

## Module Handbook – Green Technology

A **Module Handbook** or collection of module descriptions that is also available for **students to consult** should contain the following information about the individual modules:

Module designation ( Tên môn học)	<i>Green Technology</i>
Semester(s) in which the module is taught ( Học kỳ giảng dạy)	<i>6<sup>th</sup> semester</i>
Person responsible for the module	<i>Dr. Lam Van Giang</i>
Language ( ngôn ngữ)	<i>English; Vietnamese</i>
Relation to curriculum ( Các môn học liên quan)	<i>Chemistry for Environmental Engineering and science</i>
Teaching methods ( Phương pháp giảng dạy)	<i>e.g. lecture, lesson, lab works, project, seminar etc.</i>
Workload (incl. contact hours, self-study hours) (Thời lượng làm việc)	<i>(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours<sup>1</sup>:</i>
Credit points ( số tín chỉ)	<i>3</i>
Required and recommended prerequisites for joining the module ( những yêu cầu kiến thức trước khi học)	<i>Chemistry for Environmental Engineering and science</i>
Module objectives/intended learning outcomes ( Mục tiêu môn học, yêu cầu CĐR)	<ul style="list-style-type: none"> <li>- <i>Knowledge: Comprehend basic knowledge, current applications and developments of green technology</i></li> <li>- <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></li> <li>- <i>Competences: Apply knowledge to benefit society</i></li> </ul>

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content ( Nội dung )	<p>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.</p> <p>Undergraduate students are introduced about the principles, clarifications and definitions of Green on Industrial ecology, Chemical, Energy, Construction.</p> <p>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.</p> <p>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.</p> <p>Green construction also was analyzied with the multi solutions and intergated the principles of artchitecture and environment designs</p>
Exams and assessment formats ( Hình thức kiểm tra và thi)	<ul style="list-style-type: none"> <li>- <i>Midterm assessments (45 minutes each)</i></li> <li>- <i>and one final exam (70 minutes),</i></li> <li>- <i>short computer-based quizzes,</i></li> <li>- <i>take-home written assignments</i></li> <li>- <i>Labworks</i></li> </ul>
Study and examination requirements ( Tỷ lệ đánh giá học tập)	<p><i>Requirements for successfully passing the module</i></p> <ul style="list-style-type: none"> <li>- <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></li> </ul>
Reading list ( Tài liệu)	<p>[1] Robert U. Ayres and Leslie W. Ayres, (2002). A Handbook of Industrial Ecology. Edward Elgar Publishing, Inc, Cheltenham, UK • Northampton MA, USA.</p> <p>[2]James C. and Duncan M. (2002) Handbook of Green chemistry and Technology. Blackwell Pulishing.</p> <p>[3] Allen, D.T and Shonnard D.R. (2002). Green Engineering: Environmentally conscious design of chemical processes, Prentice Hall, Inc, USA.</p> <p>[4] Sanjay K. S., Ackmez M. (2010). Green chemistry for Environmental sustainability, CRC Press 2011 by Taylor and Francis Group, LLC.</p> <p>[5] Aswathanarayana U., T. Harikrishnan, Thayyib Sahini K.M. (2010). Green energy : Technology, Economics, and Policy. CRC Press. Taylor &amp; Francis Group, London, UK.</p> <p>[6] Ibrahim D., Adnan M., Arif H., T. Hikmet K. T. (2010) Global Warming: Engineering Solutions. Springer Science- Business Media. e-ISBN 978-1-4419-1017-2.</p> <p>[7] Michael B., Peter M. and Michael S. (2010) Green building – Guidebook for Sustainable Architecture, Springer-Verlag Berlin Heidelberg.</p>