

2022 Fall

| TIGP Sustainable Chemical Science and Technology Program   |   |                     |                         |
|--|---|---------------------|-------------------------|
| Introduction to Sustainable Chemical Science and Technology  |   |                     |                         |
| Period: 2022/Sep. - 2022/Dec.<br>Classroom: B105, IoC, AS<br>Time: AM09:10-12:00   |   |                     |                         |
| Goals: 1. Know the backgrounds and chemistry of sustainability-related issues.<br>2. Learn the spirit of green chemistry and the challenges/opportunities in the real world.<br>3. Get exposed to important research directions. |   |                     |                         |
| Theme  |   |                     |                         |
| <b>1</b>   | <b>Importance of Chemistry, Course Expectation, and Literature Search Skill</b>   | Hung, Chen-Hsiung   | 2022/9/14               |
| <b>2</b>   | <b>Chemistry Related Global Challenges</b>  |                     |                         |
|  | 2.1 Climate Change and Our Future Alternative Energy  | Chen, Chin-Ti       | 2022/9/21               |
|  | 2.2 Global Materials Cycling (Carbon Cycle, Nitrogen Cycle, Ocean Acidification, Heavy Metals...)                             | Hung, Chen-Hsiung   | 2022/9/28               |
|  | 2.3 Water Scarcity and Sustainable Water Supply - Principles and Chemistry  | Chuan, Yi-Hsueh     | 2022/10/5               |
|  | 2.4 Environmental Impact of Chemicals (Organic Toxic Compounds, Persistent Compounds, Ozone Hole...)                          | Chou, Charles C.-K. | 2022/10/12              |
|  | 2.5 Catalysis for Control of Atmospheric Pollutants - An Introduction   | Lin, Liang-Yi       | 2022/10/19              |
| <b>3</b>   | <b>Sustainability and Green Chemistry</b>   |                     |                         |
|  | 3.1 Spirits   | Hung, Chen-Hsiung   | 2022/10/26              |
|  | 3.2 Principles  |                     | 2022/11/2               |
|  | 3.3 Metrics to Evaluate Greenness and Life Cycle Analysis   |                     |                         |
|  | 3.4 Solvents (water, supercritical fluids, ionic liquids, switchable solvents, bio-based solvents...)                         | Chein, Rong-Jie     | 2022/11/9               |
|  | <b>***Midterm Exam Week***</b>  | <b>Midterm Exam</b> | 2022/11/16              |
|  | 3.5 Alternative Reaction Energy Sources (Microwave, Mechano, Ultrasound, Flow...)   | Lin, Chih-Hsiu      | 2022/11/23              |
|  | 3.6 Catalysis (Heterogeneous, Homogeneous, Phase Transfer, Bio, Photo, and the more recent Organo, Earth Abundant Element...) | Chiang, Ming-Hsi    | 2022/11/30<br>2022/12/7 |
|  | 3.7 Basic Toxicology, Bioremediation, and Design Principles for Degradation/Less  | Li, Wen-Shan        | 2022/12/14              |
|  | 3.8 Some Real World Cases in Industry   | Hung, Chen-Hsiung   | 2022/12/21              |
|  | 3.9 Challenges in Green Chemistry   |                     |                         |
|  | <b>*** Final Exam deadline***</b>   | <b>Final Exam</b>   | 2022/12/28              |