Equilibrium constant - Equilibrium expression - Homogeneous equilibrium - Heterogeneous equilibrium - Le Chatelier's Principles - Applications of chemical equilibrium	
Midterm Exam		
8	**Chapter 9: ELECTROLYTES, ACID- BASE, pH, AND BUFFER SOLUTIONS** - Strong and weak electrolytes - Acid-base theories: Arrhenius, Bronsted-Lowry and Lewis theories - Conjugate pairs - Conjugate acid-base strength - Ionization of water, ion-product constant Kw for water - pH - the role of pH in everyday life - Equilibrium constants for weak acids - Equilibrium constants for weak bases - Calculating pH from Ka - Buffer, calculating pH of a buffer - Henderson-Hasselbalch equation - Buffer capacity	Lecture/Homework

Class	Content	Activities
	- buffer applications	
9	**Chapter 10: THERMOCHEMISTRY AND THERMODYNAMICS** - System and surrounding - Energy and work - Internal energy: kinetic and potential energy - Energy and temperature - Heat and heat transfer mechanism - Conservation of energy - Heat of reaction and calorimetry - State of a system and state functions - The first law of thermodynamics - Enthalpy and enthalpy change - Enthalpy of reaction - Hess's law - Enthalpy of formation - Standard enthalpy - Enthalpy from bond energy - Enthalpy of solution - Entropy and the second law of thermodynamics - The third law of thermodynamics - Standard entropy - Gibbs free energy	Lecture/Homework
10	**Chapter 11: CHEMICAL KINETICS** - Rates of chemical reactions - Factors that affect the reaction rates - Rate laws - First order reaction - Second order reaction - Third order reaction - Zero order reaction	Lecture/Homework
11	**Chapter 12: GASSED AND THEIR BEHAVIORS** - The concepts of gas and vapor - Properties of gasses - Gas pressure	Lecture/Homework

Class	Content	Activities
	- Boyle's law - Charles's law - Gay-Lussac's law - The combined gas law - Avogadro's law - Ideal gas law - Partial pressure (Dalton's law) - Effusion (Graham's law)	
12	**Chapter 13: SOLUTIONS AND THEIR PROPERTIES** - The concepts of solutions - Classification of solutions - The nature of solute in solutions - Energy changes and the solution process - Units of concentration - Factors affecting solubility - Henry's law - Physical behavior of solutions: colligative properties - Raoult's law - Osmosis and osmotic pressure	Lecture
13	**Chapter 14: ELECTROCHEMISTRY** - The concepts of electrochemistry - Oxidation number - Balancing redox equations - Galvanic cell - Standard reduction potentials - Nernst equation - Batteries - Corrosion - Rusting of iron - Electrolysis	
14	**Chapter 15: INTERMOLECULAR FORCES** - The concepts of intermolecular forces - Dipole-dipole forces	Lecture/Homework

Class	Content	Activities
	- Hydrogen bonding - Ion-dipole forces - Induced dipole forces - Ion-induced dipole forces - Dipole-induced dipole forces - Induced dipole- induced dipole forces - Intermolecular forces and physical properties - Solid and types of solid - Crystal structure and the unit cell - Unit cells and coordination number - Metals and alloys - Conductor, semiconductor and Insulator	
15	**Chapter 16: NUCLEAR CHEMISTRY** - The concepts of radioactivity - Types of nuclear reactions - Types of radiation - Energy of nuclear reactions - Fission and fusion - Effect of radiation on matter - Detecting radiation - Radiation exposure and contamination - Rate of nuclear reactions - Radiocarbon dating - Radiation units	Lecture/Homework
Final Examination		

8. Course Assessment Policy

► Mid-term exam:	30%
► Assignments:	30%
► Final Exam:	40%
Total:	100%

9. Course general requirements

Students are expected to spend at least **8 hours** per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.

INTRODUCTION TO INDUSTRIAL SYSTEM AND ENGINEERING

Instructor: Dr Nguyen Van Hop

1. **Name of course**: INTRODUCTION TO INDUSTRIAL SYSTEM AND ENGINEERING
2. **Course code:** IS056IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits (45 periods)

   - Theory: 04 periods

   - Practice: 41 periods
5. **Prerequisite:** None
6. **Parallel teaching in the course:** None
7. **Course Description**: Introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. Case studies are presented and analyzed. Students will work on interdisciplinary projects which correspond to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields.
8. **Course objectives:** The course provides students with basic understanding of Logistics & Supply Chain Management fields.
9. **Course Learning** O**utcomes**

	Course Learning outcomes	**Program Learning outcome**
Knowledge	1. Understand the basis and importance of Logistics & Supply Chain Management fields	(d) an ability to function on multidisciplinary teams

Skill	2. Develop knowledge, techniques and skills which enhance a student's life-long learning ability.	(g) an ability to communicate effectively
	3. Provide students opportunities to work in interdisciplinary projects which are closed to industry.	(d) an ability to function on multidisciplinary teams
Attitude	4. To develop a life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

10. Course implementation

Time: 02 weeks for theory (03 periods per week), 12 weeks for practice (04 periods per week) and 01 week for group project presentation and demonstration

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations

- Teamwork: to do the project at the Lab

11. Course outline

Week	Topics
1	Chapter 1: Introduce to Logistics & Supply Chain Management and Assign the project to each group
2	Chapter 2: Introduction to Electrical Engineering and Automation

Lab Outline:

Week	Topics
3 - 14	Students do the project at the Lab
15	Group project presentation and demonstration

12. Course Assessment:

13.1. Grading:

Group Project/ Presentation 100%

Requirement:

The physical models are subjected to the following requirements and criteria:

- Working and Functioning as proposed.
- Application possibilities.
- Reference from industry.
- Complication of model (Components and Integration)

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**Organization of report**	Good organization: points are logically ordered; sharp sense of beginning and end			x									x	10
2	**System and functional description**	Supporting details specific to the subject. No error			x			x			x			x	15
3	**Result analysis**	The model works very well						x			x			x	20
4	**Timeliness & writing**	Report on time								x			x		05
5	**Mechanics control**	Students present information in logical, interesting sequences. Presentation has no misspellings or grammatical errors						x			x			x	15
6	**Questions & Answers**	Understand all questions and correct answers						x			x			x	20
7	**Presentation skill (nonverbal, verbal)**	Holds attention of entire audience using eye contact, body language, having clear voice and pronunciation, seldom looking at notes						x			x			x	15
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

13. Student responsibility & Policies:

- *Student responsibility:* The students work in groups, each group has 5 members. The students work in Laboratories of the Faculty.
- *Attendance:* Regular on-time attendance in this course is expected.
- *The lecturer and the technician responsibilities:* The Lecturer is in charge of his group. Lecturers are responsible for the student's accomplishment; the model can run or not. The technician is responsible for arranging group workplaces; supporting equipment and instruments/tools for groups in Laboratories. The technician introduces ways to use drilling and tools as sawing, filing.
- *Missed tests:* Students are not allowed to miss any of the Group project presentation and demonstration. There are very few exceptions. (Only with extremely reasonable excuses,

  e.g. certified paper from doctors, may students retake the tests.)

ENGINEERING DRAWING

Instructor: Dr. Nguyen Van Chung

1. **Name of course:** ENGINEERING DRAWING
2. **Course code:** IS054IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective
4. **Number of credits:** 3 credits

   - Theory: 3 credits

   - Practice: 0
5. **Prerequisite:** None
6. **Parallel teaching in the course:** None
7. **Course Description**: This course provides students skills to present and interpret spatial models on planar models, present engineering drawings according to international standards (ISO). Methods of presenting models: orthogonal projection, isometric projection, oblique projection… Apply the projections to present objects in the drawings.
8. **Course objectives:** This course is designed to teach the fundamentals of engineering drawings according to international standards (ISO), methods of presenting models: orthogonal projection, isometric projection. To present objects in the drawings. To ability to read and prepare engineering drawings.
9. **Textbooks and references: Textbooks:**

   - Basant Agrawal, Tata, *Engineering Drawing*, McGraw-Hill Education, 2008.
   - Singhal, Saxena & Gupta, *A TextBook of Engineering Drawing*, Asian.

   References:
10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Analyzing, interpreting, and presenting engineering drawings. 2. Applying appropriate drawing techniques for a practical application. 3. Problem resolution on drawings	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Skill	4. Systematically analyze the problem and apply the appropriate technique to solve the problem	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
	5. To present objects in the drawings.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Attitude	6. To develop life-long learning attitude	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

12. Course outline

Week	Topics
1	Chapter 1: Introduction to Engineering Drawing
2, 3	Chapter 2: Drawing standards and specifications, Assignment
4, 5	Chapter 3: Descriptive Geometry, Assignment
6, 7	Chapter 4: Displaying drawings, Assignment
8, 9, 10	Chapter 5: Sections and sectional views, Assignment
11, 12	Chapter 6: Part section, Assignment
13, 14	Chapter 7: Axonometric projection, Assignment

Week	Topics
15	Review

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation and assignment: 25%
- One midterm exam: 25%
- One comprehensive final exam: 50%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Individul Assignment** **- Quiz**	Analyzing, interpreting, and presenting engineering drawings						x			x			x	25
2	**- Midterm exam (Drawing sheet)** **- Quiz**	applying appropriate drawing techniques for a practical application by answering >50% of question on the test			x			x			x			x	25
3	**- Final exam (Drawing sheet)**	Problem resolution on drawings. Systematically analyze the problem and apply the appropriate technique to solve the problem by answering >50% of question on the test			x			x			x			x	50
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses,
  e.g. certified paper from doctors, may students retake the tests.)

INTRODUCTION TO COMPUTING – MATLAB APPLICATION

Instructor: Dept. of Information Technology

1. **Name of course**: INTRODUCTION TO COMPUTING
2. **Course code:** IS076IU
3. **Course type:**

☐ Specialization

☒ Core

☐ Requirement

☐ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits
- Practice:

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**:

This course will cover some basic topics and applications of Matlab about variables, data types, statements, control structures, arrays, strings, functions and Graphical User Interfaces (GUIs). Students are learning solely from an extensive lesson, a broad overview of Matlab.

8. **Course objectives:**

- Be able to criticize the engineering problem-solving method and apply the method in conjunction with technical skills to solve problems.
- Have a good idea of how to begin using Matlab, as well as the skill necessary to explore other information about Matlab on their own.
- Be able to solve engineering problems involving Probability, Statistics, and interpolation.
- Have a good ability of teamwork and project management skills.

9. **Textbooks and**

references: Textbooks:

- William J. Palm, III, Introduction to Matlab 7 for Engineers, 2nd Ed, McGraw-Hill.

References:

Matlab Programming for Engineers, Stephen J.Chapman, 5th edition, 2015. Lecturer will provide references based on each specific topic

10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Build skills necessary to explore other information about Matlab on their own	(e) An ability to identify, formulate, model and simulate and solve engineering problems
	2. Analyze algorithms to solve engineering problems using Matlab	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Skill	3. Develop algorithms to solve engineering problems using Matlab	
	4. Design the basic GUIs using Matlab	
Attitude	5. To develop a life-long learning attitude.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course

implementation Time:

15 weeks for theory.

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Course Overview and introduction to Matlab The IT/IS and its influence
2	Arrays
3	Scripts and Functions Files
4	Control Structures
5	Programming with Matlab

Week	Topics
6	Programming with Matlab (cont)
7	Strings
8	Review
9	2-D Plotting with Matlab
10	3-D Plotting with Matlab
11	Probability, Statistics, and Interpolation
12	Probability, Statistics, and Interpolation (cont)
13	Introduction to GUI
14	Design GUIs
15	Review

13. Course Assessment:

13.1. Grading:

Assessment component (1)	Assessment form (A.x.x) (2)	Percentage % (3)
A1. Process assessment	A1.1 Assignment	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
A3. Final assessment	A3.1 Full Semester Project	25%
	A3.2 Final exam	30%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Quiz** **Homework** **Assignment**	Analyze algorithms to solve engineering problems using Matlab Develop algorithms to solve engineering problems using Matlab					x						x		15
2	**- Midterm Exam**	Analyze algorithms to solve engineering problems using Matlab Develop algorithms to solve engineering problems using Matlab					x						x		30
3	**- Final exam**	Develop algorithms to solve engineering problems using Matlab Design the basic GUIs using Matlab					x						x		30
4	**Project Presentation and discussion**	Analyze algorithms to solve engineering problems using Matlab Develop algorithms to solve engineering problems using Matlab Design the basic GUIs using Matlab					x	x		x	x		x	x	25
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

INTRODUCTION TO PROGRAMMING C++/ C#, PYTHON

Instructor: Dept. of Information Technology

1. **Name of course**: INTRODUCTION TO PROGRAMMING C++/C#/PYTHON
2. **Course code: IS077IU**
3. **Course type:**

☐ Specialization

☒ Core

☐ Requirement

☐ Elective

4. **Number of credits:** 2 credits

- Theory: 1 credit
- Practice: 1 credit

5. **Prerequisite: none**
6. **Parallel teaching in the course: None**
7. **Course Description**:

Introduction to programming in C++. Operators and the C++ system; fundamental data types; flow of control; functions; arrays, pointers, and strings; application of C++ for solving engineering problems and numerical analyses.

8. **Course objectives:**

- Understand the basics of C++ programming as a tool for solving industrial engineering problems.
- Address the basic syntax and structure of C++ programs.
- Analyze and create programs with applications of industrial engineering, and engineering problems that require computer-based solutions

9. **Textbooks and references:**

Textbooks:

C++ How to program, 4th edition, Deitel Book. Publisher: Prentice Hall.

References:

Starting out with C++ from Control Structures through Objects 7th Edition.

Software: Dev C++

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
Knowledge	1. An ability to apply knowledge of mathematics, science and engineering	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Skill	2. An ability to design and conduct experiments, as well as to analyze and interpret data	
	3. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	
Attitude	5. To develop a life-long learning attitude.	

11. Course implementation

Time: 5 weeks for theory, 10 weeks for practice.

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Course Overview, Orientation Engineering Probability & Statistics Computers and Programming
2	Introduction to C++
3	Expressions and Interactivity
4	Making Decisions
5	Making Decisions
6	Looping
7	Looping
8	Review

Week	Topics
9	Function
10	Function
11	Array
12	Array
13	Searching, Sorting, and Algorithm Analysis
14	Searching, Sorting, and Algorithm Analysis
15	Review

13. Course Assessment

13.1. Grading

Assessment component	Assessment form	Percentage %
Lecture		
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. In class assessment	A2.1 In Class Test	15%
A3. Final assessment	A3.1 Full Semester Project	40%
	A3.2 Final exam	30%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Quiz Homework In Class Test**	An ability to apply knowledge of mathematics, science and engineering An ability to design and conduct experiments, as well as to analyze and interpret data					x						x		30
2	**- Final exam**	An ability to design and conduct experiments, as well as to analyze and interpret data An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.					x						X		30
3	**Presentation and discussion**	An ability to design and conduct experiments, as well as to analyze and interpret data An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. An ability to use the techniques, skills, and modern engineering tools necessary forbengineering practice.					x	x		x	x		x	x	40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

ENGINEERING PROBABILITY AND STATISTICS

Instructor: Dr. Phan Nguyen Ky Phuc

1. **Name of course**: ENGINEERING PROBABILITY AND STATISTICS
2. **Course code:** IS004IU
3. **Course type:**

☐ Specialization

☒ Core

☒ Requirement

☐ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits
- Practice: 0 credit

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: Probability problems in engineering, conditional probability, discrete and continuous distributions, sampling distribution, interval estimates, hypothesis testing, analysis of variance, regression models and non-parametric testing.
8. **Course objectives:** The course provides students with basic understanding and advanced concepts of probability and statistics for engineering.
9. **Textbooks and references: Textbooks:**

[1] Sheldon M. Ross (2004), *Introduction to Probability and Statistics for Engineers and Scientists.*
3rd edition. Elsevier Academic Press.

References:

[1] Sheldon M. Ross (2010), *A First Course of Probability. 8th edition.* Pearson Education.

10. **Course Learning Outcomes**

	Course Learning outcomes	Program Learning outcome
	1. Able to understand, calculate, and present basic statistics for a given dataset including numerical and visualization	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (e) An ability to identify, formulate, model and simulate and solve engineering problems
	2. Able to understand, calculate, and solve probability based problem	
	3. Able to understand, calculate, and solve problems relating to random variables	
	4. Able to understand the concept of sampling process, sampling distribution, and the relationship between sample and population	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data
	5. Able to perform hypothesis testing for population mean, population variance including single and multiple populations	(a) an ability to apply knowledge of mathematics, science and engineering
	6. Able to understand, construct, and analysis linear regression model including single or multiple variables	(a) an ability to apply knowledge of mathematics, science and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data
Attitude	7. To develop a life-long learning attitude.	(a) an ability to apply knowledge of mathematics, science and engineering

11. Course implementation

Time: 14 weeks for theory (04 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

12. Course outline

Week	Topics
1	**Chapter I: Introduction and Descriptive Statistics** Introduction Sample and Populations Data and Data Collection Percentiles and Quartiles Measures of Central Tendency: Mean, Mode, Median Measures of Variability: Range, Variance, Standard Deviation Grouped Data and Histogram Relationship between the Mean and the Standard Deviation: Chebyshev's Theorem, Empirical Rule Methods of Displaying Data: pie chart, bar chart, frequency polygon and ogive, time plot Exploratory Data Analysis: Stem and Leaf display, box plot
2 + 3	**Chapter II: Probability** Basic Definitions: Events, Sample Space Probabilities: Basic rules for Probability, range of value, rule of complements, mutually exclusive events, conditional probability Independence of events, product rules for independence events Combinatorial concepts: factorial, permutation, combination The law of total probability and Bayes' theorem
4 + 5	Chapter III: Random Variables and Normal Distribution Discrete and continuous random variables Probability distribution function Cumulative distribution function Expectation and properties Variance and standard deviation of a random variable Covariance and correlation Chebyshev's theorem Binomial distribution

	Hypergeometric distribution Poisson distribution Continuous random variable Uniform distribution Exponential distribution and the memoryless property Normal distribution
6	**Chapter IV: Sampling and sampling distributions** Sample Statistics as Estimators of Population Parameters. Sampling Distributions. The Central Limit Theorem. The Standardized Sampling Distribution of the Sample Mean when σ is not known. The Sampling Distribution of the Sample Proportion. The Sampling Distribution of the Sample Variance. Estimators and Their Properties: Unbiasedness, Efficiency, Consistency, Sufficiency. Degrees of Freedom.
8	**Chapter V: Confidence Intervals** Maximum likelihood Estimators and Interval Estimators. Confidence Interval for the Population Mean when the Population Standard Deviation is Known. Confidence Interval for the Population Mean when the Population Standard Deviation is Unknown. The t distribution. Large-Sample Confidence Intervals for the Population Proportion p. Confidence Intervals for the Population Variance. The Chi-square Distribution. Sample-Size Determination.
9	**Chapter VI: Hypothesis Testing** The Concepts of Hypothesis Testing. Type I and Type II Errors. The Significance Level.

	The Test Statistics. One-tailed and Two-tailed Tests. Testing for Population Means. Testing for Population Proportions. Testing for Population Variances. p-value Calculation. Optimal α and the Compromise between Type I and Type II Errors. β and the Power.
10	**Chapter VII: Comparison between two populations** Paired-Observation Comparisons: The Hypothesis Testing for the Difference between Means, The Confidence Interval for the Difference between Means. A Test for the Difference between Two Population Means Using Independent Random Samples: Cases in which the Test Statistic is Z, Cases in which the Test Statistic is t. A Large-Sample Test for the Difference between Two Population Proportions. The F Distribution and a Test for Equality of Two Population Variances. The Statistical Test for Equality of Two Populations Variance.
11	Chapter VIII: Analysis of Variance The Hypothesis Test of ANOVA. Assumptions. The Test Statistics. The Theory and Computations of ANOVA: The Sum-of-Squares Principle, The Degrees of Freedom, The Mean Squares, The F Statistic. The ANOVA Bång and Example of ANOVA. Further Analysis. The Tukey Pairwise-Comparisons Test.
12 + 13	**Chapter IX: Regression** Single Regression Model and k-Variable Multiple Regression Model.

	Model Assumptions. The Estimated Regression Relationship. The F Test of a Multiple Regression Model. How Good is the Regression. Tests of the Significance of Individual Regression Parameters. Testing the Validity of the Regression Model. Residual Plot. Using the Multiple Regression Model for Prediction. Multicollinearity. The Variance Inflation Factor. Solutions to the Multicollinearity Problem. Partial F Tests and Variable Selection Methods.
14	**Chapter X: Nonparametric Testing** The Sign Tests. The Rank Tests: Mann-Whitney U Test, Wilcoxon Signed-Rank Test. The Chi-squared Test: Goodness of Fit Test, Independent Test.

13. Course Assessment

13.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:** Questions: 1	Able to understand, calculate, and present basic statistics for a given dataset including numerical and visualization		x			x								5
2	**- Midterm exam:** Questions: 2	Able to understand, calculate, and solve probability based problem		x			x								5
3	**- Midterm exam:** Questions: 3-4	Able to understand, calculate, and solve problems relating to random variables		x			x								10
4	**- Midterm exam:** Questions: 5-6	Able to understand the concept of sampling process, sampling distribution, and the relationship between sample and population		x			x								10
5	**-Final:** Question 1-3	Able to perform hypothesis testing for population mean, population variance including single and multiple populations		x			x			x					20
6	**-Final:** Question 4-6	Able to understand, construct, and analysis linear regression model including single or multiple variables		x			x			x					20
7	**-Quizz Q1,2,3**	All relating goals		x			x			x					30
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

ENGINEERING ECONOMY

Instructor: MSc. Nguyen Hoang Huy

1. **Name of course**: ENGINEERING ECONOMY (EE)
2. **Course code:** IS020IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

   - Practice:

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: Economic decisions involving engineering alternatives; annual cost, present & future worth, rate of return, and benefit-to-cost; before and after-tax replacement economy; organizational financing; break-even charts; unit and minimum-cost public sector studies.
8. **Course objectives:**
   - **a.** Apply the appropriate engineering economics analysis method(s) for problem solving: present worth, annual cost, rate-of-return, payback, break-even, benefit-cost ratio
   - **b.** Evaluate the cost effectiveness of individual engineering projects using the methods learned and draw inferences for the investment decisions.
   - **c.** Compare the life cycle cost of multiple projects using the methods learned, and make a quantitative decision between alternate facilities and/or systems.
   - **d.** Compute the depreciation of an asset using standard depreciation techniques to assess its impact on the present.
9. **Textbooks and**

   references: Textbooks:

   Engineering Economy, 15th edition, W.G. Sullivan, E.M. Wicks, C.P. Koelling, Prentice Hall, 2012.

   References: Lecturer will provide references based on each specific topic.

10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
	1. Understand major principles of economic analysis for decision making among alternative courses of action in engineering.	(a)An ability to apply knowledge of mathematics, science and engineering (e)An ability to identify, formulate, and solve engineering problems
	2. Understand knowledge of probabilistic risk analysis in analyzing engineering practice.	
	3. Apply cash flow diagrams into economy analysis and alternative analysis techniques for engineering applications.	
	4. Prepare and analyze a business plan for an entrepreneurship/ engineering project.	(h)The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	5. Apply techniques and methods of sensitivity analysis for engineering problems. Be able to compare and make decisions between alternatives.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Attitude	6. To develop a life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team-work: Group assignment

12. Course outline

Week	Topics
1	Lecture 1: Introduction to EE
2	Lecture 2: Cost concepts and Design Economics
3	Lecture 3: Cost estimation techniques
4 & 5	Lecture 4: The time value of money
6 & 7	Lecture 5: Evaluating a single project
8	Review for Midterm examinations
9 & 10	Lecture 6: Comparison and Selection among alternatives
11	Lecture 7: Depreciation and Income taxes
12	Lecture 8: Evaluating projects with the benefit-cost ratio method
13	Lecture 9: Break-even and Sensitivity analysis
14	Lecture 10: Replacement analysis
15	Final Review

13. Course Assessment

13.1. Grading

Assessment component (1)	Assessment form (A.x.x) (2)	Percentage % (3)
A1. Process assessment	A1.1 Quiz	15%
	A1.2 Homework	15%
A2. Midterm assessment	A2.1 Midterm Exam	30%
A3. Final assessment	A3.1 Final exam	40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Homework** **- Quiz**	Understand major principles of economic analysis for decision making among alternative courses of action in engineering.		x											15
2	**- Midterm exam** **- Homework** **- Quiz**	Understand knowledge of probabilistic risk analysis in analyzing engineering practice.		x			x								15
3	**- Midterm exam** **- Final exam** **- Homework** **- Quiz**	.Apply cash flow diagram into economy analysis and alternative analysis techniques for engineering applications.			x					x					40
4	**- Final exam** **- Homework** **- Quiz**	Apply techniques and methods of sensitivity analysis for engineering problems. Be able to compare and make decisions between alternatives.					x			x					20
5	**- Presentation**	Prepare and analyze a business plan for an entrepreneurship/engineeringg project												x	10
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

SYLLABUS OF COMPULSORY SPECIALIZED COURSES

PRODUCTION MANAGEMENT

Instructor: Nguyen Van Chung

1. **Name of course**: PRODUCTION MANAGEMENT
2. **Course code:** IS019IU
3. **Course type:**

☐ Specialization

☒ Core

☐ Requirement

☐ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits
- Practice:

5. **Prerequisite:** none
6. **Parallel teaching in the course:** Operations Research 1: Deterministic Models
7. **Course Description**: Introduction to production systems. Production planning and control in decision making. Forecasting. Aggregate production planning. Capacity planning. Materials requirement planning. Advanced techniques and approaches in modern production planning and control for designing production systems.
8. **Course objectives:**

a. Understanding of the role of production manager in organization

b. Understand how production managers make decisions which are related to operation management, such as: Product design, location planning, scheduling, inventory management…

c. Understand how production management related to other functional areas in an organization

d. Gain the knowledge and skills to maintain the competitive advantage for organization by improving better productivity, reducing cost, responding more quickly to the demand and providing better quality

9. **Textbooks and references: Textbooks:**

- Russell & Taylor, Operations Management, Along the Supply Chain. John Wiley & Son, Inc, (7th ed.)

References:

1. W. J. Hopp and M. L. Spearman, Factory Physics: The Foundations of Manufacturing Management, Irwin/McGraw-Hill, 2008 (3rd ed.)
2. D. Sipper and R. L. Bulfin, Production: Planning, Control, and Integration, McGraw Hill, 1997.
3. Edward A. Silver, David F. Pyke and Rein Peterson, Inventory Management and Production Planning and Scheduling. John Wiley & Sons, (3rd ed.)
4. William J. Stevenson, Operations Management, Irwin / McGraw-Hill, 2005. (8 th ed.)
5. S. Nahmias, Production and Operations Analysis, Irwin/McGraw-Hill, 1997.

10. Course Learning Outcomes

<table>
<tr><th></th><th>Course Learning outcomes</th><th>Program Learning outcome</th></tr>
<tr><td rowspan="2">Knowledge</td><td>1. Understand the approaches and techniques necessary for an adequate knowledge and analysis of production and inventory decision systems.</td><td rowspan="5">(a) An ability to apply knowledge of mathematics, science and engineering
(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(j) a knowledge of contemporary issues</td></tr>
<tr><td>2. Apply the techniques to improve the case</td></tr>
<tr><td rowspan="2">Skill</td><td>3. Respond to the needs of community and industrial sectors.</td></tr>
<tr><td>4. Consider ethical aspects in making decisions.</td></tr>
<tr><td>Attitude</td><td>5. To develop a life-long learning attitude.</td></tr>
</table>

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team-work: Group assignment

12. Course outline

Week	Topics
1	Introduction to Production Management
2	Forecasting
3 & 4	Inventory Management
5	Aggregate Planning
6 & 7	Material Requirement Planning (MRP)
8	Review for Midterm examinations
9	Modern Production System
10 & 11	Facility layout and Location
12	Scheduling & Sequencing
13	Supply Chain management
14	Project presentation
15	Final Review

13. Course Assessment:

13.1. Grading:

Assessment component (1)	Assessment form (A.x.x) (2)	Percentage % (3)
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	5%
A2. Midterm assessment	A2.1 Midterm Exam	30%
A3. Final assessment	A3.1 Full Semester Project	20%
	A3.2 Final exam	40%

13.2. Assessment Plan

No	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	- Midterm exam - Quiz	Understanding of approaches for an adequate knowledge of production systems		x											10
2	- Midterm exam - Final exam - Quiz	Applying the methods and techniques in production and inventory decisions		x			x								20
3	- Midterm exam - Final exam - Quiz	Combining the techniques to improve the cases		x	x					x					40
4	Final exam	Respond to the needs of community and industrial sectors.											x		10
5	Presentation and discussion	Consider a real case to identify roles of production management in organization.												x	20
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

DETERMINISTIC MODELS IN OPERATIONS RESEARCH

Instructor: Dr. Ha Thi Xuan Chi

1. **Name of course**: DETERMINISTIC MODELS IN OPERATIONS RESEARCH
2. **Course code:** IS081IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☒ Requirement
   - ☐ Elective
4. **Number of credits:** 4 credits
   - Theory: 4 credits
   - Practice: 0 credit
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: This course is to introduce the fundamental methods used in deterministic operations research and to use numerical analysis and linear algebra to solve industrial engineering problems. Topics to be covered include: problem formulations, simplex method in table form, duality theory, an introduction to the geometry of the simplex method, sensitivity analysis, transportation and network flow problems.
8. **Course objectives:** Complete this course, students are able to:
   a) Students know how to formulate and solve linear programing models by using mathematical techniques.
   b) Students know how to solve the models using computer-based software.
   c) Students understand the relationship between a linear program and its dual.
   d) Students can interpret the solutions.
   e) Students can solve practical problems
9. **Textbooks and references:**

Textbook

Hillier and Lieberman, *Introduction to Operations Research* , McGraw Hill, 1995, 7th Ed.

References

Wayne L. Winston and Munirpallam Venkataramanan, *Introduction to Mathematical Programming*. Operations Research: Volume one, DuxBury, 2003, 4th edition.

Hamdy A. Taha, *Operation Research: An Introduction*, Prentice Hall, 2003, 7th Edition

10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
	1. Able to formulate the linear programming models with two variables and solve it by using graphical methods	(a) An ability to apply knowledge of mathematics, science and engineering (e) An ability to identify, formulate, and solve engineering problems
	2. Able to formulate the linear programming models with more than two variables and solve it by using simplex method	
	3. Able to formulate Integer programming, transportation, assignment, shortest paths, maximum flow, minimize costs models and solve them	
	4. Able to define initial solutions for the linear programming models by using big M and two phases techniques.	(a) An ability to apply knowledge of mathematics, science and engineering (e) An ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
	5. Able to analyze output from the linear programming model by using sensitivity analysis.	(a)An ability to apply knowledge of mathematics, science and engineering (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Attitude	6. To develop a life-long learning attitude.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course implementation

Time: 15 weeks for theory (04 periods per week) .

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homeworks

- Team work: Semester Project

12. Course outline

Week	Topics
1	Chapter1: Introduction to Operations Research
2	Chapter 1: Formulating linear programming problems.
3	Chapter 2: Solution of an LP: Graphical Solution.
4	Chapter 2: Solution of an LP: Simplex Method, Standard Form, Degeneracy, Alternate Solutions, Unbounded LP, Infeasible LP.
5	Chapter 2: Solution of an LP: Finding an initial feasible solution, Big-M Method, Two-Phase Method, Solution of an LP using a software package – LINDO
6	**Chapter 2: Typical problems - assignment problem, transportation problem, Knapsack problem**
7	Chapter 3: Revised Simplex Method, Simplex Formulas, Shadow Price, Reduce Cost.
8	Chapter 4: Sensitivity Analysis: Changing the objective function coefficient of a basic variable, changing the objective function coefficient of a nonbasic variable, changing the constraint coefficient of a nonbasic variable, changing the RHS values of constraints, adding a new variable.
9	Chapter 5: dual of an LP, Economic Interpretation of the Dual Problem and Dual Variables, Lagrange Multipliers, Complementary Slackness, Dual Simplex Method, How to Read the LINDO Output.
10	Chapter 6: Shortest Path Problems: Formulating Equipment replacement problem as Shortest Path Problems, Solving shortest path problems using Dijkstra¡'s Algorithm
11	Chapter 6: Maximum Flow Problems: Formulation, and Solution Using Ford-Fulkerson Algorithm.
12	Chapter 7: Integer Programming Problems. Either/or Constraints, Mutually Exclusive Alternatives, If then Constraints, Fixed Charge Problems, Solving Integer Programs using Branch and Bound Method.
13	Chapter 8: Dynamic programming Problems
14	Chapter 10: Non-Linear Problems
15	Project Presentation

13. Course Assessment

13.1. Grading

-Assignments: 10%

-Semester Project: 10%

-In-class quizzes: 10%

-Midterm exam: 30%

-Final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain											Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			R	WQ	P	R	WQ	P	R	WQ	P	R	WQ	P	
1	**- Assignments**	All Chapters		x			x			x					10
2	**- Semester Project**	Formulate and solve the assigned case	x			x			x					x	10
3	**- Quizzes**	- Simplex method -Revised simplex method -Dynamic Programming - Shortest Path Problem	x	x					x	x		x	x		10
4	**- Midterm exam**	- Simplex method, - Sensitivity Analysis - Revised simplex method -Big-M method -Two-phase Method		x			x						x		30
5	**- Final exam**	-Network flow problems -Integer programming problems -Dynamic programming problem -Non-linear programming problem		x			x			x			x		40
	Total														100

Note: R : Report ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

PRINCIPLES OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Instructor: Nguyen Hoang Huy

1. **Name of course**: PRINCIPLES LOGISTICS AND SUPPLY CHAIN MANAGEMENT
2. **Course code:** IS055IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits
   - Theory: 3 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: This is an introductory course to Logistics and supply chain management (SCM). It provides an overview of fundamental concepts, business processes and models/tools. This course combines SCM business knowledge with analytical thinking and pinpoints the role of SCM relative to other business disciplines. It serves as a roadmap to more in-depth courses on related topics.
8. **Course objectives:** The objective of this course is to identify problems, issues and strategies in today's supply chain operations via real-world cases. Analytical models and technical tools are introduced as needed
9. **Textbooks and references:**

   Textbooks:

   - "Management of Business Logistics, 8th edition" , Coyle, Bardi, and Langley, South-Western Publishing Company, 2008
   - "Business Logistics / Supply Chain Management: planning, organizing, and controlling the supply chain, 5th ed", Ronald H. Ballou, Prentice Hall, 2004
   - "Supply chain management: strategy, planning, and operation, 4th ed.", S. Chopra and P. Meindl, Prentice Hall, 2010.
10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
	1. Understanding new concepts of logistics and supply chain management	(f) an understanding of professional and ethical responsibility (j) a knowledge of contemporary issues
	2. Comparing the differences between in-bound supply chain, and out-bound supply chain	
	3. Understand the models, processes and tools used to analyze, design and implement operations and supply chain management solutions.	
	4. Develop a thorough understanding of the components of supply chains, the material and information flow interactions between them and the analytical and management processes that facilitate successful supply chain performance	(j) a knowledge of contemporary issues
	5. Identify and apply a range of operations management initiatives and techniques that can be considered in the development of an operations strategy	(f) an understanding of professional and ethical responsibility
Attitude	6. Working in teams effectively to complete an engineering project.	(f) an understanding of professional and ethical responsibility (j) a knowledge of contemporary issues

11. Course implementation

Time: 11 weeks for theory (04 periods per week) and 8 weeks for practice (04 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

- Teamwork: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Logistics, the Supply Chain & Competitive Strategy
2	Chapter 2: Logistics & Customer Value
3	Chapter 3: Measuring Logistics Costs and Performance
4	Chapter 4: Creating the Responsive Supply Chain
5	Chapter 5: Strategic Lead-Time Management
6	Chapter 6: The Synchronous Supply Chain
7	Chapter **7:** Review
8	Chapter 8: Managing the Global Pipeline
9	Chapter 9: Managing Risk in the Supply Chain
10	Chapter 10: Managing Risk in the Supply Chain
11	Chapter 11**:** Overcoming the Barriers to Supply Chain Integration
12	Chapter 12: Overcoming the Barriers to Supply Chain Integration
13	Chapter 13: Entering the Era of Network Competition
14	Chapter 14: Review

13. Course Assessment:

13.1. Grading:

- One midterm exam: 30%

- Mini projects, presentations & attendance: 15%
- Group Project: 15% (paper:10% & presentation: 5%)
- Final exam: 40%
- Grade Scale: 100

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Homework** **- Quiz**	Characterizing the fundamental concepts, business processes and models/tools		x											15
2	**- Midterm exam** **- Final exam** **- Homework** **- Quiz** **- Group Project**	Applying of methods to identify and analyze the components of supply chains, the material and information flow interactions between them and the analytical and management processes that facilitate successful supply chain performance	x				x								30
3	**- Midterm exam** **- Final exam** **- Quiz** **- Homework**	Developing and managing operations management initiatives and techniques that can be considered in the development of an operations strategy report		x						x					40
4	**Presentation and discussion**	Identification of the necessary and application of SCM for a selected Group Project			x									x	15
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.

BUSINESS LAW

Instructor: School of Business Administration

1. **Name of course**: BUSINESS LAW
2. **Course code:** IS073IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

   - Practice: 0 credit

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**:

The aim of this course is to:

- Familiarize the student with legal language; basic concepts, principles and general knowledge of business Law.
- Introduce to students about main business forms in Vietnam and regulations for each. Also, possibility of reorganization and Insolvency for enterprises, as the main subject matter of this course.
- Increase the student's understanding of the Vietnamese regulations over business dispute resolution,
- Expose the student to legal reasoning and develop his/her ability to apply legal concepts.
- Introduce students to main trade international organizations and main international trade rules.

Develop problem solving and legal analyzing skills and apply it to day-to-day practical situations.

8. **Course objectives:**

After completing the course, students should have:

- Basic knowledge on Legal regulations on business activities and enterprises. Main concepts and principles.

- Knowledge on specific issues for operation, reorganization and insolvency of enterprises
- Ability to analyze and choose the best way to solve business disputes and apply best suitable regulations for enterprises.

Analyzing and problem-solving skills to be applied to practical cases.

9. Textbooks and references:

Legal Texts:

1. Civil Code of Vietnam - 2005 http://www.freshfields.com/publications/pdfs/2006/14247 .pdf
2. Commercial Law – 2005 http://www.moit.gov.vn/vsi_portlets/UserFiles/LegalText/Upload/Commercial%20 Law _English%20version.doc
3. Law on Investment – 2014 http://www.moj.gov.vn/vbpq/Lists/Vn%20bn%20php%20lut/View_Detail.aspx?It emI D=30315
4. Law on Enterprises – 2014 http://www.moj.gov.vn/vbpq/Lists/Vn%20bn%20php%20lut/View_Detail.aspx?It emI D=30314
5. Law on Intellectual Property – 2005 http://www.noip.gov.vn/noip/cms_en.nsf/(agntDisplayContent)?OpenAgent&UNI D=1 8572C84165D0FC1472570DF00314856

Reference Books:

Đại học luật HN, *Giáo trình Luật Thương mại,* Tái bản có bổ sung, NXB 2008. Additional materials provided in Blackboard

The lecturer will attempt to make lecture notes and additional reading available on Blackboard. However this is not an automatic entitlement for students doing this subject. Note that this is not a distance learning course, and you are expected to attend lectures and take notes. This way, you will get the additional benefit of class interaction and demonstration.

Recommended Internet sites

UNCTAD (United Nations Conference on Trade and Development)

WTO (World Trade Organization)

MOIT - Vietnam (Official website of Ministry of Industry and Trade)

MPI - Vietnam(Official website of Ministry of Planning and Investment) **Other Resources, Support and Information**

Additional learning assistance is available for students in this course and will be made available in Blackboard. Academic journal articles are available through connections via the VNU - Central

Library. Recommended articles will be duly informed to the students.

10. Course Learning Outcomes

No	Course learning outcomes	Program Learning outcome
Knowledge	Basic knowledge on Legal regulations on business activities and enterprises. Main concepts and principles	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skills	Knowledge on specific issues for operation, reorganization and insolvency of enterprises Ability to analyze and choose the best way to solve business disputes and apply best suitable regulations for enterprises	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues
Attitude	Analyzing and problem-solving skills to be applied to practical cases	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues

11. Course implementation

Time: 14 weeks for theory (03 periods per week)

Teaching and learning activities

The learning system in this course consists of lectures and scheduled presentations/discussions. Lectures elaborate the appropriate theoretical content in the textbook and readings. Classes provide a more detailed and refined analysis of both concepts and applied materials. Classes are strongly oriented towards interactive discussion of the text and cases. In order to gain the most from the lectures and class activities, the below assigned text/reading should be read *before* the lecture to participate in the discussions.

All students are required to take active part in the discussions and Q&A session at the end of lesson or relevant part.

Additional research will be strongly encouraged and might generate additional points.

Besides, if students are facing a legal problem in practice they are welcome to bring it to the class and discuss

12. Course outline

The following is the outline that sets topics for the course. The instructor reserves the right to revise this outline throughout the semester to either add or delete material as necessary to accomplish the goals of the course.

Week	**Topic**	**Learning Materials and Activities**
1	Introduction to Business Law and Business Entity ● Introduction of the course and explanation of syllabus and other academic matters ● Briefing on Vietnam Legal System Course ● What is Business Law? ● Why does it matter? ● Nature, forms and functions and method of regulation ● Comparative study of severe business law systems ● Overview and nature of business entity in Vietnam	Allocation of Discussion Question In class Group Discussion Material: Law on Enterprise 2014
2	Business Entity: Business Household, Private Enterprise and Partnership. ● Characteristics ● Management structure ● Strength and weakness ● Comparison with other entities	Allocation of Discussion Question In class Group Discussion Material: Law on Enterprise 2014
3	Business Entity: Limited Liability Company 1 and 2 plus ● Characteristics ● Management structure ● Strength and weakness ● Comparison with other entities	Allocation of Discussion Question In class Group Discussion Material: Law on Enterprise 2014
4	Business Entity: Shareholding Company ● Characteristics ● Management structure ● Strength and weakness ● Comparison with other entities	Allocation of Discussion Question In class Group Discussion Material: Law on Enterprise 2014

5	Business Entity: State-owned Enterprise ● Characteristics ● Management structure ● Strength and weakness ● Comparison with other entities	Allocation of Discussion Question In class Group Discussion QUIZ 1 Material: Law on Enterprise 2014
6	Business Registration and Re-organization: Business Registration: ● Formalities ● Procedure Business Reorganization: ● Consolidation ● Merger ● Separation ● Division ● Dissolution ● Insolvency/Bankruptcy	In Class discussion base on Case study provided Practicing on solving legal issue
9	Business dispute resolutions: Dispute resolution under Civil Procedure ● Procedure for filling a case ● Formalities of resolution ● Principles ● 1st instance trial ● Appellate Trial ● Cassation Trail ● Re-opening trial ● Strength and Weakness	Allocation of Discussion Question In class group discussion Material: Vietnam Civil procedure Code 2004
10	Business Dispute Resolutions: Dispute resolution under Arbitration ● General introduction about Vietnamese regulation of arbitration and Ordinance on Arbitration 2010 ● Procedure under ad-hoc and permanence arbitration	Allocation of discussion Question In class group discussion Material: Arbitration Law 2010

	● Strength and weakness	
11	Contractual Law: Part 1 General Introduction: ● Definition ● Subject matter ● Principles Contract Formation ● Offer ● Acceptance ● Enforcement	Allocation of Discussion Practicing on Solving legal case Material: Vietnam Civil Code 2004
12	Contractual Law: Civil Contract Contract Implementation ● Ownership and property – nature and forms ● Civil obligations and Civil contracts and ● Inheritance Breaches and Remedies ● Breaches and its forms ● Remedies (7 types) Discharge of contract ● By law ● By breaches ● By impossibility	Allocation of discussion question QUIZ 2 Vietnam Civil Code 2004
13	Tax Law: ● Corporate Tax ● Income Tax ● Import/export Tax	Allocation of discussion question In class discussion
14	International Trade Law Introduction: ● Sources of International Trade Law: Treaties, customs Regional Trade organizations ● EU, ● ASEAN, MERCOSUR World Trade Organization History and Back	Allocation of Discussion Question In Class Discussion Materials: International Trade Law, McGraw hill, 2007

	ground: ● WTO principles and Organizational Structure ● WTO and Vietnam	
15	Revision/tutoring class	As per necessary of each lecture

13. Course Assessment:

13.1. Grading:

Mid-Term Exam 30%

Assignments/Participation/Presentation 20%

Final Exam 50%

Total 100%

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:**	Ability to give compelling arguments and reasoning to support analysis	x	x		x	x								10
2	**- Midterm exam:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x		x	x								10
3	**- Midterm exam:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x								10
4	**- Final:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x			x								20
5	**-Final:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x			x					30
6	**Assignment/ Group Presentation/ Attendance**			x	x		x			x	x			x	20
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* It is expected that the students will spend at least six hours per week studying this course. This time should be made up of reading textbooks, working on cases, and attending classes. Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities..
- *Attendance:* Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.
- *General Conduct and Behavior*: The students are expected to conduct themselves with consideration and respect for the needs of the fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. More information on student conduct is available at the university webpage.
- *Keeping informed*: The students should take note of all announcements made in lectures or on the course's Blackboard. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

WAREHOUSE ENGINEERING MANAGEMENT

Instructor: Nguyen Hoang Huy

1. **Name of course**: WAREHOUSE ENGINEERING MANAGEMENT
2. **Course code:** IS057IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**

This course provides the students with an understanding of the principles, processes and techniques for the effective planning, management and operation of warehouses. Through this exposure, students will gain insights into how warehousing adds value to the organization's supply chain and how warehousing decisions impact the performance of the organization..

8. **Course objectives**

The course provides students with basic understanding and advanced concepts of warehouse operations nowadays.

9. **Textbooks and**

references: Textbooks:

- Bartholdi, J. J., & Hackman, S. T. (2014). Warehouse & Distribution Science Release 0.96. The Supply Chain and Logistics Institute School of Industrial and Systems Engineering Georgia Institute of Technology Atlanta, GA, 30332-0205.

References:

- "Warehousing in the Global Supply Chain: Advanced Models, Tools and Applications for Storage Systems" , Manzini, R, Springer Verlag, London 2012
- "Warehouse Management: A complete Guide to Improving Efficiency and Minimizing Cost in the Modern Warehouse", Richards, G, Kogan Page, 2011.
- Hompel, M., & Schmidt, T. (2006). Warehouse management: automation and organization of warehouse and order picking systems. Springer Science & Business Media.

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Create academic work with integrity in Inventory and Warehouse Management. 2. Efficiently apply Inventory and warehouse Management principles of inventory, warehouse, and transportation and distribution management	(c) an ability to design a system, component, or process to meet desired needs within realistic
	3. Analyzing of recent trends and emerging technologies in the area of warehouse management	(f) An understanding of professional and ethical responsibility (j) a knowledge of contemporary issues
	4. Apply knowledge of Inventory and Warehouse Management in industry and service improvement 5. Systematically analyze problems and propose solutions in Inventory and Warehouse Management via research methodology.	(c) an ability to design a system, component, or process to meet desired needs within realistic
	6. Applying methods to design warehouse operation systems.	(c) an ability to design a system, component, or process to meet desired needs within realistic
	7. Work as a team with other disciplines related to Inventory and Warehouse Management.	(c) an ability to design a system, component, or process to meet desired needs within realistic (f) An understanding of professional and ethical responsibility
Attitude	8. To develop a life-long learning attitude.	(c) an ability to design a system, component, or process to meet desired needs within realistic

11. Course implementation

Time: 12 weeks for theory and 2 weeks for practice/ review/ presentation

Teaching and learning activities

- Classroom activities: Lectures, presentations
- Self-learning: Assignment

- Team work: Group project

12. Course outline

Week	Topic	Activities
1	The Role of the Warehouse Role of the Warehouse Manager	Lecture
2& 3	Warehouse operations	Lecture Assignments
4	Warehouse Management systems	Lecture Assignments
5	Storage and handling equipments	Lecture Assignments Quiz
5& 6	Order-Picking Methods	Lecture Assignments
7	**Review**	
Midterm		
8& 9	Warehouse Layout	Lecture Assignments
10& 11	Performance Management	Lecture Assignments
12 & 13	Health and Safety The Warehouse and the Environment	Lecture Assignments
13	Automation	Lecture Assignments
14	Review	

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**Home works** **Group Project**	Understand and apply modeling of warehouse management by discussing, doing quizzes and given projects.		x	x		x	x				x	x	x	30
2	**Midterm exam**	Understand the characterization of optimal control policies and analysis of single by getting more than 50% of the test.	x			x	x								30
3	**Final exam**	Efficiently apply Inventory and Warehouse Management principles of inventory, warehouse, and transportation and distribution management Computational issues by getting more than 50% of the test.	x	x		x	x		x	x					40
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

PRINCIPLES OF MARKETING

Instructor: School of Business Administration

1. **Name of course**: Principles of Marketing
2. **Course code:** BA003IU
3. **Course type:**

☐ Specialization

☒ Core

☐ Requirement

☐ Elective

4. **Number of credits:** 3 credits
5. **Prerequisite:** None
6. **Parallel teaching in the course:** None
7. **Course Description**: The course is an introduction to the language and issues of marketing with an emphasis on learning to develop responsive marketing strategies that meet customer needs. The course focuses on basic marketing concepts, the role of marketing in the organization, and the role of marketing in society. Topics include market segmentation, product development, promotion, distribution, and pricing. Other topics, which will be incorporated into the course, are external environments (which will focus on integrative topics with marketing, such as economics, politics, government, and nature), marketing research, marketing information. international/global marketing with relevance to cultural diversity, ethics, the impact of technology on marketing, and careers in marketing.
8. **Course objectives:**

Accordingly, the course emphasizes the following:

• To analyze the role of marketing within the firm and society.

• To expose you to the two parts of a marketing strategy: the target market and the marketing mix.

• To study the four basic variables in the marketing mix: product, promotion, price, and distribution.

• To exercise analytical, communication, and presentation skills (through use of technological aids, such as Microsoft Word, PowerPoint, and the Internet) – the basic tools of marketing.

9. **Textbooks and references: Textbooks:**

- Philip Kotler and Gary Armstrong (2014). Principles of Marketing. Pearson Education 2014, 15th Edition. ISBN 978-0-13-325541-6.

10. Course Learning Outcomes

No	Course learning outcomes	Program Learning outcome
Knowledge	After the course, students will be able to: ● Understand basic marketing concepts and the principles used in developing marketing programs in a firm. ● Overview and analyze the processes, problems and activities associated with the planning and executing the conception, pricing, promotion and distribution of ideas, goods and services to create exchanges. ● Define marketing terminology appropriately; explain the internal and external restraints affecting marketing decision making; identify the components of effective marketing strategy. ● Understand content of marketing strategies in terms of pricing, promotion, distribution, and product.	(d) an ability to function on multi-disciplinary teams (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skills	- Effective communication: The ability to collect, analyze and organize information and to convey that information clearly and fluently, in both written and spoken forms. - Critical argument and judgment: The ability to identify and debate critical issues / problems, as well as to evaluate financial information, make decisions and reflect critically on the justification for decisions.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

Attitude	- Learn within teams (such skills as task assignment and management, conflict resolution and co-operation, consensus building, and leadership) - Provide professional business presentations (both oral and written)	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

11. Course implementation

Time:

Lecture: Friday 8:00-10:30 Venue: TBA

Teaching and learning activities

Employing the interactive learning and problem-based teaching approach, this course emphasizes the interaction between lecturers and students. The lecture materials will be uploaded in Blackboard to help the students to preview the materials and to concentrate on listening and critical thinking during the lecture. This will help students to interact with the lecturer during the classroom. The sessions for presentations and discussions comprise company case studies as well as answering some theoretical and conceptual questions, which help the students to see how the concepts are applied in the real international business context. Students will present the case to the class and discuss with the peers.

12. Course outline

Week	Topics
1	Introduction to the Course Chapter 1:Marketing: Creating and Capturing Customer Value
2	Chapter 3: Analyzing the Marketing Environment
2-3	Chapter 4: Managing Marketing Information to Gain Customer Insights Group Presentation of Case Analysis
4-5	Chapter 5: Consumer Markets and Consumer Buyer Behavior Group Presentation of Case Analysis
5-6	Chapter 6: Business Markets and Business Buyer Behavior Group Presentation of Case Analysis
7-8	Chapter 7: Customer-Driven Marketing Strategy: Creating Value for Target Customers Chapter 8: Product, Services, and Brands: Building Customer Value

Week	Topics
	Group Presentation of Case Analysis
9	Mid-term exam
10-11	Chapter 10: Pricing Products: Understanding and Capturing Customer Value Group Presentation of Case Analysis
11-12	Chapter 12: Marketing Channels: delivering Customer Value Group Presentation of Case Analysis
13-14	Chapter 14: Communicating Customer Value: Integrated Marketing Communications Strategy Group Presentation of Case Analysis
14-15	Chapter 15: Advertising and Public Relations Group Presentation of Case Analysis Revision for the Final Exam

13. Course Assessment:

13.1. Grading:

Mid-Term Exam (90 minutes) 30%

Class Participation and Discussion 10%

Group Assignment 20%

Final Exam (120 minutes) 40%

Total 100%

13.2. Assessment Plan Essay (Written Assignment)

Students are required to submit 2 assignment reports: (1) individual assignment and (2) group assignment (four students in a group).

Length and Style: Maximum 1,000 words for each assignment report, excluding footnotes, figures and references. The format for assignments is to be double spaced with 2.5 cm margins and font size of 12 cpi. Please show the word count, along with all other details on the cover sheet.

The project will be assessed for analytical content and presentation. The same marks will be awarded to all students in the same group. All work must be original and must not have been submitted for any other subject or course here or elsewhere. Copying or plagiarizing works of other authors, including your fellow students or cutting and pasting from the internet and other sources is an offense and will be seriously penalized.

Due Date: The project report is due at (time) pm on (date, day). Assignments are to be handed to the lecturer.

- Late work will be penalized at the rate of 25 percentage points per week day.
- Students must keep copies of all work submitted

Marking criteria (project report and case presentation)

Marking Criteria	Marks	Learning outcomes/attributes
Quality of arguments: relevance, logic and cohesion	20	Ability to give compelling arguments and reasoning to support analysis
Use of frameworks to support analysis	20	Ability to structure problems in accordance with theoretical frameworks and resolve them
Use of case evidence to support analysis	20	Ability to conduct applied research to gather data/information pertaining to the case
Originality and usefulness of the analysis	20	Ability to engage in creative problem solving skills
Organization, clarity of expression, editing etc	20	Clarity of vision

Class participation and Presentation

A minimum attendance of 80 percent is compulsory. Students will be assessed on the basis of:

a) Presentation of case 10%

b) Class attendance and participation 5%

14. Student responsibility & Policies:

- *Student responsibility:* It is expected that the students will spend at least six hours per week studying this course. This time should be made up of reading textbooks, working on cases, and attending classes. Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities..
- *Attendance:* Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.
- *General Conduct and Behavior*: The students are expected to conduct themselves with consideration and respect for the needs of the fellow students and teaching staff. Conduct

which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. More information on student conduct is available at the university webpage.

- *Keeping informed*: The students should take note of all announcements made in lectures or on the course's Blackboard. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

IMPORT – EXPORT MANAGEMENT

Instructor: Nguyen Hoang Huy

1. **Name of course**: IMPORT – EXPORT MANAGEMENT
2. **Course code:** IS074IU
3. **Course type:**
   - ☒ Specialization
   - ☐ Core
   - ☒ Requirement
   - ☐ Elective
4. **Number of credits:** 3 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: This course is developed to provide students with the necessary knowledge, skills and foundations for acquiring a wide range of rewarding careers into the rapidly expanding world of Import & Export Management.
8. **Course objectives:** This course attempts to provide an authentic experience on exporting and importing principles and practice. Topics are sequentially covered in a comprehensive framework, yet specific contexts are self-selected for further exploration and inquiry. Resources beyond the textbook are utilized, in a problem-based learning approach, with the goal of expanded knowledge and skills.
9. **Textbooks and references: Textbooks:**
   - Seyoum, B. (2013). *Export-Import theory, practices, and procedures*. 3rd Edition. Routledge, Taylor & Francis Group
   - John J. Capela (2008), *Import/ Export kit for Dummies*, John Wiley & Sons
   - Weiss, K. D. (2011). *Building an import/export business*. John Wiley & Sons
   - *Incoterms 2010*

   References: Lecturer will provide references based on each specific topic.
10. **Course Learning Outcomes**

	Course Learning outcomes	Program Learning outcome
	1. Apply the mathematics involved in payroll, buying and selling inventory, interest rates and loans, taxes, insurance, depreciation, and other business computations.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	2. Analyze and apply applicable rules and regulations, and find out how to complete the necessary licensing application and shipping documents.	
	3. Identify main products to import and export, identify target markets and find customers	
	4. Develop and improve a basic transactions process in the world markets	
	5. Develop skills needed to manage imports and exports either in a comprehensive trading company or in a department of a company that depends on sourcing or exporting to achieve its strategic objectives.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	6. Apply various methods to set up an office for international trade	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	7. Develop communication and negotiation skills, informative and persuasive speaking, speaker credibility, effective use of language	(j) a knowledge of contemporary issues
Attitude	8. To develop a life-long learning attitude.	(j) a knowledge of contemporary issues

11. Course

implementation

Time: 15 weeks for

theory

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Course Overview: Introduction to Import/Export
2	Identify Foreign Buyers
3	Group Report Consultancy
4	Identify Foreign Suppliers Vietnam Government's regulations Types of Import - Export
5	Term of Sales (Incoterms 2010)
6	Term of Sales (Incoterms 2010) – Con't
7	Trade Documents and Transportation
8	Wrap-up for exam
9	International Payment
10	International Payment (Con't)
11	Pricing for Export
12	Classification & Tariffs
13	Custom Procedure
14	Presentation
15	Review

13. Course Assessment:

13.1. Grading:

- In-class quizzes, group assignments, class participation: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weight (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	- Midterm exam	Analyze and apply applicable rules and regulations, and find out how to complete the necessary licensing application and shipping documents.	x							x					15
2	- Midterm exam	Identify main products to import and export, identify target markets and find customers	x				x								15
3	- Final exam	Apply the mathematics involved in payroll, buying and selling inventory, interest rates and loans, taxes, insurance, depreciation, and other business computations.	x				x								20
4	- Final exam	4. Develop and improve a basic transactions process					x					x			20

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weight (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
		in the world markets													
5	- Group assignments - Quiz	5. Develop skills needed to manage imports and exports either in a comprehensive trading company or in a department of a company that depends on sourcing or exporting to achieve its strategic objectives.						x							10
6	Group assignments	Apply various methods to set up an office for international trade						x							10
7	Presentation and discussion	Develop communication and negotiation skills, informative and persuasive speaking, speaker credibility, effective use of language						x							10
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

MANAGEMENT INFORMATION SYSTEMS

Instructor: Dr. Dao Vu Truong Son

1. **Name of course**: MANAGEMENT INFORMATION SYSTEMS
2. **Course code:** IS061IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits

   - Theory: 3 credits

   - Practice:
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: Integrates topics of management and organization theory, information and communication theory, and systems theory relevant to managing an organization's information resources. Includes computer hardware and software, telecommunications, and database concepts and emphasizes the e-commerce and Internet based business models to get a competitiveness of global based business environments. This course meets the requirements for a Technology Intensive course.
8. **Course objectives:**
   - Student will be able to apply the concepts of systems and information to business
   - Student can address business needs for internet/electronic commerce
   - Students know how to apply development tools to business information systems.
   - Student discuss issues surrounding ethics, security, and global management as they relate to computer based information systems
9. **Textbooks and**

   references Textbooks

   - James A. O'Brien, George M. Marakas, Introduction to Information Systems, 14th edition, McGraw-Hill, 2011.

   References: Lecturer will provide references based on each specific topic.

10. **Course Learning** O**utcomes**

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Address business needs for internet/electronic commerce	(j) a knowledge of contemporary issues
	2. Discuss issues surrounding ethics, security, and global management as they relate to computer based information systems	
Skill	4. Apply the concepts of systems and information to business	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
	5. Apply development tools to business information system	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Attitude	6. To develop a life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation Time:

15 weeks for theory.

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Organization & Information Systems Changing Environment and its impact on Business The IT/IS and its influence The Organization: Structure, Managers and activities Data, information and its attributes
2	Data, information and its attributes The level of people and their information needs Types of Decisions and information Information System, categorization of information on the basis of nature and characteristics
3	Data, information and its attributes The level of people and their information needs

Week	Topics
	Types of Decisions and information Information System, categorization of information on the basis of nature and characteristics
4	**KINDS OF INFORMATION SYSTEMS:** - Transaction Processing System (TPS) - Office Automation System (OAS) - Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support System (EIS or ESS).
5	**System Analysis and Development and Models** - Need for System Analysis - Stages in System Analysis - Structured SAD and tools like DFD - Context Diagram Decision Table and Structured Diagram.
6	**System Development Models:** - Water Flow, Prototype, Spiral, RAD - Roles and responsibilities of System Analyst - Database Administrator and Database Designer
7	**System Development Models:** - Water Flow, Prototype, Spiral, RAD - Roles and responsibilities of System Analyst - Database Administrator and Database Designer
8	Review
9	**Manufacturing and Service Systems**: - Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - I Am in a hospital, hotel, and bank.
10	**Manufacturing and Service Systems**: - Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - I Am in a hospital, hotel, and bank.
11	**Enterprise System:** - Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation

Week	Topics
	- Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases. Knowledge Management and e-governance.
12	**Enterprise System:** - Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation - Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases. Knowledge Management and e-governance.
13	**Choice of IT:** - Nature of IT decision - Strategic decision - Configuration design and evaluation - Information technology implementation plan
14	**Choice of IT:** - Nature of IT decision - Strategic decision - Configuration design and evaluation - Information technology implementation plan
15	Review

13. Course Assessment

13.1. Grading:

Assessment component (1)	Assessment form (A.x.x) (2)	Percentage % (3)
A1. Process assessment	A1.1 Assignment	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	20%
	A2.2 Laboratory Exam	10%
A3. Final assessment	A3.1 Full Semester Project	15%
	A3.2 Final exam	30%
	A3.3 Laboratory Exam	10%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam**	Address business needs for internet/electronic commerce Apply the concepts of systems and information to business	x												15
2	**- Midterm exam** **- Final exam** **- Quiz**	Apply the concepts of systems and information to business Apply development tools to business information system.	x												20
3	**- Midterm exam** **- Final exam** **- Quiz**	Apply the concepts of systems and information to business Apply development tools to business information system.	x						x						40
4	**Final exam**	Apply the concepts of systems and information to business Apply development tools to business information system.										x			10
5	**Presentation and discussion**	Apply development tools to business information system.						x							5
6	**Presentation and discussion**	Apply development tools to business information system.						x							5
7	**Presentation and discussion**	Apply development tools to business information system.						x							5
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

QUALITY MANAGEMENT

Instructor: M.Sc. Duong Vo Nhi Anh

1. **Name of course**: QUALITY MANAGEMENT
2. **Course code:** IS025IU
3. **Course type:**

☐ Specialization

☐ Core

☒ Requirement

☐ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits

5. **Prerequisite:** Engineering Probability & Statistics
6. **Parallel teaching in the course:** None

7. Course Description: Introduction to the principles of quality management, with an emphasis on cross-functional problem solving. This course will provide a basic understanding of the philosophy, conceptual frameworks and the tools of Total Quality Management.

8. Course objectives: The course provides students with understanding of the laws, principles and phenomena in the field of quality management and how to adopt the theoretical and practical knowledge and skills in the field of quality management.

9. Textbooks and references: Textbooks:

13 D.L. Goetsch and Stanley B. Davis, Quality Management (Prentice Hall, 2006).

14 Howard S. Gitlow et. al., Quality Management (McGraw Hill, 2005).

References: Barry Render, Quantitative analysis for management (Prentice Hall, 2006).

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
Knowledge	1. To increase understanding of the philosophy of quality management, its principles, and its applications.	(a) An ability to apply knowledge of mathematics, science, and engineering (d) An ability to function in multidisciplinary teams

	2. To obtain a clearer understanding of the problems and opportunities in the business environment through analysis, in the light of theory, of actual practices from other organizations.	(a) an ability to apply knowledge of mathematics, science, and engineering
	3. Describing and discussing various approaches to improvement and innovation.	(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skill	4. Applying of methods to meet the needs of the industrial sector in Vietnam	(c) An ability to design a system, component, or process to meet desired needs within realistic
Attitude	6. To develop a life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topic
1	Introduction to Quality Management Fundamentals of quality: process basics, types of quality, relationship between quality and cost and productivity.
2	Why Total Quality Management Definitions and basic principles How to realize TQM: three components of TQM, quality and global competitiveness, environment of today. Why Total Quality Management in a Knowledge-Based Economy? Breaking out of the negative circle

3	Introducing the Three Pillars of TQM Quality Planning: Quality parameters- needs of customers and employees. Quality Control: Measuring and process analysis Quality Improvement & Problem Solving Method-SCRA.
4&5	Behavioral Component of TQM Establishing a quality culture, conditions for a successful TQM policy, increasing the quality of cooperation processes, TQM & the strategy of change, How can the behavioral component be developed? Management components of TQM: Role of Top Management/ Task-oriented meetings. Roadmap to business excellence
6	Technical components of TQM: Quality Systems and Quality Assurance Quality tools: ISO, …
7	Review
8	Technical components of TQM (cont) ISO and other statistical tools. Collection and presentation of data
9, 10, 11	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chart: 7 rules.
12	Standard Operating Procedures (SOP)
13	Quality Function Deployment (QFD
14	Review

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	Homeworks Group Project	Identify and discuss features of appropriate concepts and methods in Quality management.		x	x		x	x						x	30
2	**- Midterm exam**	Understand the mathematical and statistical properties of classes of quality management principles and practices by getting more than 50% points of the test.	x			x	x		x						30
3	**- Final exam**	Enable to evaluate and provide process stability conditions and countermeasures for process instability by getting more than 50% points of the test.	x	x		x	x		x	x			x		40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

PROJECT MANAGEMENT

Instructor: Tran Van Ly

1. **Name of course**: PROJECT MANAGEMENT
2. **Course code:** IS026IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☒ Requirement
   - ☐ Elective
4. **Course level**
   - ☒ Undergrad; ☐ Master; ☐ Both
5. **Number of credits:** 3 credits
   - Theory: 3 credits
   - Laboratory: Nil
6. **Prerequisite:** Nil
7. **Parallel teaching in the course:** Nil
8. **Course it replaces: NA**
9. **Course standing in curriculum:** Year 2 ISE undergrad program (see curriculum mapping in student handbook)
10. **Course Description**: This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.
    In addition, this course also provides computer aid for project management by introducing the application of Microsoft Project and project scheduling.
11. **Course objectives:**
    - Discuss leadership challenges of managing projects and various solutions.
    - Introduce the fundamentals of Project Management (PM) through an in-depth examination of key Knowledge Areas.
    - Examine the characteristics, techniques, and challenges associated with initiating, planning, executing, controlling and closeout of projects.
    - Develop a personal project management perspective and philosophy
12. **Textbooks and references:**

Textbooks:

-Book name: A Guide to the project management body of knowledge (PMBOK® Guide). 4th Edition, Newtown Square, Pa. : Project Management Institute, Inc., c2008.

References:

-Project management: a managerial approach / Jack R. Meredith, Samuel J. Mantel. 7th edition, Hoboken, N.J. : Wiley ; Chichester : John Wiley [distributor], 2009.

-The project management life cycle/ Jason West land. Kogan Page Limited, 2006.

13. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcomes**
	1. Able to understand the foundation knowledge on project management which strengthens their competence on competitive labor market, as well as equip them with a strong skill to organize and manage the project in the future career.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
	2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders	(d) An ability to function in multidisciplinary teams (g) An ability to communicate effectively
	3. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle.	(d) An ability to function in multidisciplinary teams
	4. Able to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
	5. Able to implement general business concepts, practices, and tools to facilitate project success.	

	6. Able to apply appropriate legal and ethical standards. Adapt project management practices to meet the needs of	(i) a recognition of the need for, and an ability to engage in life-long (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

14. Course implementation

Time: 15 weeks for theory (03 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group Project

15. Course outline

Week	Topics	Teaching and learning activities	Assessment
1	+ Course introduction + Introduction of Project management + The project life cycle and organization	- Lecture - Class discussion	
2	- Project management processes for a project + Common project management process interactions. + Project management process groups. + Initiating process group + Planning process group	- Lecture - Class discussion	Homework
3	- Work breakdown structure (WBS)	- Lecture - Class discussion	Quiz 1
4	- Project scheduling. + Constructing the network: AON & AOA + Gantt chart + Solving the network + Using Microsoft Project software	- Lecture - Class discussion	Homework
5	- Resource allocation + Critical path method – Crashing a project	- Lecture - Class discussion	Homework

	+ Resource allocation problem + Resource loading + Resource leveling + Constrained resource scheduling		
6	- Logical Framework Approach (LFA) (part 1)	- Lecture - Class discussion	Homework
7	- Logical Framework Approach (LFA) (part 2) - Review	- Lecture - Class discussion	Homework
Midterm exam			**Written exam**
8	- Project cost management Project budgeting & Cost estimation + Top-Down budgeting + Bottom-Up budgeting + Improving the process of cost estimation	- Lecture - Class discussion	Homework
9	- Risk management. + Risk management planning + Risk identification + Risk analysis + Risk monitoring and control + Using Crystal Ball software	- Lecture - Class discussion	Quiz 2
10	- Project quality management + Plan quality + Perform quality assurance + Perform quality control	- Lecture - Class discussion	Quiz 3
11	- Project human resource management + Develop human resource plan + Acquire project team + Develop project team + Manage project team	- Lecture - Class discussion	Homework
12	- Project procurement management + Plan procurements + Conduct procurements + Administer procurements + Close procurements	- Lecture - Class discussion	Homework
13	- Project executing. - Project monitoring & control.	- Lecture - Class discussion	Homework

14	- Project closing - Presentation of term project (part 1)	- Lecture - Group presentation Class discussion	Homework Group Project
15	- Presentation of term project (part 2) - Review	- Lecture - Group presentation Class discussion	Group Project
FINAL EXAMINATION			**Written exam**

16. Course Assessment

16.1 Grading:

Assessment component (1)	**Assessment form (A.x.x) (2)**	**Percentage % (3)**
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
A3. Final assessment	A3.1 Full Semester Project	15%
	A3.2 Final exam	40%

16.2 Assessment Plan:

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Homework** **- Quiz**	Characterizing the project life cycle and organization, project management processes; quantifying risk and probability of project completion time		x											15
2	**- Midterm exam** **- Final exam** **- Homework** **- Quiz** **- Group Project**	Applying of methods to identify and analyze deliverables, risk; success factor generate WBS; construct the network, Gantt chart, LFA; decide to crash a project,	x				x								30
3	**- Midterm exam** **- Final exam** **- Quiz** **- Homework**	Developing and managing cost, quality, procurement: determine critical path, slack time, project completion time; construct project charter, baseline budget; calculate CPI, SPI; establish status report		x						x					40
4	**Presentation and discussion**	Identification of the necessary and application of project management for a selected Group Project			x									x	15
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

17. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

LOGISTICS ENGINEERING AND SUPPLY CHAIN DESIGN

Instructor: Dr. Nguyen Van Hop

1. **Name of course**: LOGISTICS ENGINEERING & SUPPLY CHAIN DESIGN
2. **Course code:** IS078IU
3. **Course type**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits

   - Theory: 3 credits
5. **Prerequisite:** Deterministic Models in OR
6. **Parallel teaching in the course:** None
7. **Course Description**

   This course aims to

   ● Develop an understanding of concepts and key points of Supply Chain Management.

   ● Develop an understanding of Logistics and Supply Chain structure, and how to design an effective supply chain.

   ● Formulate and solve problems related to logistics and supply chain with optimization techniques.
8. **Course objectives**

   - Students can distinguish different concepts and problems in Logistics and Supply Chain Management.
   - Students know how to formulate and solve different logistics and supply chain problems by using mathematical techniques.
   - Students know how to solve the models using computer-based software such as CPLEX, LINGO, Python, Matlab.
   - Students can solve practical problems, and interpret the solutions.
9. **Textbooks and**

   references:

   Textbooks:

   - Simchi-Levi, D., Kaminsky, P., and Simchi-Levi, E. (2008). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*. Boston: McGraw-Hill/ Irwin.

   References:

- Chopra, S., and Meindl, P. (2012). *Supply chain management: Strategy, Planning and Operation, 5th ed.*. NY: Prentice Hall.
- Mankiw NG (2011*). Principles of Economics, 5th edition*. South-Western Cengage Learning.
- Simchi-Levi, D., Chen, X., Bramel, J. (2014). *The Logic of Logistics Management.* Springer Series in Operations Research and Financial Engineering.

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
	1. Understand different concepts in the Logistics and Supply Chain Management discipline and understand how to manage Supply Chain and Logistics in real companies.	(a) an ability to apply knowledge of mathematics, science, and engineering
	2. Understand primary challenges in supply chain, including risk pooling, bullwhip effect, supply contracts, outsourcing strategies, and distribution network, revenue management.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
	3. Understand and apply supply chain integration into supply chain design.	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems
	4. Formulate logistics and supply chain related problems under Mathematical Programming techniques and solve them in LINGO, CPLEX, Python software, etc.	(a) an ability to apply knowledge of mathematics, science, and engineering (c) an ability to design a system, component, or process to meet desired needs within realistic constraints (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
	5. Apply to solve real-life problems in	(c) an ability to design a system, component,

	supply chain management.	or process to meet desired needs within realistic constraints
	6. Work in a team to solve supply chain-related problems and case studies	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course implementation

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations, games
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Introduction to Supply Chain Management
2, 3, 4	Chapter 2: Inventory management and Risk Pooling - Risk pool game
5	Chapter 3: Network Planning - Distribution resource planning - Multi-echelon network design
6	Chapter 4: Distribution strategies - Decentralized distribution strategy - Centralized distribution strategy
7	Review
Midterm	

Week	Topics
8	Chapter 4: Supply contracts
9	Chapter 5: The value of information - Beer game
10, 11	Chapter 6: Aggregate Production Planning
12	Chapter 7: Coordinated product and supply chain design
13, 14	Chapter 8: Smart pricing & revenue management

13. Course Assessment:

13.1. Grading:

- In-class quizzes and activities:15%
- Group assignment: 20%
- One midterm exam: 25%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain											
			Applying			Analyzing			Evaluating			Creating		
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P
1	**- Quizzes and activities** **- Midterm** **- Final exam**	Understand different concepts in the Industrial System Engineering discipline and understand how to manage Supply Chain and Logistics in real companies.		x			x							
2	**- Quizzes and activities** **- Midterm** **- Final exam**	Understand primary challenges in supply chain, including risk pooling, bullwhip effect, supply contracts, outsourcing strategies, and distribution network, revenue management.		x	x					x	x			
3	**- Group assignment**	Understand and apply supply chain integration into supply chain design.					x				x			
4	**- Quizzes and activities** **- Group assignment**	Formulate logistics and supply chain related problems under Mathematical Programming techniques and solve them in LINGO, CPLEX, Python software, etc.		x			x						x	
	Total													

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

PROBABILISTIC MODELS IN OPERATIONS RESEARCH

Instructor: Dr. Phan Nguyen Ky Phuc

1. **Name of course**: PROBABILISTIC MODELS IN OPERATIONS RESEARCH
2. **Course code:** IS024IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits
   - Practice: 0 credit

5. **Prerequisite:** Engineering Probability & Statistics
6. **Parallel teaching in the course:** None
7. **Course Description**: This course is to introduce the fundamental probabilistic models in the operation research field. The course shows how a probabilistic system can be analyzed and come up with formulas. Topics to be covered include: random variable, discrete distribution, continuous distribution, joint distribution, expectation, Markov Chain, Poisson Process, queueing model, and reliability.
8. **Course objectives:**

   - Students know how to formulate and solve problems related to discrete and continuous distribution.
   - Students know how to model the system by using Markov chain
   - Student know how to model the system by Poisson process
   - Students know how to model the queueing system
   - Students know how to compute the reliability of the system.

9. **Textbooks and references:**

   Textbooks: Sheldon M. Ross, Introduction to Probability Models, 2014, 11th edition.

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Able to differentiate several discrete and continuous distributions. Compute the joint distributions.	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems
	2. Able to formulate a system by using Markov Chain	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems
	3. Able to formulate a system corresponding to the Poisson Process	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems
Skill	4. Able to formulate and analyze different queuing model	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Skill	5. Able to calculate the reliability of a system	
Attitude	6. To develop a life-long learning attitude.	(e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course implementation

Time: 13 weeks for theory (04 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

12. Course outline

Week	Topics
1	**Chapter I: Introduction and Descriptive Statistics** Introduction Sample and Populations

	Data and Data Collection Percentiles and Quartiles Measures of Central Tendency: Mean, Mode, Median Measures of Variability: Range, Variance, Standard Deviation Grouped Data and Histogram Relationship between the Mean and the Standard Deviation: Chebyshev's Theorem, Empirical Rule Methods of Displaying Data: pie chart, bar chart, frequency polygon and ogive, time plot Exploratory Data Analysis: Stem and Leaf display, box plot
2 + 3	**Chapter II: Probability** Basic Definitions: Events, Sample Space Probabilities: Basic rules for Probability, range of value, rule of complements, mutually exclusive events, conditional probability Independence of events, product rules for independence events Combinatorial concepts: factorial, permutation, combination The law of total probability and Bayes' theorem
4 + 5	Chapter III: Random Variables and Normal Distribution Discrete and continuous random variables Probability distribution function Cumulative distribution function Expectation and properties Variance and standard deviation of a random variable Covariance and correlation Chebyshev's theorem Binomial distribution Hypergeometric distribution Poisson distribution Continuous random variable Uniform distribution Exponential distribution and the memoryless property

	Normal distribution
6	**Chapter IV: Sampling and sampling distributions** Sample Statistics as Estimators of Population Parameters. Sampling Distributions. The Central Limit Theorem. The Standardized Sampling Distribution of the Sample Mean when σ is not known. The Sampling Distribution of the Sample Proportion. The Sampling Distribution of the Sample Variance. Estimators and Their Properties: Unbiasedness, Efficiency, Consistency, Sufficiency. Degrees of Freedom.
8	**Chapter V: Confidence Intervals** Maximum likelihood Estimators and Interval Estimators. Confidence Interval for the Population Mean when the Population Standard Deviation is Known. Confidence Interval for the Population Mean when the Population Standard Deviation is Unknown. The t distribution. Large-Sample Confidence Intervals for the Population Proportion p. Confidence Intervals for the Population Variance. The Chi-square Distribution. Sample-Size Determination.
9	**Chapter VI: Hypothesis Testing** The Concepts of Hypothesis Testing. Type I and Type II Errors. The Significance Level. The Test Statistics. One-tailed and Two-tailed Tests. Testing for Population Means. Testing for Population Proportions. Testing for Population Variances.

	p-value Calculation. Optimal α and the Compromise between Type I and Type II Errors. β and the Power.
10	**Chapter VII: Comparison between two populations** Paired-Observation Comparisons: The Hypothesis Testing for the Difference between Means, The Confidence Interval for the Difference between Means. A Test for the Difference between Two Population Means Using Independent Random Samples: Cases in which the Test Statistic is Z, Cases in which the Test Statistic is t. A Large-Sample Test for the Difference between Two Population Proportions. The F Distribution and a Test for Equality of Two Population Variances. The Statistical Test for Equality of Two Populations Variance.
11	Chapter VIII: Analysis of Variance The Hypothesis Test of ANOVA. Assumptions. The Test Statistics. The Theory and Computations of ANOVA: The Sum-of-Squares Principle, The Degrees of Freedom, The Mean Squares, The F Statistic. The ANOVA Bång and Example of ANOVA. Further Analysis. The Tukey Pairwise-Comparisons Test.
12 + 13	**Chapter IX: Regression** Single Regression Model and k-Variable Multiple Regression Model. Model Assumptions. The Estimated Regression Relationship. The F Test of a Multiple Regression Model. How Good is the Regression. Tests of the Significance of Individual Regression Parameters.

	Testing the Validity of the Regression Model. Residual Plot. Using the Multiple Regression Model for Prediction. Multicollinearity. The Variance Inflation Factor. Solutions to the Multicollinearity Problem. Partial F Tests and Variable Selection Methods.
14	**Chapter X: Nonparametric Testing** The Sign Tests. The Rank Tests: Mann-Whitney U Test, Wilcoxon Signed-Rank Test. The Chi-squared Test: Goodness of Fit Test, Independent Test.

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:** Questions: 1	Able to understand, calculate, and present basic statistics for a given dataset including numerical and visualization		x			x								5
2	**- Midterm exam:** Questions: 2	Able to understand, calculate, and solve probability based problem		x			x								5
3	**- Midterm exam:** Questions: 3-4	Able to understand, calculate, and solve problems relating to random variables		x			x								10
4	**- Midterm exam:** Questions: 5-6	Able to understand the concept of sampling process, sampling distribution, and the relationship between sample and population		x			x								10
5	**-Final:** Question 1-3	Able to perform hypothesis testing for population mean, population variance including single and multiple populations		x			x			x					20
6	**-Final:** Question 4-6	Able to understand, construct, and analysis linear regression model including single or multiple variables		x			x			x					20
7	**-Quizz Q1,2,3**	All relating goals		x			x			x					30
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

SIMULATION MODELS IN IE

Instructor: Dr. Pham Huynh Tram

1. **Name of course**: SIMULATION MODELS IN INDUSTRIAL ENGINEERING
2. **Course code:** IS028IU
3. **Course type:**

☐ Specialization

☒ Core

☒ Requirement

☐ Elective

4. **Number of credits:** 4 credits

- Theory: 3 credits
- Practice: 1 credit

5. **Prerequisite:** Engineering Probability & Statistics
6. **Parallel teaching in the course:** None
7. **Course Description**

Modeling and analysis of industrial and service systems, modeling perspectives, discrete event and continuous simulation, model building using ARENA/SIMAN, statistical aspects of simulation.

8. **Course Objectives**

- Students know how to analyze existing systems via simulation models.
- Students can design, conceptualize, and model the existing systems with simulation software such as ARENA.
- Students can make improvements throughout the results of simulation models.
- Students can interpret the solutions.
- Students can solve practical problems

9. **Textbooks and references**

Textbooks

- Banks, J., Carson, J. S., Nelson, B. L., and Nicol, D. M., Discrete-Event System Simulation, 4th edition, Prentice-Hall, 2005.

References

- Kelton, W. D., Sadowski, R. P., and Sturrock, D. T., Simulation with Arena, McGraw Hill, New York (fourth edition), 2006.

10. **Course Learning Outcomes**

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
Knowledge	Gain model building experience through various case studies involving simulation of industrial systems.	(a) an ability to apply knowledge of mathematics, science, and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (e) an ability to identify, formulate, and solve engineering problems
	Be able to model and analysis of manufacturing and service systems, discrete-event and continuous simulation using various levels of ARENA/SIMAN, and statistical aspects of simulation including input analysis, random variety generation, output analysis, and variance reduction techniques	(a) an ability to apply knowledge of mathematics, science, and engineering (b) an ability to design and conduct experiments, as well as to analyze and interpret data (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (j) a knowledge of contemporary issues (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Attitude	Be able to identify problems and seek improvement throughout simulation results	(j) a knowledge of contemporary issues (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course Outline

Week	Content	Learning outcome	Teaching and learning activities	Assessment
1	Introduction	G1	-Lecture -Presentation	Homework Assignment
2&3	Introduction to performance evaluation	G2	-Allocation -Forming study groups	Homework Assignment Group project
4&5	Basics of discrete-event simulation	G2	- Lecture - Class discussion	Homework Assignment Group project

6	Random Numbers	G2	- Lecture - Class discussion	Homework Assignment Group project
7	Review		- Lecture - Class discussion	Homework Assignment Group project
Midterm exam				**Written exam**
8&9	Input modeling	G2, G3	- Lecture - Class discussion	Homework Assignment Group project
9&10	Verification and validation of simulation models	G2, G3	- Lecture - Class discussion	Homework Assignment Group project
10&12	Output analysis and statistical issues	G2, G3	- Lecture - Class discussion	Homework Assignment Group project
13	Validation and Comparison	G2, G3	- Lecture - Class discussion	Homework Assignment Group project
14	Presentation	G1, G2, G3	- Lecture - Class discussion	Group project
15	Review		- Lecture - Class discussion	
FINAL EXAMINATION				**Written exam**

Lab Information

- **Title**: Simulation Models in Industrial Engineering Lab.
- **Units of Credit**: 1 (~ 30hrs)
- **Level**: 3rd year students
- **Time allocation**: 3hrs/week
- **Description**: This lab gives students opportunities to observe, analyze and build the simulation model regarding real industry systems by simulation software.
- **Co-requisite**: Simulation Models in Industrial Engineering.

Lab No.	Lab title	Learning Outcomes	Week
1	Introduction to ARENA-Examples - How to install and use simulation software - Create, dispose, process modules	G1	1
2	Basic process of ARENA-Examples	G1, G2	2

	- Assign, Decide, Batch, Separate modules - Identify entity type, attributes, variables - Declare type of resources and capacity		
3	Advanced Process of ARENA-Examples - Hold, Match modules - Seize, Delay, Release modules - *Example: Assembly Production*	G1, G2	3
4	Review Midterm	G1, G2	4
5	Advanced Transfer of ARENA-Examples - Route, Station, Move, PickStation module - Assign sequence - *Example: Job-shop*	G1, G2	5
6	Advanced Transfer of ARENA-Examples (Cont) - Request, Transport, Free, Conveyor modules - Declare type of transporter and capacity - *Example: Transportation, Pick-up in warehouse*	G1, G2	6
7	Simulation results: - Read reports - Analyze reports	G2, G3	7
8	Review	G1, G2, G3	8

12. Course Assessment

Assessment component (1)	**Assessment form (A.x.x) (2)**	**Percentage % (3)**
A1. Process assessment	A1.1 Assignment	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	20%
	A2.2 Laboratory Exam	10%
A3. Final assessment	A3.1 Full Semester Project	15%
	A3.2 Final exam	30%
	A3.3 Laboratory Exam	10%

Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	Midterm examination, Homework	Understand the randomness characteristics system		x			x								25
2	Final examination, homework	Able to simulate random variety generation		x			x								25
3	Group project	Able to do simulation modeling and analysis of manufacturing and service systems, discrete-event and continuous simulation			x			x			x			X	30
4	Final examination, homework	Able to seek improvement via simulation		x			x			x			X		20
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

13. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

SCHEDULING AND SEQUENCING

Instructor: Dr. Phan Nguyen Ky Phuc

1. **Name of course**: SCHEDULING AND SEQUENCING
2. **Course code:** IS027IU
3. **Course type:**

☐ Specialization

☒ Core

☒ Requirement

☐ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits
- Practice: 0 credit

5. **Prerequisite:** Deterministic Models in OR
6. **Parallel teaching in the course:** None
7. **Course Description**

This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.

8. **Course objectives:**

- Students can distinguish different problems in sequencing and scheduling in manufacturing and services.
- Students know how to formulate and solve different scheduling problems by using mathematical techniques.
- Students know how to solve the models using computer-based software such as CPLEX, Python, Matlab.
- Students can interpret the solutions.
- Students can solve practical problems.

9. **Textbooks and references:**

Textbooks

- M. L., Pinedo, *Scheduling: Theory, Algorithms, and Systems*, 3rd edition, Springer, 2008. understanding of alternative solution methodologies available in solving manufacturing scheduling problems

References

- N/A

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Able to recognize different shop configurations, manufacturing scheduling problems, and performance measures.	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems (j) a knowledge of contemporary issues
	2. Able to identify basic algorithms and procedures to use in different shop configurations.	(a) an ability to apply knowledge of mathematics, science and engineering (c) an ability to design a system, component, or process to meet desired needs within realistic (e) an ability to identify, formulate, and solve engineering problems
	3. Able to understand alternative solution methodologies available in solving manufacturing and service scheduling problems.	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems
	4. Able to formulate scheduling and sequencing problems under Mathematical Programming techniques and solve them in LINGO, CPLEX, Python software	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (j) a knowledge of contemporary issues
Attitude	6. To develop a life-long learning attitude.	(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

11. Course implementation

Time: 13 weeks for theory (04 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

12. Course outline

Week	Content
1	Introduction: Scheduling function in an enterprise, Examples to scheduling problems.
2	Models, notation, constraints, objectives. Problem classification and complexity.
3&4	Single machine scheduling
5&6	Exact methods, Heuristics and Metaheuristics in single- machine scheduling
7	Review
Midterm	
8	Flow shop scheduling
9&10	Open shop scheduling
11&12	Job shop scheduling
13	General purpose scheduling procedures and their application to machine scheduling: Dispatching rules and others.
14	Presentation
15	Review

13. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:** Questions: 1-3	Recognize different shop configurations, manufacturing scheduling problems, and performance measures.		x			x								15
2	**- Midterm exam:** Questions: 4-5	Identify basic algorithms and procedures to use in different shop configurations.		x			x								15
4	**-Final:** Question 1-3	Understand alternative solution methodologies available in solving manufacturing and service scheduling problems.		x			x			x					20
5	**-Final:** Question 4-5	Formulate scheduling and sequencing problems under Mathematical Programming techniques and solve them in LINGO, CPLEX, Python software		x			x			x			x		20
6	**-Quizz Q1,2,3**	All relating goals		x			x								30
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

INTERNATIONAL TRANSPORTATION AND LOGISTICS

Instructor: Duong Vo Nhi Anh

1. **Name of course**: INTERNATIONAL TRANSPORTATION & LOGISTICS
2. **Course code:** IS067IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☒ Requirement
   - ☐ Elective
4. **Number of credits:** 3 credits
   - Theory: 3 credits
   - Practice: 0 credit
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**:

This subject is intended to help students understand both the fundamental role and importance of transportation in companies and in our society, and the complex environment in which transportation service is provided today. This subject takes a managerial approach to teaching transportation concepts and issues, providing students the tools to adapt to this fast-paced and rapidly changing industry. The content is organized into three parts. Part I contains two chapters, Transportation, the Supply Chain and the Economy and Transportation Regulation and Public Policy. In these two chapters the role and importance of transportation in the supply chain management and the economy are explored along with an overview of transportation regulation and public policy. Part II addresses the traditional modes of transportation including special carriers and global transportation. There are six chapters that examine the fundamental economic and operating characteristics of each mode along with special carriers and global transportation. Part III discusses transportation management from both the shipper and carrier perspective. The five chapters give attention to transportation costing and pricing, carrier strategy, information management and technology, and shipper transportation management strategy and process.

8. **Course objectives:** Complete this course, students are able to:
   f) Understand scope, functions, and activity of transportation systems in the Supply Chain.
   g) Understand the role and characteristics of transportation modes in the supply chain management and the economy.
   h) Understand different carrier strategies and shipper transportation management strategy and process

i) Know how to determine transportation costing and pricing

j) Know how to plan and manage transportation activities and services

k) Know how to design a transportation network and delivery system

9. Textbooks and references: Textbooks

9.1. Coyle, John J., Robert A. Novack, Brian J. Gibson, *Transportation*, 8th edition. South-Western Cengage

References

9.2. E. Cascetta (2009) *Transportations systems analysis: models and applications*. Springer

9.3. Gentile G. and Noekel K. (2016) *Modeling public transport passenger flows in the era of Intelligent Transport Systems*. Springer

9.4. Murphy and Wood, Contemporary Logistics Management, 10th edition,; Prentice Hall Bowersox, Donald J., Closs, David J., Cooper M. Bixby, and Bowersox, John C, Supply Chain Logistics Management, 4th edition, McGraw-Hill/Irwin, Burr Ridge.

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
Knowledge	**1.** Understand scope, functions, and activity of transportation systems in the Supply Chain.	(j) a knowledge of contemporary issues
	2. Understand the role and characteristics of transportation modes in the supply chain management and the economy.	(a) An ability to apply knowledge of mathematics, science and engineering (j) a knowledge of contemporary issues
	3. Understand different carrier strategies and shipper transportation management strategy and process	(h)The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	4. Know how to determine transportation costing and pricing	(a) An ability to apply knowledge of mathematics, science and engineering
	5. Know how to plan and manage transportation activities and services **6.** Know how to design a transportation network and delivery system	(a) An ability to apply knowledge of mathematics, science and engineering (h)The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Attitude	**7.** To develop a life-long learning attitude.	(h)The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

11. Course implementation

Time: 15 weeks for theory (03 periods per week) .

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homeworks
- Team work: Group assignments

12. Course outline

Week	Topics
1	Chapter1: Introduction to Transportation and Logistics in Supply Chain
2	Chapter 2: Transportation Modes – road transportations
3	Chapter 2: Transportation Modes – air shipments
4	Chapter 2: Transportation Modes – water and ocean shipments
5	Chapter 2: Transportation Modes – railway and pipelines
6	Chapter 3: Costing and Pricing for Transportation
7	Chapter 4: Private Transportation and Fleet Management
8	**Review**
9	Chapter 5: Third Party Logistics
10	Chapter 6: Global Transportation
11	Chapter 7: Transportation Risk Management
12	Chapter 8: Transportation Planning: Supply and Demand
13	Chapter 9: Route choice and static assignment
14	Chapter 10: Network design
15	Review

13. Course Assessment:

13.1. Grading:

- Assignments, Group Presentations: 20%
- In-class quizzes: 10%
- Midterm exam: 30%
- Final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			R	WQ	P	R	WQ	P	R	WQ	P	R	WQ	P	
1	**- Assignments**	All Chapters		x			x			X					10
2	**- Presentation and discussion**	Cases Studies in Chapters 2, 3,4,5,7	x			x					x			x	10
3	**- Quizzes**	- Formulate transportation problems: loading, scheduling, assignment - Applying solution methods to calculate transportation costs, design transportation network and routes	x	x					x	x		x	x		10
4	**- Midterm exam**	- understanding different issues in transportations mode - know how to calculate costs and prices - applying management methods for private fleets		x			x						x		30
5	**- Final exam**	-Identification of transportation risks - determine and identify third party logistics and global transportation issues - Know how to plan to deliver freight to customers in the most efficient way - Applying techniques to mitigate risks, assign and select routes, design an appropriate transportation networks		x			x			x			x		40
	Total														100

Note: R : Report ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

MATERIALS HANDLING SYSTEMS

Instructor: Dr. Nguyen Van Chung

1. **Name of course**: MATERIALS HANDLING SYSTEMS
2. **Course code:** IS059IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits (45 periods)

   - Theory: 39 periods

   - Practice: 06 periods

5. **Prerequisite:** Production Management
6. **Parallel teaching in the course:** None
7. **Course Description**: Introduce proper methods for material handling and storage including safety practices, proper equipment usage, engineering controls, and personal protective equipment. Included are procedures for storage of non-hazardous and hazardous materials, material handling equipment preventative maintenance, and motor fleet safety.
8. **Course objectives:** The course provides students with basic understanding and advanced concepts of materials Handling Systems for applications in industrial plants.
9. **Textbooks and references: Textbooks:**

   - T.H. Allegri, "Materials Handling: Principles & Practice", Krieger Publishing, Malabar, Florida, 1992
   - Ray, Siddhartha, "Introduction to Materials Handling", New Age International Publishers, 2008.

   References:

   - Charles Reese, "Material Handling Systems: Designing for Safety and Health", CRC Press, 2000.
   - Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing, 3rd edition, Prentice Hall, 2007.
   - J. A Tompkins et al. "Facilities Planning", John Wiley & Sons, Inc., New York, 1996.

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Develop an understanding of the principles of designing and analyzing materials handling systems	(e) an ability to identify, formulate, and solve engineering problems
	2. Identification of materials handling and storage problems	(c) an ability to design a system, component, or process to meet desired needs within realistic (e) an ability to identify, formulate, and solve engineering problems
	3. The emphasis will be on modeling the system performance of the materials handling systems and storages	(b) an ability to design and conduct experiments, as well as to analyze and interpret data (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
	4. Introduce methods for materials handling and storage including safety practices, proper equipment usage, engineering controls.	
Attitude	5. To develop a life-long learning attitude.	(f) An understanding of professional and ethical responsibility

11. Course implementation

Time: 13 weeks for theory (03 periods per week) and 2 weeks for practice (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Teamwork: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Introduction to Materials Handling

Week	Topics
2	Chapter 2: Unit Loads and Containerization
3	Chapter 3: The effects of Flow and Movement on Plant Output
4	Chapter 4: Receiving, Shipping, and In-process Handling
5	Chapter 5: Transport Systems: AGVs
6	Chapter 6: Layout/material handling integration: Storage systems automated
7, 8	Chapter 7: Layout/material handling integration: AS/RS
9	Chapter 8: Distribution Systems: Storage space allocation
10, 11	Chapter 9: Distribution Systems: Order picking operations
12	Chapter 10: Distribution Systems: Sortation systems
13	Chapter 11: Organization, Maintenance and Safety

Lab Outline:

Week	Topics
1	Open-CIM lab: Conveyor, robot
2	Open-CIM lab: AS/RS

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Quiz**	Develop an understanding of the principles of designing and analyzing materials handling systems: conveyors	x	x			x			x					15
2	**- Midterm exam** **- Quiz**	Develop an understanding of the principles of designing and analyzing materials handling systems: AGVs	x	x			x			x					15
3	**- Final exam** **- Quiz**	Applying of methods to design storage systems automated: layout, AS/RS						x		x			x		20
4	**- Final exam** **- Quiz**	Applying of methods to design storage systems automated: order picking operation, sortation systems						x		x			x		20
5	**Lab**	Introduction to OpenCim, Programming of Conveyor, robot, AS/RS						x							25
6	**Presentation and discussion**	Identification of materials handling systems						x							5
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

FINANCIAL ACCOUNTING

Instructor: School of Business Administration

1. **General Information:**
   - Name of course: Financial Accounting
   - Course code: BA184IU
   - Course Lecturer:
2. **Course type:**
   - ☐ Specialization
   - ☒ Core
   - ☐ Requirement
   - ☐ Elective
3. **Number of credits:** 4 credits
4. **Prerequisite:** none
5. **Parallel teaching in the course:** None
6. **Course Description**: This course is designed to provide students with an understanding of the basic principles, concepts, and applications of financial accounting. The course aims to address fundamental accounting concepts and generally accepted principles underlying accounting theory and practices; the accounting cycle; preparation of financial statements including cash flows statements, income statement and balance sheet; accounting for cash, receivables, inventories, fixed and intangible assets, current, deferred and contingent liabilities.**Course objectives:** The course provides students with basic understanding and advanced concepts of nanotechnology for applications in drug delivery.
7. **Textbooks and references: Textbooks:**

   Financial & Managerial Accounting, 2nd edition, by Weygandt, Kimmel, and Kieso

   References: The lecturer will attempt to make lecture notes and additional reading available on Blackboard. However this is not an automatic entitlement for students taking this course. Note that this is not a distance learning course, and you are expected to attend lectures and take notes so that you will get the additional benefit of class interaction and demonstration.
8. **Course Learning Outcomes**

No	Course learning outcomes	Program Learning outcome
Knowledge	Identify the importance of accounting information in decision-making and its role within the business environment	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues
Skills	Appreciate, understand, and demonstrate the relevant procedures of the accounting information life cycle and transformation of accounting information during this process	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Attitude	Comprehend the development of accounting principles and policies through accounting theories and undertaking of the accounting professions	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues

9. Course implementation

It is expected that the students will spend at least ***nine*** **hours per week** studying this course. This time should be made up of reading, working on exercises and problems, and attending classes. In periods where they need to complete assignments or prepare for examinations, the workload may be greater. Due to time limits, the lecturer will not be able to cover all of the chapter's content in each lecture. Thus, students are expected to read the required material (e.g., textbook) in order to have a better understanding of the course.

From the third week, a three-hour tutorial will be offered every 2 weeks and will cover selected tutorial questions and homework.

10. Course outline

The following is the outline that sets topics for the course. The instructor reserves the right to revise this outline throughout the semester to either add or delete material as necessary to accomplish the goals of the course.

WEEK	TOPICS	CONTENTS
1	Lecture 1: Introduction to Accounting and Business - The Nature of Accounting and Business - Accounting Equation	Ch 1

	- Financial Statements	
2	Lecture 2: Analyzing Transactions - Double-entry Accounting System - Journalizing Entries and Posting Them to Accounts - Trial Balance	Ch 2
3	Lecture 3: Introduction to Vietnam Accounting Standards - Vietnam Accounting Standards - Asset accounts - Liability accounts - Owner's equity accounts	(Thông Tư Hướng Dẫn Chế Độ Kế Toán Doanh Nghiệp, 200/2014/Tt-Btc, Chapter 2: Accounting System)
4	Lecture 4: The adjusting process - Adjusting entries - Adjusted Trial Balance	Ch 3
5	Lecture 5: Completing the Accounting Cycle - Flow of Accounting Information - Closing Entries - Accounting Cycle	Ch 4
6	Lecture 6: Accounting for Merchandising Businesses - Financial Statements for a Merchandising Business - Merchandising Transactions	Ch 5
7	Lecture 7: Inventories - Inventory Costing Methods - Reporting Merchandising Inventory in the Financial Statements - Estimating Inventory Cost	Ch 6
8	Revision session and tutorials	
9	**Midterm**	
10	Lecture 8: Receivables - Direct write-off method for Uncollectible Accounts - Allowance Method for Uncollectible Accounts	Ch 8

12	Lecture 9: Cash & Fixed Assets - Cash Control - Bank Accounts - Bank Reconciliation - Depreciation Methods	Ch 7 & Ch 9
12	Lecture 10: Current Liabilities and Payroll - Current Liabilities - Payroll and Payroll Taxes	Ch 10
13	Lecture 11: Corporations: Organization, Stock Transactions and Dividends - Paid-In Capital - Accounting for Dividends - Reporting Stockholders' Equity - Stock Split	Ch 11
14	Lecture 12: Statement of Cash Flow - Reporting Cash Flows - The Indirect and Direct Methods	Ch 13
15	Lecture 13: Financial Statements Analysis - Basic Analytical Methods - Solvency and Profitability Analysis - Corporate Annual Reports	Ch 14
16	- Revision Session	
17 05/01/14	**Final**	

11. Course Assessment:

11.1 Formal Requirements

In order to pass this course, the students must:

- achieve a composite mark of at least 50; and
- make a satisfactory attempt at all assessment tasks (see below).

11.2 Assessment Details

Mid-Term Exam	30%
Homework & Quiz *	30%

Final Exam

4

0% Total

1

00%

*Extra credits can be given for those students **who actively participate in and contribute to the lectures**

Assessment Rationale

Quiz & Homework: Students will take quizzes and do homework on every class date.

Examination: Mid-term and final tests will be a combination of MCQ, short answer questions, and application problems.

Programmable calculators will not be allowed for use during the exams. The use of a programmable calculator will result in receiving a zero for the exams.

The examination schedule and room will be announced by the Office of Academic Affair. Any issues regarding the administration of, timetabling of and non-attendance at final examinations need to be directed to the Office of Academic Affair. **These issues are not the responsibility of the individual lecturer.**

Others: Students will not be allowed to attend the final exam if the students' result of either homework or mid-term exam is zero.

11.3 Class participation and Presentation

A minimum attendance of 80 percent is compulsory. Students will be assessed based on the basis of class attendance and participation

11.4 Special Consideration

*Requests for special consideration (for final examination only) must be made to the Office of Academic Affairs within **one week after the examination**. General policy and information on special consideration can be found at the Office of Academic Affairs.*

MULTI-CRITERIA DECISION MAKING

Instructor: Dr. Ha Thi Xuan Chi

1. **Name of course**: MULTI-CRITERIA DECISION MAKING
2. **Course code:** IS033IU
3. **Course type**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits

   - Theory: 3 credits
5. **Prerequisite:** Deterministic Models in OR
6. **Parallel teaching in the course: None**
7. **Course Description**

Decision making is one of the important parts in operations research or management science. Decision making techniques help management choose the best alternative based on quantitative criteria. This course provides students with basic knowledge about decision model formulation, so that they can make decisions based on the results of the models. This course also provides students with specific techniques for practical applications in production and services.

8. **Course Objectives**

- Students can identify different requirements/input regarding decision making problems
- Students can understand and apply suitable decision-making techniques to a given problem.
- Students know how to formulate and solve different decision-making problems by using mathematical techniques.
- Students know how to solve the models using computer-based software such as CPLEX, Python, MATLAB.
- Students can interpret the solutions.
- Students can solve practical problems

9. **Textbooks and**

references Textbooks

- Gwo-Hshiung_Tzeng,_Jih-Jeng_Huang, Multiple_Attribute Decision Making
- Milan Zeleny, Multiple Criteria Decision Making, McGraw-Hill, 1982.

References

N/A

10. **Course Learning** O**utcomes**

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Understand the decision-making processes in various contexts of deterministic or stochastic, single-criterion or multi-criterion, multi-objective, and multi-attribute	(a) an ability to apply knowledge of mathematics, science, and engineering
G2	Understand and employ suitable decision-making techniques to different decision - making problems	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems
G3	Formulate multi-objective decision making problems under Mathematical Programming techniques and solve them in LINGO, CPLEX	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
G4	Apply different heuristics and meta-heuristics and programming softwares to solve multi-objective decision making problems.	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
G5	Interpret model results in terms of trade-off among different objectives such as time, costs, sustainability, etc	(a) an ability to apply knowledge of mathematics, science, and engineering (e) an ability to identify, formulate, and solve engineering problems

11. Course Outline

Week	Content	Learning Outcome	Learning materials and activities	Assessment
1	Introduction to Multi-Attribute Decision Making	G1	Forming study groups Allocation	Homework
2&3	Simple Addictive Weight Technique, TOPSIS	G2	Textbook, Slides, Assignment.	
4 & 5	AHP (Analytic Hierarchy Approach) and Fuzzy AHP	G2	Text book, Slides,Assignment	
6	ELECTRE	G2	Text book, Slides, Assignment.	
7	Review			
Midterm				
9	Introduction to Multi-Objective Decision Making	G1	Text book, Slides,Assignment	

10 & 11	Minimum Deviation and Compromise Programming	G2, G3, G4, G5	Text book, Slides,Assignment	
12	Goal Programming	G2, G3, G4, G5	Text book, Slides,Assignment	
13	De Novo Technique	G2, G3, G4, G5	Text book, Slides,Assignment	
14	Presentation	G2, G3, G4, G5		
15	Review			
Final exam				

12. Course Assessment

Assessment component (1)	**Assessment form (A.x.x) (2)**	**Percentage % (3)**
A1. Process assessment	A1.1 Quiz	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	30%
A3. Final assessment	A3.1 Full Semester Project	15%
	A3.2 Final exam	40%

Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**Midterm exam**	Understand the decision-making processes in various contexts of deterministic or stochastic, single-criterion or multi-criterion, multi-objective, and multi-attribute		X			X								20
2	**Midterm exam** **Final exam**	Understand and employ suitable decision-making techniques to different decision - making problems		X			X								20
3	**Assignment and Project**	Formulate multi-objective decision making problems under Mathematical Programming techniques and solve them in LINGO, CPLEX			X			X			X			X	15
4	**Assignment and Project**	Apply different heuristics and meta-heuristics and programming softwares to solve multi-objective decision making problems.			X			X			X			X	15
5	**Final examination**	Interpret model results in terms of trade-off among different objectives such as time, costs, sustainability, etc		X			X			X					30
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

13. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

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SYLLABUS OF ELECTIVE SPECIALIZED COURSES

E-LOGISTICS IN SUPPLY CHAIN MANAGEMENT

Instructor: Dr. Nguyen Van Hop

1. **Name of course**: E-LOGISTICS IN SUPPLY CHAIN MANAGEMENT
2. **Course code:** IS062IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective
4. **Number of credits:** 3 credits
5. **Prerequisite:** Logistics Engineering and Supply Chain Design, Warehouse Engineering Management, Operations Research 1
6. **Parallel teaching in the course:** None

7. Course Description: This course introduces supply chain management concepts, techniques and applications in the new era of e-Business. This course also shows how supply chain management and logistics have evolved in the context of increasing application of information and communication technologies (ICT).

8. Course objectives: The course provides students with basic understanding of new concepts in supply chain management that arose during the era of e-Business. The course walks students step by step over the evolution of supply chain management to solve its traditional problems with the help of ICT.

9. Textbooks and

references: Textbooks:

.1 Chaffey D. and Hemphill T., *Digital business and E-Commerce management,* Pearson, 2019.

.2 Ross D. F., *Introduction to E-Supply Chain Management: Engaging Technology to Build Market – Winning Business Partnerships,* St.Lucie Press, 2003. (e-book, https://www.scribd.com/document/51582619/e-supply-chain-book)

.3 Wang Y. and Pettit S., *E-logistics: Managing your digital supply chains for competitive advantage*, KoganPage, 2016.

References:

1. Simchi-Levi D., Chen X., and Bramel J., *The Logic of Logistics: Theory, Algorithms, and Applications for Logistics Management.* Springer Series in Operations Research and Financial Engineering: 2014.
2. Janice Reynolds, *Logistics and Fulfillment for E-Business: A Practical Guide to Mastering Back Office Functions for Online Commerce*.CMP Books, 2001

10. Course Learning O**utcomes**

	Course Learning outcomes	**Program Learning outcome**
	1. Understanding new concepts of logistics and supply chain management in e-Business	(j) a knowledge of contemporary issues
	2. Comparing the differences between traditional supply chain, and e-supply chain.	
	3.Understanding and being able to solve new problems in supply chain management in the era of e-Business	
	4. Integrating knowledge from other courses to analyze and quantify the benefits that e-supply chain offers in comparison with traditional supply chain.	
	5. Applying various algorithms to solve complex optimization problems arisen in the era of e-Business	
Attitude	6. Working in teams effectively to complete an engineering project.	
	7. Understanding the urge of self-continuous improvement, and self-studying to catch up with the rapid development of industries	

11. Course implementation

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Introduction to supply chain management in e-Business
2	Chapter 2: e-Business models
3, 4	Chapter 3: e-Procurement
5, 6	Chapter 4: e-CRM
7	Chapter 5: Manufacturing in the age of e-Business
Midterm	
9	Chapter 6: e-Logistics
10, 11	Chapter 7: Several e-Logistics problems in Operations Research (OR)
12	Chapter 8: Distribution and Omni-channel retailing
13	Chapter 9: e-Shipping and Transportation
14	Chapter 10: e-Warehousing
15	Project report

13. Course Assessment:

13.1. Grading:

- In-class quizzes, class participation: 15%
- Midterm exam: 20%
- Group project: 30%
- Final exam: 35%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Quiz** **- Final exam**	Understanding new concepts of logistics and supply chain management in e-Business		X											
2	**- Midterm exam** **- Quiz** **- Final exam**	Comparing the differences between traditional supply chain, and e-supply chain.		X			X	x							
3	**- Midterm exam** **- Final exam** **- Quiz** **- Group project**	Understanding and being able to solve new problems in supply chain management in the era of e-Business		X			X	X	x						
4	**- Midterm exam** **- Final exam** **- Group project**	Integrating knowledge from other courses to analyze and quantify the benefits that e-supply chain offers in comparison with traditional supply chain		x	X		x	X		X		x		X	
5	**Group project**	Applying various algorithms to solve complex optimization problems arisen in the era of e-Business			x		x	x			x			X	
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

TIME SERIES AND FORECASTING TECHNIQUE

Instructor: Dr. Ha Thi Xuan Chi

1. **Name of course**: TIME SERIES AND FORECASTING TECHNIQUE
2. **Course code:** IS058IU
3. **Course type:**

☐ Specialization

☐ Core

☐ Requirement

☒ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits

5. **Prerequisite:** Engineering Probability & Statistics
6. **Parallel teaching in the course:** None
7. **Course Description**: Time series analysis comprises methods for analyzing time series data in order to extract meaningful statistics and other characteristics of the data. Time series forecasting is the use of a model to predict future values based on previously observed values. Time series are widely used for non-stationary data, like economic, weather, stock price, and retail sales.
8. **Course objectives:** The course provides students with basic understanding and advanced concepts of nanotechnology for applications in drug delivery. At the end of the course, the student should be able to formulate and choose forecasting models, understand about Regression Analysis, derive the properties of ARIMA and state-space models, choose an appropriate ARIMA model for a given set of data and fit the model using an appropriate package, and compute forecasts for a variety of linear methods and models.
9. **Textbooks and references: Textbooks:**

15 Introduction to Time Series and Forecasting (Wiley, 2012)
16 Introduction to Time Series and Forecasting (Springer, 2010)

References: Lecturer will provide references based on each specific topic.

10. **Course Learning Outcomes**

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Analyzing of the nanoparticulate drug delivery systems	(a) An ability to apply knowledge of

	2. Analyzing of recent trends and emerging technologies in the area of nanoparticulate drug delivery systems	mathematics, science and engineering
	3.Identification of nanotherapeutics in related disease	
Skill	4. Applying of methods to design and manufacture of nanoparticulate drug delivery systems	
	5. Applying of various methods of nanotechnological drug delivery systems	
Attitude	6. To develop a life-long learning attitude.	

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topic
1	1. INTRODUCTION 1.1 Simple Stationary Models 1.2 Trends and Seasonality
2,3	2. STATISTIC OVERVIEW FOR FORECASTING 2.1 Graphical Displays 2.2 Numerical Description of Time Series Data 2.3 Use of Data Transformations and Adjustments 2.4 General Approach for Time Series Modeling and Forecasting 2.5 Evaluating and Monitoring Forecasting Model Performance
4,5	3. REGRESSION ANALYSIS 3.1 Least Square Estimation 3.2 Statistical Inference in Linear Regression 3.4 Prediction of New Observations 3.5 Generalized and Weighted Least Square 3.6 Regression Models for General Time Series Data
6,7	4.STATIONARY PROCESSES 4.1 Properties

Week	Topic
	4.2 Linear Processes 4.3 Autoregressive Processes 4.4 Moving Average Processes 4.5 Forecasting
8,9	5. ARMA MODELS: ESTIMATION AND FORECASTING 5.1 Basic Properties 5.1.1 ARMA (p; q) models 5.1.2 Autocorrelation and Partial Autocorrelation Functions 5.1.3 Forecasting 5.2 Estimation and Model Selection 5.2.1 Method of Moments 5.2.2 Maximum Likelihood 5.2.3 Residual Checking 5.2.4 Model Selection
10,11	6. NON-STATIONARY AND SEASONAL MODELS 6.1 ARIMA Models 6.2 Unit Roots 6.3 Seasonal Models 6.4 Estimation, Hypothesis Testing and Forecasting
12,13	7.STATE-SPACE MODELS 7.1 State-Space Formulation 7.2 Structural Models 7.3 State-Space Formulation of ARIMA Models 7.4 Filtering and Smoothing: The Kalman Filter and EM Algorithm
14	Review

13. Course Assessment:

13.1. Grading

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	Homeworks Group Project	Identify and discuss features of appropriate forecasting models by doing the quizzes and given Projects.		x	x		x	x						x	30
2	- Midterm exam	Understand the mathematical and statistical properties of classes of forecasting models by getting more than 50% points of the test.	x			x	x		x						30
3	- Final exam	Enable to manipulate features of a computer package and evaluate forecast error measures by getting more than 50% points of the test.	x	x		x	x		x	x			x		40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

SYSTEMS ENGINEERING

Instructor: Dr. Dao Vu Truong Son

1. **Name of course**: SYSTEMS ENGINEERING
2. **Course code:** IS035IU
3. **Course type:**

☐ Specialization

☐ Core

☐ Requirement

☒ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: Systems Science is the course of methods to develop and analyze the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.
8. **Course objectives:** After completing this course, students will be able to analyze and evaluate existing systems, select the necessary components of a system, and develop a new system (manufacturing and services).
9. **Textbooks and references: Textbooks:**

17 Blanchard B.S., Systems Engineering and Analysis (Prentice Hall, 2010).

References:

18 Hunger J.W., Engineering the System Solution (Prentice Hall, 1995).

19 Van Nostrand Reinhold, Successful System Engineering for Engineers and Managers (O'Reilly, 1993).

10. **Course Learning Outcomes**

	Course Learning outcomes	Program Learning outcome
	1. Understand the fundamentals and concepts related to system types and system design, etc.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	2. Select the necessary components of a system	
Skill	3. Develop a new system (manufacturing and services)	
Attitude	6. To develop a life-long learning attitude.	

11. Course implementation

Time: 15 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topic
1	Introduction to Systems
2	Conceptual System Design
3	Preliminary System Design
4	Detail Design and Development
5	System Test, Evaluation, and Validation
6	Alternatives and Models in Decision Making
7	Review
8	Models For Economic Evaluation
9	Control Concepts and Methods
10	Design for Reliability

11	Design for Maintainability
12	Design for Producibility, Disposability, and Sustainability *(optional)*
13	Review

13. Course Assessment

13.1. Grading

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	Homeworks Group Project	Identify and discuss a possible topic in IE. Provide literature review. Find possible ways to analyze practical systems.		x	x		x	x						x	30
2	**- Midterm exam**	Understand the steps of classes of system engineering principles and practices by getting more than 50% points of the test.	x			x	x		x						30
3	**- Final exam**	Understand the steps of classes of system engineering principles and practices by getting more than 50% points of the test.	x	x		x	x		x	x			x		40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

PROCUREMENT MANAGEMENT

Instructor: MSc. Duong Vo Nhi Anh.

1. **Name of course**: PROCUREMENT MANAGEMENT
2. **Course code:** IS068IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits

   - Theory: 3 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None

7. Course Description: This course covers the following: the role of Purchasing and Procurement in Supply Chain Management, purchasing procedures, supplier sourcing and management, negotiations, supplier relationships, specifying product quality, matching supply with demand and support tools for purchasing and procurement. Comprehensive theories and models developed by practitioners are examined.

8. **Course objectives**

The course is intended to provide participants with an understanding of:

- The Procurement Management Process is consistent, including all phases of the Procurement Life Cycle, and from the perspective of both Buyers and Sellers.
- The processes required to prepare effective RFPs and those required to respond successfully to RFPs
- Contract types (e.g., Output Contracts, Option Contracts) and common contract clauses (e.g., the often misunderstood 'Terms Conditions' language).
- Pricing mechanisms (e.g., firm fixed fees, penalty clauses, time & materials) and their implementation.
- Outsourcing methodologies
- Global contracting and contract management and some of the ethical challenges and issues that may arise in that context

9. **Textbooks and references: Textbooks:**

- Michiel R. Leenders, P. Fraser Johnson, Anna E. Flynn and Harold E. Fearon. Purchasing and Supply Management, McGraw-Hill, 2006 – 13th Edition or later

References:

- Kenneth Lysons and Brian Farrington. Purchasing and Supply Chain Management, Financial Times / Prentice Hall, 2006 – 7th Edition

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
	▪ Understand the role of Purchasing and Procurement within organizations and in the overall supply chain. ▪ Understand different purchasing strategies, processes and activities	(a) An ability to apply knowledge of mathematics, science and engineering (h)The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	▪ Engage lifelong learning ▪ Know skills needed for managing purchasing activities ▪ Understand the importance of the course	(f) An understanding of professional and ethical responsibility
	▪ Know the knowledge, processes, models in procurement management ▪ Know which fields are closely relating with this subject	(f) An understanding of professional and ethical responsibility (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skill	▪ Self-aware	(f) An understanding of professional and ethical responsibility (g) An ability to communicate effectively
	▪ Team-working	
Attitudes	▪ Open-minded	(f) An understanding of professional and ethical responsibility
	▪ Inquisitive and curious,	
	▪ Fair and intellectually honest,	
	▪ Learning passion	

11. Course implementation

Time: 11 weeks for theory (04 periods per week) and 8 weeks for practice (04 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations

- Self-learning: Reading, homework
- Teamwork: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Introduction to Procurement Management
2	Chapter 2: Supply Processes and Technology
3	Chapter 3: Make or Buy Decisions
4	Chapter 4: Needs Identification, Specifications
5	Chapter 5: Quality and Services
6	Chapter 6: Quantity and Inventory
7	Chapter 7: Transportation and Delivery
8	Chapter 8: Price
9	Chapter 9: Cost and Supplier Selection
10	Chapter 10: Supplier Management and Development
11	Chapter 11: Global Supply Management
12	Semester Project Presentation

13. Course Assessment:

13.1. Grading:

- Mid-Term Exam: 30%
- Final Exam: 40%
- Assignments, cases, and attendance: 10%.
- Semester Project: 20%
- **Examinations**: Opened Book Exams

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Homework** **- Quiz**	Characterizing the the role of Purchasing and Procurement within organizations and in the overall supply chain.		x											15
2	**- Midterm exam** **- Final exam** **- Homework** **- Quiz** **- Group Project**	Applying of methods to identify and analyze deliverables and engage lifelong learning, develop skills needed for managing purchasing activities such as Quantity and Inventory, purchasing process	x				x								30
3	**- Midterm exam** **- Final exam** **- Quiz** **- Homework**	Developing and managing cost, quality, procurement such as Transportation and Delivery, Cost and Supplier Selection, Global Supply Management		x						x					40
4	**Presentation and discussion**	Identification of the necessary and application of purchasing project for a selected Group Project			x									x	15
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.

LEADERSHIP

Instructor: Dr. Pham Huynh Tram

1. **Name of course**: LEADERSHIP
2. **Course code:** IS045IU
3. **Course type:**

   ☐ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

   - Practice: 0 credit

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**

The course will offer engineering students an opportunity to manage their valuable knowledge resources and the people in organizations. They will be taught experience and knowledge processes that keep industry in a continuous demand. This course concentrates on defining leadership theories as the following: leadership styles, Trait approach, style approach, situational approach, contingency theory, path-goal theory, transformational Leadership Description, team leadership theory, psychodynamic approach, woman and leadership and popular approaches to leadership. These are essential for leaders in their professional success.

8. **Course Objectives**

- Understand and remember key assumptions and components of various leadership models
- Know how to apply leadership models to real-life situations
- Be able to relate leadership theory to other academic subjects and current events
- Care about leadership and learning more about it
- Self aware and open minded
- Work efficiently in team

9. **Textbooks and references**

Textbooks

Leadership Theory and Practice- Peter G. Northouse Sage Publications, Inc.

10. Course Learning Outcomes

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Understand the role of leadership and management	(f) an understanding of professional and ethical responsibility (i) a recognition of the need for, and an ability to engage in life-long learning
G2	Know important leadership traits, styles	(f) an understanding of professional and ethical responsibility (i) a recognition of the need for, and an ability to engage in life-long learning
G3	Understand different factors affect the leadership process and effectiveness	(i) a recognition of the need for, and an ability to engage in life-long learning
G4	Apply leadership models in practice	(j) a knowledge of contemporary issues
G5	Self aware and open minded	(i) a recognition of the need for, and an ability to engage in life-long learning
G6	Able to work efficiently in team	(g) an ability to communicate effectively

11. Course Outline

Week	Content	Learning outcome	Teaching and learning activities	Assessment
1	**Introduction Leadership- Trait Approach** ● Examines on individuals' personal leadership characteristics ● Discusses some of the important traits that are consistently identified in the people we call leaders ● Defines leadership and describes its various characteristics	G1, G2, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: IQ/EQ test

2	**Style Approach** Focuses on the behavior of leaders- what they do and how they act in various contexts	G2, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	
3	**Situational Approach** ● Describes a model to be extensively in training and development ● Describes how leaders should adapt their styles to the development level of followers and demands of various Organizational settings.	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	
4	**Contingency Theory** Discusses how effective leadership may result when a leader's style correctly matches the characteristics of a particular situation	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	
5	**Path-Goal Theory** Discusses how leaders can motivate subordinates to be productive and satisfied with their work by selecting a style of leadership	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	
Midterm exam				**Written exam**
8	**Leader- Member Exchange Theory** ● Addresses leadership as a process of interactions between leaders and followers, making the leader- member relationship the pivotal concept in the leadership process.	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review
9	**Transformational Leadership** Addresses a full range of leadership behaviors, including factors that contribute to transformational, transactional, and non-transactional leadership	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review

10	**Team Leadership Theory** ● Focuses on organizational teams, the vital functions of team leadership and the factors contributing to organizational team effectiveness.	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review
11	**Psychodynamic Approach** Focuses on the basic personality of the leader and subordinates and stresses the idea that leaders can become more effective by obtaining insights into their own upbringing, prior relationships and psychological development.	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review
12	**Women and Leadership** Use women's and feminist theory, explores the relationship between gender and leadership, providing historical, theoretical, and practical perspectives.	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review
13	**Popular Approaches to Leadership** Analyzes the common themes of current leadership approaches typically found in writings intended for a general audience	G3, G4, G5, G6	- Lecture - Class discussion - Questionnaires - Case study	Homework: movie review
14	**Group project presentation**			
15	**Review**			
FINAL EXAMINATION				**Written exam**

12. Course Assessment

Assessment component (1)	**Assessment form (A.x.x) (2)**	**Percentage % (3)**
A1. Process assessment	A1.1 Assignment	5%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Midterm Exam	20%
A3. Final assessment	A3.1 Full Semester Project	15%
	A3.2 Final exam	50%

Assessment Plan

	Assessment tasks	Assessment criteria	Level of cognitive Domain											Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Quiz** **- Final exam**	● Understand the role of leadership and management		X			X								20
2	**- Midterm exam** **- Quiz** **- Final exam**	● Know important leadership traits, styles		X			X								25
3	**- Midterm exam** **- Final exam**	● Understand different factors affect the leadership process and effectiveness		X			X			X			X		25
4	**- Presentation** **- Group project**	● Apply leadership models in practice		X	X		X	X		X				X	15
5	**-Presentation** **-Group project**	● Self-aware and open minded			X			X			X			X	15
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

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13. Student responsibility & Policies

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses,

  e.g. certified paper from doctors, may students retake the tests.)

INVENTORY MANAGEMENT

Instructor: Dr. Nguyen Van Hop

1. **Name of course**: INVENTORY MANAGEMENT
2. **Course code: IS023IU**
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☐ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits
   - Practice: 0 credit

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: This course is to introduce the fundamental policy in inventory control and management. The course shows how an inventory system can be controlled and managed through different policies and scenarios. Topics to be covered include: The role of inventory control and management in industry, the KPI of inventory, EOQ and its extension models, inventory control policies for deterministic demands, inventory control policies for stochastic demands.
8. **Course objectives:**
   - Students know how to formulate and solve problems related to discrete and continuous distribution.
   - Students know how to model the system by using Markov chain
   - Student know how to model the system by Poisson process
   - Students know how to model the queueing system
   - Students know how to compute the reliability of the system.
9. **Textbooks and references:**
   - **Textbooks:** Edward A. Silver, David F. Pyke, Rein Peterson:Inventory Management and Production Planning and Scheduling

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Able to understand the important role of inventory management in industry	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems (j) a knowledge of contemporary issues
	2. Able to identify the proper KPI in inventory control and management.	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problem
Skill	4. Able to formulate inventory models when demand rate is constant, deterministic, stochastic.	(a) an ability to apply knowledge of mathematics, science and engineering (e) an ability to identify, formulate, and solve engineering problems (c) an ability to design a system, component, or process to meet desired needs within realistic
	5. Able to formulate inventory models when several items are considered.	
Attitude	6. To develop a life-long learning attitude.	(c) an ability to design a system, component, or process to meet desired needs within realistic

11. Course implementation

Time: 14 weeks for theory (04 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

12. Course outline

Week	Topics
1	Introduction role of inventory control and management in industry
2	Inventory control and its KPI

3	Inventory control policy when demand rate is constant: EOQ, POQ model
4	Inventory control policy when demand rate is constant: backlog, discount model
5	Inventory control policy when demands are deterministic: Wagner-Whitin
6	Inventory control policy when demands are deterministic: Silver-Meal, least Unit cost,…
7	Aggregation Ordering Problem
Midterm exam	
8	The power of 2 policy
9	Nested System under PO2
10	Newsvendor Problem
11	(Q,r) approximation
12	Base-stock policy
13	Simulation approach for optimal inventory control policy
14	Simulation approach for optimal inventory control policy (cont.)
15	Review

13. Course assessment

13.1 Grading

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2 Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:** Questions: 1	Understand the important role of inventory management in industry		x			x								5
2	**- Midterm exam:** Questions: 2	Identify the proper KPI in inventory control and management.		x			x								5
3	**- Midterm exam:** Questions: 3-4	Able to formulate inventory models when demand rate is constant		x			x								10
4	**- Midterm exam:** Questions: 5-6	Able to formulate inventory problem when demands are deterministic		x			x								10
5	**-Final:** Question 1-3	Able to formulate inventory problem when several items are considered together		x			x			x					20
6	**-Final:** Question 4-6	Able to formulate inventory problem when demands are stochastic		x			x			x					20
7	**-Quizz Q1,2,3**	All relating goals		x			x			x					30
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

RETAIL MANAGEMENT

Instructor: MSc. Nguyen Hoang Huy

1. **Name of course**: RETAIL MANAGEMENT *(Quản lý bán lẻ)*

2. Course code: IS082IU

3. Course type:

☒ Specialization

☐ Core

☐ Requirement

☐ Elective

4. Number of credits: 3 credits

- Theory: 3 credits

5. Prerequisite: none

6. Parallel teaching in the course: None

7. Course description:

This course provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.

8. Course objectives: The course provides students with basic understanding and advanced concepts of retail management.

9. Textbooks and Other Required Materials: Textbook:

- Michael Levy, Barton Weitz - Retailing Management, 8th Edition-McGraw-Hill_Irwin (2011)

Reference books:

- "Retailing 7th Edition" , Dunne, Lusch and Carver, Southwestern Cengage Learning
- "Logistics and Retail Management: Emerging Issues and New Challenges in the Retail Supply Chain, 3rd Edition", John Fernie, Leigh Sparks, Kogan Page, 2009
- "Retail Management: A Strategic Approach PIE 12E", Barry Berman / Joel R. Evans

10. Course Learning Outcomes

Students who complete the course will be able to:

- Understand basic retailing principles and the scope of retailing activities involved in the retail industry.
- Use current technology along with future trends in retailing.
- Apply consumer and shopper behavior concepts to store design, merchandising private label branding, loyalty programs and other customer touch points.
- Understand new and diverse retail formats such as small format
- Understand terminology, components and emerging promotional strategies in the retail environment.
- Understand omni-channel strategies and tactics affecting the total customer experience.
- Identify career opportunities in retail organizations available to graduates with academic retailing credentials.

  Students who complete this course will demonstrate the following:
- Applying technology to the Path to Purchase in the retail environment to understand shopper behavior in order to drive trial and repeat purchase.

  Students develop these skills and knowledge through the following course activities and assignments:
- The group project, "Building a Retail Store", will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process.

11. Course learning outcomes

	Course Learning outcomes	**Program Learning outcome**
	1. Understand basic retailing principles and the scope of retailing activities involved in the retail industry.	(a) An ability to apply knowledge of mathematics, science and engineering (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	2. Use current technology along with future trends in the retailing	(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	3. Understand terminology, components and emerging promotional strategies in the retail environment.	(f) An understanding of professional and ethical responsibility

	4. Understand omni-channel strategies and tactics affecting the total customer experience.	(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	5. Understand new and diverse retail formats such as small format	h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	6. Apply consumer and shopper behavior concepts to store design, merchandising private label branding, loyalty programs and other customer touch points.	(a) An ability to apply knowledge of mathematics, science and engineering (f) An understanding of professional and ethical responsibility (g) An ability to communicate effectively
	7. Applying technology to the Path to Purchase in the retail environment to understand shopper behavior in order to drive trial and repeat purchase.	
	8. The group project, "Building a Retail Store", will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process.	
Attitude	9. Identify career opportunities in retail organizations available to graduates with academic retailing credentials.	(f) An understanding of professional and ethical responsibility

12. Course implementation

Time: 15 weeks for theory

Teaching and learning activities

- Classroom activities: Lectures, presentations
- Self-learning: Reading, assignment
- Team work: Group project

13. Course Outline:

Lecture	Chapter	Topic	Activities	Lecturer
1	1	Introduction to the world of retailing	Lecture	

2	2	Types of retailers		
3	3	Multichannel retailing	Lecture Assignments	
4	4	Customer buying behavior	Lecture Assignments	
5	4	Customer buying behavior (Con't)		
6	7	Retail locations	Lecture Assignments	
7	8	Retail site location	Lecture Assignments	
8		Review		
		Midterm exam		
9	12	Managing the Merchandise process	Lecture Assignments	
10	14	Retail pricing	Lecture Assignments	
11	15	Retail communication mix	Lecture Assignments	
12	15	Retail communication mix (Con't)	Lecture Assignments	
13	17	Store layout and design	Lecture Assignments	
14	18	Customer service	Lecture Assignments	
		Review		
		Final Exam		

14. Course Assessment:

14.1 Grading:

-One midterm exam: 30%

-Projects, Quizzes, homework: 30%

-Final exam: 40%

14.2 Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	- Midterm exam	● Understand basic retailing principles and the scope of retailing activities involved in the retail industry ● Analyze and identify the problem of real cases, give recommendations ● Apply methods to design a system in retail environment	x	x		x				x			x		30
2	- Final exam	● Understand basic retailing principles and the scope of retailing activities involved in the retail industry ● Analyze and identify the problem of real cases, give recommendations ● Apply methods to design a system in retail environment	x	x		x				x			x		30
3	Homework and quiz	● Analyze the real systems and figure out					x			x			x		10

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
		the potential problem ● Apply the related technologies to give solutions. ● Evaluate the current systems to discuss about learning study													
4	Project Presentation	● Design a real retailing systems/ virtual retailing systems with cases of Vietnamese market Topic “Building a Retail Store” that must solve the potential problems and suggest the development strategies						x			x			x	20
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

15. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

SUSTAINABILITY IN SUPPLY CHAIN

Instructor: MSc. Nguyen Hoang Huy

1. **Name of course**: SUSTAINABILITY IN SUPPLY CHAIN
2. **Course code: IS063IU**
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

5. **Prerequisite:** None
6. **Parallel teaching in the course:**
7. **Course Description**:

   There is global experience and examples that show how comprehensive organizational environmental sustainability and archaeological criteria integrated into the supply chain management/procurement process and decision-making of public and private agencies, organizations and corporate entities can improve financial and environmental performance, while addressing ethics, social regeneration, resource/waste impacts and economic development concerns. This course will allow students to participate in applied research projects that include designing supply chain management and procurement systems and products, which address environmental, social and ethical considerations in organizational and corporate policy, program and reporting.

8. **Course objectives**

   By the end of this course, you should be able to:

   - Understanding of the sustainability challenges and opportunities facing supply chains today
   - Examine factors that are contributing to the adoption of sustainability strategies, such as legislations that are penalizing negative environmental and social impacts, and society's expectations of business in terms of health, human rights, and the environment.
   - Measure performance of a supply chain in terms of social, environmental and economic

9. **Textbooks and references: Textbooks:**

Grant, D. B., Trautrims, A., and Wong, C. Y., *Sustainable Logistics and Supply Chain Management: Principles and Practices for Sustainable Operations and Management*, Kogan Page.

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
	1. Understanding of the sustainability challenges and opportunities facing supply chains today	(f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues
	2. Examine factors that are contributing to the adoption of sustainability strategies, such as legislations that are penalizing negative environmental and social impacts, and society's expectations of business in terms of health, human rights, and the environment.	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (j) a knowledge of contemporary issues
	3. Measure performance of a supply chain in terms of social, environmental and economic.	(c)an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skill	4. Understand and quantify impacts of sustainability-related regulations on supply chain.	(j) a knowledge of contemporary issues
Attitude	5. Work in a team to solve problems and case studies on sustainable supply chain	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Sustainability in Logistics and supply chain management
2	Chapter 2: Science of sustainability
3	Chapter 3: Freight transport
4	Chapter 4: Sustainable warehousing
5	Chapter 5: Product design, cleaner production and packaging
6	Chapter 6: Sustainable purchasing and procurement
7	Review
Midterm	
8	Chapter 6: Sustainable purchasing and procurement
9, 10	Chapter 7: Reverse logistics and recycling
11	Chapter 8: Risk, corporate social responsibility and ethics

Week	Topics
12, 13	Chapter 9: Sustainable logistics and supply chain management strategy
14	Review

13. Course Assessment:

13.1. Grading:

- Quiz, presentation & attendance: 15%
- Group project: 15%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Quiz and activities** **- Midterm** **- Final exam**	Understanding of the sustainability challenges and opportunities facing supply chains today		x	x		x								15
2	**- Quiz and activities** **- Midterm** **- Final exam**	Examine factors that are contributing to the adoption of sustainability strategies, such as legislations that are penalizing negative environmental and social impacts, and society's expectations of business in terms of health, human rights, and the environment.		x	x					x	x				15
3	**- Group assignment** **- Midterm** **- Final exam**	Measure performance of a supply chain in terms of social, environmental and economic.					x			x	x		x	x	30
4	**- Quiz and activities** **- Group assignment**	Understand and quantify impacts of sustainability-related regulations on supply chain.		x	x		x	x		x	x		x	x	40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

ENTREPRENEURSHIP IN SUPPLY CHAIN

Instructor: Dr. Pham Huynh Tram

1. **Name of course**: ENTREPRENEURSHIP IN SUPPLY CHAIN
2. **Course code:** IS064IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

5. **Prerequisite:** None
6. **Parallel teaching in the course:**
7. **Course Description**:

   This course is designed to give students the following contents such as the nature and importance of entrepreneurship; forms of entrepreneurship; the entrepreneurial process; the entrepreneurial mind; creativity, ideas and innovation; screening entrepreneurial opportunities; identifying resources to support entrepreneurial activities; intellectual property issues; accessing finance and other resources; the entrepreneurial team; assessing risk; business structure and ethics; entrepreneurial strategy; finding and reaching customers and marketing innovation; feasibility planning.

8. **Course objectives**

   After studying this course, the students would be able to build on personal as well as external resources with a view to successfully launching and subsequently managing their enterprises about logistics and supply chain. They would have not only a definite idea as to which support/developmental agency to look up to and for what purpose, but also the necessary know-how and wherewithal for accessing their help. They would have basic knowledge and skills in logistics & supply chain, manufacturing systems, finance, marketing, and human resource management.

9. **Textbooks and**

   references: Textbooks:

Deakins, D., and Freel, M.. *Entrepreneurship and Small Firms*, 6th edition, McGraw Hill, 2012.

Duening, T. N., Hisrich, R. A., and Lechter, M.A. *Technology Entrepreneurship: Taking innovation to the marketplace*, 2nd ed., Academic Press, 2014.

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
	1. Understand and get familiar with forms of entrepreneurship; the entrepreneurial process; the entrepreneurial mind; creativity, ideas and innovation	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (i) a recognition of the need for, and an ability to engage in life-long learning (j) a knowledge of contemporary issues
	2. Screening entrepreneurial opportunities for logistics and supply chain sector	(j) a knowledge of contemporary issues
	3. Identifying and assessing risk, finance (source, issues and debt finance) and other resources to support entrepreneurial activities.	(j) a knowledge of contemporary issues
Skills	4. Apply techniques and methods to analyze real problems	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints (j) a knowledge of contemporary issues
Attitude	4. Work in a team to design entrepreneurial strategy, and develop feasible planning	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints

11. Course implementation

Teaching and learning

activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework

- Team work: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Sustainability in Logistics and supply chain management
2	Chapter 2: Science of sustainability
3	Chapter 3: Freight transport
4	Chapter 4: Sustainable warehousing
5	Chapter 5: Product design, cleaner production and packaging
6	Chapter 6: Sustainable purchasing and procurement
7	Review
Midterm	
8	Chapter 6: Sustainable purchasing and procurement
9, 10	Chapter 7: Reverse logistics and recycling
11	Chapter 8: Risk, corporate social responsibility and ethics
12, 13	Chapter 9: Sustainable logistics and supply chain management strategy
14	Review

13. Course Assessment:

13.1. Grading:

- Quiz, presentation & attendance: 15%
- Group project: 15%
- One midterm exam: 30%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Quiz and activities** **- Group project** **- Midterm** **- Final exam**	Understand and get familiar with forms of entrepreneurship; the entrepreneurial process; the entrepreneurial mind; creativity, ideas and innovation		x	x		x	x							15
2	**- Group project** **- Midterm** **- Final exam**	Screening entrepreneurial opportunities for logistics and supply chain sector		x	x		x	x		x	x				15
3	**- Quiz & activities** **- Midterm** **- Final exam**	Identifying and assessing risk, finance (source, issues and debt finance) and other resources to support entrepreneurial activities					x			x	x		x	x	30
4	**- Quiz and activities** **- Group assignment**	Work in a team to design entrepreneurial strategy, and develop feasible planning		x	x		x	x		x	x		x	x	40
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

SUPPLY CHAIN SECURITY AND RISK MANAGEMENT

Instructor: Dr. Phan Nguyen Ky Phuc

1. **Name of course**: SUPPLY SECURITY & RISK MANAGEMENT
2. **Course code: IS065IU**
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

5. **Prerequisite:** Principles of Logistics and Supply Chain Management, Stochastic Process, Engineering Economics
6. **Parallel teaching in the course:**
7. **Course Description**:

   This course aims to provide students basic understanding of supply chain risk management, from strategic to operations probabilistic modeling and analytics. The course also equips students with tools and techniques to qualify and quantify strategic risk, financial risk, and operational risks.

8. **Course objectives**

   In this course, students understand the basic concept of risk and risk management, as well as differentiate between enterprise risk management and supply chain management. In addition to all these, the qualitative risk management framework and the quantitative approach using probabilistic models are explained to students for better understanding of risks in supply chain.

   Complete this course, students are able to:

   - Define risks in general, and risks in the supply chain in particular.
   - Know how to apply risk management frameworks to identify and plan solutions for risks.
   - Understand the application of statistics and stochastic processes into quantifying and understanding risks.

9. **Textbooks and references:**

   Textbooks:

   Schlegel, G.L, Trent R.J., *Supply Chain Risk Management: An emerging discipline*, 1st ed. CRC Press: 2014.

10. Course learning outcomes

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Identify risk types, analyze risk sources and approaches to tackle risks in a supply chain with the support of several risk management frameworks	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (j) a knowledge of contemporary issues
Skill	2. Apply business and management knowledge to qualify risk impacts in a supply chain	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
	3. Apply statistics and stochastic processes to quantify the impacts of risks to business and to the supply chain.	
Attitude	4. Work in a team to address real risk- related projects	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints (i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1, 2	Chapter 1: Supply Chain Risk Management: Setting the stage
3	Chapter 2: Building the Risk Management Foundation

Week	Topics
4	Chapter 3: Strategic Risk
5	Chapter 4: Financial Risk
6	Chapter 5: Operational Risk
7	Review
Midterm	
9	Chapter 6: Emerging Risk Management Framework for Success
10,11	Chapter 7: Using Probabilistic Models to understand risk
12, 13	Chapter 8: Emerging Risk Management Tools, Techniques, and Approaches
14	Group presentation & Review

13. Course Assessment:

13.1. Grading:

- Quiz, presentation & attendance: 15%
- Group project: 20%
- One midterm exam: 25%
- One comprehensive final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain											
			Applying			Analyzing			Evaluating			Creating		
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P
1	**- Quiz and activities** **- Midterm** **- Final exam**	Identify risk types, analyze risk sources and approaches to tackle risks in a supply chain with the support of several risk management frameworks		x	x		x							
2	**- Quiz and activities** **- Group assignment** **- Midterm** **- Final exam**	Apply business and management knowledge to qualify risk impacts in a supply chain		x	x		x	x		x	x			
3	**- Quiz and activities** **- Group assignment** **- Midterm** **- Final exam**	Apply statistics and stochastic processes to quantify the impacts of risks to business and to the supply chain.		x	x		x	x		x	x		x	x
	Total													

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

DATA MINING IN SUPPLY CHAIN

Instructor: Dr. Dao Vu Truong Son

1. **Name of course**: DATA MINING IN SUPPLY CHAIN
2. **Course code:** IS066IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☐ Requirement

   ☒ Elective

4. **Number of credits:** 3 credits

   - Theory: 3 credits

5. **Prerequisite:** None
6. **Parallel teaching in the course:**
7. **Course Description**:

   Data mining refers to a family of techniques used to detect interesting nuggets of relationships/knowledge in data. With the availability of large databases to store, manage and assimilate data, the new thrust of data mining lies at the intersection of database systems, artificial intelligence and algorithms that efficiently analyze data. The distributed nature of several databases, their size and the high complexity of many techniques present interesting computational challenges.

   An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts.

8. **Course objectives**

   By the end of this course, you should be able to:

   - Understand key concepts in data mining, including: data warehouses and data cube technology, mining stream, mining social networks, multimedia, and other complex data.
   - Know how to discover data patterns hidden in large data sets.
   - Study and apply various algorithms to address advanced topics, such as mining object-relational databases, time-series databases, text databases, the world wide web, etc. in supply chain.

9. **Textbooks and references:**

Textbooks:

Han, J., Kamber, M., and Pei, J. *Data mining: Concepts and Techniques*, 3rd ed., The Morgan Kaufmann Series in Data Management Systems, 2011.

10. Course Learning Outcomes

	Course Learning outcomes	**Program Learning outcome**
	1. Understand key concepts in data mining, including: data warehouses and data cube technology, mining stream, mining social networks, multimedia, and other complex data.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) a knowledge of contemporary issues
	2. Know how to discover data patterns hidden in a large data sets	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (i) a recognition of the need for, and an ability to engage in life-long learning
	3. Study and apply various algorithms to address advanced topics, such as mining object-relational databases, time-series databases, text databases, the world wide web, etc. in supply chain.	(j) a knowledge of contemporary issues
Skill	4. Study and apply SQL and Java in mining data for supply chain decision	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints
Attitude	5. Work in a team to mine real-life database	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints

11. Course implementation

Teaching and learning

activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

Week	Topics
1	Chapter 1: Introduction to DataMining
2	Chapter 2: Getting to Know Your Data
3	Chapter 3: Data preprocessing
4	Chapter 4: Data Warehousing and Online Analytical Processing
5	Chapter 5: Data Cube Technology
6	Chapter 6: Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods
7	Review
Midterm	
8	Chapter 6: Intelligence & Opportunity
9	Chapter 7: Developing Business Intelligence and Market Intelligence
10	Chapter 8: Supply Market Intelligence
11	Chapter 9: Developing Sourcing Strategy
12	Chapter 10: Execute Sourcing Strategy
13	Benchmarking
14	Review

13. Course Assessment

13.1. Grading:

- Quiz, presentation & attendance: 10%
- Group project: 20%
- One midterm exam: 20%
- One comprehensive final exam: 50%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Quiz and activities** **- Midterm** **- Final exam**	Understand key concepts in data mining, including: data warehouses and data cube technology, mining stream, mining social networks, multimedia, and other complex data.		x	x										10
2	**- Quiz and activities** **- Group assignment** **- Midterm** **- Final exam**	Know how to discover data patterns hidden in a large data sets		x	x		x	x							20
3	**- Group assignment** **- Midterm** **- Final exam**	Study and apply various algorithms to address advanced topics, such as mining object-relational databases, time-series databases, text databases, the world wide web, etc. in supply chain					x	x		x	x		x	x	20
4	**- Quiz and activities** **- Group assignment**	Study and apply SQL and Java in mining data for supply chain decision		x	x		x	x		x	x		x	x	50
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

PORT PLANNING AND OPERATIONS

Instructor: Dr. Nguyen Van Chung

1. **Name of course**: **PORT PLANNING AND OPERATIONS**
2. **Course code: IS072IU**
3. **Course type:**

☒ Specialization

☐ Core

☒ Requirement

☐ Elective

4. **Number of credits:** 3 credits
   - Theory: 3 credits
   - Practice: 0
5. **Prerequisite:** None
6. **Parallel teaching in the course:** None
7. **Course Description**: This course provides the students with an understanding of the port system, geographical location of ports, related planning and operational issues. Methods and processes for port planning and design. Besides that, the students are provided with knowledge about Inland connectivity, port's linkage to transport infrastructure, intermodal connections, and marine operations in ports. Traffic management, cargo handling, terminal operations, facilities and equipment, port security.
8. **Course objectives:** This course is designed to help students better understand the planning and operations aspect of ports and terminals, so that students can be more effective to assist in port planning in real cases.
9. **Textbooks and references:**

Textbooks:

- Alderton, P. (2008) Port management and operations, 3rd edition, LLP ltd, London.

10. Course Learning outcomes

	Course Learning outcomes	Program Learning outcome
	1. Develop an understanding of the port system, geographical location of ports, related planning and operational issues.	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints.
	2. Identification of Methods and processes for port planning and design.	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints.
	3. The emphasis will be knowledge about Inland connectivity, port's linkage to transport infrastructure, intermodal connections, and marine operations in ports.	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints. (j) a knowledge of contemporary issues
	4. Introduce methods for Traffic management, cargo handling, terminal operations, facilities and equipment, port security.	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
Attitude	5. To develop a life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: 13 weeks for theory (03 periods per week).

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading,

homework Teamwork: Group

assignment

12. Course outline

Week	Topics
1	Chapter 1: Characterization of port system
2	Chapter 2: Geographical location of ports and related planning and operational issues
3, 4	Chapter 3: Methods and processes for port planning and design
5	Chapter 4: Inland connectivity, port linkage to transport infrastructure, intermodal connections
6	Chapter 5: Marine operations in ports
7	Chapter 6: Traffic management
8, 9	Chapter 7: VTS (vessel traffic system)
10	Chapter 8: Port Navigational System
11	Chapter 9: Cargo handling
12, 13	Chapter 10: Terminal operations
14	Chapter 11: Facilities and equipment
15	Chapter 12: Port security

13. Course Assessment:

13.1. Grading:

- One midterm exam: 30%
- Mini projects, presentations & attendance: 15%
- Group project: 15% (paper: 10%, presentation: 5%)
- Final exam: 40%

3.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Quiz**	Develop an understanding of port system, geographical location of ports, related planning and operational issues		x			x			x					15
2	**- Midterm exam** **- Quiz**	Develop an understanding of the principles of Methods and processes for port planning and design.		x			x			x					15
3	**- Final exam** **- Quiz**	Applying of methods to design about Inland connectivity, port's linkage to transport infrastructure, intermodal connections, and marine operations in ports					x			x			x		20
4	**- Final exam** **- Quiz**	Applying Traffic management, cargo handling, terminal operations, facilities and equipment, port security.					x			x			x		20
5	**Group project**	planning and operations aspect of ports and terminals, in real cases.			x			x			x			x	30
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

CREATIVE THINKING

Instructor: Dr. Pham Huynh Tram

1. **Name of course**: CREATIVE THINKING
2. **Course code:** IS080IU
3. **Course type:**

☒ Specialization

☐ Core

☒ Elective

☐ Requirement

4. **Number of credits:** 3 credits (45 periods)

- Theory: 45 periods
- Practice: 0 periods

5. **Prerequisite:** None
6. **Parallel teaching in the course:** None

Course Description: The art of Creative Thinking is crucial for many individuals in different fields, whether it's school, job or personal use, everyone should learn how to think creatively. This course will help you understand the role of creativity and innovation in your own work and in other disciplines. It will challenge you to move outside of your existing comfort zone and to recognize the value of that exploration. This course will help you understand the importance of diverse ideas, and to convey that understanding to others.

7. **Course objectives:** The course helps students:
   - Develop your mental flexibility and think creatively.
   - Get through each of the different steps of the creative process and reformulate the process according to your needs
   - Apply some of the most relevant creative techniques to generate and systematize ideas
   - Use the creative thinking mindset through each step of idea implementation, catalyzing innovation
8. **Textbooks and**

references: Textbooks:

[1] Berkun, S. (2010). Myths of innovation. Sebastopol, CA: O'Reilly Sawyer, K. (2013).
[2] Zig Zag: The Surprising Path to Greater Creativity. San Francisco: Jossey-Bass. Nussbaum, B. (2013).

References:

[3] Creative Intelligence: Harnessing the Power to Create, Connect and Inspire. New York: Harper.

9. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
	1. Develop an understanding of the importance of thinking skills in their everyday life.	(e) an ability to identify, formulate, and solve engineering problems (j) a knowledge of contemporary issues
	2. Appreciate their existing thinking habits, mental blocks and attitudes that hinder them from being creative and/or critical.	(e) an ability to identify, formulate, and solve engineering problems (j) a knowledge of contemporary issues
	3. Develop creative thinking to become more attuned to fallacious reasoning in everyday life and know how to correct the fallacies found	(e) an ability to identify, formulate, and solve engineering problems (d) an ability to function on multidisciplinary teams (g) an ability to communicate effectively
	4. Apply the techniques for creative thinking in evaluating solutions and arguments.	
Attitude	5. Develop the attitude towards and techniques for creative problem solving	(f) An understanding of professional and ethical responsibility (i) a recognition of the need for, and an ability to engage in life-long learning

10. Course implementation

Time: 15 weeks for

theory

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Teamwork: Group assignment

11. Course outline

Week	Topics
1	Chapter 1: Introduction to creative thinking
2	Chapter 2: The origin of creative thinking

Week	Topics
3, 4	Chapter 3: Creative Problem Solving
5	Chapter 4: Ideation of creative thinking
6	Chapter 5: Best Practices of Creativity
7, 8	Chapter 6: Creative Intelligence
9	Chapter 7: Design Thinking
10, 11, 12, 13	Chapter 8: Introduction to Creative Process
14	Chapter 9: Putting It All Together
15	Project: Presentations

12. Course Assessment:

12.1. Grading:

- In-class quizzes, class participation and labs: 30%
- One midterm exam: 30%
- One comprehensive final exam: 40%

12.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam** **- Quiz**	Develop an understanding of the importance of thinking skills in their everyday life.	x	x			x			x					15
2	**- Midterm exam** **- Quiz**	Appreciate their existing thinking habits, mental blocks and attitudes that hinder them from being creative and/or critical	x	x			x			x					15
3	**- Final exam** **- Quiz**	Apply the techniques for creative thinking in evaluating solutions and arguments.						x		x			x		20
4	**- Final exam** **- Quiz**	Develop creative thinking to become more attuned to fallacious reasoning in everyday life and know how to correct the fallacies found						x		x			x		20
5	**Presentation and discussion**	Develop the attitude towards and techniques for creative problem solving						x							5
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

13. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)

ORGANIZATIONAL BEHAVIOR

Instructor: School Of Business Administration

1. **Name of course:** Organizational Behavior
2. **Course code:** BA130IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☐ Requirement
   - ☒ Elective
4. **Number of credits:** 3 credits
5. **Prerequisite:** BA130IU (Organizational Behavior)
6. **Parallel teaching in the course:** None
7. **Course Description**:

   This course examines the theory and practice of how and why organizations behave the way they do. The course analyzes the factors that cause certain behavior within an organization and presents conceptual frameworks for the analysis of how such behavior influences decision making and organizational effectiveness. Key topics of study include: the dynamics of people and organization, managing communication, social systems and organizational cultures, motivation and reward systems, leadership and empowerment, attitudes and its effects, interpersonal and group behavior, teams and team building, managing change, stress and counseling.....

8. **Textbooks and references:**

   Textbook:

- Donald R. Brown, *An Experiential Approach to Organization Development*, 8th edition, Prentice Hall
- Naomi Stanford, *Organizational Design: The Collaborative Approach*, 1st edition, Elsevier
- Richard Daff, Organizational Theory and Design, 10th edition, South Western.

Additional materials provided in Blackboard

The lecturer will attempt to make lecture notes and additional reading available on Blackboard. However this is not an automatic entitlement for students doing this subject. Note that this is not a distance learning course, and you are expected to attend lectures and take notes. This way, you will get the additional benefit of class interaction and demonstration.

Recommended Internet sites

UNCTAD (United Nations Conference on Trade and Development)

WTO (World Trade Organization) Business Week

The Economist

Fortune

Forbes

Recommended Journals

Harvard Business Review

International Business Review Journal of Management Studies

Asia Pacific Journal of Management

9. Course Learning Outcomes

No	Course learning outcomes	Program Learning outcome
Knowledge	After completing the course, students should have developed skills in: − Analyzing how organizations can use Organizational Behavior theories and practices to enhance the learning and cooperation within the organization. − Careful blending of theory and practice so that concepts and models of Organizational Behavior are applied in the real world to build better and effective organizations in the competitive business environment. − Thinking critically on how to manage the human side of the organization when not all behavior is entirely rational.	(d) an ability to function on multi-disciplinary teams (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skills	- Effective communication: The ability to collect, analyze and organize information and to convey that information clearly and fluently, in both written and spoken forms.	(g) an ability to communicate effectively (h) the broad education necessary to understand the impact of engineering solutions in a global, economic,

	- Critical argument and judgment: The ability to identify and debate critical issues / problems, as well as to evaluate financial information, make decisions and reflect critically on the justification for decisions.	environmental, and societal context
Attitude	- Learn within teams (such skills as task assignment and management, conflict resolution and co-operation, consensus building, and leadership) - Provide professional business presentations (both oral and written)	(f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

10. Course implementation Time:

Lecture:

T

BA Venue:

TBA

Teaching and learning activities

The learning system in this course consists of lectures and scheduled presentations/discussions. Lectures elaborate the appropriate theoretical content in the textbook and readings. Classes provide a more detailed and refined analysis of both concepts and applied materials. Classes are strongly oriented towards interactive discussion of the text and cases. In order to gain the most from the lectures and class activities, the assigned text/reading should be read *before* the lecture to participate in the discussions.

From the second week, the students will need to form small discussion groups (3-4 students/group), which will take turns in presenting the assigned cases each week. However, all students are required to take active part in the discussions in class. Look at articles and clippings from business sections of relevant electronic and print media which are relevant to the presentation topic. The students should explain how the material relates to the theory discussed in the text. Discuss with group members as to the common strategy for sourcing, documenting, analyzing and presenting cases each week - for which a basic minimum interaction will be necessary. For the audience, it is important that they contribute to the case by getting additional information carefully beforehand so that they are fully familiar with the materials, and are prepared to participate in the discussions.

11. Course outline

Week	Topic	Learning materials and activities
1	**INTRODUCTION TO ORGANIZATIONAL BEHAVIOR** Definition of OB Why to study OB Challenges in OB	Textbook, Chapter 1 Develop class norms Explain Learning Assessment and form presentation groups
2	**PART I: THE INDIVIDUAL IN THE ORGANIZATION** Personality Traits and Work Values	Textbook, Chapters 2 Explain written assignment topic and requirements. Explain the presentation topic and how to work on it as a group. List of the groups
3	**PART I: THE INDIVIDUAL IN THE ORGANIZATION (Cont.)** Individual Perception and Decision-Making Job Attitudes	Textbook, Chapters 3 and 4
4	**PART I: THE INDIVIDUAL IN THE ORGANIZATION (Cont.)** Motivation	Textbook, Chapters 5 and 6
5	**PART I: THE INDIVIDUAL IN THE ORGANIZATION (Cont.)** Moods, Emotions and Organizational Behavior	Textbook, Chapter 7
6	**PART II: GROUPS IN THE ORGANIZATION** Groups Teams	Textbook, Chapters 8 and 9
7	**PART II: GROUPS IN THE ORGANIZATION (Cont.)** Communication Processes	Textbook, Chapter 10
8	**Midterm exam**	
9	**PART II: GROUPS IN THE ORGANIZATION (Cont.)** Leadership	Textbook, Chapter 11

10	**PART II: GROUPS IN THE ORGANIZATION (Cont.)** Power and Politics	Textbook, Chapter 12
11	**PART II: GROUPS IN THE ORGANIZATION (Cont.)** Conflict and Negotiation	Textbook, Chapter 13
12	**PART III: THE ORGANIZATION SYSTEM (Cont.)** Organizational Culture	Textbook, Chapter 15
13	**PART III: THE ORGANIZATION SYSTEM (Cont.)** Organizational Change	Textbook, Chapter 16

12. Course Assessment:

12.1 Grading

Mid-Term Exam (One Hour) 30% (approx. 60mins)
Class participation 10%
Team project and presentation 20%
Final Exam (Two Hours) 40% (approx. 90mins)

Total 100%

12.2 Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:**	Ability to give compelling arguments and reasoning to support analysis	x	x		x	x								10
2	**- Midterm exam:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x		x	x								10
3	**- Midterm exam:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x								10
4	**- Final:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x			x								20
5	**-Final:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x			x					20
6	**Class participation**	All relating goals		x	x		x			x	x			x	10
7	**Team project and Presentation**	All relating goals		x	x		x	x		x	x		x	x	20
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

13. Student responsibility & Policies:

- *Student responsibility:* It is expected that the students will spend at least 8 hours per week studying this course. This time should be made up of reading textbooks, working on cases, and attending classes. Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities..
- *Attendance:* Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.
- *General Conduct and Behavior*: The students are expected to conduct themselves with consideration and respect for the needs of the fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. More information on student conduct is available at the university webpage.
- *Keeping informed*: The students should take note of all announcements made in lectures or on the course's Blackboard. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

SALES MANAGEMENT

Instructor: School of Business Administration

1. **Name of course**: Sales Management
2. **Course code:** BA032IU
3. **Course type:**
   - ☐ Specialization
   - ☐ Core
   - ☐ Requirement
   - ☒ Elective
4. **Number of credits:** 3 credits
5. **Prerequisite:** Principles of Management
6. **Parallel teaching in the course: None**
7. **Course Description**:.
8. **Course objectives:**

   The purpose of this course is to prepare students for the exciting challenges related to leading sales organizations in today's hyper-competitive global economy. The course focuses on providing students with a basic theoretical foundation in sales management but will also balance the theory with practical application one will need to know in order to lead top- performing sales teams. Key topics of study include: coverage of culture and the global sales environment, analyzing customer and markets, the management of sales force's structure, coverage of sales leadership and ethics.
9. **Textbooks and references: Textbooks:**

   David Jobber, Geoffrey Lancaster, (2015), Selling and Sales Management, Prentice Hall.

   References:

   John Tanner JR, Earl D. Honeycutt Jr, and Robert C. Erffmeyer, (2014), Sales Management: Shaping Future Sales Leaders, Pearson Prentice Hall.

   Harvard Business Review on Sales and Selling, (2008), Harvard Business School Publishing Corporation (ISBN 978-1-4221-4591-3)
10. **Course Learning** O**utcomes**

No	Course learning outcomes	Program Learning outcome
Knowledge	After completing the course, students will be able to connect academic aspects of sales management with the professional perspective of putting theory into practice, as such: ● Understanding the role of the sales management process in today's business environment. ● Describe the personal selling function, and different sales roles. ● Understand the importance of good communication and negotiation ● Understand the importance of the recruitment and selection process to the wellbeing of the organization. ● Understand motivation and compensation as it applies to the sales force. ● Determine sales force effectiveness and performance. ● Understand of ethical issues involved in personal selling	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skills	- Effective communication: The ability to collect, analyze and organize information and to convey that information clearly and fluently, in both written and spoken forms. - Critical argument and judgment: The ability to identify and debate critical issues / problems, as well as to evaluate financial information, make decisions and reflect critically on the justification for decisions.	(d) an ability to function on multi-disciplinary teams (g) an ability to communicate effectively (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Attitude	- Learn within teams (such skills as task assignment and management, conflict resolution and co-operation, consensus building, and leadership) - Provide professional business presentations (both oral and written)	(d) an ability to function on multi-disciplinary teams (f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

11. Course implementation

Time:

Lecture: 1.00 - 3.30 pm Venue: TBA

Teaching and learning activities

Employing the interactive learning and problem-based teaching approach, this course emphasizes the interaction between lecturers and students. The lecture materials will be uploaded in Blackboard to help the students to preview the materials and to concentrate on listening and critical thinking during the lecture. This will help students to interact with the lecturer during the classroom. The sessions for presentations and discussions comprise company case studies as well as answering some theoretical and conceptual questions, which help the students to see how the concepts are applied in the real international business context. Students will present the case to the class and discuss with the peers.

12. Course outline

Week	Topics
1	Sales Perspectives: The Role of Selling in Marketing
2	Sales Perspectives: Sales Strategies
3	Sales Techniques: Sales Responsibilities and Preparation
4	Sales Techniques: Key Account Management and Relationship selling
5	Sales Techniques: Personal Selling Skills and Direct Marketing
6	Sales Environment: Consumer and organizational behavior
7	Sales Environment: Sales Settings
8	Revision class
MID-TERM	
9	Sales Management: Recruitment and Selection
10	Sales Management: Motivation and Training
11	Sales Management: Organization and Compensation
12	Sales Control: Forecasting and Budgeting
13	Sales Control: Salesforce Evaluation
14	International Selling and IT applications in Sales
15	Revision class
FINAL	

13. Course Assessment:

13.1. Grading:

Sales Proposal and Presentation	30%
4 Online Quizzes	10%
Mid-Term Exam (60 minutes)	20%
Final Exam (Two Hours)	40%
Total	**100%**

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:**	Ability to give compelling arguments and reasoning to support analysis	x	x		x	x								10
2	**- Midterm exam:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x		x	x								10
3	**- Midterm exam:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x								10
4	**- Final:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x			x								20
5	**-Final:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x			x					20
6	**Class participation**	All relating goals		x	x		x			x	x			x	10
7	**Team project and Presentation**	All relating goals		x	x		x	x		x	x		x	x	20
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

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14. Student responsibility & Policies:

Workload. It is expected that the students will spend at least *six* hours per week studying this course. This time should be made up of reading, research, working on exercises and problems, and attending classes. In periods where they need to complete assignments or prepare for examinations, the workload may be greater.

Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities.

*Attendance***.** Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.

General Conduct and Behavior. The students are expected to conduct themselves with consideration and respect for the needs of the fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. More information on student conduct is available at the university webpage.

Keeping informed. The students should take note of all announcements made in lectures or on the course's Blackboard. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

HUMAN RESOURCES MANAGEMENT

Instructor: School of Business Administration

1. **Name of course**: HUMAN RESOURCES MANAGEMENT
2. **Course code:** BA156IU
3. **Course type:**

☐ Specialization

☐ Core

☐ Requirement

☒ Elective

4. **Number of credits:** 3 credits

- Theory: 3 credits
- Practice: 0 credit

5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**: examining the role of supervisory function in the housekeeping department, the course provides a thorough overview of maintaining a quality staff, planning or organizing, the technical details of cleaning a room, managing the laundry, and control of supplies and equipment The course examines mainly the theory and practice of managing human resources. It aims at providing an overview of the HR department, both strategic and everyday undertakings, to enable the business to readily have the right people for the smooth operations in the short term and long term. Key topics of study include: the strategic human resource environment; staffing and organization; enhancing motivation and performance; compensating and rewarding the workforce; and managing careers and work environments and labor relations. In general, the course presents the students with the standard process of HR management and also some best practices to perform the task efficiently.
8. **Course objectives:** The course is designed to give students a comprehensive view of human resource management, its scope, functions and importance in business. Students will learn the basic principles of human resource management; how an organization acquires, motivates, utilizes and manages its employees effectively. The course also introduces students to the practices and techniques for recruiting and selecting employees, evaluating performance, training the workforce, and developing the compensation and benefits system.

9. Textbooks and

references: Textbooks:

Noe & Hollenbeck & Gerhart & Wright, Fundamentals of Human Resource Management, 6th edition,

McGraw-Hill..

10. Course Learning outcomes

No	Course learning outcomes	Program Learning outcome
Knowledge	Describe trends in the labor force composition and how they impact human resource management practice Discuss how to strategically plan for the human resources needed to meet organizational goals and objectives	(d) an ability to function on multi-disciplinary teams (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Skills	Define the process of job analysis and discuss its importance as a foundation for human resource management practice Explain how legislation impacts human resource management practices Identify channels for recruiting and discuss both advantages and disadvantages of each channel Compare and contrast methods used for selection and placement of human resources Describe the steps required to develop and evaluate training	(g) an ability to communicate effectively (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
Attitude	Summarize the activities involved in evaluating and managing employee performance Identify and explain the issues involved in establishing compensation system	(f) an understanding of professional and ethical responsibility (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

11. Course implementation

Time: 14 weeks for theory (03 periods per week)

Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Group assignment

12. Course outline

The following is the outline that sets topics for the course. The instructor reserves the right to revise this outline throughout the semester to either add or delete material as necessary to accomplish the goals of the course.

Week	Content	Activities
1	Course introduction Chapter 1: Managing Human Resources	
2	Chapter 2: Trends in Human Resource Management	
3	Chapter 4: Analyzing Work and Designing Jobs	- O*NET ONLINE
4	Chapter 5: Planning for and Recruiting Human Resources	- Online Recruitment Pages
5	Chapter 6: Selecting Employees and Placing Them in Jobs	- MBTI Test
6	Chapter 7: Training Employees	
7	Chapter 8: Managing Employees' Performance	- Group Presentation
8	Guest Speaker SharingMidterm Review	
MIDTERM EXAM		
9	Writing Job Applications Preparing for Interviews	- Group Presentation
10	Chapter 9: Developing Employees for Future Success	- Group Presentation - Submit Individual Job Application
11	Chapter 10: Separating and Retaining Employees	- Group Presentation
12	Chapter 11: Establishing a Pay Structure	- Group Presentation
13	Chapter 12: Recognizing Employee	- Group Presentation

	Contributions with Pay	
14	Chapter 13: Providing Employee Benefits	- Group Presentation
15	Course Review	- Group Presentation
FINAL EXAM		

13. Course Assessment:

13.1. Grading:

Mid-Term Exam 30%

Assignments/Group Presentation/Attendance 30% Final Exam 40%

Total 100%

13.2. Assessment Plan

No.	Content of assessment (*)	Course outcomes	Level of cognitive Domain												Total (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**- Midterm exam:**	Ability to give compelling arguments and reasoning to support analysis	x	x		x	x								10
2	**- Midterm exam:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x		x	x								10
3	**- Midterm exam:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x								10
4	**- Final:**	Ability to structure problems in accordance with theoretical frameworks and resolve them		x			x								20
5	**-Final:**	Ability to conduct applied research to gather data/information pertaining to the case		x			x			x					20
6	**Assignment/ Group Presentation/ Attendance**			x	x		x			x	x			x	30
	Total														100

Note: MCQ: Multiple choice questions ; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

- *Student responsibility:* It is expected that the students will spend at least six hours per week studying this course. This time should be made up of reading textbooks, working on cases, and attending classes. Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities.
- *Attendance:* Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.
- *General Conduct and Behavior*: The students are expected to conduct themselves with consideration and respect for the needs of the fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. More information on student conduct is available at the university webpage.
- *Keeping informed*: The students should take note of all announcements made in lectures or on the course's Blackboard. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

SYLLABUS OF INTERNSHIP AND THESIS

INTERNSHIP 1
Instructor: MSc. Duong Vo Nhi Anh.

1. **Name of course**: INTERNSHIP 1
2. **Course code:** IS069IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 2 credits

   - Lecture: 2 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**:

This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.

Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor).

Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.

8. **Course objectives:** Students have to visit a real industrial environment in order to:
   - Experience real working conditions
   - Learn how to use industrial equipments and instruments
   - Understand daily problems that workers face.
9. **Textbooks and references: Textbooks:**
   - “Retailing 7th Edition” , Dunne, Lusch and Carver, Southwestern Cengage Learning
   - “Logistics and Retail Management: Emerging Issues and New Challenges in the Retail Supply Chain, 3rd Edition”, John Fernie, Leigh Sparks, Kogan Page, 2009

- "Retail Management: A Strategic Approach PIE 12E", Barry Berman / Joel R. Evans

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Analyzing factory process	(b) an ability to collect data
	3.Identification of few problem in process	(e) an ability to identify problem then give suggestion
Skill	4. Applying of methods to solve problem	(c) an ability to design a system, component, or process to meet desired needs of current system
Attitude	6. To develop life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: 15 working days (5 days visit factory, 5 days write report, 5 days to get approval from supervisor).

12. Course outline

13. Course Assessment:

13.1. Grading:

- Advisor Evaluation: 50%
- Supervisor Evaluation: 50%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**Report**	Applying of methods of analysis and suggest the improvement	x												100
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

14. Student responsibility & Policies:

Students must complete the following forms and requirements:

- Internship Registration: register internship through Edusoft or form.
- Internship Application and Student Performance Record.
- Supervisor & Advisor Evaluations: This questionnaire helps ensure that the ISE receives a complete and fair assessment of each student's performance from the site supervisor and advisor. At the completion of the internship, students are responsible for requesting their site supervisor and advisor to complete, and send this form to their advisor and then submit it to the Program Assistant.
- Final Report: In order to receive credit and a final grade for an approved internship students must submit the final report. See below for suggested final report requirements. This report is to be completed by the student and must be submitted to the Program Assistant no later than the due date (to be defined later). 10 points will be deducted from your final grade when the final report is submitted late.

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INTERNSHIP 2

Instructor: MSc. Duong Vo Nhi Anh.

1. **Name of course**: INTERNSHIP 2
2. **Course code:** IS070IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 3 credits

   - Lecture: 3 credits
5. **Prerequisite:** none
6. **Parallel teaching in the course:** None
7. **Course Description**:

This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.

Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 320 working hours or 40 working days is required. Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.

Students should be both supported and challenged and encouraged to take initiative and develop life-long learning skills. Each intern works under a site supervisor at the host organization and an advisor from IU (ISE's lecturer). The role of the site supervisor (or advisor) is to oversee the students and provide mentorship throughout the internship. The site supervisor and advisor will complete a performance evaluation form at the conclusion of the internship. Students will discuss their experiences through weekly reports and online discussions.

8. **Course objectives:** Students work as engineers in industrial environment and have opportunities to:
   - experience real working conditions
   - get involved in real company's projects
   - apply theories and principles learned in academic coursework to real cases

- Gain insight into a possible career path of interest while learning about the industry in which the organization resides, organizational structure, and roles and responsibilities within that structure.
- Develop professional connections and identify a strategy for maintaining those connections

9. Textbooks and

references: Textbooks:

- "Retailing 7th Edition" , Dunne, Lusch and Carver, Southwestern Cengage Learning
- "Logistics and Retail Management: Emerging Issues and New Challenges in the Retail Supply Chain, 3rd Edition", John Fernie, Leigh Sparks, Kogan Page, 2009
- "Retail Management: A Strategic Approach PIE 12E", Barry Berman / Joel R. Evans

10. Course Learning Outcomes

	Course Learning outcomes	Program Learning outcome
Knowledge	1. Analyzing factory process	(b) an ability to collect data
	2. Analyzing of recent system such as quality, procurement, supply chain,…	(j) a knowledge of supply chain
	3.Identification of few problem in process	(e) an ability to identify problem then give suggestion
Skill	4. Applying of methods to solve problem	(c) an ability to design a system, component, or process to meet desired needs of current system
Attitude	6. To develop life-long learning attitude.	(i) a recognition of the need for, and an ability to engage in life-long learning

11. Course implementation

Time: A minimum of 320 working hours or 40 working days is required.

12. Course outline

13. Course Assessment:

13.1. Grading:

- Advisor Evaluation: 50%
- Supervisor Evaluation: 50%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Level of cognitive Domain												Weigh (%)
			Applying			Analyzing			Evaluating			Creating			
			MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	MCQ	WQ	P	
1	**Report**	Applying of methods of analysis and suggest the improvement current systems	x												100
	Total														100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

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14. Student responsibility & Policies:

Students must complete the following forms and requirements:

- Internship Registration: register internship through Edusoft or form.
- Internship Application and Student Performance Record.
- Supervisor & Advisor Evaluations: This questionnaire helps ensure that the ISE receives a complete and fair assessment of each student's performance from the site supervisor and advisor. At the completion of the internship, students are responsible for requesting their site supervisor and advisor to complete, and send this form to their advisor and then submit it to the Program Assistant.
- Final Report: In order to receive credit and a final grade for an approved internship students must submit the final report. See below for suggested final report requirements. This report is to be completed by the student and must be submitted to the Program Assistant no later than the due date (to be defined later). 10 points will be deducted from your final grade when the final report is submitted late.

THESIS

Instructor: Dr. Nguyen Van Hop

1. **Name of course**: THESIS
2. **Course code:** IS071IU
3. **Course type:**

   ☒ Specialization

   ☐ Core

   ☒ Requirement

   ☐ Elective
4. **Number of credits:** 10 credits
5. **Prerequisite:** None
6. **Parallel teaching in the course:** None
7. **Course Description**: Thesis project is a semester-long, individual study taken at the last semester of the senior year. Students are required to solve a large-scale problem by designing a new system or developing a comprehensive solution to improve the current system. The new design or solution for improvement must take into account realistic constraints such as economic, social and environmental conditions.
8. **Course objectives:**
   - Students can apply their knowledge and experiences acquired in previous courses to their research.
   - Students can design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental)
   - Students can write formal reports and give presentations of their work.
9. **Learning outcomes**

Learning Outcome Codes	Course learning outcomes	Program Learning outcomes (*)
G1	Be able to study a system by identifying its inputs, outputs and constraints, including economic, social and environmental conditions	(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social,

		political, ethical, health and safety, manufacturability, and sustainability (e) an ability to identify, formulate, and solve engineering problems
G2	Be able to identify, formulate problems of the system by collecting and analyzing data	(b) an ability to design and conduct experiments, as well as to analyze and interpret data (e) an ability to identify, formulate, and solve engineering problems
G3	Be able to conduct literature review related to a specific topic	(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (i) a recognition of the need for, and an ability to engage in life-long learning (j) a knowledge of contemporary issues
G4	Be able to design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental)	(a) an ability to apply knowledge of mathematics, science, and engineering (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (e) an ability to identify, formulate, and solve engineering problems (f) an understanding of professional and ethical responsibility (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
G5	Be able to write a formal report and give presentation of their work	(g) an ability to communicate effectively

10. Course outline

No.	Content
1	Identify the thesis scope (must be broader than the capstone project)
2	Conduct literature review and study related theory
3	Propose research plan
4	Proposal defense
5	Study the system by identifying all of its inputs, outputs and realistic constraints, including economics, social and environmental
6	Design a new system or develop a solution to improve the system on a large scale with those complicated and realistic constraints.
7	Midway report and defense
8	Validate the proposed design or solution
9	Final report and defense

11. Course Assessment:

13.1. Grading:

- One midterm exam: 30%
- Mini projects, presentations & attendance: 15%
- Group project: 15% (paper: 10%, presentation: 5%)
- Final exam: 40%

13.2. Assessment Plan

No.	Assessment tasks	Assessment criteria	Weigh (%)
1	Proposal defense	- Be able to study a system by identifying its inputs, outputs and constraints, including economic, social and environmental conditions - Be able to identify, formulate problems of the system	Pass or Fail

		by collecting and analyzing data - Be able to conduct literature review related to a specific topic - Be able to write a formal report and give presentation of their work	
2	Midway report	- Be able to study a system by identifying its inputs, outputs and constraints, including economic, social and environmental conditions - Be able to design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental) - Be able to write a formal report and give presentation of their work	Pass or Fail
3	Final report	- Be able to study a system by identifying its inputs, outputs and constraints, including economic, social and environmental conditions - Be able to design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental) - Be able to write a formal report and give presentation of their work	Pass or Fail
4	Thesis defense		100
	Total		100

Note: MCQ: Multiple choice questions; **WQ**: Writing questions; **P**: Presentation

12. Student responsibility & Policies:

- *Student responsibility:* Students are expected to spend at least 8 hours per week self – studying. This time should be made up of reading, working on exercises and problems and group assignments.
- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students retake the tests.)