| Module |
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| **INTERNATIONAL SCHOOL: TOWARDS A GREEN AND SUSTAINABLE WORLD** |

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| **Tutors** | Ali Abou-Hassan, Professeur<br>Franck Launay, Professeur<br>Julie Oble, Professeure |

- **GENERAL**

| **Title of Module** | **TOWARDS A GREEN AND SUSTAINABLE WORLD** | |
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| **Autonomous Teaching Activities**<br>*in case credits are awarded separately for distinct parts e.g. Lectures, Lab Exercises, etc. Specify the total teaching hours and credits.* | **Total Teaching Hours** | **Credits Units** |
| Asynchronous: Reading and watching autonomously the recommended didactical content: learning clips & articles | 20 | 1 |
| Synchronous: lectures and work group | 32 | 2 |
| **Language of Tutoring and Examination:** | ENGLISH | |

- **EDUCATIONAL OBJECTIVES**

**Educational Objectives**

The Educational objectives of the thematic unit/course describe the specific knowledge, skills, and abilities of an appropriate level that learners will acquire upon successful completion of the course.

Green Label I, 1 ECTS, Feb 5 – 10/2025 + Feb 14 – 21/2025 (asynchronous, autonomous, online)

This first teaching unit (UE) aims at enabling students to acquire knowledge about green chemistry concepts and sustainability through self-learning modules comprising online videos and matching quizzes.

In this teaching unit, students are introduced to: a) green chemistry: its principles and its indicators; b) some environmental issues in the field of sustainable development.

**General Skills**

*Note the general skills that the trainee acquires. Which of these does the course aim at?*
*Research, analysis, and synthesis of data and information, using the necessary technologies*
*Adaptation to new situations*
*Decision making*
*Independent work*
*Teamwork*
*Working in an international environment*
*Working in an interdisciplinary environment*
*Generating new research ideas*
*Project planning and management*
*Respect for diversity and multiculturalism*
*Respect for the natural environment*
*Demonstrating social, professional, and ethical responsibility and sensitivity to gender issues*
*Exercise of critical and self-critical thinking*
*Promotion of free, creative, and inductive thinking*

The course "Towards a Green and Sustainable World" aims to help trainees acquire several of the general skills listed:

1. **Research, Analysis, and Synthesis of Data and Information, Using the Necessary Technologies**: The course involves self-directed research and data analysis through activities like online quizzes, video content comprehension, and reports based on autonomous searches.
2. **Adaptation to New Situations**: The focus on understanding and applying principles

of green chemistry in various contexts promotes flexibility in tackling environmental challenges.

3. **Decision Making**: Students are encouraged to make decisions regarding environmental solutions and remedial measures, especially through case studies and group work.
4. **Independent Work**: Autonomous online activities, such as quizzes and video-based learning, cultivate independent work skills.
5. **Teamwork**: The course includes synchronous group activities for analyzing case studies and preparing presentations, fostering teamwork.
6. **Working in an Interdisciplinary Environment**: Topics like green nanomaterials, $CO_2$ valorization, and biomass introduce interdisciplinary perspectives relevant to sustainable chemistry.
7. **Generating New Research Ideas**: Through the analysis of environmental issues and the development of solutions, students are encouraged to think creatively and propose new ideas.
8. **Project Planning and Management**: Group tasks require project planning and management skills to meet deadlines, collaborate on research, and prepare presentations.
9. **Respect for Diversity and Multiculturalism**: The course's international setting, designed by Sorbonne University for students of Democritus University of Thrace, promotes intercultural awareness.
10. **Demonstrating Social, Professional, and Ethical Responsibility**: The program addresses social responsibility through the environmental focus on reducing toxic impacts and promoting sustainable practices.
11. **Exercise of Critical and Self-Critical Thinking**: Critical evaluation of green chemistry applications and assessing their benefits foster self-critical thinking.
12. **Promotion of Free, Creative, and Inductive Thinking**: Students are encouraged to explore creative solutions for environmental issues, supported by autonomous research and inductive reasoning during case studies.

The course integrates these skills into its structure, aligning with its goals of fostering environmental awareness, sustainability knowledge, and actionable skills in green chemistry.

- **MODULE CONTENT**

- **Green Label I**

In this teaching unit, students are introduced to: a) green chemistry: its principles and its indicators; b) some environmental issues in the field of sustainable development

- **TEACHING and LEARNING METHODS - ASSESSMENT**

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| **Training Method**<br>*Physical presence/on-line /blended.* | Green Label I: asynchronous, autonomous, online |
| **Use Of Information And Communication Technologies (Ict)**<br>*Use of ICT in Teaching, in Laboratory Education, in Communication with Trainees* | Moodle platform |

| **Evaluation Of Trainees**<br>*Description of the evaluation process*<br><br>*Evaluation Language, Evaluation Methods, Formative or Summative, Multiple Choice Test, Short Answer Questions, Essay Questions, Problem Solving, Written Assignment, Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Patient Examination, Artistic Interpretation, Other*<br><br>*Explicitly specified evaluation criteria are mentioned and if and where they are accessible to the trainees.* | ***Green Label I***<br>*The successful completion of this teaching unit involves:*<br>• *Viewing and answering the quiz introducing green chemistry. This part represents 50% of the final mark and comprises 10 questions (duration: 20 min, 3 attempts per question, the average of the 3 marks constitutes the overall score).*<br>• *Viewing a set of videos covering different topics and answering the corresponding quizzes. This part represents 50% of the final mark and comprises 10 questions (duration: 20 min, 3 attempts per question, the average of the 3 marks constitutes the overall score).* |
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- **RECOMMENDED BIBLIOGRAPHY**

1) Paul Anastas and John Warner, **Green Chemistry: Theory and Practice**
2) John W. Hill, Terry W. McCreary, Doris K. Kolb, **Chemistry for Changing Times, 13th Edition**
3) Albert Matlack, **Introduction to Green Chemistry, 3rd Edition**

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- **GENERAL**

| **Title of Module** | **TOWARDS A GREEN AND SUSTAINABLE WORLD** | |
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| **Autonomous Teaching Activities**<br>*in case credits are awarded separately for distinct parts e.g. Lectures, Lab Exercises, etc. Specify the total teaching hours and credits.* | **Total Teaching Hours** | **Credits Units** |
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| Synchronous: lectures and work group | 32 | 2 |
| **Language of Tutoring and Examination:** | ENGLISH | |

- **EDUCATIONAL OBJECTIVES**

**Educational Objectives**

The Educational objectives of the thematic unit/course describe the specific knowledge, skills, and abilities of an appropriate level that learners will acquire upon successful completion of the course.

Green Label II, 2 ECTS, Feb 10 afternoon - 14/2025 (synchronous, onsite)

This second teaching unit (UE) aims at enabling students to diagnose problematic situations and to suggest remedial measures through case studies. The topics covered include: a) The calculation of different types of indicators, advanced « green metrics »; b) Catalysis, green nanomaterials, carbon dioxide recovery, substitution of oil for biomass.

**General Skills**

*Note the general skills that the trainee acquires. Which of these does the course aim at?*
*Research, analysis, and synthesis of data and information, using the necessary technologies*
*Adaptation to new situations*
*Decision making*
*Independent work*
*Teamwork*
*Working in an international environment*
*Working in an interdisciplinary environment*
*Generating new research ideas*
*Project planning and management*
*Respect for diversity and multiculturalism*
*Respect for the natural environment*
*Demonstrating social, professional, and ethical responsibility and sensitivity to gender issues*
*Exercise of critical and self-critical thinking*
*Promotion of free, creative, and inductive thinking*

The course "Towards a Green and Sustainable World" aims to help trainees acquire several of the general skills listed:

1. **Research, Analysis, and Synthesis of Data and Information, Using the Necessary Technologies**: The course involves self-directed research and data analysis through activities like online quizzes, video content comprehension, and reports based on autonomous searches.
2. **Adaptation to New Situations**: The focus on understanding and applying principles of green chemistry in various contexts promotes flexibility in tackling environmental challenges.
3. **Decision Making**: Students are encouraged to make decisions regarding environmental solutions and remedial measures, especially through case studies

and group work.

4. **Independent Work**: Autonomous online activities, such as quizzes and video-based learning, cultivate independent work skills.
5. **Teamwork**: The course includes synchronous group activities for analyzing case studies and preparing presentations, fostering teamwork.
6. **Working in an Interdisciplinary Environment**: Topics like green nanomaterials, $CO_2$ valorization, and biomass introduce interdisciplinary perspectives relevant to sustainable chemistry.
7. **Generating New Research Ideas**: Through the analysis of environmental issues and the development of solutions, students are encouraged to think creatively and propose new ideas.
8. **Project Planning and Management**: Group tasks require project planning and management skills to meet deadlines, collaborate on research, and prepare presentations.
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The course integrates these skills into its structure, aligning with its goals of fostering environmental awareness, sustainability knowledge, and actionable skills in green chemistry.

- **MODULE CONTENT**

  - **Green Label II**

This second teaching unit (UE) aims at enabling students to diagnose problematic situations and to suggest remedial measures through case studies. The topics covered include: a) The calculation of different types of indicators, advanced « green metrics »; b) Catalysis, green nanomaterials, carbon dioxide recovery, substitution of oil for biomass.

- **TEACHING and LEARNING METHODS - ASSESSMENT**

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| **Training Method**<br>*Physical presence/on-line /blended.* | Green Label II: synchronous, onsite |
| **Use Of Information And Communication Technologies (Ict)**<br>*Use of ICT in Teaching, in Laboratory Education, in Communication with Trainees* | Moodle platform |

| **Evaluation Of Trainees**<br>*Description of the evaluation process*<br><br>*Evaluation Language, Evaluation Methods, Formative or Summative, Multiple Choice Test, Short Answer Questions, Essay Questions, Problem Solving, Written Assignment, Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Patient Examination, Artistic Interpretation, Other*<br><br>*Explicitly specified evaluation criteria are mentioned and if and where they are accessible to the trainees.* | ***Green Label II***<br>*The successful completion of this teaching unit involves:*<br>• *Study of the different topics and evaluation of their understanding (50% of the grade)*<br>• *Creating a presentation describing a selected topic, accompanied by constructive suggestions for improvements (50% of the grade)* |
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