

**VIETNAM NATIONAL UNIVERSITY
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY**

**MODULE HANDBOOK
OF
NATURAL RESOURCES AND
ENVIRONMENTAL MANAGEMENT
PROGRAM – 2019**

Ho Chi Minh City, Update May 2023

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Module designation	<i>English 1</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Hoang Vo Bich Phuong</i>
Language	<i>English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, group discussion, presentation</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 45</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 22.5</i> <i>-Others: 10</i> <i>-Self-Study: 22.5</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of the module, students will be able to:</i> <i>- Knowledge: lexical resources regarding common topics for everyday communication; use certain grammar points properly.</i> <i>- Skills: clearly discuss and communicate the themes of the book contents.</i> <i>- Competences: evaluate new information and develop their own opinions and ideas to share when engaging in group discussions.</i>
Content	<i>Authentic materials and motivating stories regarding the topics of where their Heart is, Health and Happiness, Learning, and Family and Friends.</i>
Exams and assessment formats	<i>Multiple choice questions: one Midterm test (50 min), one Final exam (50 min); in-class and online quizzes,, take-home written assignments.</i>
Study and examination requirements	<i>The final grade in the module is composed of 50% performance on exams, 20% mid-term assessment, 20% quizzes and assignments, 10% take-home assignments, 10% online tasks. Students must have a final grade of 50% or higher to pass</i>
Reading list	<i>[1] Douglas, N., & Morgan. J. (2018). Perspectives 1. Cengage Learning.</i>

2. Physical Training 1

PE1003

Module designation	<i>Physical Training 1: Table Tennis</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Le Quang Khoi</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Lecture, lesson, exercise.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 90</i> <i>-Lectures: 20</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 70</i> <i>-Mini Project: 0</i> <i>-Others: 0</i> <i>-Self-Study: 0</i>
Credit points	<i>0</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Law of table tennis , theory of basic technique Skills: complete practical subject</i> - <i>Competences: Students know how to play tennis table</i>
Content	<ul style="list-style-type: none"> - <i>Rules of table tennis</i> - <i>Theory basic technique.</i> - <i>Good practical skills</i>
Exams and assessment formats	<i>Students will complete subject by entirely of practical examination</i>
Study and examination requirements	<i>Students must reach at least 50% of practical test requirements, students must attend fully.</i>
Reading list	<i>[1] Giáo trình bóng bàn – trường đại học TDTT TPHCM 2016</i> <i>[2] Luật thi đấu bóng bàn – tổng cục TDTT năm 2016</i>

Module designation	<i>Calculus 1</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Dr. Tran Ngoc Diem</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, project.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200</i> <i>-Lectures: 45</i> <i>-Tutorial/Exercise: 14</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 24</i> <i>-Others: 20</i> <i>-Self-Study: 97</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students know how to:</i> <ul style="list-style-type: none"> <i>– Be able to recall definitions, properties, methods of calculating derivatives and integrals of single variable functions and ordinary differential equations.</i> <i>– Apply theory to solve practical problems.</i> <i>– Be able to work in groups</i>
Content	<i>Part 1: Theory of differentiation and integration of functions of one variable and their applications .</i> <i>Part 2: Ordinary differential equations and their applications.</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>– Quizzes.</i> <i>– One midterm test (50 minutes).</i> <i>– One project.</i> <i>– One final exam (100 minutes).</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>The final grade in the course is composed of 50% performance on exams, 5% quizzes, 25% midterm test, 20% project. Students must have a final grade of 50% (5/10) or higher to pass.</i>
Reading list	<p><i>[1] Calculus 1, Nguyen Dinh Huy (Main author), Viet Nam National University, HCM City 2016 (in Vietnamese).</i></p> <p><i>[2] Calculus early transcendentals. James Stewart , 7e, Thomson Brooks Cole 2008.</i></p> <p><i>[3] Applied Cacculus for managerial, life and social sciences_brief approach – Soo T.Tan – Brooks Cole-Cengage learning 2008.</i></p>

Module designation	<i>Linear Algebra</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Dr. Dang Van Vinh, Msc. Phan Thi Khanh Van</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture, lesson, project.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 14</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 24</i> <i>-Others: 15</i> <i>-Self-Study: 67</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students know how to:</i> <i>- Understand main concept of linear algebra</i> <i>- Solve basis problems in linear algebra.</i> <i>- State and solve practice problems such as Markov model, Leslei model, Input Output model, Least square problem, ...</i>
Content	<i>The subject provides students with fundamental knowledge:</i> <i>- Matrix algebra: matrix, determinant, rank, inverse of a square matrix, system of linear equations.</i> <i>- Vector spaces: Space, subspace, linear independence, basis and dimension</i> <i>- Euclidean space: inner product, orthogonal complement, orthogonal projection, Gram Schmidt process</i> <i>- Linear mapping, Kernel and Image of linear mapping, matrix representation of linear mapping.</i> <i>- Eigenvalues and eigenvectors, diagonalization, orthogonal diagonalization, quadratic form.</i>
Exams and assessment formats	<i>- One mid-term test (45 minutes)</i> <i>- Short exercises (in classroom)</i> <i>- One final exam (90 minutes)</i> <i>- Group homework (work in group and give presentation)</i> <i>- Project</i>
Study and examination requirements	<i>Requirements for successfully passing the course:</i> <i>The final grade in the course is composed of 50% performance on final exams, 5% exercises, 20% project, 25% mid-term test. Students must have a final grade of 5.0/10.0 or higher to pass</i>
Reading list	<i>[1]Dang Van Vinh. Textbook of Linear algebra, VNU HCM, 2020.</i> <i>[2] Nguyen Tien Dung. Linear algebra. Theory and applications, VNU HCM, 2018.</i>

	<p>[3] Strang G. <i>Linear algebra and its applications</i>, 4th edition, Thomson Brook/Cole, 2006.</p> <p>[4] Steven Leon. <i>Linear Algebra with Applications</i>, 7th Edition, Pearson Prentice Hall, 2006</p> <p>[5] David C. Lay, <i>Linear Algebra and its applications</i>, Addison - Wesley Publishing Company, New York, 1993.</p> <p>[6] Howard Anton, Chris Rorrer. <i>Elementary Linear Algebra</i>, application version, 10th edition, John Wiley & Sons, 2010.</p>
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Module designation	<i>General Physics 1</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Ph.D. Ly Anh Tu</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Ass. : Assignment, homework Project: group assignment Midterm test : multiple-choice Final exam: multiple-choice</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200 -Lectures: 45 -Tutorial/Exercise: 14 -Labs/Practice: 0 -Mini Project: 24 -Others: 20 -Self-Study: 97</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> <i>• Presenting the basic knowledge of Physics A1 at the university level.</i> <i>• Applying scientific reasoning, logical thinking, as a basic for studying and researching the engineering specialties and technical specialties in the future.</i> <i>• Self-learning, researching, drafting and presenting (writing and speaking) the physics related topics.</i> <i>• Using computational programs to solve problems of physics.</i>
Content	<i>Introduction of the course</i>
Exams and assessment formats	<i>Mechanics</i> <i>1. Fundamentals of kinematics</i> <i>2. Laws of motion</i> <i>3. Dynamics of particle systems Mechanics of rigid bodies</i> <i>Thermodynamics</i> <i>4. Thermodynamics of gas</i> <i>5. Laws of thermodynamics</i>
	<i>Electricity</i> <i>6. Electrostatics in free space</i> <i>7. Dielectrics and conductors</i>
	<i>Magnetostatics</i> <i>8. Magnetostatics in free space</i>
Study and examination requirements	<i>Assignment; project (group assignment); Midterm test (multiple choice, problems- 70 minutes); Final exam (multiple choice, problems- 90 minutes).</i>
Reading list	<ul style="list-style-type: none"> <i>- Ass. : Assignment, homework</i> <i>- MTest: Midterm test (60')</i> <i>- Exam: Final Exam (90')</i> <i>- Project: group assignment</i>

	<p>[1] Nguyen Thi Be Bay et al., <i>General Physics A1</i>, HCMUT Textbook, 2016.</p> <p>[2] Tran Van Luong et al., <i>General Physics Practice A1</i>, VNU- HCMC pub., 2018</p> <p>[3] Study materials can be downloaded from BKEL (http://e- learning.hcmut.edu.vn/). The lecture slides are updated weekly according to the progress of class. Besides, students can self- study and learn more through the following documents:</p> <p>[4] Halliday, Resnick, Walker, <i>Fudamental physics</i>, Edu. Pub., 2000.</p> <p>[5] Serway, Jewett: <i>Physics for Scientists and Engineers – 10th Edition</i>, Cengage, 2019.</p>
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Module designation	<i>General Physics Labs</i>
Semester	1st
Person responsible for the module	<i>M.Sc. Tran Anh Tu Dr.Eng. Tran Trung Nghia</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, lab works</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 50</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 30</i> <i>-Mini Project: 0</i> <i>-Others: 5</i> <i>-Self-Study: 15</i>
Credit points	1 (2 ECTS)
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	<p><i>The course is one of the courses integrated into almost the curriculum programmes that is to get students to appreciate the underlying theories or principles of science and engineering by acquiring practical or hands-on experience from the lab experiments. During the lab session, students are required to form several groups to share instruments and equipment in their lab experiment.</i></p> <p>Course objectives: <i>This course helps students getting to:</i></p> <ul style="list-style-type: none"> <i>- master basic physics concepts by performing an experiment relevant to corresponding course work;</i> <i>- gain hands-on experiences with experimental processes and develop effective written communication skills;</i> <i>- develop collaborative learning skills by working in a group.</i> <p>Intended learning outcomes: <i>On successful studying of this course, students can acquire the following learning outcomes:</i></p> <ul style="list-style-type: none"> <i>- Demonstrating basic experimental skills by the practice of setting up and conducting an experiment;</i> <i>- Demonstrating an understanding of the analytical methods required to interpret, analyze results, and draw conclusions as supported by experimental data;</i> <i>- Demonstrating basic communication skills by working in groups on laboratory experiments and the thoughtful discussion and interpretation of data.</i>
Content	<p><i>This course provides an introduction to experimentation and demonstration the physics of mechanics, waves, optics, fluids, thermodynamics, electronics, electricity, and electromagnetism. Class time is comprised of fifteen 2hr laboratory sessions spread over the semester.</i></p> <p>Orientation (lev. 1):</p>

	<ul style="list-style-type: none"> - Lab resources; - Safety. Plagiarism. Report writing. <p>Measurements and Uncertainties (lev. 2). Graphing (lev. 2).</p> <p>Precision measuring instruments (lev. 2).</p> <p>Laboratories (lev. 2): Each semester, based on the condition of equipment and schedule, the instructor will select the appropriate laboratories (at least 07 for the standard programme, and at least 08 for the international programme).</p> <ul style="list-style-type: none"> - Lab 1: determining density of rigid objects. - Lab 2: determining the gravitational acceleration with a reversible pendulum. - Lab 3: determining the moment of inertia of a flywheel and the friction force of rotary bearings. - Lab 4: thermocouple. - Lab 5: measuring viscosity of a liquid using Stoke's method. - Lab 6: determining unknown resistance and capacitance using neon lamp oscillator circuit. - Lab 7: DC and AC circuits. - Lab 8: measuring refractive index of glass using microscope. - Lab 9: measuring focal lengths of convex and concave lenses. - Lab 10: determining the Cp/Cv ratio of gas. - Lab 11: measuring the wavelength of a laser using the planar diffraction grating. - Lab 12: Newton's laws. - Lab 13: Conservation of momentum. - Lab 14: The RLC resonant circuit (I). - Lab 15: The RLC resonant circuit (II). - Lab 16: e/m_e of the electron. - Lab 17: verification of Stefan-Boltzman law. <p>Discussion and report evaluation days (at least 03 times).</p>
Exams and assessment formats	<ul style="list-style-type: none"> - Pre-lab (15-minute quiz at the start of each session and preparation); - Lab works (attendance, participation); <p>Laboratory reports.</p>
Study and examination requirements	<p>The final grade is composed of 50% performance in the lab contributions (pre-lab, attendance, participation) and performance 50% in laboratory reports. Students must complete the required laboratories (at least 06 for the standard programme, at least 07 for the international programme) and have a final grade of 50% or higher to pass.</p> <ol style="list-style-type: none"> 1. The grading guidelines are as follows: Prelab (10%); Attendance (20%); Participation (20%); Laboratory Reports (50%). 2. A grade of zero (0) will be given for any missed experiment with no excuse. 3. Submission of the lab report is due the following week class begins – penalty for lateness is 10% per day.

	<p><i>4. Laboratory Report Grading (points):</i></p> <ul style="list-style-type: none"> - <i>Style; font type, font size, line space, margin, etc. given by the lab instructor (0.5)</i> - <i>Title (0.5)</i> - <i>Introduction including Objective and Theoretical Background (0.5)</i> - <i>Experimental Procedure (0.5)</i> - <i>Results: Experimental Data (1.5) and Calculation (1.5)</i> - <i>Discussion and analysis of results; Answers to questions (3.5)</i> - <i>Conclusions (1.0)</i> - <i>Raw Data Sheet (0.5); unless otherwise instructed, raw data sheets (or photocopies of raw data) should be attached in the lab report. The raw data should be checked and signed by the instructor at the completion of the lab experiment.</i>
Reading list	<p><i>[1]. Trần Anh Tú, Nguyễn Minh Châu, Trần Trung Nghĩa, Nguyễn Dương Hùng, Nguyễn Thị Hương Linh, Trịnh Trần Hồng Duyên. Thí nghiệm Vật lý đại cương A, NXB ĐHQG HCM-2020.</i></p> <p><i>[2]. Tran Anh Tu, Tran Trung Nghia, Nguyen Minh Chau, Nguyen Duong Hung, Huynh Quang Linh, Tran Thi Thu Hanh, Ngo Thi Minh Hien, Vo Nhat Quang, Tran Phuoc Duy, General Physics Laboratory, VNU-HCM Press, 2021.</i></p>

Module designation	<i>Introduction to Engineering</i>
Semester	<i>1st</i>
Person responsible for the module	<i>Dr. Lam Van Giang Dr. Ha Quang Khai Dr. Vo Thanh Hang</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 12 -Labs/Practice: 0 -Mini Project: 27 -Others: 15 -Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon the completion of the course, students are able to achieve the following knowledge and skills: Understand issues in the area of environmental engineering and management; Understand required fundamental knowledge in the field of environment and natural resources; Develop and formulate personal skills; Develop attitudes for future career; Form effective teamwork and communications; Understand contemporary issues in the area of environment and resources.</i>
Content	<i>This course will provide students with essential and crucial skills for engineers, including: The first part: information on and knowledge of engineer's duties and roles; effective learning ways in university. The second part: crucial skills, including: teamwork/group working; critical thinking; inter-personal communication skills; experiment and survey design; professional report composing. The third part: professional ethics and responsible behavior to learners in the field of natural resources and environmental management – environmental engineering for which they pursue to work.</i>
Exams and assessment formats	<i>- Midterm assessments (45 minutes each) - and one final exam (70 minutes), - short computer-based quizzes, - take-home written assignments - Labworks</i>

Study and examination requirements	<p><i>Requirements for successfully passing the module</i></p> <p><i>- the final grade in the module is composed of 50% performance on exams, 5% quizzes, 5% take-home assignments, 5% in-class participation and pilot project 35%. Students must have a final grade of 50% or higher to pass</i></p>
Reading list	<p><i>[1]. Phạm Văn Toàn, Phạm Công Bằng (2014). Nhập môn về Kỹ thuật. Nhà xuất bản ĐHQG Tp.HCM.</i></p> <p><i>[2]. Nguyễn Văn Tuấn (2013). Từ nghiên cứu đến công bố: Kỹ năng mềm cho nhà khoa học. Nhà xuất bản tổng hợp Tp.HCM.</i></p> <p><i>[3]. Evans, D. and Gruba, P. (2005). How to Write a Better Thesis. 2nd Edition, Melbourne University Press.</i></p> <p><i>[4]. Lebrun, J-L. (2007). Scientific Writing: A Reader and Writer's Guide. World Scientific, New Jersey.</i></p> <p><i>[5]. Lipson, C. (2005). How to Write a BA Thesis: A Practical Guide from Your First Ideas to Your Finished Papers. Chicago, the University of Chicago Press.</i></p>

Module designation	<i>English 2</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Nguyen Thanh Thuy</i>
Language	<i>English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, group discussion, presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 45</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 22.5</i> <i>-Others: 10</i> <i>-Self-Study: 22.5</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>English 1</i>
Module objectives/intended learning outcomes	<i>Upon completion of the module, students will be able to:</i> <ul style="list-style-type: none"> <i>• Knowledge: use certain lexical resources regarding common topics for everyday communication; use certain grammar points properly.</i> <i>• Skills: clearly discuss and communicate the themes of the book contents.</i> <i>• Competences: evaluate new information and develop their own opinions and ideas to share when engaging in group discussions.</i>
Content	<i>Authentic materials and motivating stories regarding the topics of emotions, travel, sports, food, and work, at intermediate levels.</i>
Exams and assessment formats	<i>Multiple choice questions: one Midterm test (50 minutes), one Final exam (50 minutes);</i> <i>In-class and online quizzes, take-home written assignments</i>
Study and examination requirements	<i>The final grade in the module is composed of:</i> <ul style="list-style-type: none"> <i>• 50% performance on final exams,</i> <i>• 20% on midterm test,</i> <i>• 20% on in-classes participation and quizzes and, take-home assignments,</i> <i>• 10% on online quizzes</i> <i>Students must have a final grade of 50% or higher to pass</i>
Reading list	<i>[1] Lansford, L., Barber, D., & Jeffries, A. (2018),</i> <i>Perspective 1B: Compo Split, Cengage ELT.</i>

9. Physical Training 2

PE1005

Module designation	<i>Physical Training 2: Volley ball</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Nguyen Duc Toan</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Lecture, lesson, exercise.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 90</i> <i>-Lectures: 20</i> <i>-Tutorial/Exercise:0</i> <i>-Labs/Practice: 70</i> <i>-Mini Project: 0</i> <i>-Others: 0</i> <i>-Self-Study: 0</i>
Credit points	<i>0</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Law of Volley ball , theory of basic technique.</i> - <i>Skills: complete practical subject</i> - <i>Competences: Students know how to play volley ball</i>
Content	<ul style="list-style-type: none"> - <i>rules of volley ball</i> - <i>theory basic technique.</i> - <i>good practical skills</i>
Exams and assessment formats	<i>Students will complete subject by entirely of practical examination</i>
Study and examination requirements	<i>Final exam. Students must reach at least 50% of practical test requirements, students must attend fully.</i>
Reading list	<i>[1] Giáo trình bóng chuyền – trường ĐH TDTT TPHCM 2017</i> <i>[2] Luật bóng chuyền - tổng cục TDTT 2017</i>

Module designation	<i>Calculus 2</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Dr. Nguyen Quoc Lan</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, project.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200</i> <i>-Lectures: 45</i> <i>-Tutorial/Exercise: 14</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 24</i> <i>-Others: 20</i> <i>-Self-Study: 97</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students know how to:</i> <ul style="list-style-type: none"> <i>– Be able to recall definitions, properties, methods of calculating derivatives and integrals of multivariable functions and series.</i> <i>– Apply theory to solve practical problems.</i> <i>– Be able to work in groups</i>
Content	<i>Part 1: Theory of differentiation and integration of multivariable functions and their applications.</i> <i>Part 2: Theory of number series and power series.</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>– Quizzes.</i> <i>– One midterm test (50 minutes).</i> <i>– One project.</i> <i>– One final exam (100 minutes).</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>The final grade in the course is composed of 50% performance on exams, 5% quizzes, 25% midterm test, 20% project. Students must have a final grade of 50% (5/10) or higher to pass</i>
Reading list	<ul style="list-style-type: none"> <i>[1] Calculus 2, Nguyen Dinh Huy (Main author), Viet Nam National University, HCM City 2016 (in Vietnamese).</i> <i>[2] Calculus early transcendentals. James Stewart, 7e, Thomson Brooks Cole 2008.</i> <i>[3] Applied Caculus for managerial, life and social sciences_brief approach – Soo T.Tan – Brooks Cole-Cengage learning 2008.</i>

Module designation	<i>General Chemistry</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Nguyen Tuan Anh</i>
Language	<i>Vietnamese/English</i>
Relation to curriculum	<i>Compulsory All programs in HCMUT</i>
Teaching methods	<i>Blended Learning, Practice, Active Learning.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 20 -Mini Project: 15 -Others: 15 -Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>L.O.1 Present basic structure of chemicals L.O.2 Calculate thermodynamic quantities and chemical balances L.O.3 Calculate properties of chemical solutions L.O.4 Calculate properties of electrochemical system and redox reactions</i>
Content	<i>Part 1- Matter Structure: This part supplies the modern knowledge on atoms, electronic structure and the periodic law, bonding types in molecules and molecular structure. Part 2- Basic Theories of Chemical Processes: This part supplies basic concept of foundation theories on Chemical Processes: Thermochemistry, entropy and Gibbs energy, the concept of chemical equilibrium and factors affecting it, equilibrium types in electrolyte solutions, equilibrium in heterogeneous systems, the direction and extent of non-change oxidation state reactions, the direction and extent of oxidation-reduction reactions, reaction rate and factors affecting it. Part 3- Laboratory practice: Learn safety rules in the laboratory and practice using some essential tools in the chemical laboratory, the techniques of preparation and titration of solutions, and the calculation of experimental errors. Students perform experiments to verify the theory and evaluate the results for each experiment</i>
Exams and assessment formats	<i>Experiments: 25%; Assignments: 5%; Midterm exam: 20%; Final Exam: 50%</i>
Study and examination requirements	<i>Students must attend in laboratory 100% of class meetings in order to receive credit for the course. Students must submit their projects on time.</i>

Reading list	<p><i>Materials of the subject (lecture slides) can be downloaded from BKEl page (http://e-learning.hcmut.edu.vn/). Students can also use the following documents:</i></p> <p><i>Textbooks:</i></p> <p><i>[1] Nguyễn Đình Soa, Hóa Đại Cương, NXB Đại học Quốc Gia Tp. HCM, 2017.</i></p> <p><i>[2] Huỳnh Kỳ Phương Hạ, Nguyễn Sơn Bạch, Trần Minh Hương, Nguyễn Thị Bạch Tuyết, Nguyễn Minh Kha, Nguyễn Lê Trúc, Bài tập trắc nghiệm Hóa đại cương, NXB. Đại học quốc gia Tp.HCM, 2016.</i></p> <p><i>References:</i></p> <p><i>[1] Lê Mậu Quyền, Hóa học Đại cương, NXB. Khoa Học và Kỹ Thuật, Hà Nội, 2003.</i></p> <p><i>[2] Hoàng Nhâm, Hóa học vô cơ, Tập 1, NXB Giáo dục, Hà Nội, 1994.</i></p> <p><i>[3] David W. Oxtoby, H.P. Gillis, Alan Campion, Principles of Modern Chemistry, 8th edition, Thomson Brooks/Cole, 2016.</i></p> <p><i>[4] Darrell D. Ebbing and Steven D. Gammon, General Chemistry, 11th edition, Houghton Mifflin Company, New York, 2016.</i></p> <p><i>[5] Lucy T.Eubanks, Preparing for your ACS examination in General Chemistry, ACS Chem Ed Exams, 1998.</i></p>
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Module designation	<i>Microbiology and Experiment</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Assoc. Prof. Dang Vu Bich Hanh</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>Compulsory</i> <ul style="list-style-type: none"> - <i>Biological processes in environmental engineering(required)</i> - <i>Wastewater treatment engineering (required)</i> - <i>Solid waste engineering (required)</i> <i>Names of other study programmes with which the module is shared (Environmental Engineering program; Natural Resources and Management)</i>
Teaching methods	<i>Lecture, lab works, presentation, blended course</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200</i> <ul style="list-style-type: none"> -<i>Lectures: 30</i> -<i>Tutorial/Exercise: 0</i> -<i>Labs/Practice: 30</i> -<i>Mini Project: 45</i> -<i>Others: 20</i> -<i>Self-Study: 75</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Basic knowledge on:</i> <ul style="list-style-type: none"> - <i>General chemistry</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Understand and identify groups in microbes kingdom and taxonomic skills.</i> - <i>Understand biochemical reactions in intra and extracellular.</i> - <i>Develop skills for analysis, argument and identify metabolic substances in environment</i> - <i>Analyze and evaluate role of microbes in pollution treatment and monitoring</i> - <i>Practical skills and knowledge opening</i>
Content	<ul style="list-style-type: none"> - <i>Students understand a basic general knowledge of structures, habitats and characteristics of microorganism in environment; principles of microbial metabolism and microbes influences all living thing in environment and safety in microbial lab working.</i> - <i>How to analyze and apply the biological processes in the environmental technologies and environmental management or fundamental biotechnology, as well</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Class work activities/ Quizzes; Take – home written assignments; Lab work with report; Final examination in quizzes.</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>The final grade in the module is composed of 30% performance on exams, 10% quizzes, 20% take-home assignments, 40% in-class participation. Students must have a final grade of 50% or higher to pass</i>

Reading list	<p>[1] <i>Handbook of Water and Wastewater Microbiology</i> – Duncan Mara and Nigel Horan – Academic Press – 2003</p> <p>[2] <i>Principles and Practice of Disinfection, Preservation & Sterilization</i> - Russell, Hugo & Ayliffe's – Black Well Publishing – 2004</p>
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Module designation	<i>Engineering Drawing</i>
Semester	<i>2nd</i>
Person responsible for the module	<i>Nguyen Thi Kim Uyen</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Lecture</i> - <i>Exercise</i> - <i>Experiment</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <ul style="list-style-type: none"> - <i>Lectures: 30</i> - <i>Tutorial/Exercise: 10</i> - <i>Labs/Practice: 20</i> - <i>Mini Project: 0</i> - <i>Others: 15</i> - <i>Self-Study: 75</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Students know how to use drawing equipment and AutoCAD software.</i> - <i>Students are able to understand technical ideas on the technical scheme and know the way to construct the drawing representations according to TCVN and ISO.</i> - <i>Understanding the orthographic projection method in representing the basic geometrical features.</i> - <i>Students know how to show the representations of screw thread, keys, pins, the technical requirements of assembly drawings and detail drawings; construct and understand the assembly drawing, draw the detail drawing.</i> <p><i>Key question: what learning outcomes should students attain in the module?</i></p> <p><i>E.g. in terms of:</i></p> <ul style="list-style-type: none"> - <i>Knowledge: familiarity with information, theory and/or subject knowledge</i> <i>Skills: cognitive and practical abilities for which knowledge is used</i> - <i>Competences: integration of knowledge, skills and social and methodological capacities in working or learning situations²</i> <p><i>E.g.: "Students know that/know how to/are able to..."</i></p>
Content	<ul style="list-style-type: none"> - <i>Chapter 1- Use and Converse Drawing Instruments or Equipment</i> - <i>Chapter 2- Principles of Engineering Drawing</i> - <i>Chapter 3- Geometric Construction</i> - <i>Chapter 4- Orthographic Projection</i>

	<ul style="list-style-type: none"> - Chapter 5- Types of Solid - Chapter 6- Orthographic Representation - Chapter 7- Sectional view and Section - Chapter 8- Assembly Drawing - Chapter 9- Threads and Fasteners - Chapter 10- Tolerance and Surface Roughness - The description of the contents should clearly indicate focus areas and the level of difficulty.
Exams and assessment formats	<ul style="list-style-type: none"> - Final exam on computer with AutoCAD software (100 minutes) - Midterm test (50 minutes) by hand in the class - Exercise or practice in the class and at home - Experiment on computer with AutoCAD software - e.g. two oral Midterm assessments (20 minutes each) and one final oral exam (40 minutes), short computer-based quizzes, take-home written assignments
Study and examination requirements	<p>Students should use materials uploaded to the BKeL website.</p> <p>All exercises and assignment (manual drawings and computer- based drawings) should be executed.</p> <p>Scores recorded throughout the course include the following components:</p> <ul style="list-style-type: none"> - Exercise: 15% - Experiment: 20% - Midterm test: 15% - Final exam: 50% <p>Midterm test (week 8 or 9): Orthographic drawing: construct the third view that works as a solution with two views given, draw the third regular view, and determine the true size of certain line/surface.</p> <p>Final exam: Assembly Drawings, Detail Drawings - draw all the necessary views: orthographic views, sectional views, and auxiliary views.</p> <p>Requirements for successfully passing the module</p> <ul style="list-style-type: none"> - e.g. the final grade in the module is composed of 60% performance on exams, 10% quizzes, 10% take-home assignments, 10% in- class participation. Students must have a final grade of 60% or higher to pass
Reading list	<p>[1] <i>Vẽ Kỹ Thuật Cơ Khí Tập 1,2</i> Trần Hữu Quế, NXB Giáo Dục, 2009.</p> <p>[2] <i>Vẽ kỹ Thuật Cơ Khí</i>, Lê Khánh Điền, NXB ĐHQG TP HCM, 2014.</p> <p>[3] <i>Vẽ kỹ thuật theo tiêu chuẩn quốc tế</i>, Trần Hữu Quế – Nguyễn Văn Tuấn, NXB Bách Khoa Hà Nội, 2009.</p> <p>[4] <i>Mechanical Drawing, French – Svensen – Helsel – Urbanick</i>, Glencoe/McGraw – Hill, 1997.</p> <p>[5] <i>Hình Học Hoạ Hình</i>, Nguyễn Đình Điện, NXB Giáo Dục, 2005.</p>

Module designation	<i>English 3</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Nguyen Cao Nguyen</i>
Language	<i>English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture, lesson, group discussion, presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 45</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 22.5</i> <i>-Others: 10</i> <i>-Self-Study: 22.5</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>English 2</i>
Module objectives/intended learning outcomes	<i>Upon completion of the module, students will be able to:</i> <ul style="list-style-type: none"> <i>- Knowledge: use certain lexical resources regarding common topics for everyday communication; use certain grammar points properly.</i> <i>- Skills: clearly discuss and communicate the themes of the book contents.</i> <i>- Competences: evaluate new information and develop their own opinions and ideas to share when engaging in group discussions.</i>
Content	<i>Authentic materials and motivating stories regarding the topics of emotions, travel, sports, food, and work, at intermediate levels</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>• Multiple choice questions: one Midterm test (50 minutes), one Final exam (50 minutes);</i> <i>• In-class and online quizzes, take-home written assignments</i>
Study and examination requirements	<i>The final grade in the module is composed of:</i> <ul style="list-style-type: none"> <i>• 50% performance on final exams,</i> <i>• 20% on midterm test,</i> <i>• 20% on in-classes participation and quizzes and, take-home assignments,</i> <i>• 10% on online quizzes</i> <i>Students must have a final grade of 50% or higher to pass</i>
Reading list	<i>[1] Lansford, L., Barber, D., & Jeffries, A. (2018), Perspective 2A: Compo Split, Cengage ELT.</i>

Module designation	<i>Introduction to Vietnamese Law</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Le Mong Tho</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, Lesson, teamwork, homework, essay</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 24</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 18</i> <i>-Others: 10</i> <i>-Self-Study: 48</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<p><i>About the knowledge: To be able to acknowledge, present the basic concepts of the State, the laws, and theories of some legal fields of Vietnamese legal system; To be able to evaluate the appropriateness of the impact of the laws on legal phenomena related to society in general and to major of students in particular.</i></p> <p><i>About the skills: To be able to self-study, teamwork, to update and improve knowledge of legal science; To be able to deal with common legal situations in family and in society.</i></p> <p><i>About the manner: To be aware of ethical and legal issues, strictly comply with the School's regulations; To actively strive to prevent and eliminate illegal acts; to believe and uphold the principle "Living and working in accordance with the laws".</i></p>
Content	<ul style="list-style-type: none"> <i>- Gaining the full knowledge of the State and the law from the perspective of Marxism-Leninism, having a firm grasp of the Party's and State's views, undertakings, policies performed in the provisions of the law.</i> <i>- Gaining skills to handle cases in relation to real life and law; being aware of standards of conduct as regulated by the law in order to live and work pursuant to the law.</i> <i>- Gaining ability to update topical issues in legal field; boosting legal awareness, civic awareness of students in University activities and in society.</i> <i>- Practicing honesty, responsibility, professional ethics, discipline, professionalism and the ability to adapt to changes in reality.</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>- Regular evaluation: Attendance, performance in classes: 20% .</i> <i>- Courework (essay): 30%.</i>

	<ul style="list-style-type: none"> - <i>End-of- module exam (EXAM): 50% (multiple choice, no materials allowed, 50 minutes, test question sheet must be returned).</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Students must not be absent more than 20% of the total number of module's periods.</i> - <i>Students read materials and fully prepare the topics specified in the Course Syllabus, read the reference materials and research before the lecture about the content to be learned during the week.</i> - <i>Students have to watch all instructional videos and take quizzes with a score of 5 or higher for each.</i>
Reading list	<ul style="list-style-type: none"> - <i>Main Textbooks</i> <i>[1] Ministry of Education and Training (2019), General Law Textbook, University of Education Publishing House.</i> - <i>References</i> <i>[1]Constitutional Law 2013; Administrative Law; Criminal Law 2015, Criminal Procedure Law 2015; Civil Law 2015, Civil Procedure Law 2015; Labor Law 2019.</i> <i>[2] Legal documents relating in each lesson.</i>

Module designation	<i>Physical Training 3: Basket ball</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Tran Quang Vinh</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Lecture, lesson, exercise.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 90</i> <i>-Lectures:20</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 70</i> <i>-Mini Project: 0</i> <i>-Others: 0</i> <i>-Self-Study: 0</i>
Credit points	<i>0</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Law of Basketball , theory of basic technique Skills: complete practical subject</i> - <i>Competences: Students know how to play basket ball</i>
Content	<ul style="list-style-type: none"> - <i>rules of Basket ball</i> - <i>theory basic technique.</i> - <i>good practical skills</i>
Exams and assessment formats	<i>Students will complete subject by entirely of practical examination</i>
Study and examination requirements	<i>Final exam. Students must reach at least 50% of practical test requirements, students must attend fully.</i>
Reading list	<i>[1] Giáo trình bóng rổ – trường ĐH TDTT TPHCM 2016</i> <i>[2] Luật bóng rổ - tổng cục TDTT 2018</i>

Module designation	<i>Analytical Chemistry (CH2009)</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Dr. Tran Thi Kieu Anh, Dr. Nguyen Thi Lan Phi, Msc. Lam Hoa Hung, Msc. Nguyen Thi Thu Van</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, instrumental analysis methods (spectrophotometry, electrochemistry and simple chromatography)</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon the completion of this course, students are able to achieve the following knowledge and skills:</i> <i>- Knowledge: Understand fundamental concepts and theory of analytical chemistry; the principles of chemical analytical methods as well as some presented instrumental analysis methods.</i> <i>- Skills: Students can develop skills and apply studied knowledge in solving not only theoretical but also practical analytical problems</i>
Content	<i>The purpose of this course is to provide the students of Chemical Engineering and Biotechnology with an introduction to some fundamental concepts and theory of analytical chemistry, the principles of chemical analytical methods.</i>
Exams and assessment formats	<i>- One (01) Lab experimental report 30%</i> <i>- One (01) Mid-term exam 20%</i> <i>- One (01) Final Exam: 50 %</i>
Study and examination requirements	<i>- All materials (lecture handouts, article papers, reports and case studies) are provided on BK-elearning (BkeL).</i> <i>- Because of the limited time, the practice part of this course involves only the quantitative chemical analysis which includes two main groups of method: Chemical method involves practical exercises of Gravimetry and Titrimetry.</i> <i>- Instrumental analysis method involves practical exercises of VIS-UV spectroscopy, potentiometric titrimetry and simple chromatography.</i>

Reading list	<p><i>Textbook and main readings:</i></p> <p>[1]. Nguyễn Thị Thu Vân, <i>Phân Tích Định Lượng</i>, NXB ĐH Quốc Gia TP. HCM, 2004</p> <p>[2] Nguyễn thị Thu Vân, <i>Bài Tập & Sổ tay PhânTích định lượng</i>, NXB ĐH Quốc Gia TP. HCM, 2005</p> <p>[3] Bùi Long Biên, <i>Phân tích Hóa học Định lượng</i>, NXB Khoa Học & Kỹ Thuật, Hà Nội, 1995</p> <p>[4] Nguyễn thị Thu Vân & các cộng sự, <i>Thí nghiệm PhânTích định lượng</i>, NXB ĐH Quốc Gia TP. HCM, 2006</p> <p>[5] D.A Skoong, <i>Principles of Instrumental Analysis</i>, NXB Holt Rinehart and Winston (lần thứ năm), 1992</p> <p>[6] A.P Kreskov (người dịch: Từ Vọng Nghi, Trần Tứ Hiếu), <i>Cơ sở Hóa học Phân tích. Tập I &II</i>. NXB Đại Học & Giáo dục Chuyên nghiệp, Hà nội, 1989</p>
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Module designation	<i>Probability and Statistics</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Dr. Nguyen Tien Dung Dr. Phan Thi Huong</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, project.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200 -Lectures: 45 -Tutorial/Exercise: 0 -Labs/Practice: 0 -Mini Project: 45 -Others: 20 -Self-Study: 90</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students know how to:</i> <ul style="list-style-type: none"> <i>– present definitions and formulas in Probability and Statistics.</i> <i>– analyze the questions and apply appropriate formulas into solving questions.</i> <i>– work in groups and present reports effectively.</i>
Content	<i>Part 1: Probability Part 2: Random variables and random vectors Part 3: Some special distributions Part 4: Confidence interval Part 5: Hypothesis testing for 1 and 2 samples Part 6: Anova Part 7: Linear regression models</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>– Quizzes.</i> <i>– One midterm test (50 minutes).</i> <i>– One project.</i> <i>– One final exam (100 minutes).</i>
Study and examination requirements	<i>Requirements for successfully passing the module The final grade in the course is composed of 40% performance on the final exam, 20% on midterm test, 25% on project, and 5% on practice. Students must have a final grade of 50% (5/10) or higher to pass the course.</i>
Reading list	<p><i>[1] Xác suất - Thống kê & phân tích số liệu. Nguyễn Tiến Dũng (chủ biên), Nguyễn Đình Huy. NXB Đại học Quốc gia TP HCM, 2019.</i></p> <p><i>[2] Applied Statistics and Probability for Engineers. Douglas a. C. Montgomery, George C. Runger. Hoboken, NJ: Wiley, 2007.</i></p>

Module designation	<i>Ecology</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Dao Thanh Son</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, seminar, braining storming, group discussion, video clip illustration, etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Key question: what learning outcomes should students attain in the module</i> <i>After completing the course, students could (learning outcomes)</i> <ul style="list-style-type: none"> - <i>Gain the basic knowledge on ecology and environment, and the transformation of energy and materials in ecosystems</i> - <i>Be able to analyze and predict the ecological alteration upon human impacts</i> - <i>Be able to improve the sof skills (present, discuss and work together,...)</i>
Content	<i>Introduction to the course</i> <i>Chapter 1: Introduction to ecology – General definitions</i> <i>Chapter 2: Environmental parameters: the limit factors of ecosystem</i> <i>Chapter 3: Autecology, polupation and community ecology</i> <i>Chapter 4: Ecosystem</i> <i>Chapter 5: Ecotoxicology</i> <i>Group presentation / report</i>
Exams and assessment formats	<i>assignment, seminar (25 min of presentation; 15 – 20 min for question/ answer): 30%</i> <i>mid-term test (multiple choice, 50 min): 20% final examination (essay, 80 min): 50%</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>Students must have a final grade of 50% or higher to pass; the final exam must be graded of not less than 3/10.</i>
Reading list	<i>Main material:</i> <i>[1] Peter Stiling, 2002. Ecology: theories and application, 4th Edition.</i> <i>[2] Prentice-Hall of India Private Limited. New Delhi.</i> <i>Further readings:</i>

	<p>[1] Robert Welzel, 2001. <i>Limnology : lake and river ecosystems</i>, 3rd edition. Academic Press, San Diego</p> <p>[2] Walker, C.H., Hopkin, S.P., Sibly, R.M., Peakall, D.B., 2006. <i>Principles of Ecotoxicology</i>. CRC Press, Taylor & Francis Group, U.S.</p> <p>[3] Nguyễn Văn Tuyên, 1998. <i>Ecology and Environment</i>. Educational Publishing House of Hochiminh City.</p> <p>[4] Vũ Trung Tạng, 2007. <i>Fundamental of Ecology</i>. Educational Publishing House of Hanoi.</p> <p>[5] Lê Văn Khoa, Nguyễn Xuân Quýnh, Nguyễn Quốc Việt, 2007. <i>Biological indicators for environment</i>. Educational Publishing House of Hanoi.</p> <p>[6] Đỗ Hồng Lan Chi, Bùi Lê Thanh Khiết, Đào Thanh Sơn, 2015.</p> <p>[7] <i>Độc học Sinh thái</i>. NXB ĐHQG TP.HCM</p>
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Module designation	<i>Chemistry for Environmental Engineering and Science</i>
Semester	<i>3rd</i>
Person responsible for the module	<i>Ph.D. Vo Nguyen Xuan Que</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>lecture, lab works, seminar</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 30</i> <i>-Mini Project: 0</i> <i>-Others: 15</i> <i>-Self-Study: 75</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Basic knowledge on:</i> <i>- Chemistry;</i> <i>- Analytical chemistry;</i>
Module objectives/intended learning outcomes	<i>This course provides the student with basic knowledge about environmental chemistry, analysis of pollutants in water and soil, and use them to assess environmental quality of water and soil. After finished the course, the student are require to understand the water and soil chemistry and analytical parameters for natural water, waste water and soil environment, recognize the source of pollutants, predict the behavior of pollutant in water and soil.to/are able to..."</i>
Content	<i>- Water chemistry: chemical equilibrium in water, water quality parameter, pollutant transformation</i> <i>- Soil chemistry: interaction between soil components, chemical reactions, pollutant behavior and toxicity</i>
Exams and assessment formats	<i>- Exercise: homework, exercise during class</i> <i>- Experiment</i> <i>- Final exam: Writing test</i>
Study and examination requirements	<i>- Exercise: 20%</i> <i>- Experiment: 30%</i> <i>- Final exam: 50%</i>
Reading list	<i>[1]. Werner Stumm; James J. Morgan (1995). Aquatic Chemistry: Chemical Equilibria and Rates in Natural Waters. Third edition. New York : John Wiley & Sons.</i> <i>[2] Stanley E. Manahan (2000). Environmental chemistry, Seven Edition, Lewis.</i> <i>[3]. Donald L. Sparks, Environmental Soil Chemistry, Second Edition, Academic Press, 2003.</i>

Module designation	<i>English 4</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Nguyen Trang Dung</i>
Language	<i>English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Interactive lecture, blended learning, group discussion</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 45</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 22.5</i> <i>-Others: 10</i> <i>-Self-Study: 22.5</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>English 3</i>
Module objectives/intended learning outcomes	<i>Upon completion of the module, students will be able to:</i> <ul style="list-style-type: none"> <i>- Knowledge: use certain lexical resources regarding common topics for everyday communication; use certain grammar points properly.</i> <i>- Skills: clearly discuss and communicate the themes of the book contents.</i> <i>- Competences: evaluate new information and develop their own opinions and ideas to share when engaging in group discussions.</i>
Content	<i>Authentic materials and motivating stories regarding the topics of superhuman, shopping, communication, entertainment, and time, at intermediate levels</i>
Exams and assessment formats	<i>Multiple choice questions: one Midterm test (50 minutes), one Final exam (50 minutes);</i> <ul style="list-style-type: none"> <i>- In-class and online quizzes, take-home written assignments</i>
Study and examination requirements	<i>The final grade in the module is composed of:</i> <ul style="list-style-type: none"> <i>- 50% performance on final exams,</i> <i>- 20% on midterm test,</i> <i>- 20% on in-classes participation and quizzes and, take-home assignments,</i> <i>- 10% on online quizzes</i> <i>Students must have a final grade of 50% or higher to pass.</i>
Reading list	<i>[1] Lansford, L., Barber, D., & Jeffries, A. (2018), Perspective 2B: Compo Split, Cengage ELT.</i>

Module designation	<i>Marxist - Leninist philosophy</i>
Semester	<i>4th</i>
Person responsible for the module	<i>PhD. Nguyen Thi Minh Huong</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, essay, seminar</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 12</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 27</i> <i>-Others: 15</i> <i>-Self-Study: 66</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Provide primitive and systematic insights on Marxist - Leninist philosophy.</i> - <i>Building a worldview of dialectical materialism and methodological materialism dialectics as the theoretical basis for the awareness of issues and content of other subjects.</i> - <i>Recognizing the very intrinsic valuable, scientific and revolutionary nature of Marxist - Leninist philosophy.</i>
Content	<ul style="list-style-type: none"> - <i>Chapter 1 introduces the most general features of philosophy as well as Marxist - Leninist philosophy and the role of Marxist - Leninist philosophy in social life.</i> - <i>Chapter 2 presents the basic contents of dialectical materialism, including matter and consciousness; materialist dialectics; Cognitive reasoning of dialectical materialism.</i> - <i>Chapter 3 brings out the basic contents of historical materialism, including socio-economic morphological issues; class and ethnicity; government and social revolution; social awareness; philosophy of people.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Regular testing and assessment (BT): Attendance, discussion, presentation, exams, lesson contribution, BK E_learning...</i> - <i>Coursework: Essay</i> - <i>End-of-course exam: Open-ended questions exam (Examination time: 90 minutes).</i>

Study and examination requirements	<ul style="list-style-type: none"> - Assignment: 20% (Attendance: 10%; Discussion or presentation: 10%). -Coursework: 30% (03Coursework /01 Essay).Students shall submit coursework in week 13 of the course (15-week course). 30% of points will be deducted for late submission with reasonable excuse for each delayed week, deadline for late submission is at week 14. - Final Exam: 50% (Quiz (do not use documents). - Conditions for end-of-course exam: Students are required to attend at least 80% of lectures (number of attendance checking), to complete all assignments and participate fully groupworkactivities.
Reading list	<p>[1] The Central Council's direction on the compilation of national textbook of Marxist-Leninist science courses, Ho Chi Minh's Ideology, Marxist-Leninist Philosophy Curriculum, National Politics Publisher, Hanoi, 1999.</p> <p>[2] Ministry of Education and Training, Marxist-Leninist Philosophy Curriculum (For students not majoring in Political Theory), National Politics Publisher, Hanoi, 2021.</p> <p>[3] Nguyen Thi Minh Huong, Le Duc Son, Learning materials: Marxist-Leninist Philosophy, (ISBN: 978 – 604)(73 – 806) Vietnam National University – Ho Chi Minh City Publisher, 2021.</p>

Module designation	<i>Environmental Law and Policy</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Le Van Khoa Pham Thi Thanh Thuy Nguyen Thi Hieu</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory / elective / specialisation Names of other study programmes with which the module is shared</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Power Point + Video Clip</i> - <i>Discussion</i> - <i>Group Work,</i> - <i>Group Presentation,</i> - <i>Play a role,</i> - <i>Case Study,</i> - <i>Live stream – Online learning,</i> - <i>Practical Survey, Observation,</i> - <i>Blended Teaching.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <ul style="list-style-type: none"> -<i>Lectures: 30</i> -<i>Tutorial/Exercise: 0</i> -<i>Labs/Practice: 30</i> -<i>Mini Project: 0</i> -<i>Others: 15</i> -<i>Self-Study: 75</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>The objective of the course is to provide students with basic information and knowledge about laws, policies, and other legal bases for environmental protection and natural resource management in Vietnam and International; course learning will help students to build some skills, including: problem-solving; systems thinking; critical thinking; and effective teamwork & communication. And, students also know how to apply knowledge to benefit society.</i>
Content	<i>This course introduces the concepts of environmental protection governance, policy cycle: theory & practices in viet Nam; main contents of environmental protection law, environmental impact assessment, strategic environmental assessment, commitment of environmental protection, handling violation of the law in environmental protection; and other related legal basics such as: Forest resource, Mineral resource, Water resource. The course also introduces some key national strategies of environmental protection such as: Sustainable Development, Environmental Protection, Green Growth; and international regulations and conventions related to natural resources and environmental protection.</i>

Exams and assessment formats	<ul style="list-style-type: none"> - Group assignment + Oral Presentation (60 – 90'/assignment), One final exam (80 minutes), - And home works (individual, group)
Study and examination requirements	<p><i>Evaluation form: Scale of 10; less than 5.5 does not pass; Assignment x 50% + Exam x 50%</i></p> <ul style="list-style-type: none"> - Besides, participating actively in class (AIC), completing homeworks (HW) will be awarded points (not than 20% of exam scores). <p><i>Conditions for taking the exam:</i></p> <ul style="list-style-type: none"> - Attend more than 2/3 of the total number of lectures; - Prepare and report group assignment.
Reading list	<p>[1] Gregor Haberle (eds.), Hartmut Fritzsche et al. 2013. <i>Fachwissen Umwelttechnik – (Bản tiếng Việt: Dương Minh Trí và cs dịch và hiệu đính). Chuyên ngành Kỹ thuật môi trường. Phương Nam Book. 2020.</i></p> <p>[2] Nguyễn Đăng Dung (chủ biên), 2021. <i>Chính trị học</i>. NXB Đại học Quốc gia Hà Nội.</p> <p>[3] Nguyễn Hồng Thao, Nguyễn Thị Xuân Sơn (đồng chủ biên), 2020.</p> <p>[4] <i>Giáo trình Luật quốc tế về môi trường</i>. NXB Đại học Quốc gia Hà Nội.</p> <p><i>References/books:</i></p> <p>[5] <i>Law, policy, regulation, circular, national standards related to Natural resources and environmental protection in Vietnam and International</i></p>

Module designation	<i>Environmental Hydrology</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Assoc. Prof. Dr. Tran Thi Van</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, seminar (invited expert, if any), presentation, video, lab visit (if any).</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 12</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 27</i> <i>-Others: 15</i> <i>-Self-Study: 66</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Provide the basic elements to understand the water physics processes, river basin, flow, the interactions between hydrosphere and environment, contaminant transport. Equip students with computational skills and software practice to apply hydrology in the environment and basin management. Training will be achieved through lectures, the use of analytical and numerical models, and exercises in the classroom.</i>
Content	<i>Students achieve the water physics processes, the water cycle, processes in the hydrologic cycle, river and basin hydrology, flow formation, groundwater, reservoirs and swamps, tides and saline intrusion, pollution and water quality, hydrographic measurement and calculation. Numerical methods for the solution of flow and transport problems in aquifers.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Midterm: Term project (30 minutes/presentation)</i> - <i>Final exam: Writing exam (60-120 minutes)</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Assignment: 30%</i> - <i>Project: 20%</i> - <i>Final exam: 50%</i>
Reading list	<ul style="list-style-type: none"> <i>[1] Nguyen Thi Bay (2018). Applied hydrology and calculations. Ho Chi Minh City National University Publishing House</i> <i>[2] Nguyen Khac Cuong (2007). Environmental hydrology. Ho Chi Minh City National University Publishing House</i> <i>[3] Nguyen Van Tuan (2006). General hydrology. Agriculture Publishing House</i> <i>[4] Nguyen Van Tuan, Nguyen Huu Khai (2021). Hydrogeography. Hanoi National University Publishing House</i>

	<p>[5] Nguyen Thanh Son, Dang Quy Phuong (2003). <i>Measuring and editing hydrological data</i>. Hanoi National University Publishing House</p> <p>[6] Nguyen Huu Khai (2008). <i>Statistical analysis in hydrology</i>. Hanoi National University Publishing House</p> <p>[7] Tran Thanh Xuan, Hoang Minh Tuyen, Tran Thuc, Tran Hong Thai, Nguyen Kien Dung (2012). <i>Water resources of the main river systems of Vietnam</i>. Science and Technology Publishing House</p> <p>[8] Andy D. Ward, Stanley W. Trimble, Suzette R. Burckhard, John G. Lyon (2015). <i>Environmental Hydrology</i> [3 ed.]. CRC Press</p> <p>[9] Saeid Eslamian (2014). <i>Handbook of Engineering: Hydrology Environmental Hydrology and Water Management</i>. CRC Press</p> <p>[10] Rajib Maity (2018). <i>Statistical Methods in Hydrology and Hydroclimatology</i> [1st ed.]. Springer Singapore</p> <p>[11] André Musy; Benoit Hingray; Cécile Picouet (2014). <i>Hydrology : A Science for Engineers</i>. CRC Press. Taylor and Francis Publisher</p> <p>[12] Bedient, Philip B.; Huber, Wayne Charles; Vieux, Baxter E. (2013).</p> <p>[13] <i>Hydrology and Floodplain Analysis</i>. Pearson Publisher.</p>
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Module designation	<i>Environmental Processes</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Assoc. Prof. Dr. Bui Xuan Thanh MSc. Du My Le</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, lab works, project, seminar</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 24 -Labs/Practice: 0 -Mini Project: 9 -Others: 15 -Self-Study: 72</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>- CH1003 (General Chemistry) - EN2031 (Chemistry for Environmental Engineering and Science)</i>
Module objectives/intended learning outcomes	<i>This course will provide students with fundamental principles of physico-chemical/chemical and biological processes occurring in natural and engineered systems. Undergraduate students will be able to evaluate species transport and transformations in these systems by mass transport, chemical kinetics, chemical equilibria and interfacial phenomena, In addition, the course also helps students acquire experience and explore knowledge, systematic thinking, skills, personal communication as well as teamwork.</i>
Content	<i>The first part will cover material balances, diffusion, gas transfer, adsorption, particle destabilization, flocculation, and membrane separation. Chemical reactions, reaction kinetics, reaction engineering will also be introduced. This part will help student analyze and solve problems encountered in environmental engineering. In other hand, the second part to introduces the basic principles and dynamics of the microorganism growth used in bioremediation include suspended growth processes, adhesion growth processes and combined processes in wastewater treatment; emissions biological filtration process; aerobic and anaerobic incubation in waste treatment. This part provides students with basic knowledge of the biological processes in the application of environmental technologies, including wastewater, water and solid waste treatment; polluted soil biology rehabilitation and exhaust treatment.</i>

	After this course, students are expected to be able to design and operate typical treatment units for air, water, and wastewater pollution control.
Exams and assessment formats	<ul style="list-style-type: none"> • In-class activities and homework sets • Seminar (group exercise and/or presentation) • Final exam (writing, 90 minutes)
Study and examination requirements	<p>Requirements for successfully passing the module</p> <ul style="list-style-type: none"> - Students need to attend at least 80% of class hours. - Students need to read and understand the theory and do the exercises of the textbook - Midterm exam format: written exam, time: 45 minutes - Final exam format: written test, time: 60 minutes <p>Subject assessment:</p> <ul style="list-style-type: none"> - Exercise: 10% - Midterm exam (seminar): 20% - o Final exam: 70%
Reading list	<p>[1] Mark M. Benjamin and Desmond F. Lawler, <i>Water Quality Engineering: Physical/Chemical Treatment Process</i>, John Willey & Sons, 2013.</p> <p>[2] William W. Nazaroff and Lisa Alvarez-Cohen, <i>Environmental Engineering Science</i>, John Willey & Sons, 2001.</p> <p>[3] Dương Mỹ Lệ, Bài giảng môn học Các quá trình Hóa học và Hóa lý trong lĩnh vực Kỹ thuật Môi trường, Bộ môn Kỹ thuật Môi trường, Khoa Môi trường, ĐHBK Tp.HCM. Sách tham khảo:</p> <p>[4] Warren L. McCabe, <i>Unit Operations of Chemical Engineering</i>, Seventh Edition, Mc.Graw Hill Inc., New York, 2005.</p> <p>[5] E.L. Cussler, <i>Diffusion – Mass transfer in Fluid Systems</i>, Cambridge, 2003.</p> <p>[6] Vũ Bá Minh, <i>Kỹ thuật phản ứng</i>, NXB Đại học Quốc gia Tp.HCM, 2004 (in Vietnamese).</p> <p>[7] Vũ Bá Minh, <i>Truyền Khối</i>, NXB Đại học Quốc gia Tp.HCM, 2004 (in Vietnamese).</p> <p>[8] Xuan-Thanh Bui, Phuoc-Dan Nguyen, Dinh-Duc Nguyen, Huu-Hao Ngo, Ashok Pandey (2022). <i>Advances in Biological Wastewater Treatment Systems</i>, Elsevier.</p> <p>[9] Xuan-Thanh Bui* (Lead Editor), Chart Chiemchaisri, Takahiro Fujioka & Sunita Vajarni, <i>Water and Wastewater Treatment Technologies</i>, Springer, 2018.</p> <p>[10] Bùi Xuân Thành (2012). <i>Sổ Tay Hướng Dẫn Thiết Kế Các Công Trình Xử Lý Sinh Học</i>, NXB Đại Học Quốc Gia TPHCM Viet Nam. ISBN: 978-604-73-1409-6</p> <p>[11] George Tchobanoglous, Franklin Burton, H. David Stensel, <i>Wastewater Engineering: Treatment and Reuse</i> (4th edition), Metcalf & Eddy, Inc., McGraw-Hill, 2003. [5] C.P. Leslie Grady, Glen T. Daigger, Henry C. Lim, <i>Biological Wastewater treatment</i>, Marcel Dekker Inc., 1999.</p>

	<p>[12] Joseph S. Devinny, Marc A. Deshusses and Todd S. Webster, <i>Biofiltration and Air Pollution Control</i>, Lewis Publishers, 1998.</p> <p>[13] METCAF&EDDY. <i>Wastewater engineering. Treatment, Disposal and Reuse</i>. 3rd ed. Mc Graw Hill pub. New York 1991.</p> <p>[14] Bùi Xuân Thành & Lê Văn Khoa (2013). <i>Thuật ngữ chuyên ngành kỹ thuật và quản lý nước-nước thải</i>, NXB Đại Học Quốc Gia TPHCM Viet Nam. ISBN: 978-604-73-1807-0</p>
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Module designation	<i>Marxist - Leninist Political Economy</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Vu Quoc Phong.</i>
Language	<i>Viet Nam</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, group work, homework.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 24</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 18</i> <i>-Others: 10</i> <i>-Self-Study: 48</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Pre-study of Marxist-Leninist philosophy</i>
Module objectives/intended learning outcomes	<i>- Knowledge: Equipping students with basic knowledge about economic categories and laws to form economic thinking.</i> <i>- Skills: Formation of skills to apply, analyze and evaluate socio- economic issues in the development process of the country and the students.</i> <i>- Competences: Contribute to building stance, ideology, social responsibility of students in work and life.</i>
Content	<i>The subject includes knowledge such as: goods, markets; produce surplus value; competition and monopoly; the socialist- oriented market economy in Vietnam; economic benefit relations in Vietnam; industrialization, modernization and international economic integration of Viet Nam.</i>
Exams and assessment formats	<i>- In-class participation: Regular testing and assessment, etc</i> <i>- Coursework: Essay.</i> <i>- Final Exam: Multiple choice (40 minutes).</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>- The final grade in the module is composed of 50% final exam, 30% coursework, 20% in-class participation. Students must have a final grade of 50% or higher to pass.</i>
Reading list	<i>[1] Ministry of Education and Training. (2019). Textbook of Marxist - Leninist Political Economy. Hanoi: National Politics Publisher.</i> <i>[2] Ministry of Education and Training. (2006). Textbook of Marxist - Leninist Political Economy. Hanoi: National Politics Publisher.</i> <i>[3] Karl Marx – Engels. (2004). The Complete Series – Volume 20, 23, 25. Hanoi: National Politics Publisher.</i>

	<p>[4] Communist Party of Vietnam. (2016). <i>Final report of some theoretical - practical issues during 30 years of innovation</i>. Hanoi: National Politics Publisher.</p> <p>[5] Communist Party of Vietnam. (2016). <i>Documents of 12th National Congress of the Communist Party of Vietnam</i>. Hanoi: National Politics Publisher.</p> <p>[6] Communist Party of Vietnam. (2017). <i>Resolution No.11- NQ/TW dated June 03rd 2017 of Party Central Committee on “The completion of socialist-oriented market economy institutions”</i>.</p> <p>[7] Jeremy Rifkin. (2014). <i>The Third Industrial Revolution</i>. Hanoi: Labour and Society Publisher.</p> <p>[8] <i>The Central Council’s direction on the compilation of national textbook of Marxist- Leninist science courses, Ho Chi Minh’s Ideology</i>. (2004). <i>Marxist-Leninist Scientific Socialism Textbook</i>, Hanoi: National Politics Publisher.</p> <p>[9] Lenin. (2005). <i>The Complete Series– Volume 3</i>, 27, 31. Hanoi: National Politics Publisher.</p> <p>[10] Manfred B. Steger. (2011). <i>Globalization</i>. Hanoi: Knowledge Publisher.</p> <p>[11] Klaus Schwab. (2018). <i>The Fourth Industrial Revolution</i>. Hanoi: National Politics Publisher</p> <p>[12] Nguyen Hong Hai, Vu Quoc Phong, Nguyen Thi Thu Trang & Do Thi Thuy Yen. (2016). <i>The history of economic theories Textbook</i>. Ho Chi Minh City: Publishing House of Ho Chi Minh City University of Education.</p> <p>[13] The Prime Minister. (2017). <i>Directive No. 16/CT-TTg of the Prime Minister dated May 04th 2017 on “The strengthening of the ability to access the Fourth Industrial Revolution”</i>.</p> <p>Furthermore, there are other learning materials on website BKEL: http://e-learning.hcmut.edu.vn</p>
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Module designation	<i>Air Pollution Control</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Assoc. Prof. Dr. Nguyen Nhat Huy Dr. Ngo Thi Ngoc Lan Thao</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Specialisation</i>
Teaching methods	<i>Lecture, lesson, lab works, project</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 20 -Mini Project: 15 -Others: 15 -Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Chemistry for Environmental Engineering and Science 2</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students should</i> <ul style="list-style-type: none"> - <i>Understand and differentiate air pollution control methods</i> - <i>Understand and apply dust collection methods</i> - <i>Understand and apply gaseous pollutant control methods</i> - <i>Understand and apply the basic of noise and noise pollution control methods</i> - <i>Understand and apply air monitoring and emission estimates</i> - <i>Understand and calculate air pollutant dispersion models</i> - <i>Practice in air pollution control</i>
Content	<i>Introduction to air pollution control Particulate control Gaseous pollutants control Noise pollution control Measurements, emission estimates Air pollutant concentration model Experiment on pilot-scale air pollution control devices: absorber, adsorber, cyclone, baghouse, biofilter</i>
Exams and assessment formats	<i>Homework: group of 2 – 4 students, at home Quiz: individual, closed book, in class Mid-term exam: closed book, 45 min Final exam: open book, 60 min Experiment: report and test</i>
Study and examination requirements	<i>Requirements for successfully passing the module: The final score will be from group homework (10%), in-class quiz (10%), mid-term exam (20%), final exam (30%), experiment (30%) To pass the courses, the final score need to be ≥ 5.0 and no part of the score < 3.0.</i>
Reading list	<i>[1]. Noel de Neuvers, Air pollution control engineering, 3rd edition, MacGraw-Hill, 2017. [2]. Daniel Vallero, Fundamentals of Air Pollution, 5th Edition, Amsterdam : Academic Press, 2014. [3]. K.B. Schnelle, R.F. Dunn, and M.E. Ternes, Air Pollution Control Technology Handbook, Second Edition, CRC Press, 2015.</i>

Module designation	<i>Solid and Hazardous Waste Management</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Dr. Ngo Thi Ngoc Lan Thao</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, lab works, project.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<p><i>This course provides to undergraduate students of environmental technology and management major the basic knowledge on solid and hazardous waste management. Knowledge of solid waste management consist of sources, composition, quantity, and characteristic of solid waste; collection system. Knowledge of hazardous waste management consist of definition and classification of hazardous waste; sources of generation; environmental impact and health risk assessment; storage, collection and transportation of hazardous waste; hazardous waste stabilization and solidification and landfill.</i></p> <p><i>Upon completion of this course, students should</i></p> <ul style="list-style-type: none"> <i>• Student knows and understands the main rules of waste classification and principles of waste management.</i> <i>• Student knows the core concepts and methods for solid waste, waste gases and wastewater treatment.</i> <i>• Student knows and understands basic rules of waste legislation and waste auditing.</i> <i>• Student understands environmental, health and social issues related to waste management.</i> <i>• Student knows and understands the importance to design, implement and set up “clean” waste processing logics for the environment.</i> <i>• Student knows and understand the quality requirements and regulatory standards of recycling and re-use programs</i>
Content	<p><i>Generation and classification of solid waste in industrial society</i></p> <p><i>Sources, composition, quantities and properties of municipal solid waste</i></p> <p><i>Collection system of solid waste and hazardous waste</i></p> <p><i>Transfer and transport of solid waste</i></p> <p><i>Basic processing of solid waste Stabilisation and solidification</i></p>

	<p><i>Solid and hazardous wastes treatment technologies Practical models</i></p> <p><i>Term paper and presentation Laboratory</i></p>
Exams and assessment formats	<p><i>Homework: group of 2 – 3 students, at home Quiz: individual, opened book, in class</i></p> <p><i>Final exam: closed book, 90 min Experiment: report and test</i></p>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Group presentation: 30%</i> - <i>Laboratory: 20%</i> - <i>Final examination: 50 %</i>
Reading list	<p><i>[1] George Tchobanoglous, Hilary Theisen, and Samuel Vigil, Integrated solid waste management: Engineering principles and management issues, McGraw-Hill, Inc., New York, USA, 1993.</i></p> <p><i>Open resources:</i></p> <p><i>[2] William A. Worrell and P. Aarne Vesilind, Solid Waste Engineering, Cengage Learning, USA, 2nd Edition, 2012.</i></p> <p><i>[3] Michael D. LaGrega, etc., Hazardous Waste Management, McGraw-Hill, Inc., 2001.</i></p>

Module designation	<i>Environmental Systems Analysis</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Dr. Nguyen Hoang Anh</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lectures: theories and methods, projects, seminars</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 12</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 27</i> <i>-Others: 15</i> <i>-Self-Study: 66</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>- Algebra, statistics</i> <i>- Existing competencies in understanding environmental problems</i>
Module objectives/intended learning outcomes	<p>AIMS OF THIS COURSE:</p> <ul style="list-style-type: none"> <i>- The purpose of this course is to train students on concrete and rigorous problem-solving tools that provide a mathematical basis for decision-making. By the end of the course, students will be able to define systems and their boundaries, optimize systems for a set of constraints and objectives, determine the sensitivity of decisions and optimal solutions based on changes in constraints, translate complex problems into networks, and define appropriate sets of solutions when there are multiple, competing objectives. Example problems span natural resource management, traditional environmental engineering processes, and issues in green design and environmental policy.</i> <p>COURSE LEARNING OUTCOMES:</p> <ul style="list-style-type: none"> <i>- Skills of thinking and problem solving</i> <i>- Knowledge gain by practice and discovery</i> <i>- Skill of system thinking</i> <i>- Personal skills and characteristics</i> <i>- Professional skills and characteristics</i> <i>- Performing ideas on technical and management systems</i> <i>- Building project/program/policy</i> <i>- Applying project/program/policy to practice</i>
Content	<p>INTRODUCTION OF THE COURSE</p> <ul style="list-style-type: none"> <i>- Information about instructor</i> <i>- Information about course</i> <i>- Ways of teaching & learning</i> <i>- Introduction of references</i>

	<p>Introduction to Systems Theory - Types of systems:</p> <ul style="list-style-type: none"> - Isolated; Closed; Open; Properties of systems - Feedback;; Complexity; Self-organization - Self-regulation; Emergence; System hierarchy Complex system behavior - Exponential growth - Logistic growth - Overshoot and oscillation - Overshoot and collapse - System Analysis - Methodology - System thinking - Techniques for system analysis <p>Methods for System Analysis</p> <ul style="list-style-type: none"> - Statistical analysis - Introduction to environmental statistics - Statistics fundamental: Data types, Random variation and distribution, Sampling; Sample moments - Exploratory data analysis (EDA) - Statistical Hypothesis Testing: T-test, one/multi-way ANOVA Get familiar with Jamovi - a user-friendly statistical software <p>Methods for System Analysis (cont.)</p> <ul style="list-style-type: none"> - Techniques of Graphical Analysis of the environmental systems - Construct model from the analysis of a system: Compartment model <p>Qualitative Analysis</p> <ul style="list-style-type: none"> - Multi-criteria Analysis - The weighting methods - Matrix Method for generating scores and weights - Simple Additive Weighting Method (SAW) - Simple Multi-Attribute Rating Technique (SMART) - Cause and effect analysis - Group-based weighting decisions - Delphi method. <p>Decision Analysis</p> <ul style="list-style-type: none"> - Multi-criteria Decision Analysis (MCDA) - The concept of decision-support analysis
Exams and assessment formats	<ul style="list-style-type: none"> - Solutions Using Alternate Objectives - Defining non-inferior sets (Pareto optimality) <p>Decision Analysis (cont.)</p> <ul style="list-style-type: none"> - Pareto optimality and tradeoff analysis

	<ul style="list-style-type: none"> - Trade-off Evaluation (Environmental, Economic, Social Criteria) - Cost-Benefit Analysis - Utility Scoring - Analytical Hierarchy Process (AHP) <p>Quantitative Analysis</p> <ul style="list-style-type: none"> - Establishing Objectives, Decision Variables, and Constraints - Exploring Different Types and Scales of Systems - Graphing Decision Space and Objective Functions <p>Quantitative Analysis (cont.)</p> <ul style="list-style-type: none"> - Tragedy of the Commons as an Optimization Problem - Problems with Many Decision Variables - Network Analysis and Dynamic Modelling – Solving Multi-Stage/MultiDecision Environmental Problems <p>Environmental Systems Analysis Tools</p> <ul style="list-style-type: none"> - Selecting questions and tools - Why these tools? - Key to the questions - Environmental Impact Assessment (EIA) - Strategic Environmental Assessment (SEA) - Life Cycle Assessment (LCA) - Environmental Risk Assessment (ERA)
Study and examination requirements	<ul style="list-style-type: none"> - Exercises in class - Project and seminars - Final examination (written)
Reading list	<p>Forms of evaluation: Scale of mark: 10; under mark 5 .5 is not met; presentation and submit group assignment.</p> <ul style="list-style-type: none"> - Exercise: 20% - Project and seminars: 30% - Final examination: 50%
	<p>[1] Meadows (2008) <i>Thinking in Systems, System lens & The basics</i></p> <p>[2] Matthews et al. (2015) <i>Life Cycle Assessment</i></p> <p>[3] <i>Practical Optimization: A Gentle Introduction</i></p>

Module designation	<i>Industrial Safety and Environmental Hygiene</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Dao Thi Viet Huong Nguyen Thi Hieu</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, exercise, group discussion etc</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: Arguing, thinking about the common problems of labor safety; Identify, analyze and establish the issues of industrial sanitation; Survey, analysis and recommendations on safety techniques; Management, training of fire protection engineering; Management, construction safety and occupational health policy according to OHSAS 18001;</i> - <i>Skills: Group working and effective communication.</i> - <i>Competences: Apply knowledge to benefit society.</i>
Content	<ul style="list-style-type: none"> - <i>The subject will introduce the following contents:</i> - <i>Purpose, importance, and content of safety at work, current law system about labor safety and hazard factors in industrial production.</i> - <i>Technical measures of environmental safety and working sanitation, management methods to prevent industrial accidents and occupational disease.</i> - <i>Management of safety of equipment and hazardous chemical substances. Strict request of safety at work, including: pressure equipment, electrical safety, chemical safety...</i> - <i>Prevention fire and explosion in industrial factories.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Exercises</i> - <i>Mid-term examination</i> - <i>Final examination</i>
Study and examination requirements	<i>Students must adhere to strict regulations enacted Studies. Students submit assignments late will be penalized</i> <i>Final grade coursework is assessed throughout the course</i> <ul style="list-style-type: none"> - <i>Exercises: 30%</i> - <i>Mid-term test: 20%</i>

	- <i>Final examination: 50%</i>
Reading list	<p>[1]-Handout from lecturer</p> <p>[2]- Lý Ngọc Minh, Quản lý an toàn sức khỏe môi trường lao động và phòng chống cháy nổ ở Doanh nghiệp, 2006.; NXB Khoa học và Kỹ thuật, Hà Nội.</p> <p>[3]- Nguyễn Thế Đạt, Khoa học kỹ thuật bảo hộ lao động và một số vấn đề về môi trường, 2005, NXB Khoa học và Kỹ thuật, Hà Nội.</p> <p>[4]- Phạm Ngọc Đăng, Quản lý môi trường đô thị và khu công nghiệp, 2005. NXB Xây dựng.</p>

Module designation	<i>Scientific Socialism</i>
Semester	<i>5th</i>
Person responsible for the module	<i>PhD. Thi ngoc trinh An</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Interpretation, present, semina,</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 24</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 18</i> <i>-Others: 10</i> <i>-Self-Study: 48</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Marxist Leninist Political Economy</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: Students understand and master the most basic, fundamental knowledge of scientific socialism.</i> - <i>Skills: Students enhance realistic ability and the capacity to apply knowledge of the subject to the consideration and assessment of socio-political issues of the country</i> - <i>Competences: Students Building trust, right political attitudes and ideas about scientific socialism module in particular and the Party's ideology in general</i>
Content	<i>The scientific socialism subject of is one of the three components of Marxism – Leninism, As a result of applying the worldview, Marxist - Leninist methodolog and the doctrines of Marxist - Leninist political economy into studying the indispensable rule of the birth of the socialist socio-economic form; Socio-political issues that are normative in the process of socialist revolution in the world and in real life in Vietnam today.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Regular testing and assessment (assignment): 20% (Attendance, discussion, classroom tasks, BK Elearning...)</i> - <i>Coursework: 30% (Essay)</i> - <i>Final exam: 50% (Multiple-choice)</i>
Study and examination requirements	<i>Requirements for successfully passing the module e.g. the final grade in the module is composed of 60% performance on exams, 10% quizzes, 10% take-home assignments, 10% in- class participation. Students must have a final grade of 60% or higher to pass</i>
Reading list	<i>Coursebook:</i> <i>[1]. Ministry of Education and Training (2019). Scientific Socialism Coursebook (for higher education – not majoring in Political Science). Corrections and addtions were added after pilot teaching.</i> <i>References:</i>

	<p>[1]. <i>The Central Council's direction on the compilation of national textbook of Marxist-Leninist science courses, Ho Chi Minh's Ideology, Marxist-Leninist Philosophy Coursebook</i> National Politics Publisher, Hanoi.</p> <p>[2]. <i>Ministry of Education and Training (2006), Scientific Socialism Coursebook – Used in universities, colleges, National Politics Publisher, Ha Noi.</i></p> <p>[3]. <i>An Thi Ngoc Trinh (2017), Building contemporary family culture in Vietnam , University of Education Publishing House, Ho Chi Minh City.</i></p>
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Module designation	<i>Gis & Remote Sensing for Natural Resources and Environmental Management</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Luu Dinh Hiep</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, lab works, project, seminar</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Computer skill</i> <i>Existing competences in Environmental Management</i>
Module objectives/intended learning outcomes	<i>Comprehend basic knowledge and practices about GIS, remote sensing in natural resources and environmental management.</i> <i>Be able to monitor, judge and resume environmental problems by Geographic Information Systems</i> <i>Be able to estimate and analyse qualitatively environmental problems by Geographic Information Systems</i> <i>Perform field surveys and know how to refer document and digital information (GIS data) for comprehending environmental problems which need to be solved</i> <i>Update information in the field of GIS, remote sensing for natural resources and environmental management</i> <i>Modeling of natural resources environmental information system and insuring goals can be achieved</i>
Content	<ul style="list-style-type: none"> - <i>Students will be supplied the basic knowledge about GIS, remote sensing (RS) and skills to apply GIS, RS in collecting, processing spatial data for natural resources and environmental management. In addition, students will be provided skills to practice on ArcGIS, ENVI software.</i> - <i>Course provides basic knowledge of Geographic Information System (GIS), Remote Sensing (RS) and models of a Geographic Information System, history of GIS establishment and development. The course helps students to represent spatial objects in GIS and using GIS, RS data to analysis, report, making decision. Specialy, course going into the analysis capabilities of GIS and remote sensing applications in natural resource management and environment through the exploitation of object information has been designed</i>

	<i>and installed in the database along with the ability to integration of GIS.</i>
Exams and assessment formats	<i>Midterm assessments in the form of seminars, projects and one final written exam (90 minutes), computer-based assignments</i>
Study and examination requirements	<i>The final grade in the module is composed of 50% performance on final exams, 10% quizzes, 10% in-class participation, 30% assignments on computer lab. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p><i>[1] Trần Vĩnh Phước, 2001. GIS Một số vấn đề chọn lọc, Nhà xuất bản Giáo dục.</i></p> <p><i>[2] Lê Văn Trung, 2005. Viễn Thám, NXB Đại học Đại học Quốc gia TP.HCM.</i></p> <p><i>[3] Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind, 2004. Geographic Information Systems and Science,.</i></p> <p><i>[4] Wiley Keith C. Clarke, 1999. Getting Started with Geographic Information Systems, Prentice Hall.</i></p>

Module designation	<i>Water and Wastewater Treatment Engineering</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Dang Viet Hung Dr. Nguyen Thai Anh</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory , Specialisation Environmental Engineering</i>
Teaching methods	<i>Lecture, documentary films, in-class exercises, group discussion/ presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200 -Lectures: 45 -Tutorial/Exercise: 0 -Labs/Practice: 30 -Mini Project: 0 -Others: 20 -Self-Study: 105</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<ul style="list-style-type: none"> - <i>Pre-requisite course: None</i> - <i>Pre-course: Analytical Chemistry (CH2009), Chemistry for Environmental Engineering 1 (EN2005), Physico-Chemical Processes in Environment (EN2045), Biological Processes in Environmental Engineering (EN2003)</i> - <i>Parallel courses: None</i>
Module objectives/intended learning outcomes	<p><i>Upon the completion of this course, students are able to achieve the following knowledge and skills:</i></p> <ul style="list-style-type: none"> - <i>Knowledge: (i) Understand and explain the significance and important role of water and wastewater treatment engineering (WWWTE); (ii) Understand and analyse steps of water and wastewater treatment process; (iii) Identify and analyze the characteristics of untreated water and wastewater, (iv) Design and operate the water and wastewater treatment system.</i> - <i>Skills: (i) Develop skills for doing WWWTE experiments in Lab, design the water and wastewater treatment process; (ii) Teamwork and multidisciplinary cooperation.</i> - <i>Comptences: (i) Design and operate the water and wastewater treatment units; and (ii) Analyse and evaluate the effectiveness of water and wastewater treatment process.</i>

Content	<p><i>The purpose of this course is to provide students with following topics:</i></p> <ul style="list-style-type: none"> - <i>Principle and design calculation of physical treatment processes (sedimentation, flotation, screening), chemical treatment processes (chemical solution dosing, pH adjustment, precipitation, coagulation and flocculation, oxidation and reduction, disinfection).</i> - <i>Principle and design calculation of sorption processes (adsorption, ion exchange), basic filtration processes and membrane filtration.</i> - <i>Principle and design calculation of biological treatment (aerobic, nitrification, denitrification, biofilm attached growth process), sludge treatment.</i> - <i>Experiments on primary treatment, biological treatment.</i>
Exams and assessment formats	<p><i>The final grade includes process evaluation, lab experiments and final exam.</i></p> <ul style="list-style-type: none"> - <i>Mid-term test (20%)</i> - <i>Assignment (10%)</i> - <i>Lab experiments (20%)</i> - <i>Final exam (50%)</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>All materials (lecture handouts, article papers, reports and case studies) are provided on BK-elearning (BkeL).</i> - <i>Students are required to be at least 90% attendance of theoretical lectures and 100% of individual assignments, discussion, presentation of the course.</i> - <i>Students are provided with ideas of individual essay's topics in Week 2 of the course. Individual essays should be submitted in Week 9. Maximum length of the essay is 2,500 words (excluded tables, diagrams, figures).</i> - <i>Group works presentation will be performed in Week 7 – 10. Assessment Rubrics for group presentation will be discussed in Week 1 of the course.</i> - <i>Students must have a final grade of 50% or higher to pass the course.</i> - <i>Students do not submit individual assignment and do not participate group presentation will not be allowed to participate the final exam.</i>
Reading list	<p>Textbook and main readings:</p> <p>[1] Mecalff and Eddy, <i>Wastewater Engineering: Treatment and Resource Recovery Fifth Edition</i>, McGraw-Hill Education, 2014.</p> <p>[2] Trinh Xuan Lai, <i>Design of wastewater treatment units</i>, NXB Xay dung, 2018.</p> <p>[3] Lam Minh Triet and Tran Hieu Nhue, <i>Wastewater treatment, Volume 1 + Volume 2</i>, NXB Xay dung, 2018.</p> <p>Additional readings:</p> <p>[4] Kerry J. Howe_David W. Hand_John C. Crittenden_R. Rhodes Trussell_George Tchobanoglous, <i>Principles of Water Treatment</i>, John Wiley & Sons, Inc, 2012.</p> <p>[5] Mackenzie L. Davis, <i>Water and wastewater engineering</i>, Mc Graw Hill, 2010.</p>

Module designation	<i>Environmental Impact and Risk Assessment</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Pham Thi Thanh Thuy</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, homework, presentation, essay etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Environmental Law and Policy</i>
Module objectives/intended learning outcomes	<i>- Knowledge: Comprehend basic knowledge and practices about report preparation and appraisal of environmental impact assessment , develop a plan to respond to environmental risks technology.</i> <i>- Skills: Skills of thinking and problem solving ; Experimental skills and knowledge discovery; Skill of system thinking; Professional skills and characteristics;; Skills of group working and effective communication.</i> <i>- Competences: Apply knowledge to benefit society</i>
Content	<p><i>This course aims to provide undergraduate students Environmental field with basic knowledge and experiences of environmental impact assessment (EIA) and environmental risk assessment (ERA), two of environmental management tools.</i></p> <p><i>The course provides case studies of ERA, HRA at Vietnam and some other countries in the world related to quantitative and qualitative of ERA and health risk assessment (HRA) due to existence or use of polluted materials.</i></p> <p><i>In addition, the course presents results of ERA, HRA and provide information of health and environmental management that support to make a decision and contribute to health and environmental protection objectives.</i></p> <p><i>- After finishing course, students can implement studied knowledge and methodologies on predict environmental impacts, risks and proposal mitigation measures in order to reduce and prevent the impact and risk in detail project</i></p>
Exams and assessment formats	<i>Essay (Individual implement and presentation, critical group) and one final exam (90 minutes),</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <i>- Essay: 50%</i>

	<p>- <i>The final examination: 50%</i> <i>Students must have a final grade of 50% or higher to pass</i></p>
Reading list	<p>[1] Lê Thị Hồng Trân, <i>Đánh giá rủi ro môi trường (Environmental Risk Assessment)</i>, 2008, Nhà xuất bản Khoa Học Kỹ Thuật</p> <p>[2] Nguyễn Văn Phước và Nguyễn Thị Vân Hà, <i>Quản lý chất lượng môi trường (Environmental Quality Management)</i>, Chương 6, 2006, Nhà xuất bản Xây Dựng.</p> <p>[3] Lê Thị Hồng Trân, <i>Đánh giá rủi ro sức khỏe và hệ sinh thái (Health and ecosystem risk assessment)</i>, 2008, Nhà xuất bản Khoa Học.</p>

Module designation	<i>Internship</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Luu Dinh Hiep Pham Thi Thanh Thuy</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lab works, projects</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100 -Lectures: 0 -Tutorial/Exercise: 0 -Labs/Practice: 0 -Mini Project: 0 -Others: 10 -Self-Study: 90</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>- Applying basic science and specialized knowledge to understand overview of related scientific and technological, management issues - Understanding and applying knowledge in technical analysis and problem solving - Having professional skills, ethics, teamwork and communication skills - Expressing comprehensive awareness in Environmental Engineering for society and communities</i>
Content	<i>Intership is a form of visual learning for 3rd-year students. Technical internship requires students to visit and learn about the equipment and operating practices related to Environmental Engineering and Management specializations at off-campus establishments such as research institutions, enterprises, companies, and laboratories, Environmental Protection and Management Agency (Government)</i>
Exams and assessment formats	<i>Submission of intership report</i>
Study and examination requirements	<i>Conditions for students to complete the internship: 1. Comply with the content and requirements of the instructor 2. Attend all training sessions 3. The internship report is presented in accordance with regulations and submitted on time. 4. Grading is scored based on the instructor's evaluation of the assessment of the essay and the practice process.</i>
Reading list	<i>Instruction of internship – NREM department</i>

Module designation	<i>History of Vietnamese communist party</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Nguyen Huu Ky Ty</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, group work, homework</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 24</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 18</i> <i>-Others: 10</i> <i>-Self-Study: 48</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Pre-study of Scientific socialism</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: understand and be able to analyze and generalize the process of forming and developing the views and policies of the Communist Party of Vietnam during the process of leading the Vietnamese revolution.</i> - <i>Skills: applying historical awareness into practice, criticizing misconceptions about the line of the Communist Party of Vietnam; training capacity for independent thinking in researching, discovering and solving problems from the reality of the country's socio-economic development; ability to work effectively as a team for a common goal.</i> - <i>Competences: Building a serious working habit, a sense of respect for objective truth, raising students' pride and confidence in the leadership of the Communist Party of Vietnam in the past and present.</i>
Content	<i>Equipping students with the knowledge of subjects, purposes, tasks, research and study methods of the module, History of Communist Party, as well as the basic, core and systematic knowledge about the birth of the Party (1920-1930), the process of the Party leading the revolutionary struggle for power (1930-1945), leading two resistance wars against French colonialism and American imperialist invasion, completing national liberation, unifying the country (1945 - 1975), leading the country in transition to socialism and innovation process (1975-2018). Thereby affirming the successes, raising the limitations, summarizing the experiences of the revolutionary leadership of the Party to help learners raise awareness, belief in the Party and the ability to apply the learned knowledge into working practice, contributing to the construction and protection of the Socialist Republic of Vietnam.</i>

Exams and assessment formats	<ul style="list-style-type: none"> - <i>In-class participation: Regular testing and assessment, etc</i> - <i>Coursework: Essay.</i> - <i>Final Exam: Multiple choice (50 minutes).</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Requirements for successfully passing the module</i> - <i>The final grade in the module is composed of 50% final exam,</i> - <i>30% coursework, 20% in-class participation. Students must have</i> - <i>a final grade of 50% or higher to pass.</i>
Reading list	<p>[1] <i>Ministry of Education and Training, Textbook of History of the Communist Party of Vietnam (for universities – non- specialized Political Science system), (waiting for textbooks of the Ministry of Education and Training).</i></p> <p>[2] <i>Ministry of Education and Training (2006), Textbook of History of the Communist Party of Vietnam (for universities and colleges), first reprinted edition, National Politics Publisher, Hanoi.</i></p> <p>[3] <i>Communist Party of Vietnam, Complete Documents of the Party, National Politics Publisher, Hanoi</i></p> <p>[4] <i>Dao Thi Bich Hong (2017), Southern Security Force during the anti-US period (Monograph book), Culture and Arts Publisher, Ho Chi Minh.</i></p> <p>[5] <i>Dao Thi Bich Hong (2019), Economic restructuring (A case study of Bac Lieu province) (Monograph book), Vietnam National University- Ho Chi Minh City Publisher.</i></p>

Module designation	<i>Environmental Management in Urban and Industrial Park</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Le Van Khoa Ho Thi Ngoc Ha</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Power Point + Video Clip</i> - <i>Discussion</i> - <i>Group Work</i> - <i>Group Presentation,</i> - <i>Play a role</i> - <i>Case Study</i> - <i>Live stream – Online learning</i> - <i>Practical Survey, Observation</i> - <i>Blended Teaching</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <ul style="list-style-type: none"> -<i>Lectures: 30</i> -<i>Tutorial/Exercise: 0</i> -<i>Labs/Practice: 0</i> -<i>Mini Project: 45</i> -<i>Others: 15</i> -<i>Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Students acquire basic and practical knowledge about environmental management in urban & in industrial production activities; course learning will help students to build some skills, including: problem- solving; experiment and knowledge discovery; systems thinking; critical thinking; and effective teamwork & communication. And, students also know how to apply knowledge to benefit society.</i>
Content	<i>For meeting the course's objective, its content includes the concepts of current environmental issues, main environmental management instruments in urban and industrial areas. The course focuses to three prominent urban environmental issues as: Air quality management, water resource management and solid waste management. Besides, main approaches in industrially environmental management & practical environmental management issues in industrial parks also are introduced. Integrated with theory, practical experiences of environmental management in urban & industrial areas in Vietnam and around the world are presented and analysed.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Group assignment + Oral Presentation (45' – 60'/assignment),</i> - <i>One final exam (90 minutes),</i> - <i>And home works (individual, group)</i>
Study and examination requirements	<i>Evaluation form: Scale of 10; less than 5.5 does not pass; Assignment x 50% + Exam x 50%</i>

	<ul style="list-style-type: none"> - Besides, participating actively in class (AIC), completing homeworks (HW) will be awarded points (not than 20% of exam scores). • Conditions for taking the exam: <ul style="list-style-type: none"> - Attend more than 2/3 of the total number of lectures; - Prepare and report group assignment.
Reading list	<ul style="list-style-type: none"> [1] Phạm Ngọc Đăng, 2010. Quản lý môi trường đô thị và khu công nghiệp. Hà Nội: Nhà xuất bản Xây dựng. [2] Jiri Marsalek et al., 2008. Urban Water Cycle Processes and Interactions. UNESCO Publishing. [3] Salah M. El-Haggar, 2007. Sustainable Industrial Design and Waste Management: Cradle-to-cradle for Sustainable Development. Elsevier. [4] UNEP & CalRecovery, Inc, 2005. Solid Waste Management (Volume I). UNEP. [5] Gregor Haberle (eds.), Hartmut Fritzsche et al. 2013. Fachwissen Umwelttechnik – (Bản tiếng Việt: Dương Minh Trí và cs dịch và hiệu đính). Chuyên ngành Kỹ thuật môi trường. Phương Nam Book. 2020. [6] I.V Murali Krishna and Valli Manickam (Auth.), 2017. Environmental Management - Science and Engineering for Industry. Butterworth-Heinemann. [7] Daniel Vallero, 2014. Fundamentals of Air Pollution, Fifth Edition. Elsevier. [8] Susan J. Masten and Mackenzie L. Davis, 2020. Principles of Environmental Engineering and Science (4th edit.). McGraw-Hill Education. [9] Tamim Younos, Tammy E. Parece (eds.), 2016. Sustainable Water Management in Urban Environments. Springer International Publishing.

Module designation	<i>Water Resources Management</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Assoc. Prof. Vo Le Phu Dr. Vo Thanh Hang</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory (of major specialisation) Natural Resources and Environmental Management (only)</i>
Teaching methods	<i>Lecture, documentary films, group works/discussion/ presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 12 -Labs/Practice: 0 -Mini Project: 27 -Others: 15 -Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<ul style="list-style-type: none"> - <i>Pre-courses: Ecology (EN1005), Environmental Chemistry Engineering (EN2005)</i> - <i>Parallel courses: Environmental Hydrology (EN2023)</i>
Module objectives/intended learning outcomes	<p><i>Upon the completion of this course, students are able to achieve the following knowledge and skills:</i></p> <ul style="list-style-type: none"> - <i>Knowledge: (i) Understand the significance and important role of water resources; (ii) Identify and analyse characteristics of water resources; (iii) Identify and factors influencing water resources.</i> - <i>Skills: (i) Develop skills for analysis, argument and identification of water resources related issues; (ii) Teamwork and multidisciplinary cooperation.</i> - <i>Competences: (i) Understand external context and trend in the management of water resource; and (ii) Compare and evaluate policies and measures for water resources management.</i>
Content	<p>The aim of this course is to provide students with basic knowledge on fundamental concept of water resources, the vital role of water resources in the course of socio-economic development as follows:</p> <ul style="list-style-type: none"> - <i>The overview of water resources, the need for management, boundary of management and the evolution of international water dialogues, concerns over water resource as well as background of institutional frameworks of water management practices in Vietnam.</i> - <i>Fundamental knowledge on the formulation of water sources, global hydrological cycle, water pollutants and adverse effects of water pollution on the environments and human health.</i> - <i>Water rights, values, water demand, pressures of urbanisation and industrialisation on water resources, and</i>

	<p><i>the connection of sustainable development and water resources management.</i></p> <ul style="list-style-type: none"> - <i>Comprehensive knowledge of integrated water management as well as regional and international lessons learned in the management practices of water resources.</i> - <i>Climate change and its impacts on water resources and adaptation measures.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Four (04) in-class exercises (quizzes and open questions)</i> - <i>One (01) Individual Essay (take-home written assignment): students work in 6 weeks and submit in the 8th week of the course.</i> - <i>One (01) Group Works: each group consists of 4-5 students, choose their own topic from week 2. Group presentation in week 7 for about 30 minutes. Assessment of each group is based on an agreed rubric.</i> - <i>One (01) Mid-term exam (week 7)</i> <p><i>One (01) final exam: quizzes-based and opened questions.</i></p>
Study and examination requirements	<ul style="list-style-type: none"> - <i>All materials (lecture handouts, article papers, reports and case studies) are provided on BK-elearning (BKeL).</i> - <i>Students are required to be at least 90% attendance of theoretical lectures and 100% of individual assignments, discussion, presentation of the course.</i> - <i>Students are provided with ideas of individual essay's topics in Week 2 of the course. Individual essays should be submitted in Week 7 or 8. Maximum length of the essay is 2,500 words (excluded tables, diagrams, figures). Specific requirements of essay will be provided in Week 1</i> - <i>Group works presentation will be performed in Week 7 – 10. Assessment Rubrics for group presentation will be discussed in Week 1 of the course.</i> - <i>The final grade includes individual Essay (30%); group presentation (20%); final exam (50%).</i> - <i>Students must have a final grade of 50% or higher to pass the course.</i> - <i>Students do not submit individual assignment and do not participate group presentation will not be allowed to participate the final exam.</i>
Reading list	<p><i>Textbook and main readings:</i></p> <p><i>[1]. Loucks, D.P. and van Beek, E. (2005). Water Resources Systems Planning and Management: An Introduction to Methods, Models and Application. UNESCO, Delft, the Netherlands [Chapter 1].</i></p> <p><i>[2]. World Water Development Programme (2003). Water for People, Water for Life. UNESCO Publishing and Berghahn Books, Barcelona [Chapters: 1 – 2 – 4 – 7 & 12].</i></p> <p><i>[3]. World Water Development Programme (2009). The United Nations World Water Development Report 3: Water in a Changing World. Paris, UNESCO and London, Earthscan [Chapters: 2 – 5 – 8 – 10 & 11].</i></p> <p><i>[4]. Gleick, P.H. (2012). The World's Water (Volume 7): The Biennial Report on Freshwater Resources. Island Press, Washington, D.C [Chapters 1 & 3].</i></p>

	<p>[5]. Cunningham, W.P. and Cunningham, M.A. (2010). <i>Environmental Science: A Global Concern</i>. 11th Edition, McGraw Hill (Higher Education), Boston [Chapters 17 & 18].</p> <p>Additional readings:</p> <p>[6]. Uitto, I.J. & Biswas, A.K. (eds) (2000). <i>Water for Urban Areas: Challenges and Perspectives</i>. United Nations University Press, Tokyo, 245.</p> <p>[7]. Hansen, J. M. and Do Hong Phan (2005). <i>Integrated Water Resources Management in Vietnam: Present Status and Future Challenges</i>. In A. K. Biswas, O. Varis and C. Tortajada. <i>Integrated Water Resources Management in South and South-East Asia</i> Oxford University Press, New Delhi. 219-249.</p> <p>[8]. Biswas, K.A. (1997). <i>Water Resources: Environmental Planning, Management and Development</i>. McGraw Hill, New York.</p> <p>[9]. World Water Assessment Programme (2006). <i>The United Nations World Water Development Report 2: Water – A Shared Responsibility</i>. Paris, UNESCO Publishing and Berghahn Books, Barcelona.</p> <p>[10]. Kundzewicz, Z.W., Mata, L.J., Arnell, N.W., Döll, P., Kabat, P., Jiménez, B., Miller, K., Oki, T., Şen, Z. & Shiklomanov, I.A. (2007). <i>Freshwater Resources and Their Management</i>. In: Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J. & Hanson, C.E. (eds), <i>Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change</i>, Cambridge University Press, Cambridge, pp. 173-210.</p>
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Module designation	<i>Semester Paper</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Dr. Ha Quang Khai</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Students receive the assignments from the instructor.</i> - <i>The teacher announces the schedule and location to meet and instruct student.</i> - <i>After 15 weeks in the main semester or 7-8 weeks in the summer semester, student submit the report to the department. Student have to refer the guideline to write the report.</i> - <i>Student give the presentation before the assessment committee. The grade is the average grade of all the committee members</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <ul style="list-style-type: none"> - <i>Lectures: 0</i> - <i>Tutorial/Exercise: 0</i> - <i>Labs/Practice: 0</i> - <i>Mini Project: 90</i> - <i>Others: 10</i> - <i>Self-Study: 0</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>The purpose of this course is to help students summerise and apply their knowledge in dealing with the problems of managing the environment in practice. After this work, students are capable of improving their knowledge as well as necessary skills to accomplish their special subjects for graduation</i>
Content	<i>The subject includes an overview of the issues, the current status and legal basis related to the research subjects, in order to prepare for the Capstone Project in the next semester</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>One (01) Individual Essay.</i> - <i>Student give the presentation before the assessment committee. The grade is the average grade of all the committee members</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Students mut submit individual assignment and muts participate group presentation to qualify for entering the final exam.</i>
Reading list	<ul style="list-style-type: none"> - <i>Guidelines for writing semeter paper</i> - <i>Semeter paper samples</i>

Module designation	<i>Study Tour</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Vo Thanh Hang Luu Dinh Hiep</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Collecting information and documents;</i> - <i>Take photos of the study tour;</i> - <i>Interview ;</i> - <i>Writing Report</i> - <i>Group Work</i> - <i>Group Presentation</i> - <i>Subject evaluation: reporting points account</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 50</i> <ul style="list-style-type: none"> - <i>Lectures: 0</i> - <i>Tutorial/Exercise: 0</i> - <i>Labs/Practice: 0</i> - <i>Mini Project: 45</i> - <i>Others: 5</i> - <i>Self-Study: 0</i>
Credit points	<i>1 (2 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Comprehend activities and work in the field of natural resource and environmental management;</i> - <i>Skills of thinking and problem solving;</i> - <i>Experimental skills and knowledge discovery;</i> - <i>Skill of systematic thinking;</i> - <i>Personal skills and characteristics;</i> - <i>Professional skills and characteristics;</i> - <i>Understanding enterprise context</i> - <i>Skills of group working and effective communication.</i> - <i>Apply knowledge to benefit society</i>
Content	<p><i>This course aims to provide the student with an opportunity to observe, gain practical insight, and to visualize activities and jobs in the field of natural resources and environmental management, thereby supplementing practical knowledge into the theory, that they were learned at university. Besides, the practice also contributes to the friendship between the members of the class.</i></p> <p><i>Depending on the location, the study tour is suitable. However, the main focus will be on guiding students to visit waste treatment stations, environmental management agencies, protected areas, research institutes/ centers, and environmental companies, etc. Through that, the student can visualize the actual work of environmental engineers in the future</i></p>
Exams and assessment formats	<i>- Students must attend 100% of the internship (about 4-5 days)</i>

	<ul style="list-style-type: none"> - Lecturer and the council class's members have to arrange the study tour plan at least two months before the beginning day of the intership and completes the documents for the University's decision to set up the tour. - Students must know the plan and place of visit before 01 month from the start of the tour to prepare the content and questionnaire. - The main activities of the visit are: collecting information and documents; have the photos of the study tour; direct interview the guiding officers of the visiting unit. - Internship report: grouping about 2-3 students / group. Submit the report 1-2 weeks after the completion of the field trip. - Subject evaluation: reporting points account for 100% of course completion.
Study and examination requirements	<p>Requirements for successfully passing the module</p> <p>The report points account for 100% of course completion.</p>
Reading list	<p>Documents provided by the trainee unit and combination with references from the Internet</p>

Module designation	<i>Ho Chi Minh ideology</i>
Semester	<i>8th</i>
Person responsible for the module	<i>Phan Duy Anh</i>
Language	<i>Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, group work, homework.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 100</i> <i>-Lectures: 24</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 18</i> <i>-Others: 10</i> <i>-Self-Study: 48</i>
Credit points	<i>2 (4 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Pre-study of History of Communist Party of Vietnam</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: Understand, master and state the formation and development of Ho Chi Minh ideology; name and analyze basic stages in the formation and development processes of Ho Chi Minh ideology.</i> - <i>Skills: Build and strengthen materialist worldview and dialectical methodology.</i> - <i>Attitudes: Raise national pride, be proud of Vietnam Communist Party and President Ho Chi Minh</i>
Content	<i>This course provides systematic knowledge of origin of Ho Chi Minh ideologies, the basic contents of Ho Chi Minh ideologies and applied process of Ho Chi Minh ideologies into solving practical problems of Vietnam's revolution. Contacting practical Ho Chi Minh ideologies as a creative application of Marxism - Leninism to specific conditions of Vietnam is shown in the lines, guidelines and policies of Vietnam Communist Party and the State law.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>In-class participation: Regular testing and assessment, etc</i> - <i>Coursework: Essay.</i> - <i>Final Exam: Multiple choice (40 minutes).</i>
Study and examination requirements	<i>Requirements for successfully passing the module - The final grade in the module is composed of 50% final exam, 30% coursework, 20% in-class participation. Students must have a final grade of 50% or higher to pass.</i>
Reading list	<i>Main textbooks:</i> <i>[1]. Ministry of Education and Training: Ho Chi Minh's Ideology Textbook (For College and University students not majoring in Marxist-Leninist Philosophy and Ho Chi Minh's Ideology), National Politics Publisher, Hanoi, 2018.</i>

	<p>[2] Ministry of Education and Training: <i>Ho Chi Minh's Ideology Textbook (For College and University students not majoring in Marxist-Leninist Philosophy and Ho Chi Minh's Ideology)</i>, circulated in 2019, waiting for being published (provided by lecturers).</p> <p>References:</p> <p>[3]. National Textbook Edition Council: <i>Ho Chi Minh's Ideology Textbook</i>, National Politics Publisher, Hanoi, 2004.</p> <p>[4]. Complete works of Ho Chi Minh, 15 volumes, National Politics Publisher, Hanoi, 2011.</p> <p>[4]. Selected Works of Ho Chi Minh, National Politics Publisher, Hanoi, 2004.</p> <p>[5]. Lai Quoc Khanh, Phan Duy Anh, <i>Ho Chi Minh's Political Philosophy: Structure, Features and Value</i>, Social Sciences and Humanity Magazine, Volume 2, No.1, 2016.</p> <p>[6]. Phan Duy Anh, <i>The Power of National great unity in August 1945 Revolution- An evidence of Ho Chi Minh's Philosophy about Political subject</i>, Social Sciences and Humanity Magazine of Ho Chi Minh City, Aug, 2015.</p> <p>[7]. Phan Duy Anh, <i>Culture- A way to understand by Ho Chi Minh in Prison Diary</i>, Nhiep Cau Tri Thuc Magazine, Sep, 2013.</p> <p>[8]. Tran Thi Thu Hoai, Phan Duy Anh, <i>Four "Truth" in Ho Chi Minh's Testament on building the Ruling Party</i>, Political Science Magazine, Sep, 2013.</p> <p>[9]. Nguyen Van Khanh, Phan Duy Anh, <i>Ho Chi Minh and talent issue</i>, Communist Party's History Magazine, May, 2010.</p>
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Module designation	<i>Basic Scientific Research Methods in Natural Resources and Environmental Management</i>
Semester	<i>8th</i>
Person responsible for the module	<i>Le Van Khoa Ngo Thi Ngoc Lan Thao</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<ul style="list-style-type: none"> - <i>Power Point + Video Clip</i> - <i>Discussion (Thảo luận)</i> - <i>Group Work (Làm việc nhóm),</i> - <i>Group Presentation (Trình bày nhóm),</i> - <i>Live stream – Online learning (Giảng dạy trực tuyến)</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <ul style="list-style-type: none"> - <i>Lectures: 30</i> - <i>Tutorial/Exercise: 0</i> - <i>Labs/Practice: 0</i> - <i>Mini Project: 45</i> - <i>Others: 15</i> - <i>Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>This course aims to provide to undergraduate students the basic knowledge and skills of scientific research methods which help them to gain better learning & researching results, especially in the performance of their thesis.</i>
Content	<i>This course includes: General concepts of scientific research and scientific research methods; Selection of scientific topic; Establishment of scientific arguments; Ascertainment of scientific arguments; presentation of scientific arguments; and Ethical issues in scientific research.</i>
Exams and assessment formats	<i>Group assignment + Oral Presentation (45-60'/assignment), One final exam (80 minutes),</i>
Study and examination requirements	<i>Evaluation form: Scale of 10; less than 5.5 does not pass; Assignment x 50% + Exam x 50%</i> <ul style="list-style-type: none"> - <i>Besides, participating actively in class (AIC), completing homeworks (HW) will be awarded points (not than 20% of exam scores).</i> • <i>Conditions for taking the exam:</i> <ul style="list-style-type: none"> - <i>Attend more than 2/3 of the total number of lectures;</i> - <i>Prepare and report group assignment.</i>
Reading list	<i>[1] Vũ Cao Đàm, 2016. Phương pháp luận nghiên cứu khoa học (tái bản lần 8). NXB Giáo dục Việt Nam.</i>

	<p>[2] Ranjit Kumar, 2011. <i>Research Methodology – A step-by-step guides for beginners</i>. 3rd edition. SAGE Publications Ltd.</p> <p>[3] Giuseppe Iarossi, 2006. <i>The Power of Survey Design - A User's Guide for Managing Surveys, Interpreting Results, and Influencing Respondents</i>. The World Bank. Washington D.C. Bản tiếng việt dịch giả: Nguyễn Thị Việt Hà và cs . Sức mạnh của thiết kế điều tra – Cẩm nang dùng trong quản lý điều tra, diễn giải kết quả điều tra, và chi phối đối tượng điều tra. NXB Chính trị quốc gia, 2009)</p> <p>[4] Dương Văn Tiến, 2006. <i>Giáo trình Phương pháp luận nghiên cứu khoa học</i>. NXB Xây dựng.</p> <p>[5] Nguyễn Văn Tuấn, 2013. <i>Từ nghiên cứu đến công bố - Kỹ năng mềm cho nhà khoa học</i>. NXB Tổng hợp TP.HCM.</p> <p>[6] Nguyễn Văn Tuấn, 2018. <i>Cẩm nang Nghiên cứu khoa học</i> -</p> <p>[7] <i>Từ ý tưởng đến công bố</i>. NXB Tổng hợp TP.HCM</p> <p>[8] Shyama Prasad Mukherjee, 2020. <i>A Guide to Research Methodology - An Overview of Research Problems, Tasks and Methods</i>. CRC Press.</p> <p>[9] Anol Bhattacharjee, 2012. <i>Social Science Research: Principles, Methods, and Practices</i>. Scholar Commons USF.</p> <p>[10] Amanda M. Rosen, 2019. <i>Effective Research Methods for Any Project</i>. The Great Courses.</p>
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Module designation	<i>Capstone Project</i>
Semester	<i>8th</i>
Person responsible for the module	<i>Head of Dept. NREM</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 200</i> <i>-Lectures: 0</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 0</i> <i>-Others: 20</i> <i>-Self-Study: 180</i>
Credit points	<i>4 (8 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Internship; Semester project; English; and accumulation credit of 80%</i>
Module objectives/intended learning outcomes	<i>The capstone project is implemented under the instruction of one or more teachers. The purpose of the course is applying learnt knowledge systematically to solve environmental problems. The topic, including theory, research, or real application, will be proposed by the teacher or students and have to be approved by the Head of Department.</i>
Content	<i>a/ Thesis book (clean and clear, without serious errors, sections are balanced)</i> <i>b/ Introduction and literature review (review sufficient literature)</i> <i>c/ Methodology (suitable, achieve the research objectives)</i> <i>d/ Results (sufficient, reliable, and useful results)</i>
Exams and assessment formats	<i>Oral defense</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Grade of the thesis is the average grade from 5 members: instructor, reviewer, and 3 member of the committee</i> - <i>If the different point between the instructor and the reviewer is ≥ 2, the instructor and the reviewer need to discuss, otherwise, the committee will make the final decision.</i> - <i>The study can have thesis oral presentation after receiving the approval of both the instructor and the reviewer. If the reviewer do not approve the thesis, the committee have to decide whether the student can have oral presentation or not 2 days before the official oral date.</i> - <i>The grades the thesis from instructor and reviewer (based on instructor/reviewer grading sheet template) have to be sent to the committee secretary. After considering and combining the grades, the secretary inform these grades to the committee member for reference.</i> <i>The committee have 3 member, the instructor must not join the committee.</i>
Reading list	<i>- Open sources, based on the instructor.</i>

Module designation	<i>Entrepreneurship</i>
Semester	4th
Person responsible for the module	<i>Truong Minh Chuong</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (A)</i>
Teaching methods	<i>Lecture, project, seminar.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>- Describe the entrepreneur, entrepreneurship process and roles of entrepreneurship in economy development</i> <i>Demonstrate the capability in entrepreneurship process performance</i> <i>L.O.1 - Produce a business plan</i> <i>L.O.2 - Express careful preparation in decision making to become an entrepreneur</i>
Content	<i>Introduction to the course</i> <i>Entrepreneurial opportunity identification Entrepreneurial idea Feasibility analysis of entrepreneurial opportunity</i> <i>Industrial analysis</i> <i>Business model concepts – Business model classification and their contents</i> <i>Startup business plan Preparation for startup Team venture and pitching</i> <i>Management of startup business</i>
Exams and assessment formats	<i>In-class Exercises : 10%</i> <i>Group Assignment : 30%</i> <i>Final exam : 60%</i>
Study and examination requirements	<i>Weighted sum of the in-class exercises, group assignment and final exam must be larger than 5.5 (max. 10)</i>
Reading list	<i>[1] Barringer, Ireland (2019), Entrepreneurship: Successfully launching new ventures 6th Ed., Pearson Education</i> <i>[2] Scarborough, N. M. and Cornwall, J. R. (2016). Essentials of Entrepreneurship and Small Business Management. 8th Ed. Pearson Education.</i> <i>[3] Aulet, B. (2013). Disciplined Entrepreneurship: 24 Steps to a Successful Startup. John Wiley & Sons.</i> <i>[4] Pijl, P., Lokitz, J., and Solomon, L. K. (2016). Design a Better Business. John Wiley & S</i>

Module designation	<i>Project Management For Engineers</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Nguyen Thuy Trang</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (A)</i>
Teaching methods	<i>Lecture, lesson, group discussion, presentation</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of the module, students will be able to": To increase management component in a project team environment, this course will equip learners with general project management skills to help her/him to deal with problems in any field of work. Learners will also gain practical experience of using project management techniques in managing a project</i>
Content	<i>The course PM provides fundamental knowledge and skills of project management such as analyzing and selecting alternatives, planning, scheduling, monitoring, and controlling a project. Varied approaches which are used to deal with problems rising in the progress of a project are also mentioned.</i> <ul style="list-style-type: none"> - <i>Explain, distinguish concepts, processes, and methods to solve problems in projects</i> - <i>Apply various approaches to assess a project's feasibility</i> - <i>Apply various methods in managing projects</i> - <i>Demonstrate presentation skills</i>
Exams and assessment formats	<i>Multiple choice questions: one Midterm test (50 min), one Final exam (50 min); in-class and online quizzes,, take-home written assignments.</i>
Study and examination requirements	<i>The final grade in the module is composed of 50% performance on exams, 20% mid-term assessment, 20% quizzes and assignments, 10% take-home assignments, 10% online tasks. Students must have a final grade of 50% or higher to pass</i>
Reading list	<i>[1] Larson E.W. & Gray C. F. (2021). Project Management: The Managerial Process (8th ed.). McGraw-Hill International Edition.</i> <i>[2] Project Management Institute (2021). A Guide to the Project Management Body of Knowledge - PMBOK Guide (7th ed.). Newtown Square, Pennsylvania.</i>

	<p>[3] Heagney, Joseph (2018). <i>Quản trị dự án – Những nguyên tắc căn bản</i>. Nhà xuất bản công thương</p> <p>[4] The Stationery Office (2017). <i>Managing Successful Projects with PRINCE2</i>. United Kingdom.</p> <p>[5] Joseph, H. (2016). <i>Fundamentals of Project Management</i> (5th ed.). American Management Association, New York.</p>
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Module designation	<i>Engineering Economics</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Lai Huy Hung Tran Duy Thanh Pham Tien Minh</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (A)</i>
Teaching methods	<i>Lecture, lesson, group discussion, presentation</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 0 -Mini Project: 45 -Others: 15 -Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>After completing the course, learners are able to - Explain the basic economic concepts - Explain supply, demand and market interaction - Explain and analyse firm behaviors in different market structures - Describe and discuss macroeconomic topics such as national income accounts, inflation and unemployment and related problems - Explain the financial system, money system, banking system and the role of central bank. - Discuss and appreciate macroeconomic policies</i>
Content	<i>- This course is designed to provide a basic understanding of the economic system. Fundamental economic concepts will be explored and contemporary economic problems and issues will be examined in light of the concepts learned. The course will cover supply, demand and market equilibrium, theory of the firm, competitive market equilibrium, and non-competitive market structures, national income accounting, inflation and unemployment, fiscal policy, the financial system and monetary policy.</i>
Exams and assessment formats	<i>Assignment 15%, Midterm 35%, Project 15%, Final exam 35%.</i>
Study and examination requirements	<i>Requirements for successfully passing the module. Students must have a final grade of 50% or higher to pass.</i>
Reading list	<i>[[1] Mankiw, N. G. (2017). Principles of economics. Cengage Learning. [2] Karl, E., Case, F., Oster, R., & Sharon, E. (2017). Principles of Economics. Pearson</i>

Module designation	<i>Strength of Materials</i>
Semester	<i>4th</i>
Person responsible for the module	<i>Nguyen Hong An Nguyen Thai Binh Luong Van Hai Cao Van Vui</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>lecture, lab works</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 20 -Mini Project: 15 -Others: 15 -Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>An ability to identify, formulate and solve complex engineering problems by applying principles of mathematics, science and engineering.</i> - <i>Determine calculation diagrams for real structures; modeling external loadings and actions; Determine reaction forces; drawing internal force diagrams for bars and beams</i> - <i>Show the distribution of stress on the cross-section of the bar/beam; evaluation of the strength condition (3 fundamental problems) for bar/beam; calculate the displacement in bar/beam</i> - <i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives</i> - <i>An ability to design and conduct appropriate experimentation, analyze and interpret data in the field of engineering.</i> - <i>Ability to prepare and conduct tests to determine the mechanical properties of materials; investigate the behavior of bar/beam structures subjected to different types of loadings; be able to present the results report of the experiments</i>
Content	<p><i>The description of the contents should clearly indicate focus areas and the level of difficulty.</i></p> <p><i>CHAPTER 1A. BASIC CONCEPTS:</i></p> <p><i>The concept of the subject (tasks, objects); Object classification, basic deformation classification; Basic assumptions; External loadings, types of supports and reactions; Equilibrium Equations.</i></p> <p><i>CHAPTER 1B. INTERNAL FORCE THEORY:</i></p>

	<p>General concepts; Determining internal force; Internal force of plan problem (conventional internal force sign, internal force diagrams); Relationship of internal force and acting loads for plan problem; Introducing two methods for drawing the internal force diagrams; Internal force and stress relationship.</p> <p>CHAPTER 2. AXIAL LOAD SIMPLE TENSION (COMPRESSION):</p> <p>Definitions axially loaded member; normal force diagram; normal stress; normal strain; lateral strain; Mechanical Properties of Materials; Stress Strain Relation; allowable stresses and allowable loads; elastic deformations under tension (compression); strength conditions & 3 fundamental problems.</p> <p>CHAPTER 3. STRESS STATE & THEORY OF FAILURE</p> <p>CHAPTER 4. PROPERTIES OF CROSSECTIONAL AREAS:</p> <p>First moment of area; coordinates of the centroid; moments of inertia of an area w/r an axis; polar moment of inertia; product of inertia of an area; principal axes of inertia; central principal axes; radii of gyration; moments of inertia with respect to parallel axes; transformation of area moments of inertia – rotation of axes; moments of inertia of some particular sections.</p> <p>CHAPTER 5. PLANE BENDING OF BEAM:</p> <p>Introduction; Pure bending of beam (experiment & observations, hypotheses, formulation of normal stress, normal stress diagram, stress strain relation, stress - internal forces relations); Transverse bending (formulation of normal stress, formulation of shear stress, shear stress diagram); Strength conditions, 3 fundamental problems; Deflection of beams: slope and displacement by integration.</p> <p>CHAPTER 6. PURE TORSION OF CIRCULAR SHAFTS:</p> <p>Introduction; internal torque diagram in statically determinate members; Torsional members of circular cross section: formulation of stress, strength of condition, 3 fundamental problems; Transmission of power by circular shafts; Pure torsion of rectangular cross section members; Stress and strain in closed- coiled helical springs.</p> <p>CHAPTER 7. COMBINED LOADINGS</p> <p>CHAPTER 8. EXPERIMENTS:</p> <p>1. Tension test (ductile and brittle materials: steel and cast iron); 2. Compression test (ductile and brittle materials: steel and cast iron); 3. Displacement and rotation of cantilever beam/simple beam; 4. Torsion test.</p>
Exams and assessment formats	<p>Final exam: 90 minutes; constructed response; closed-book exam Assignments</p> <p>Experimental final report: Prerequisite</p>
Study and examination requirements	<p>Requirements for successfully passing the module</p> <p>Final exam – 60%;</p> <p>Group assignments – 20%; Experimental report – 20%.</p>
Reading list	<p>[1] Hibbeler R.C., Mechanics of Materials, Prentice Hall, 2014</p> <p>[2] Gere J.M., Mechanics of Materials, Thomson Learning, 2001</p>

	<p>[3] <i>Benham, Crawford, Mechanics of Engineering Materials, 2nd Edition, Longman, 1996</i></p> <p>[4] <i>Lecture notes of Strength of Materials (Update every semester)</i></p>
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Module designation	<i>Fluid Mechanics</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Dr. Huynh Cong Hoai</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>Lecture, seminar (invited expert, if any), presentation, video, lab visit (if any).</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise:</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>The course supplies the basic laws of equilibrium and motion of fluid, the interactions between fluid and moving bodies or with rigid boundaries.</i> <i>The knowledge in the course is applied to solve the basic problems of fluid.</i> <i>All the basic phenomena and principles of fluid mechanics are examined through the experiments in the laboratory</i>
Content	<ul style="list-style-type: none"> - <i>Fluid Mechanics is a fundamentally engineering course for all engineering students.</i> - <i>The course is designed to equip the students the basic laws of equilibrium and motion of fluid, the interactions between fluid and moving bodies or with rigid boundaries.</i> - <i>At the same time the course also provides technical applied to solve basic problems in engineering field such as Civil Engineering,</i> - <i>Water Resources Engineering, Water Supply, Electrical System, Mechanical Engineering, Chemical Engineering, Automational System, Aerodynamic Engineering, Environment Engineering ect....</i> <i>Besides, student carries out the experiment to understand well the principles and basic phenomina of fluid mechanics and to know how to use the equipments for measuring the flow in the laboratory.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Midterm: Term project (30 minutes/presentation)</i> - <i>Final exam: Writting exam (60-120 minutes)</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Midterm: 20%</i> - <i>Final exam: 50%</i> - <i>Experiment: 20%</i> - <i>Exercise: 10%</i>

<p>Reading list</p>	<p>[1] Nguyễn Ngọc Ân, Nguyễn Thị Bảy, Lê Song Giang, Huỳnh Công Hoài, Nguyễn Thị Phương. <i>Giáo trình Cơ Lưu Chất</i>. ĐH Bách Khoa, Năm 1998</p> <p>[2] Nguyễn Ngọc Ân, Nguyễn Thị Bảy, Nguyễn Khắc Dũng, Lê Song Giang, Huỳnh Công Hoài, Nguyễn Thị Phương, Hồ Xuân Thịnh, Nguyễn Quốc Ý. <i>Bài tập Cơ Lưu Chất</i>. ĐH Bách Khoa, Năm 2011.</p> <p>[3] Hoàng văn Quý và Nguyễn Cảnh Cầm. <i>Thủy lực 1</i>. NXB Giáo dục, 1973.</p> <p>[4] Nguyễn hữu Chí, Nguyễn hữu Dy, Phùng văn Khương, <i>Bài tập Cơ học Chất lỏng ứng dụng</i>. NXB Giáo Dục 1998</p> <p>[5] Bruce R. Munson, Donald F. Young, Theodore H. Okiishi. <i>E- book: Fundamentals of fluid mechanics</i>. John Wiley & Sons Inc. 2006</p> <p>[6] Subramanya.K. <i>Theory and application of fluid mechanics</i>. Mc.Graw - Hill 1993</p>
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Module designation	<i>Environmental Modelling</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Assoc. Prof. Bui Ta Long</i>
Language	<i>Vietnamese; English</i>
Relation to curriculum	<i>- Elective (B1)</i>
Teaching methods	<i>Lecture, lesson, laboratory works, and seminar.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 24</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 9</i> <i>-Others: 15</i> <i>-Self-Study: 72</i>
Credit points	<i>3(6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>- Numerical methods and mathematical models;</i> <i>- Knowledge of environmental processes;</i> <i>- Analysing, mining, and visualizing data;</i> <i>- Application of GIS and remote sensing for model.</i>
Module objectives/intended learning outcomes	<p>Module objectives:</p> <ul style="list-style-type: none"> - Knowledge: this course will provide students with basic knowledge and advanced applications of the mathematical model, the environmental modelling techniques in solving a huge urgent environmental problems, pay attention to the mathematical models appearing in water supply, wastewater, solid waste, air pollution simulation; - Skills: know how to use plenty of software that calculates the transmission and diffusion of environmental pollutants consisting of ModelMaker (kinetic equations), CAP (air environment), ENVIMAP (air environment), Streeter (water environment), QUAL2K (water environment) , MIKE11 (water environment); - Competences: Guide students to logical thinking skills, creativity, through the decision thinking, rational, responsible educational experience about the possible consequences when adopting decisions. <p>Intended learning outcomes:</p> <ul style="list-style-type: none"> - Modeling with the aid of information technology in current times has become a crucial branch of modern science and is a merely powerful tool to uncover the world. Research, modeling and applications on the computer opens up new horizons to identify the dependence of the mathematics and computer science and other disciplines - both natural and social; - Subject environment modelling provides a theoretical basis and practical construction as well as application of mathematical models for environmental protection. The basic concepts such as modeling, environmental modeling, modeling the environmental issues of air, surface water, ground water is presented. Furthermore, it also devoted

	<i>special attention to the specific application of environmental problems in our country.</i>
Content	<p>Module objectives:</p> <ul style="list-style-type: none"> - Knowledge: this course will provide students with basic knowledge and advanced applications of the mathematical model, the environmental modelling techniques in solving a huge urgent environmental problems, pay attention to the mathematical models appearing in water supply, wastewater, solid waste, air pollution simulation; - Skills: know how to use plenty of software that calculates the transmission and diffusion of environmental pollutants consisting of ModelMaker (kinetic equations), CAP (air environment), ENVIMAP (air environment), Streeter (water environment), QUAL2K (water environment) , MIKE11 (water environment); - Competences: Guide students to logical thinking skills, creativity, through the decision thinking, rational, responsible educational experience about the possible consequences when adopting decisions. <p>Intended learning outcomes:</p> <ul style="list-style-type: none"> - Modeling with the aid of information technology in current times has become a crucial branch of modern science and is a merely powerful tool to uncover the world. Research, modeling and applications on the computer opens up new horizons to identify the dependence of the mathematics and computer science and other disciplines - both natural and social; <p>Subject environment modelling provides a theoretical basis and practical construction as well as application of mathematical models for environmental protection. The basic concepts such as modeling, environmental modeling, modeling the environmental issues of air, surface water, ground water is presented. Furthermore, it also devoted special attention to the specific application of environmental problems in our country.</p>
Exams and assessment formats	<p>(1) Introduction:</p> <p>(2) The basic concepts of environmental modelling and measurement systems for modelling service:</p> <p>(3) The meteorological factors affecting the dispersion of pollution:</p> <p>(4) Modelling air pollution according the Gauss approach:</p> <p>(5) Modeling air pollution Berliand approach:</p> <p>(6) Model of Streeter in simulating river water quality:</p> <p>(7) Qual2K Model</p>
Study and examination requirements	<ul style="list-style-type: none"> - Take-home written assignments; - Mid-term test: written examination, time: 45 minutes; - Final exam: written examination, time: 90 minutes.
Reading list	<p>The final grade in the module is composed of:</p> <ul style="list-style-type: none"> - 10% in-class participation: students need to attend a minimum of 80% hours of coursework; - 20% take-home assignments: report must be submitted by the student group; - 20% performance on mid-term test;

	- 50% performance on final exam.
	<p>Names of textbooks:</p> <p>[1] <i>Environmental Modelling</i> (2014);</p> <p>[2] <i>Practical Exercises for Environmental Modelling</i> (2014);</p> <p>Names of reference books:</p> <p>[1] <i>Fundamentals of Ecological Modelling, 4th Edition</i> (1994);</p> <p>[2] <i>Environmental Modeling: Fate and Transport of Pollutants in Water, Air, and Soil</i> (1996);</p> <p>[3] <i>Surface Water-Quality Modeling</i> (1997);</p> <p>[4] <i>Air pollution and exhaust gas treatment: Volume 1 - Air Pollution and Computation for Pollutants Diffusion</i> (2002);</p> <p>[5] <i>Geodesy and Revise Hydrological Data</i> (2003).</p>

Module designation	<i>Environmental Management Systems</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Nguyen Thi Hieu Ho Thi Ngoc Ha</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Law and Policy</i>
Module objectives/intended learning outcomes	<i>This subject provides basic knowledge on Environmental management systems (EMS), related to processes and practices to reduce its environmental impacts and increase its operating efficiency. It also helps students to understand the ISO14001 and Environmental audit process, establish and assess a typical environmental management system (EMS).</i>
Content	<ul style="list-style-type: none"> - The subject introduces the following contents: - EMS Overview: definition, basic EMS, cost/benefit, EMS under ISO14001 - ISO14001 Standard Overview: definition, purpose, scope, structure, PDCA model (Plan-Do- Check-Act), application steps, etc. - Introducing other integrated MS, relation of ISO9001 and ISO45001 with ISO14001 - Environmental Auditing: definition, types, methods, reports including Internal Audits
Exams and assessment formats	<ul style="list-style-type: none"> - Midterm assessments (45 minutes each) - and one final exam (70 minutes), - short computer-based quizzes, - take-home written assignments
Study and examination requirements	<i>The final grade in the module is composed of:</i> <ul style="list-style-type: none"> - 10% in-class participation: students need to attend a minimum of 80% hours of coursework; - 20% take-home assignments: report must be submitted by the student group; - 20% performance on mid-term test; - 50% performance on final exam.
Reading list	<p><i>[1] Hoàng Thị Huê, Giáo trình hệ thống quản lý chất lượng môi trường, NXB Khoa học Tự nhiên và Công nghệ, 2020.</i></p> <p><i>[2] Lê Thị Hồng Trân, Thực thi hệ thống quản lý môi trường, NXB Đại học Quốc Gia TP HCM, 2010.</i></p>

	<p>[3]- Lê Thị Hồng Trân, Kiểm toán hệ thống quản lý môi trường ISO 14001 cho tổ chức, NXB Đại học Quốc Gia TPHCM, 2008.</p> <p>[4]- Christopher Sheldon, Mark Yoxon, Environmental Management Systems, Step-by-step guide to implementation and maintenance, Third edition, Earthscan, USA, 2006.</p> <p>[5]- National standard TCVN ISO14001:2015, Environmental Management systems – Requirements with guidance for use</p> <p>[6]- National standard TCVN ISO9001:2015, Quality Management systems – Requirements</p> <p>[7]- ISO45001:2018, Occupational health and safety Management systems – Requirements with guidance for use.</p>
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Module designation	Environmental Toxicology and Lab Works
Semester	5th
Person responsible for the module	Dr. Lam Van Giang
Language	English; Vietnamese
Relation to curriculum	Elective (B1)
Teaching methods	lecture, lesson, lab works, project, seminar etc.
Workload (incl. contact hours, self-study hours)	<p>Total workload (Hours): 150</p> <ul style="list-style-type: none"> -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 20 -Mini Project: 15 -Others: 15 -Self-Study: 70
Credit points	3 (6 ECTS)
Required and recommended prerequisites for joining the module	Chemistry for Environmental Engineering and science
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - Knowledge: Recognise current environmental ecotoxicology problems and comprehend ecotoxicology characteristics - Skills: Skills of thinking and problem solving ; Experimental skills and knowledge discovery; Skill of system thinking; Personal skills and characteristics;; Skills of group working and effective communication - Competences: Apply knowledge to benefit society
Content	<p>Students will be supplied knowledge about toxicology agents in environment, their sources and biogeochemistry cycles, the ways they threat the eco-system and human beings. This subject also supplies the knowledge about methods of prevention and cures.</p> <p>Undergraduate students are introduced about the principles, clarifications and definitions of environmental toxicology. The subject also introduces chemical and physical agents in earth, water and air as well as the behaviors and poisoning ways of those agents in component environments and their biogeochemistry cycles.</p> <p>The subject particularly focuses on the detrimental effects of toxic elements and substances on living organisms, especially on populations and communities within defined ecosystems. Moreover, undergraduate students are also introduced about the accumulation processes of chemical and physical agents in the environment, the transfer pathways of those agents and their interactions with the environment, the response of living organisms on those agents.</p>
Exams and assessment formats	<ul style="list-style-type: none"> - Midterm assessments (45 minutes each) - and one final exam (70 minutes), - short quizzes, - take-home written assignments - Labworks

Study and examination requirements	<p><i>Requirements for successfully passing the module</i></p> <ul style="list-style-type: none"> - <i>the final grade in the module is composed of 70% performance on exams, 5% quizzes, 5% take-home assignments, 5% in-class participation and Labworks report 15%. Students must have a final grade of 50% or higher to pass</i>
Reading list	<p><i>[1] Peter Calow. Handbook of Ecotoxicology. Blakwell sciences. Inc Cambridge, 1993</i></p> <p><i>[2] Ruchirawat, M. Environmental toxicology. Vol. I, UNDP, Bangkok, 1997</i></p> <p><i>Ruchirawat, M. Environmental toxicology. Vol. II, UNDP, Bangkok, 1997</i></p>

Module designation	<i>General HSE</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Nguyen Thi Hieu</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>Lecture, presentation, team assignment.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 24</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 9</i> <i>-Others: 15</i> <i>-Self-Study: 72</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Understand HSE and its overall requirements</i> - <i>Understand and establish environmental factors in industrial hygiene</i> - <i>Identify and controls of safety risk and harmful factors in Industries</i> - <i>Understand the Occupational health and safety (OHS) management system in accordance with and ISO45001</i>
Content	<ul style="list-style-type: none"> - <i>Overview about general HSE field and legislation requirements related to occupation health and safety (high risk equipment, electrical safety and incident management)</i> - <i>Safety management including Industrial Hygiene: dangerous and harmful factors at workplace including chemical management, noise, dust, radiation, etc and its control.</i> - <i>Fire protection management and regulatories.</i> - <i>ISO45001 OHS management system</i>
Exams and assessment formats	<i>Conditions:</i> <ul style="list-style-type: none"> - <i>More than 80% class time attendance;</i> - <i>80% class exercise participation</i> <i>Assessment activities:</i> <ul style="list-style-type: none"> - <i>Group presentation: 3-6 students/group</i> - <i>Exercise: teamwork</i> - <i>Final examination: 75min</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Exercise (BT/TH): 20% Report (Individual - Homework)</i> - <i>Presentation (BTL/TL): 30% Report (Group – In-class)</i> - <i>Final examination: 50%, Essay Test</i>
Reading list	<i>[1] Lecture materials from Instructor.</i>

	<p>[2] Lý Ngọc Minh, <i>Quản lý an toàn sức khỏe môi trường lao động và phòng chống cháy nổ ở Doanh nghiệp</i>. NXB Khoa học và Kỹ thuật, Hà Nội 2006.</p> <p>[3] Nguyễn Thế Đạt, <i>Khoa học kỹ thuật bảo hộ lao động và một số vấn đề về môi trường</i>. NXB Khoa học và Kỹ thuật, Hà Nội 2005.</p> <p>[4] Phạm Ngọc Đăng, <i>Quản lý môi trường đô thị và khu công nghiệp</i>, NXB Xây dựng, 2005</p> <p>[5] Phil Hughes, Ed Ferrett, <i>NEBOSH Introduction to Health and Safety at Work</i>, Elsevier, 2009</p> <p>[6] Stephen Asbury, Peter Ashwell, <i>Health and Safety, Environment and Quality Audit</i>, First edition 2007</p> <p>[7] ISO 45001:2018, <i>Occupational health and safety Management systems – Requirements with guidance for use</i>.</p> <p>[8] Responsible Business Alliance (RBA) Validated Audit Program (VAP) Operations Manual, Revision 6.0, 2018</p> <p>[9] Herman Koren, <i>Handbook of Environmental Health and Safety</i>, Fourth edition, 2003</p> <p>[10] R.Gilbert, <i>A Quick Guide to Health and Safety</i>, First published 2008</p>
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Module designation	<i>Analysis and Design of Structures for Environmental Engineers</i>
Semester	<i>5th</i>
Person responsible for the module	<i>Dr. Ho Duc Duy Dr. Dinh The Hung Dr. Nguyen Minh Long Dr. Tran Thai Minh Chanh MSc. Tran Tien Duc</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>Lecture, lesson, homework, presentation, essay</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: -Labs/Practice: -Mini Project: 45 -Others: 15 -Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>- Knowledge: Apply engineering fundamental knowledge to design of environmental engineering structures; Understanding the design procedure for reinforced concrete structures and steel structures; Analysis and design of some common environmental engineering structures - Skills: Training the skill in design of environmental engineering structures: • Skill in analysis of structures • Skill in presentation the report • Apply studied knowledge to design real structures • Skill in design of specialized structures - Competences: Apply knowledge to benefit society</i>
Content	<i>This course aims to introduce the students for analyzing, designing of some common structures in environmental engineering field. After this course the students familiarize themselves with analysis of internal forces, understand of design skills, and apply for real structures.</i>
Exams and assessment formats	<i>Lecture materials are available on BKeL or are provided to students on the first class-time. Students must bring them to all class-time; Students must attend all class-time and make Q&A on class; – Homework : 2 ~ 4 times; lecturer gives homework after corresponding contents; students do homework and submit them on time. – Midterm exam: writing, 60 minutes, open books. – Final exam: writing, 90 minutes, open books.</i>

Study and examination requirements	<p><i>Requirements for successfully passing the module</i></p> <ul style="list-style-type: none"> - Homework: 10% - Mid-term examination: 40% - Final examination: 50% - Students must have a final grade of 50% or higher to pass
Reading list	<p>[1]- Vũ Mạnh Hùng, <i>Cơ học và kết cấu công trình</i>, 1999, Nhà xuất bản Xây dựng.</p> <p>[2]- Nguyễn Đình Cống, <i>Kết cấu công trình</i>, 2010, Nhà xuất bản Xây dựng.</p> <p>[3]- Tiêu chuẩn quốc gia, TCVN 5574:2012, <i>Kết cấu bê tông và bê tông cốt thép – Tiêu chuẩn thiết kế</i></p> <p>[4]- Tiêu chuẩn quốc gia, TCVN 338:2005, <i>Kết cấu thép – Tiêu chuẩn thiết kế</i></p> <p>[5]- Nguyễn Đình Cống, <i>Tính toán thực hành cấu kiện bê tông cốt thép</i>, 2008, Nhà xuất bản Xây dựng.</p> <p>[6]- Phạm Văn Hội, <i>Kết cấu thép công trình dân dụng và công nghiệp</i>, 2003, Nhà xuất bản Khoa học và Kỹ thuật.</p>

Module designation	<i>Environmental Monitoring</i>
Semester	5th
Person responsible for the module	<i>Dr. Ha Quang Khai</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B1)</i>
Teaching methods	<i>lecture, exercise, assignment.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Student can be able:</i> <i>to understand basic knowledge on environmental monitoring;</i> <i>to understand basic related law and regulation in environmental monitoring.</i> <i>to know technique and methods for environmental monitoring. To know how to implement a monitoring program.</i>
Content	<i>Aim to provide basic knowledge on environmental monitoring including air, soil and water monitoring and discussed monitoring methods and techniques. The course also discuss about law, regulation and how to implement a monitoring project as well as guide student step by step from identify monitoring strategy to reporting results.</i>
Exams and assessment formats	<i>Two oral Midterm assessments (20 minutes each) and one final oral exam (40 minutes), short computer-based quizzes, take-home written assignments</i>
Study and examination requirements	<i>The final grade in the module is composed of 50% performance on exams, 20% exercise, 30% group assignment. Students must have a final grade of 60% or higher to pass</i>
Reading list	<i>[1] Nguyễn Văn Kiết, Huỳnh Trung Hải. Quan trắc nước thải công nghiệp. Nxb KH&KT, 2006</i> <i>[2] Janick Artiola, Ian L. Pepper, Mark L. Brusseau. Environmental Monitoring and Characterization, Elsevier Science & Technology Books, 2004</i>

Module designation	<i>Management of Urban Water Supply and Sewerage Systems</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Ph.D. Nguyen Quang Truong, MSc. Phan Xuan Thanh</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>lecture, lesson, homework, presentation, essay etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Internship; Semester project; English; and accumulation credit of 80%</i>
Module objectives/intended learning outcomes	<i>This course introduces the basic concepts of the project management of the water distribution network, sewerage and storm water systems. The issues mentioned as planning, design, construction and installation of water supply distribution network, sewerage and storm water systems, the management issues such as planning steps for management and operation, maintenance, construction and maintenance of water supply and sewer infrastructure.</i>
Content	<i>Units of water supply distribution and sewerage system</i> <i>Water distribution network</i> <i>Sewerage system</i> <i>Indoor water distribution network</i> <i>Indoor sewerage system</i> <i>Management of operation and maintenance of the Units in water supply distribution and sewerage system</i>
Exams and assessment formats	<i>- Seminar: for every student, oral presentation</i> <i>- Exam: writing test, 90 min</i>
Study and examination requirements	<i>- Homework for design water distribution and sewer systems: 40%</i> <i>- Final exam: 60%, 90 minutes</i> <i>- Examination forbidden: absent from class more than 20%</i>
Reading list	<i>[1] BM KT Tài nguyên nước. Bài giảng Cấp thoát nước. Trường ĐH Bách khoa TP. HCM, 2015.</i> <i>[2] Trần Hiếu Nhuệ & nnk. Cấp thoát nước. NXB Khoa Học & Kỹ Thuật, 2020</i> <i>[3] Nguyễn Thống. Cấp thoát nước. NXB Xây dựng, 2015</i> <i>[4] Dương Thanh Lượng. Hệ thống cấp nước. NXB Xây dựng, 2020.</i> <i>[5] Walski T. M. et al. Water distribution modeling. Haestad Press, 2020.</i>

Module designation	<i>Climate Change</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Vo Le Phu Dr. Ha Quang Khai</i>
Language	<i>Vietnamese and English</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, documentary films, in-class exercises, group discussion/ presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 12 -Labs/Practice: 0 -Mini Project: 27 -Others: 15 -Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Pre-course: Environmental Law and Policy (EN2025) Parallel courses: Water Resources Management (EN3039); Coastal Zone Management (EN3045); Green Technology (EN4015); Forestry Management & Biodiversity (EN4013)</i>
Module objectives/intended learning outcomes	<i>Upon the completion of this course, students are able to achieve the following knowledge and skills:</i> <ul style="list-style-type: none"> - <i>Knowledge: Understand what is climate change and climate-related risks; causes and effects of climate change.</i> - <i>Skills: Students are able to apply theoretical knowledge for analysing impacts of climate change on natural resources and the environments.</i> - <i>Comptences: Identify countermeasures for climate change adaptation and mitigation at both global and local levels to meet the goal of sustainable development.</i>
Content	<i>The purpose of this course is to provide students with basic knowledge of the science of the Earth's climate system, driving forces of climate change, challenges and opportunities of climate change, effects of climate change on global natural resources and environments, and human's responding measures for climate change impacts.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>One (01) Individual Essay (take-home written assignment): students work in 6 week and submit in week 7 or 8 of the course.</i> - <i>One (01) Group Works: each group consists of 4-5 students, choose their own topic from week 2. Group presentation in week 7 for about 30 minutes. Assessment of each group is based on an agreed rubric.</i> - <i>One (01) Final Exam: quizzes-based and open questions</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>All materials (lecture handouts, article papers, reports and case studies) are provided on BK-elearning (BkeL).</i> - <i>Students are required to be at least 90% attendance of theoretical lectures and 100% of individual assignments, discussion, presentation of the course.</i>

	<ul style="list-style-type: none"> - Students are provided with ideas of individual essay's topics in Week 2 of the course. Individual essays should be submitted in Week 7 or 8. Maximum length of the essay is 2,500 words (excluded tables, diagrams, figures). Specific requirements of essay will be provided in Week 1 - Group works presentation will be performed in Week 7 – 10. Assessment Rubrics for group presentation will be discussed in the 1st week of the course. - The final grade includes in-class exercises (20%); individual essay (20%); group presentation (10%); mid-term exam (20%); and final exam (30%). - Students must have a final grade of 50% or higher to pass the course. - Students must submit individual assignment and must participate group presentation to qualify for entering the final exam.
Reading list	<p>Textbook and main readings:</p> <p>[1]. IPCC (2013). <i>Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change</i> [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.</p> <p>[2]. IMHEN and UNDP (2015). <i>Special Report on Disaster Risk Management and Extreme Climate Events in Vietnam for Enhancing Climate Change Adaptation (in Vietnamese)</i>. Publisher of Vietnam Natural Resources – Environment & Mapping, Hanoi.</p> <p>[3]. Kaya, Y., Yamaji, K., Akimoto, K. (2015). <i>Climate Change and Energy: Japanese Perspectives on Climate Change Mitigation Strategy</i>. Imperial College Press, London.</p> <p>[4]. World Bank (2010). <i>Climate Risks and Adaptation in Asian Coastal Cities: A Synthesis Report</i>. World Bank, Washington, DC.</p> <p>Additional readings:</p> <p>[5]. UNEP (2009). <i>Climate Change Science Compendium</i>. United Nations Environment Programme, Nairobi.</p> <p>[6]. Dasgupta, S., Laplante, B., Meisner, C., Wheeler, D. and Yan, J. (2007). <i>The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis</i>. World Bank Policy Research Working Paper 4136. World Bank, Washington, DC.</p> <p>[7]. WWF (2009). <i>Mega-Stress for Mega-Cities: A Climate Vulnerability Ranking of Major Coastal Cities in Asia</i>. WWF International, Gland, Switzerland.</p> <p>[8]. Fuchs, R. J. (2010). "Cities at Risk: Asia's Coastal Cities in an Age of Climate Change". <i>Analysis from East-West Center. Asia Pacific Issue</i>, 96(2010): 1 – 12.</p>

	<p>[9]. Bates, B., Kundzewicz, Z.W., Wu, S. and Palutikof, J.P. (eds). (2008). <i>Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change. IPCC Secretariat, Geneva.</i></p> <p>[10]. Hardy, J.T. (2003). <i>Climate Change: Causes, Effects and Solutions. John Wiley & Sons, Chichester.</i></p>
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Module designation	<i>Coastal Zone Management</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Vo Le Phu Dr. Ha Quang Khai</i>
Language	<i>Vietnamese and English</i>
Relation to curriculum	<i>Elective (B2) (of the major specialisation) Natural Resources and Environmental Management (only)</i>
Teaching methods	<i>Lecture, documentary films, group works/discussion/ presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 12 -Labs/Practice: 0 -Mini Project: 27 -Others: 15 -Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>- Pre-courses: Ecology (EN1005), Water Resources Management (EN3039)</i>
Module objectives/intended learning outcomes	<i>Upon the completion of this course, students are able to achieve the following knowledge and skills:</i> <ul style="list-style-type: none"> <i>- Knowledge: (i) Understand and explain significance and important role of coastal zone; (ii) Propose and analyse terminologies and concepts of coastal zone; (iii) Identify and analyse characteristics and factors influencing coastal zone.</i> <i>- Skills: (i) Develop skills for teamwork and multidisciplinary cooperation.</i> <i>- Competences: (i) Understand and analyze contexts and approaches to coastal zone management; and (ii) Identify and develop principles for sustainable coastal zone management.</i>
Content	<i>The purpose of this course is to provide the following contents and knowledge:</i> <ul style="list-style-type: none"> <i>- The environments and resources of coastal zone, coastal ecosystems and the vital role of coastal zone in the course of socio-economic development;</i> <i>- The pollution and degradation of coastal resources in Vietnam and the world under the effects of human and natural forces;</i> <i>- Managing coastal resources and environment by using the approach to Integrated Coastal Zone Management (ICZM);</i> <i>- Practical and case studies on integrated coastal zone management (ICZM) in countries of the Asia-Pacific region;</i> <i>- Climate change and its impacts on coastal resources and the environments.</i>

Exams and assessment formats	<ul style="list-style-type: none"> - One (01) Individual Essay (take-home written assignment): students work in 6 week and submit in week 7 or 8 of the course. - One (01) Group Works: each group consists of 4-5 students, choose their own topic from week 2. Group presentation in week 7 for about 30 minutes. Assessment of each group is based on an agreed rubric. <p>One (01) Final Exam: quizzes-based and open questions</p>
Study and examination requirements	<ul style="list-style-type: none"> - All materials (lecture handouts, article papers, reports and case studies) are provided on BK-elearning (BkeL). - Students are required to be at least 90% attendance of theoretical lectures and 100% of individual assignments, discussion, presentation of the course. - Students are provided with ideas of individual essay's topics in Week 2 of the course. Individual essays should be submitted in Week 7 or 8. Maximum length of the essay is 2,500 words (excluded tables, diagrams, figures). Specific requirements of essay will be provided in Week 1 - Group works presentation will be performed in Week 7 – 10. Assessment Rubrics for group presentation will be discussed in the 1st week of the course. - The final grade includes in-class exercises (20%); individual essay (20%); group presentation (10%); mid-term exam (20%); and final exam (30%). - Students must have a final grade of 50% or higher to pass the course. Students must submit individual assignment and must participate group presentation to qualify for entering the final exam.
Reading list	<p>Textbook and main readings:</p> <p>[1] Viles, H. and Spencer, T. (1995). <i>Coastal Problems: Geomorphology, Ecology and Society at the Coast</i>. Edward Arnold, London.</p> <p>[2] Carter, R.W.G. (1991). <i>Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines</i>. Academic Press.</p> <p>[3] Harvey, N., Ed. (2006). <i>Global Change and Integrated Coastal Management: The Asia-Pacific Region</i>. Coastal Systems and Continental Margins. Springer, Dordrecht.</p> <p>[4] Trung tâm Nghiên cứu Bảo tồn Sinh vật biển và Phát triển Cộng đồng (MCD) và Khoa Sinh thái học hệ thống - Đại học Stockholm Thụy Điển (2012). <i>Cẩm nang Quy hoạch Không gian Biển và Vùng bờ cấp địa phương</i>. Hà Nội, MCD.</p> <p>[5] Cục Bảo vệ Môi trường (2006). <i>Atlas Đới bờ Việt Nam</i>. Dự án Việt Nam – Hà Lan về Quản lý Tổng hợp Đới bờ. Hà Nội, Công ty Cổ phần Thông tin Đối ngoại.</p> <p>Additional readings:</p> <p>[6] Nicholls, R.J., P.P. Wong, V.R. Burkett, J.O. Codignotto, J.E. Hay, R.F. McLean, S. Ragoonaden and C.D. Woodroffe, 2007: <i>Coastal systems and low-lying areas</i>.</p>

	<p>[7]M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., <i>Cambridge University Press, Cambridge, UK</i>, 315-356. <i>Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.</i></p> <p>[8]Clark, J. (1996). <i>Coastal Zone Management Handbook. Lewis Publishers, Boca Raton.</i></p>
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Module designation	<i>Forestry Management and Biodiversity</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Dr. Nguyen Thi Kim Dung</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, documentary films, group works/discussion/presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 12</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 27</i> <i>-Others: 15</i> <i>-Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Ecology</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> – <i>Know different types of natural forests and distributions worldwide and in Vietnam</i> – <i>Understand important functions of forests and biodiversity to human economics, politics, societies and environments</i> – <i>Understand different approaches applied to forest and biodiversity management worldwide and in Vietnam</i> – <i>Analyze and identify key factors leading to effective forest and biodiversity management</i> – <i>Know lessons experienced by experts/practitioners in biodiversity protection</i> – <i>Understand important roles of legal and institutional frameworks in directing sustainable forest and biodiversity management</i>
Content	<i>The course provides students with an integration of knowledge, skill, and attitude in relation with ecology and social science of forest and biodiversity management. The course emphasizes on clarifying the important roles of forests and biodiversity to human being, key factors leading to effective forest and biodiversity management, and the important roles of legal and institutional frameworks for sustainable forest management.</i>
Exams and assessment formats	<ul style="list-style-type: none"> – <i>Mid-term exam: Multiple choice, 40 min.</i> – <i>Group assignment: Report & presentation</i> <i>The final examination: Multiple choice, 40 min.</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <ul style="list-style-type: none"> – <i>Mid-term exam: 20%</i> – <i>Group assignment (report & presentation): 30%</i> – <i>The final examination: 50%</i> <i>Students must have a final grade of 50% or higher to pass</i>

<p>Reading list</p>	<p>[1]. ITTO and IUCN (2009). <i>ITTO/IUCN Guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests</i>. Yokohama.</p> <p>[2]. PARC Project (2006). <i>Policy brief: Building Vietnam's National Protected Areas System: Policy and Institutional Innovations Required for Progress</i>. In: <i>Creating Protected Areas for Resource Conservation Using Landscape Ecology (PARC) Project F. P. Department, U. N. D. P. (UNDP) and T. W. C. U. (IUCN)</i>. Hanoi.</p> <p>[3]. Secretariat of the Convention on Biological Diversity (2009). <i>Sustainable Forest Management, Biodiversity and Livelihood: A good practice guide</i> Montreal: 47+iii pages.</p> <p>[4]. Sunderlin, W. D. and Huynh Thu Ba (2005). <i>Poverty Alleviation and Forests in Vietnam</i>. Indonesia, CIFOR.</p>
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Module designation	<i>Soil Pollution Management And Control</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Ph.D. Vo Nguyen Xuan Que</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, seminar</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 24</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 9</i> <i>-Others: 15</i> <i>-Self-Study: 72</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Basic knowledge on:</i> <i>- Soil resource;</i> <i>- Soil contamination, remediation and management;</i>
Module objectives/intended learning outcomes	<i>This course provide students advanced knowledge of soil resources, soil contamination and environmental risks contaminated soils, management approaches and remediation solutions</i>
Content	<i>- Soil resource: origin, components and properties, soil degradation, sustainable management</i> <i>- Soil contamination: pollutant speciation, biological and chemical soil processes, remediation methods</i>
Exams and assessment formats	<i>- Exercise: homework, exercise during class</i> <i>- Seminar: presentation, group discussion</i> <i>- Final exam: Writing test</i>
Study and examination requirements	<i>- Exercise: 20%</i> <i>- Seminar: 20%</i> <i>- Final exam: 60%</i>
Reading list	<i>[1]. Blanco H. and Lal R., Principles of Soil Conservation and Management. Springer, 2008</i> <i>[2]. Jannoyer M. L. et al., Crisis Management of Chronic Pollution – Contaminated Soil and Human Health, CRC Press, 2017.</i> <i>[3]. Mirsal I., Soil Pollution – Origin, Monitoring and Remediation, Springer-Verlag Berlin Heidelberg, 2008.</i> <i>[4]. Chen F. H. (Fu Hua), Soil Engineering – Testing, Design and Remediation, CRC Press, 2000.</i> <i>[5]. Suthersan S. S., et al., Remediation Engineering- Design Concepts, Second Edition, CRC Press, 2016.</i> <i>[6]. Các tiêu chuẩn và quy chuẩn Việt Nam [7]. Các tài liệu theo qui chuẩn của các nước</i>

Module designation	<i>Environmental And Natural Resource Economics</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Dao Thi Viet Huong</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lectures: theories, seminars</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 12</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 27</i> <i>-Others: 15</i> <i>-Self-Study: 66</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>- Micro- economics</i> <i>- Existing competencies in understanding environmental problems</i>
Module objectives/intended learning outcomes	<p>Aims of this course: <i>The purpose of this course is help students understand the key concepts of economics and environmental and natural resource economics, economics instruments for natural resource and environment management towards sustainable development.</i></p> <p>Course Learning Outcomes</p> <ul style="list-style-type: none"> <i>- Understand the basic concepts of economics and environmental economics</i> <i>- Explain how to use economics knowledge to solve environmental issues</i> <i>- Analyse the economic instruments for natural resources and environmental management in practice</i> <i>- Formulate effective teamwork</i> <i>- Develop presentation skill</i>
Content	<ol style="list-style-type: none"> 1. INTRODUCTION: <i>Some basic environmental issues</i> <i>What is environmental economics?</i> <i>The economic approach- Role of incentives</i> 2. THEORITICAL FOUNDATIONS OF ECONOMICS <i>Benefits and Costs</i> <i>Supply and Demand</i> <i>Markets, Economics Efficiency, Social Efficiency</i> <i>Market Failure</i> 3. CAUSE OF ENVIRONMENTAL DEGRADATION – <i>market failure</i> <i>External costs</i> <i>Public goods</i> <i>Open- access resources</i> 4. THE ECONOMIC OF ENVIRONMENTAL QUALITY <i>The target level of pollution</i> <i>Environmental policies</i> <i>Economic instruments for environmental management</i>

	<p>5. <i>NATURAL RESOURCE ECONOMICS</i> <i>Some natural resource issues</i> <i>Fundamental Principles of resources exploitation</i> <i>Economic instruments for resources management</i></p> <p>6. <i>NATURAL RESOURCES AND ENVIRONMENTAL VALUATION</i> <i>Market- based technique</i> <i>Benefits transfer</i> <i>Revealed preference</i> <i>Stated preference</i></p>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Exercises in class</i> - <i>Seminars</i> - <i>Final examination (written)</i>
Study and examination requirements	<ul style="list-style-type: none"> - <i>Exercise: 30%</i> - <i>Seminars: 20%</i> - <i>Final examination: 50%</i>
Reading list	<p>[1] <i>Barry Field and Nancy Olewiler (2005). Environmental Economics, Updated 2nd Canadian Edition.</i></p> <p>[2] <i>N. Gregory Mankiw (2015) Micro- economics.</i></p> <p>[3] <i>Robert S.Pidyck and Daniel I.Rubinfeld (2014). Micro Economics.</i></p> <p>[4] <i>OECD (1999) Economics Instrument for Pollution Control and Natural Resources Management in OECD countries: A Survey.</i></p>

Module designation	<i>Micro-algae: Benefit and Risk Assessment</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Dao Thanh Son</i>
Language	<i>Vietnamese and English</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, seminar, exercise, group discussion, video clip illustration, etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	
Module objectives/intended learning outcomes	<p><i>Key question: what learning outcomes should students attain in the module</i></p> <p><i>After completing the course, students could (learning outcomes)</i></p> <ul style="list-style-type: none"> - <i>Know the basic knowledge on microalgal groups in aquatic environment and their distribution in nature</i> - <i>Understand the relationship between the microalgal development and environmental in water bodies</i> - <i>Be able to analyze and evaluate the potential benefit and risk of microalgae to aquatic environment and ecosystems</i> - <i>Be able to practice / answer a question based on microalgae data</i> - <i>Be able to present/ discuss/ group working</i>
Content	<p><i>The description of the contents should clearly indicate focus areas and the level of difficulty.</i></p> <p><i>Introduction to the course</i></p> <p><i>Chapter 1: Introduction on microalgae</i></p> <p><i>Chapter 2: Development of microalgae and function of environmental parameters</i></p> <p><i>Chapter 3: Benefits from microalgae</i></p> <p><i>Chapter 4: Negative effects of microalgae</i></p> <p><i>Chapter 5: Approaches for prevention, mitigation and control the blooms of microalgae algae, and treatments on algal toxins</i></p> <p><i>Group presentation / report</i></p>
Exams and assessment formats	<p><i>Assignment, seminar (25 min of presentation; 15 – 20 min for question/ answer): 30%</i></p> <p><i>mid-term test (multiple choice, 50 min): 20% final examination (essay, 50 min): 50%</i></p>
Study and examination requirements	<p><i>Requirements for successfully passing the module</i></p> <p><i>Students must have a final grade of 50% or higher to pass; the final exam must be graded of not less than 3/10.</i></p>

<p>Reading list</p>	<p><i>Main material</i></p> <p>[1] Bellinger, E.G., Sigee, D.C., 2015. <i>Freshwater Algae - Identification and Use as Bioindicators</i>. Wiley-Blackwell</p> <p>[2] Singh, B., Bauddh, K., Bux, F., 2015. <i>Algae and environmental sustainability</i>. Springer. 194 pp</p> <p><i>Further readings</i></p> <p>[3] Luisa Gouveia, 2011. <i>Microalgae as a feedstock for biofuels</i>. Springer</p> <p>[4] Chorus, I., Bartram, J., 1999. <i>Toxic cyanobacteria in water: a guide to their health consequences, monitoring and management</i>. E & FN Spon</p> <p>[5] Graneli, E., Turner, J.T., 2006. <i>Ecology of harmful algae</i>. Springer</p> <p>Seckbach, J., 2007. <i>Algae and cyanobacteria in extreme environment</i>. Springer</p> <p>[6] Ayhan Demirbas and M. Fatih Demirbas, 2010. <i>Algae Energy - Algae as a new source of biodiesel</i>. Springer</p> <p>[7] Nguyễn Văn Tuyên, 2003. <i>Đa dạng sinh học tảo trong thủy vực nội địa Việt Nam - triển vọng và thử thách</i>. NXB Nông Nghiệp Tp Hồ Chí Minh</p>
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Module designation	<i>Green Technology</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Dr. Lam Van Giang</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 20</i> <i>-Mini Project: 15</i> <i>-Others: 15</i> <i>-Self-Study: 70</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Chemistry for Environmental Engineering and science</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: Comprehend basic knowledge, current applications and developments of green technology</i> - <i>Skills: Skills of thinking and problem solving ; Experimental skills and knowledge discovery; Skill of system thinking; Personal skills and characteristics;; Skills of group working and effective communication</i> - <i>Competences: Apply knowledge to benefit society</i>
Content	<ul style="list-style-type: none"> - <i>Students will be supplied knowledge about professional technology applications in term of Green and eco-friendly. Green technology was involved the design, assesment, application, management tools on the fields of Industrial Ecology, Chemical, Energy, Construction.</i> - <i>Undergraduate students are introduced about the principles, clarifications and definitions of Green on Industrial ecology, Chemical, Energy, Construction.</i> - <i>The industrial ecology was analyzied with the principle of prevent pollutions, zero emission in the material recycle ways. The subject also introduces to analyze the production process, material-cycle, energy efficiency and to quantify the impact factors. The typical modem was introduced in each parts.</i> - <i>Green technology is introduced also on Chemitry and Energy research and applications in term of intergated analyses technology, economy, policy to forward low carbon development.</i> - <i>Green construction also was analized with the multi solutions and intergrated the principles of artchitecture and environment designs</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Midterm assessments (45 minutes each)</i> - <i>and one final exam (70 minutes),</i> - <i>short computer-based quizzes,</i> - <i>take-home written assignments</i> - <i>Labworks</i>

Study and examination requirements	Requirements for successfully passing the module the final grade in the module is composed of 70% performance on exams, 5% quizzes, 5% take-home assignments, 5% in-class participation and Labworks report 15%. Students must have a final grade of 50% or higher to pass
Reading list	<p>[1] Robert U. Ayres and Leslie W. Ayres, (2002). <i>A Handbook of Industrial Ecology</i>. Edward Elgar Publishing, Inc, Cheltenham, UK Northampton MA, USA.</p> <p>[2] James C. and Duncan M. (2002) <i>Handbook of Green chemistry and Technology</i>. Blackwell Publishing.</p> <p>[3] Allen, D.T and Shonnard D.R. (2002). <i>Green Engineering: Environmentally conscious design of chemical processes</i>, Prentice Hall, Inc, USA.</p> <p>[4] Sanjay K. S., Ackmez M. (2010). <i>Green chemistry for Environmental sustainability</i>, CRC Press 2011 by Taylor and Francis Group, LLC.</p> <p>[5] Aswathanarayana U., T. Harikrishnan, Thayyib Sahini K.M. (2010). <i>Green energy : Technology, Economics, and Policy</i>. CRC Press. Taylor & Francis Group, London, UK.</p> <p>[6] Ibrahim D., Adnan M., Arif H., T. Hikmet K. T. (2010) <i>Global Warming: Engineering Solutions</i>. Springer Science-Business Media. e-ISBN 978-1-4419-1017-2.</p> <p>[7] Michael B., Peter M. and Michael S. (2010) <i>Green building – Guidebook for Sustainable Architecture</i>, Springer-Verlag Berlin Heidelberg.</p>

Module designation	<i>Mechanical Processes in Environment Engineering</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Nguyen Nhat Huy Dr. Nguyen Thai Anh Ms. Vo Thi Thanh Thuy</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 0 -Mini Project: 45 -Others: 15 -Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Upon completion of this course, students should</i> <ul style="list-style-type: none"> - <i>Get/calculate the required properties of gas and liquid</i> - <i>Calculate the pipe and duct systems</i> - <i>Choose a suitable pump type and calculate to the pump</i> - <i>Choose a suitable fan, blower, a compressor and calculate them</i> - <i>Estimate/calculate a mixer/mixing tank</i> - <i>Understand the sedimentation process and calculate the sedimentation tank and efficiency</i> - <i>Understand the filtration process and calculate the filtration in air and water</i>
Content	<i>Engineering fundamentals Pipes and ducts Pumps Gas movers Agitation Sedimentation Filtration</i>
Exams and assessment formats	<i>Homework: group of 2 – 4 students, at home Quiz: individual, closed book, in class Final exam: open book, 90 min</i>
Study and examination requirements	<i>Requirements for successfully passing the module: The final score will be from group homework (40%), in-class quiz (10%), final exam (50%) To pass the courses, the final score need to be ≥ 5.0 and no part of the score < 3.0.</i>
Reading list	<i>[1] Benjamin and Lawler, Water Quality Engineering: Physical/Chemical Treatment Processes, 2013, Wiley. [2] McCabe, Smith, and Harriott, Unit Operations of Chemical Engineering, 6th edition, 2001, McGraw-Hill. Perry's Chemical Engineers' Handbook, 1999, McGraw-Hill.</i>

Module designation	<i>Waste Incinerator Engineering</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Nguyen Nhat Huy Dr. Nguyen Thai Anh Ms. Vo Thi Thanh Thuy</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150 -Lectures: 30 -Tutorial/Exercise: 0 -Labs/Practice: 0 -Mini Project: 45 -Others: 15 -Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>This subject is to provide to students the knowledge of calculating the incineration process and equipments; combustion engineering for solid waste in the industrial incinerators; knowledge of recovery energy in waste incineration</i>
Content	<i>The subject content is expressed into 07 chapters as follows: System approach for incineration process and equipment; the governing equations for mass conservation; energy conservation; heat transfer. Calculating the power equipments that provided substances for the chemical and physical process taking place. Calculating the solid waste treatment in some type of incinerators; introducing some kinds of combustion technology combined with energy recovery.</i>
Exams and assessment formats	<i>Homework: group of 2 – 4 students, at home Quiz: individual, closed book, in class Final exam: open book, 90 min</i>
Study and examination requirements	<i>Requirements for successfully passing the module: The final score will be from group homework (40%), in-class quiz (10%), final exam (50%) To pass the courses, the final score need to be ≥ 5.0 and no part of the score < 3.0.</i>
Reading list	<i>[1] Phạm Văn Trí, Dương Đức Hồng, Nguyễn Công Cẩn. Lò đốt công nghiệp, NXB Khoa học và Kỹ thuật. [2] Alfons Buekens. Incineration Technologies 2013 [3] Walter R. Niessen. Combustion and Incineration Processes 2002 [4] Maximilian Lackner, Franz Winter, Avinash Kumar Agarwal. Handbook of Combustion, Volume 1 Fundamentals and Safety 2010</i>

	<p>[5] Niessen, Walter R. <i>Combustion and Incineration Processes Applications in Environmental Engineering</i>, Fourth Edition 2010</p> <p>[6] Charles E. Baukal Jr. The John Zink Hamworthy. <i>Combustion Handbook Volume 2 - Design and Operations</i> 2013</p> <p>[7] Hans Y. Tammemagi. <i>The Waste Crisis Landfills, Incinerators, and the Search for a Sustainable Future</i> 1999</p>
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Module designation	<i>Ecological Engineering</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Dang Viet Hung</i>
Language	<i>Vietnamese and English</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, documentary films, group works/ discussion/ presentation.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Provide students necessary skills's engineer in advising, designing, constructing, installing, operating and managing the protecting and recovering resource - environment projects and constructions. Students are provided specialized knowledge about ecological engineering in global, area, nation and local context in order to be capable of working in management units, research centers, environmental companies, industrial parks, export processing zones ... after graduation.</i>
Content	<i>- The course's content is knowledges related to ecological engineering like ecological theory and deploying engineering.</i> <i>First part of the course is introduction about definitions and principles of ecological engineering.</i> <i>The latter part of the course is introduction about application engineering and typical examples of ecological engineering like ecological urbanism, ecological industry, ecological agriculture, waste treatment, environment restoration.</i> <i>Auditing tool and modeling environment by "emergy" are also mentioned.</i>
Exams and assessment formats	<ul style="list-style-type: none"> <i>- Exercise, present: 25%</i> <i>- Classroom test: 25%</i> <i>- Final exam: 50%</i>
Study and examination requirements	<i>Requirements for successfully passing the module:</i> <i>The final score will be from group homework (40%), in-class quiz (10%), final exam (50%)</i> <i>To pass the courses, the final score need to be ≥ 5.0 and no part of the score < 3.0.</i>
Reading list	<i>Books, Main textbook:</i>

	<p>[1]. William J. Mitsch, Sven Erik Jorgensen (1989). <i>Ecological Engineering: An Introduction to Ecotechnology</i>. John Wiley and Sons.</p> <p>[2]. Patrick C.Kangas (2004). <i>Ecological Engineering: Principles and Practice</i>. Lewis Publishers.</p>
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Module designation	<i>Unit Operations in Environmental Engineering</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Assoc. Prof. Dang Viet Hung</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>None</i>
Module objectives/intended learning outcomes	<i>Supplying undergraduate students with knowledge from theory to practice and giving them access to waste treatment plants/systems, suitable for management, operation and maintenance as well as learning outcomes for the degree of engineer in Environmental Engineering.</i>
Content	<i>Covering many issues that are the subjects of principles, mechanisms, affecting factors and beneficial uses of management, operation and maintenance for waste treatment plants/systems.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>In-class activities and homework sets</i> - <i>Seminar (group exercise and/or presentation)</i> - <i>Final exam (writing, 90 minutes)</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <ul style="list-style-type: none"> - <i>Mid-term exam score = 40% (homework) + 60% (mid-term writing test) The final exam score:</i> - <i>Final exam score = 30% (homework) + 20% (oral presentation) + 50% (final writing test)</i> - <i>Final score = Mid-term exam score (50%) + Final exam score (50%) Exam: writing test, 90 min</i> - <i>Note: students absent > 3 classes or did not have oral presentation cannot take the exam</i>
Reading list	<p><i>[1] Frank R. Spellman, Handbook of water & wastewater treatment plant operations, CRC Press LLC, 2000.</i></p> <p><i>[2] Louis Theodore_Anthony J. Buonicore, Air Pollution Control Equipment: Selection, Design, Operation and Maintenance, Springer, 2011.</i></p> <p><i>[3] Thomas H. Christensen, Solid Waste Technology & Management, 1 & 2, Wiley Online Library, 2011.</i></p>

Module designation	<i>Environmental Planning</i>
Semester	<i>7th</i>
Person responsible for the module	<i>Dr. Ha Quang Khai</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>e.g. lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Environmental hydrology, Environmental pollution (i.e., Air, water and soil) pollution, Environmental Impact Assessment, Environmental monitoring</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: Provide basic theory of environmental planning practice</i> - <i>Skills: Skills of system thinking and problem solving; Experimental skills and knowledge discovery; Personal skills and characteristics; Skills of group working and effective communication</i> - <i>Competences: Apply knowledge to benefit society</i>
Content	<i>The subject will provide basic understanding on:</i> <ul style="list-style-type: none"> - <i>The use and practicality of different environmental protection tools and impact assessment methods</i> - <i>The utility and practicality of planning approaches such as land capability and/or suitability assessment, & conservation & green infrastructure planning;</i> - <i>Using appropriate maps, information sources, and field observation, identify elements of and apply appropriate watershed and waterway protection tools and strategies;</i> - <i>The process and outcomes of planning for hazards;</i> - <i>The impacts of land use development such as urban, agriculture, aquaculture and growth on water availability, wastewater, stormwater, water quality, wetlands, and programs for managing these impacts.</i> - <i>The relationship between relationships between energy, air quality and climate change and natural hazards; and how to apply adaptation and mitigations of these impacts</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Final exam (70 minutes),</i> - <i>Short computer-based quizzes,</i> - <i>Take-home written assignments</i> - <i>Group assignments</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <ul style="list-style-type: none"> - <i>the final grade in the module is composed of 50% performance on exams, 15% take-home assignments, 15% for quizzes and in-class participation, and 20% for group</i>

	presentations. Students must have a final grade of 50% or higher to pass
Reading list	<p>[1] John R., 2012, <i>Environmental Land Use Planning and Management, Second Edition</i>. Island Press: Washington, DC.</p> <p>[2]. Lawrence S., Ravi K. J., Andrew O. M. 2001. <i>Better Environmental Policy Studies: How to Design and Conduct More Effective Analyses</i></p> <p>[3] Tietenberg, Thomas. "Economic Instruments for Environmental Regulation" in Robert Stavins (ed). <i>Economics of the Environment</i>. W.W. Norton & Co. (2000). ISBN: 9780393913408.</p> <p>[4] Callison, Candis. <i>How Climate Change Comes to Matter: the Communal Life of Facts</i>. Duke University Press, 2014. ISBN: 9780822357872.</p>

Module designation	<i>Conflict management</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Dr. Ha Quang Khai</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective</i>
Teaching methods	<i>Lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 0</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 45</i> <i>-Others: 15</i> <i>-Self-Study: 60</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Environmental pollution (i.e., Air, water and soil) pollution, Environmental Impact Assessment, Environmental monitoring</i>
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> - <i>Knowledge: be able to explain and apply foundational theory and concepts relating to the source, structure, and management of environmental conflicts.</i> - <i>Skills: Skills of system thinking and problem solving; Experimental skills and knowledge discovery; Personal skills and characteristics; Skills of group working and effective communication. Skills and practices necessary for facilitating a group meeting</i> - <i>Competences: Apply knowledge to benefit society</i>
Content	<i>The subject includes:</i> <ul style="list-style-type: none"> - <i>Introduction of environmental conflicts</i> - <i>Basic understanding on environmental justice, resources scarcity and conflict assessment</i> - <i>Conflict negotiation</i> - <i>Conflict management processes</i> - <i>Facilitator/mediator training and techniques</i> - <i>And cross-cultural considerations</i>
Exams and assessment formats	<ul style="list-style-type: none"> - <i>Final exam (70 minutes),</i> - <i>Short computer-based quizzes,</i> - <i>Take-home written assignments</i> - <i>Group assignments</i>
Study and examination requirements	<i>Requirements for successfully passing the module the final grade in the module is composed of 50% performance on exams, 15% take-home assignments, 15% for quizzes and in-class participation, and 20% for group presentations. Students must have a final grade of 50% or higher to pass</i>
Reading list	<i>[1] Fisher, R., W. Ury, and B. Patton. 2011. Getting to Yes, Revised edition. New York: Penguin Books.</i> <i>[2]. Callison, Candis. How Climate Change Comes to Matter: The Communal Life of Facts. Duke University Press Books, 2014. ISBN: 9780822357872.</i>

	<p>[3] Colborn, Theo, Dianne Dumanoski, and John Peterson Myers. <i>Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival? - A Scientific Detective Story</i>. Plume, 1997. ISBN: 9780452274143.</p>
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Module designation	Noise Control Technology
Semester	6th
Person responsible for the module	Assoc. Prof. Nguyen Nhat Huy
Language	English; Vietnamese
Relation to curriculum	Elective (B2)
Teaching methods	Lecture, lesson, lab works, project, seminar etc.
Workload (incl. contact hours, self-study hours)	<p>Total workload (Hours): 150</p> <ul style="list-style-type: none"> -Lectures: 30 -Tutorial/Exercise: 24 -Labs/Practice: 0 -Mini Project: 9 -Others: 15 -Self-Study: 72
Credit points	3 (6 ECTS)
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	<i>This course will provide students with fundamental principles of the heat balance inside and outside the ventilated room, determine the heat transfer in the room, calculate the ventilation rate and the efficiency of an ventilation system, skills, personal communication as well as teamwork. Understand the basic of noise and the effect of noise on human, know the noise criteria for various environments. Have ability of assessment a noise control equipment, analyze and assess the noise source and propose noise control solution.</i>
Content	<i>the student learns about basics of acoustics, types and sources of noise, human ear and the effect of noise, and noise criteria and measurement. The noise pollution control will also be provided including noise control at the source, in the transmission path, and at the receiver references. The calculation for noise isolation and silencers are also provided in this course.</i>
Exams and assessment formats	<ul style="list-style-type: none"> - In-class activities and homework sets - Seminar (group exercise and/or presentation) - Final exam (writing, 90 minutes)
Study and examination requirements	<p>Requirements for successfully passing the module</p> <ul style="list-style-type: none"> - Mid-term exam score = 40% (homework) + 60% (mid-term writing test) The final exam score: - Final exam score = 30% (homework) + 20% (oral presentation) + 50% (final writing test) - Final score = Mid-term exam score (50%) + Final exam score (50%) Exam: writing test, 90 min - Note: students absent > 3 classes or did not have oral presentation cannot take the exam
Reading list	<p>[1] Industrial Ventilation – A Manual of Recommended Practice, ACGIH, 2001, ACGIH.</p> <p>[2] Kỹ thuật thông gió, Trần Ngọc Chấn, 2012, NXB. Xây dựng.</p>

	<p>[3] <i>Industrial Noise Control and Acoustics</i>, Randall F. Barron, 2003, Marcel Dekker, Inc.</p> <p>[4] <i>Handbook of industrial noise control</i>, 1976, Industrial Press Inc, New York.</p> <p><i>Noise control in industry</i>, Third edition, E.& F.N. Spon, 1991, Chapman and Hall</p>
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Module designation	<i>Ergonomics</i>
Semester	<i>6th</i>
Person responsible for the module	<i>Nguyen Thi Hieu</i>
Language	<i>English; Vietnamese</i>
Relation to curriculum	<i>Elective (B2)</i>
Teaching methods	<i>Lecture, Lesson, presentation etc</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload (Hours): 150</i> <i>-Lectures: 30</i> <i>-Tutorial/Exercise: 24</i> <i>-Labs/Practice: 0</i> <i>-Mini Project: 9</i> <i>-Others: 15</i> <i>-Self-Study: 72</i>
Credit points	<i>3 (6 ECTS)</i>
Required and recommended prerequisites for joining the module	<i>Basic knowledge of statistics; means, standard deviations, and percentiles.</i>
Module objectives/intended learning outcomes	<i>Accurately recognize and evaluate hazards (ergonomic in nature) which are likely to cause occupational illnesses or injuries</i> <i>Design and redesign tasks and workstations to fit employees.</i> <i>Explain the psychology of human behavior as it relates to workplace safety.</i> <i>Identify ergonomic hazards; recommend appropriate controls. Skills of presentation, group working and effective communication</i>
Content	<i>The course on the application of knowledge about human capabilities and limitations to the design of workplaces, work methods and jobs for optimal safety, efficiency, productivity and comfort.</i> <i>Topics include: systems design and task analysis, muscle use and anthropometry, workspace design, activity-related soft tissue disorders, back injuries, shiftwork, organizational and psychosocial aspects of work, skilled work and mental activity and regulations in ergonomics</i>
Exams and assessment formats	<i>Course evaluation will be based on one in-class midterm, three take-home assignments (worth 10% each) and a final project. Students will choose either a research paper or a practical project for their final project. They will be expected in each case to define a problem, review the literature corresponding to the problem, take measurements (if doing a practical project), summarize the information and present practical recommendations. Final projects will be presented in written and oral presentations.</i>
Study and examination requirements	<i>Requirements for successfully passing the module</i> <ul style="list-style-type: none"> <i>- Mid-term: 30%</i> <i>- Home assignment: 30%</i> <i>- Final project: 40%</i> <i>Students must have a final grade of 50% or higher to pass</i>

Reading list	<p>[1] Kroemer, K.H.E., <i>Fitting the Human: Introduction to Ergonomics</i>, CRC Press, 2009.</p> <p>[2] Freivalds, A., <i>Neibel's Methods, Standards and Work Design</i>, McGraw Hill.</p> <p>[3] Pheasant, S. & Haslegrave, C., (2005). <i>Bodyspace: Anthropometry, Ergonomics, and the Design of Work</i>, 3rd Ed. CRC Press.</p> <p>[4] Pheasant, S. & Haslegrave, C., (2005). <i>Bodyspace: Anthropometry, Ergonomics, and the Design of Work</i>, 3rd Ed. CRC Press.</p> <p>[5] Jordan, P., (1998). <i>An Introduction to Usability</i>, Taylor & Francis.</p> <p>ISO 45001 Health and safety management standard - HSE</p>
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