**Instructor:** Ajchara Aksomboon Vongsawan

**The Goal:**

The three-year Biology curriculum serves as a pre-requisite for Science-Math majors in preparation for entering biomedical sciences as well as other science fields.

Mathayom 4 (Secondary Grade 10) - Year 1 Biology 1, 2

**Mathayom 5 (Secondary Grade 11) - Year 2 Biology 3, 4**

Mathayom 6 (Secondary Grade 12) - Year 3 Biology 5, 6

The study approach follows the Thai curriculum using combination of US and Singaporean textbooks. English is the language of instruction in the English Program. Students planning to enter the biomedical field or medical field within the Thai university system are advised to read a Thai version of textbook in preparation for their entrance exam due to technical term discrepancy that may be used in Thai exams. Pre-med and biomedical science students will be expected to pay close attention to current knowledge of bioscience technology for future use at undergraduate university level.

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| **Grade 11 (M5): Year 2 Biology 3****Semester 1: (SCI 32242) 1.5 Credits, 60 hours** |
| **Course Content** | **Details** |
| **Unit 1:** **Structure and Function of Flowering** **Plants** | • Structure and Function of Plant tissue• Structure and Function of Root, Stem and Leaf• Transpiration in Plant• Transport System of water and  Mineral Salt in Plants• Transport of Organic Substance in Plants |
| **Unit 2: Plant Growth and Development** | • Plant Hormones• External Stimulus Inducing Plant Development  |
| **Midterm Exam**  | **Material Covered from Units 1 and 2** |
| **Unit 3:** **Adaptations Flowering Plant use for** **Survival** | • Life Cycle of Flowering Plant• Reproduction in Flowering Plant• Plant Sexual Organs• Seed Germination  |
|  **Unit 4:** **Photosynthesis** | • Importance of Photosynthesis• Mechanism of Photosynthesis • Photorespiration• C3 and C4 Plants• CAM Plants• Factors affecting Photosynthesis |
| **Final Exam** |  **Material Covered from Units 3 and 4** |
| **Grade 11 (M5) Year 2: Biology 4****Semester 2: (SCI 32242) 1.5 Credits, 60 hours** |
| **Course Content** | **Details** |
| **Unit 1: Respiratory System and Circulatory** **System** | • Gas Exchange in Living Things• Open and Closed Circulatory System• The Structure and Function of Mammalian Heart.• Human Circulatory System |
| **Unit 2:** **Maintaining Homeostasis in the body** | • Excretion of waste product in Unicellular Organisms, invertebrates, and vertebrates including humans• Kidney Function• Kidney Diseases |
| **Midterm Exam** | **Material Covered from Units 1 and 2** |
| **Unit 3:** **Digestive System** | • Digestive System in Micro-organisms• Digestion System in Mammals• Digestion System in Humans |
| **Unit 4:** **Immune System** | • Defence Mechanisms of the Body• Types of Immune System• Components of the Immune System• Immune Deficiency |
| **Final Exam** | **Material Covered from Units 3 and 4** |

**Expectations from students:**

(1) to always attend class and sign in roll call attendance (for online teaching roll call through

 class line)

(2) to critically read the assigned material before class

(3) to enthusiastically participate in class discussions and problem-solving sessions (for online by zoom meetings).

(4) to diligently prepare for all exams

**Evaluation**

**Video Clip Presentation** with prepared dialogue will be assigned via classroom 15 points

**Lab and Lab Report** 15 points

**Test with** **Mindmap** 20 points

**Class Attendance/ Class Participation** 10 points

**Midterm** 20 points

**Final** 20 points

**Study and Reading Materials**

**(1) Campbell PowerPoint Lectures and uploads given in conjunction with textbooks**

**(2) Textbooks**

2.1. Biology: A Global Approach, Global Edition, 10/E

Neil A. Campbell, University of California, Riverside

Jane B. Reece, Palo Alto, California

Lisa Urry

Michael L Cain, Bowdoin College, Brunswick, Maine

Steven A Wasserman, University of California, San Diego

Peter V Minorsky, Mercy College, Dobbs Ferry, New York

Robert B Jackson, Duke University, Durham, North Carolina

**or equivalent version**.

2.2. New Century Elective Biology: Secondary 4,5, and 6.

 Hodder Education Singapore, 2019 Edition.

 Beverly Tay, Loo Kwok Wai, Ong Bee Hoo, and Janlin Chan