

|   |  |
|---|--|
| <b>Full Title:</b>  | Environmental Chemistry and Biogeochemistry  |
| <b>Module Code:</b>   | CHEMS7011  |
| <b>Credits:</b>   | 7.5  |
| <b>Valid From:</b>  | Semester 1 - 2013/14 ( September 2013 )  |
| <b>Module Delivered in</b>  | <a href="#">1 programme(s)</a>   |
| <b>Module Description:</b>  | Following this course, students will be able to critically synthesise and analyse the chemical processes that occur in the environment, with reference to the impacts of various natural and human inferences on associated biogeochemical cycles. |
| <b>Learning Outcomes:</b>   |  |
| <i>On successful completion of this module the learner should be able to</i>  |  |
| <ol style="list-style-type: none"> <li>1. Appraise the role of environmental chemistry and biochemistry in the geosphere.</li> <li>2. Evaluate the fundamental processes that drive biogeochemical cycles at a local scale.</li> <li>3. Evaluate the effects of human-related pressures on biogeochemical cycles at a global scale, including global climate change.</li> <li>4. Describe and relate aspects of environmental chemistry and biochemistry to the physical environment.</li> <li>5. Quantify and assess changes in key chemical cycles in the environment.</li> </ol> |  |

## Module Content & Assessment

| Indicative Content   |
|--|
| <b>Environment and its chemistry</b><br>Structure and composition of main spheres in the environment; inter-relation of different spheres.   |
| <b>Atmospheric chemistry</b><br>Composition of the atmosphere, chemical processes, solubility of atmospheric pollutants in water; large-scale climate effects, including human related climate change, chemistry of acid deposition. |
| <b>The lithosphere</b><br>Composition and structure; weathering; leaching; soil chemistry; mineral resources and pollution; geochemical solubility.  |
| <b>The hydrosphere</b><br>Chemical composition and physical properties; water cycle; equilibria in aqueous systems; water pollution; large-scale human-related effects e.g. ocean acidification.                                     |
| <b>The biosphere</b><br>Composition, major and minor elements; toxicology of heavy metals and organic pollutants, bioaccumulation.   |
| <b>Biogeochemical cycles for various elements.</b><br>Biogeochemical cycling of for C, N, P, and S, and effects of human-related pressures.  |

| Assessment Breakdown             | %      |
|----------------------------------|--------|
| Course Work                      | 40.00% |
| End of Module Formal Examination | 60.00% |

## Full Time

| Course Work                 |   |                   |            |              |            |                 |          |
|-----------------------------|---|-------------------|------------|--------------|------------|-----------------|----------|
| Assessment Type             | Assessment Description  | Outcome addressed | % of total | Marks Out Of | Pass Marks | Assessment Date | Duration |
| Practical/Skills Evaluation | Range of practicals quantifying chemical composition of air, water and solid environmental samples. | 1,4,5             | 30.00      | 0            | 0          | Every Week      | 0        |
| Project                     | Review of relevant literature and media articles.   | 2,3,4             | 10.00      | 0            | 0          | Sem 1 End       | 0        |

No Project

No Practical

| End of Module Formal Examination |                                   |                   |            |              |            |                 |          |
|----------------------------------|-----------------------------------|-------------------|------------|--------------|------------|-----------------|----------|
| Assessment Type                  | Assessment Description            | Outcome addressed | % of total | Marks Out Of | Pass Marks | Assessment Date | Duration |
| Formal Exam                      | End-of-Semester Final Examination | 1,2,3,4           | 60.00      | 0            | 0          | End-of-Semester | 0        |

DKIT reserves the right to alter the nature and timings of assessment

### Module Workload & Resources

**Workload: Full Time**

| Workload Type                 | Workload Description   | Hours | Frequency  | Average Weekly Learner Workload |
|-------------------------------|--|-------|------------|---------------------------------|
| Practical                     | n/a  | 3.00  | Every Week | 3.00                            |
| Lecture                       | No Description   | 3.00  | Every Week | 3.00                            |
| Independent Study             | To include student project focused on compilation of news articles on environmental chemistry and biogeochemistry. | 4.00  | Every Week | 4.00                            |
| Total Weekly Learner Workload |  |       |            | 10.00                           |
| Total Weekly Contact Hours    |  |       |            | 6.00                            |

**This course has no Part Time workload.**

### Resources

*Recommended Book Resources*

Kathleen C. Weathers, David L. Strayer, Gene E. Likens (Editors) 2012, *Fundamentals of ecosystem science*, Elsevier Amsterdam

Thibodeaux, L. J. 1996, *Environmental chemodynamics: movement of chemicals in air, water, and soil*, 2nd Ed., Wiley New York

Frank M. Dunnivant 2004, *Environmental laboratory exercises for instrumental analysis and environmental chemistry [electronic resource]*, ebrary, Inc via DkIT library Ed., Wiley

Colin Baird, Michael McCann 2008, *Environmental chemistry*, 4th Ed., W.H. Freeman and Co. New York

*This module does not have any article/paper resources*

*Other Resources*

Link: *Library Catalogue*  
<http://tinyurl.com/nmmrxyd>

### Module Delivered in

| Programme Code | Programme   | Semester | Delivery |
|----------------|---|----------|----------|
| DK_SAPBI_7     | <a href="#">Bachelor of Science in Applied Bioscience</a> | 6        | Elective |