**Instructor:** Ajchara Aksomboon Vongsawan

**Semester 2:** (SCI 32242) 1.5 Credits, 60 hours

Science majors in Mathayom 5, Secondary Grade 11, continues semester 2 of 2021 Academic School Year with Advanced level Biology 4 (SCI 32242) focusing on the Circulatory, Excretion, Digestive and Immune Systems in living things with more emphasis on humans. Students will continue to link the biological systems within the body in order to understand maintenance of homeostasis. Students will be assigned to collaborate on group projects from scientific journal readings in order to understand discoveries and laboratory techniques involved in published biomedical research. Biology 4 Students are also expected to acquire hands-on experiments.



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| **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 | Elective Biology 4Chapter 7-Transport in AnimalsChapter 8-RespirationCampbell BiologyChapter: Circulation and Gas Exchange |
| **Unit 2:** **Maintaining Homeostasis in the body** | • Excretion of waste product in Unicellular Organisms, invertebrates, and vertebrates including humans• Kidney Function• Kidney Diseases | Elective Biology 4Chapter 6-ExcretionCampbell BiologyChapter: Osmoregulation and Excretion |
| **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 | Elective Biology 4Chapter 4-Focus on EnzymesChapter 5-DigestionCampbell BiologyChapter: Digestive System  |
| **Unit 4:** **Immune System** | • Defense Mechanisms of the Body• Types of Immune System• Components of the Immune System• Immune Deficiency | Campbell BiologyChapter: Immune System |
| **Final Exam** | **Material Covered from Units 3 and 4** |  |

**Expectations from students:**

(1) to always attend class

(2) to critically read the assigned material before class

(3) to enthusiastically participate in class discussions and problem-solving sessions

(4) to diligently prepare for all exams

**Evaluation Points**

Laboratory Experiment(s) 10

Lab Report 10

Research Project from published medical journals

(Group Work with Presentation)20



Pop Quiz10 (+Concept map)

Class Attendance/Class Participation 10

Midterm 20

Final Exam 20

**Study and Reading Materials:**

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

**(2) Textbook**

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**.

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