



**SAMSEN WITTAYALAI SCHOOL
ENGLISH PROGRAM**

COURSE OUTLINE

Subject: Biology (SC33241)

Learning Period: 3 Periods/Week

Grade Level: Mattayomsuksa 6

Learning Area: Science and technology

Teachers: Dr.Nuttaphon Onparn and Dr.Trilert Chaicherdsakul

Course Classification: Additional

Credit Unit : 1.5

Semester 1, Academic Year 2022

Samsenwittayalai School English Program

I. COURSE DESCRIPTION

Study plant biology on every aspect, define plants, observe plant anatomy of various plant groups, use different tools to study plant taxonomy, study plant morphology and plant reproductive system, compare plant anatomy and plant physiology of plants including photosynthesis from different taxonomic groups, study plant physiology and responses of plants to different stimuli.

By using the scientific processes, searching data, discussion, analyzing, comparing, presentation, testing, prediction, investigation and experimenting.

For improving the scientific knowledge, thoughts and understanding so that the students can make use of the knowledge to make decision, use the 21st century skills in information technology, critical thinking and problem-solving, communicating. They can also use the knowledge in every day's life, leading to scientific mind, ethics, virtues and appropriate attitudes.

II. LEARNING OUTCOMES

1. Learners' reading, analytical thinking and writing skills meet the criteria prescribed by the respective educational institutions.
2. Learners' desirable characteristics meet the criteria prescribed by the respective educational institutions.
3. Explain about the types and characteristics of plant tissues and draw diagrams to summarize the types of plant tissues.
4. Observe, explain, and compare the internal structure of monocotyledon and dicotyledon root and stem from cross-sectional cuttings.
5. Observe and explain the internal structure of plant leaves from cross-sectional cuts.
6. Search for information, observe and explain gas exchange and plant dehydration
7. Investigate and explain the mechanism of water and nutrient transport of plants
8. Search for information, explain the importance of nutrients, and give examples of important nutrients that affect the growth of plants.
9. Explain food transport mechanisms in plants
10. Search for information and summarize studies obtained from past scientists on photosynthesis.
11. Explain steps in the photosynthesis process of plants C3
12. Compare the mechanism of carbon dioxide fixation in plants C3, Plant C4 and CAM Plant

13. Search for information, discuss and summarize light intensity factors Carbon dioxide concentration and temperature that affects the photosynthesis of plants
14. Explain the alternate life cycle of flowering plants
15. Explain and compare the process of male and female reproductive cells of flowering plants and explain the fertilization of flowering plants.
16. Describe seed germination and fruiting of plants, flowers, seed structure and fruiting and give examples of the use of various structures of seeds and fruits
17. Experiment and explain about various factors affecting seed germination. Seeds dormancy and provides guidelines for solving seed dormancy conditions
18. Search for information explaining the role and function of auxin, cytokinin, gibberellin, ethylene and abscissic acid and discuss about agricultural uses
19. Search for experimental data and discuss about external stimuli that affect the growth of plants

III. TENTATIVE COURSE OUTLINE

Week	Topics / Contents	Learning outcome	Period(s)
1.	Defining plants and their general characteristics	L1, 3, 4	3
2.	Morphology of plants from different taxonomic groups	L1, 2, 3	3
3.	Plant cells, tissues, and organs	L1, 4	3
4.	Compare plants of different taxonomic groups from their anatomy	L2, 5	3
5.	Plant nutrients and transport	L5, 6, 7, 8	3
6.	Photosynthesis: cellular and tissue	L6, 7, 9	3
7.	Light dependent reactions	L9, 10, 11	3
8.	Light independent reactions: C3, C4, CAM	L10, 11, 12	3
9	Plant reproduction	L12, 13	3
10	Flower structure and variation	L13, 15	3
11	Seed formation	L15, 16	3
12	Fruits and seed dispersal	L15, 16	3
13	Plant life cycle	L15, 16, 17	3
14	Plant hormones	L18, 19	3
15	Plant adaptation	L18, 19	3
16	Plant ecology	L18, 19	3

IV. TEACHING METHODS AND MANAGEMENT

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Experiment | <input checked="" type="checkbox"/> Lecture/Discussion | <input checked="" type="checkbox"/> Group work |
| <input checked="" type="checkbox"/> Individual work | <input checked="" type="checkbox"/> Game | <input checked="" type="checkbox"/> Project |
| <input checked="" type="checkbox"/> Self-learning | <input checked="" type="checkbox"/> Demonstration | |

