# COURSE SYLLABUS

**1. Name of Curriculum**: Bachelor of Science (Biological Science)
Bachelor of Science (Environment)
Mahidol University International College

**2. Course Code**: ICBI 317 / ICEN 317 **Course Title**: Aquatic Ecology

**3. Number of Credits**: 4 **(Lecture/lab)** (3 - 2)

**4. Prerequisites**: ICNS 112

**5. Type of Course**: Elective for 3rd year students

**6. Semester / Academic Year**: Trimester 3

**7. Course Description**:

An introduction to aquatic systems including lakes, streams, rivers, estuaries and marginal seas and the processes that regulate and affect the distribution, abundance, diversity and productivity of aquatic organisms.

**8. Course Objectives**:

By the end of the course students should be able to describe and explain:

- the hydrological cycle and its reservoirs
- the relationship between temperature, salinity and density of water
- the relationship between temperature, salinity and dissolved oxygen (DO) and the factors affecting DO concentration in aquatic systems
- the importance of light in aquatic environments
- lake types and seasonal patterns of thermal stratification and biological productivity
- the relationship between nutrient supply and plant productivity
- biomanipulation of lake ecosystems as a form of management
- material transport in streams and rivers
- the difference between autochthonous and allochthonous inputs to aquatic systems
- the River Continuum Concept (RCC) and the Flood Pulse Concept (FPC)
- the types of estuaries and estuarine biodiversity and productivity.

**9. Course Outline**

| Class | Topic | | | | Lecturer |
|---|---|---|---|---|---|
| | Lecture / Seminar | Hour | Lab | Hour | |
| 1 | Hydrological cycle / hypsographic curves | 2 | - | | Dr W. Phillips |
| 2 | Physical + chemical properties of water | 4 | - | | |
| 3 | Light and aquatic systems | 4 | - | | |
| 4 | Physical limnology | 4 | - | | |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Biological activity of lakes<br>(+ Mid-term exam) | 4<br>(+ 2) | - | | |
| 6 | Trophic interactions in lakes | 4 | | | |
| 6 | Nutrient limitation in aquatic systems | 4 | - | | |
| 7 | Streams and rivers | 4 | - | | |
| 8 | Autochthonous and allochthonous inputs | 4 | - | | |
| 9 | River Continuum Concept<br>Flood Pulse Concept | 4 | - | | |
| 10 | Estuaries | 4 | - | | |

**10. Teaching Methods**:
Lectures, in-class practical exercises, discussion, self-study and field trip with practical exercises

**11. Teaching Media**:
Text and teaching materials, Powerpoint, handouts, field exercises.

**12. Course Achievement**:
Assessment made from stated criteria: students with 80%+ obtain grade A

**13. Course Evaluation**:
1. Field trip report (x2) 30%
2. Assignments (x4) 20%
3. Mid-term exam 20%
4. Final exam 30%

**14. References**:
Dobson and Frid, 1998. Ecology of aquatic systems. Longman, UK.
Adams (ed), 2002. Biological indicators of aquatic ecosystem stress. American Fisheries Society, Bethesda, Md
Talling and Lemoalle, 1998. Ecological dynamics of tropical inland waters. CUP.
Wetzel and Likens, 2000. Limnological analysis. Springer-Verlag, New York.
Wetzel, 2001**.** Limnology: lake and river ecosystems. Academic Press, California
Additional readings set by instructor

**15. Instructor**:
Dr Wayne Phillips

**16. Course Coordinator**:
Dr Wayne Phillips