# TQF 3 Course Specifications

## Section 1 General Information

1. Course code and course title

Thai ICGN 112 มองดาว มองเรา

English ICGN 112 Stargazer

2. Number of credits 4 (3-2-7)
3. Program and type of subject
   - 3.1 Program Undergraduate Degree (International Program)
   - 3.2 Type of Subject General Education
4. Course Coordinator and Course Lecturer
   - 4.1 Course Coordinator Suraphong Yuma, Department of Physics, Faculty of Science, Mahidol University, suraphong.yum@mahidol.edu
   - 4.2 Course Lecturer Suraphong Yuma, suraphong.yum@mahidol.edu
5. Trimester/ Year of Study
   - 5.1 Trimester All trimesters (including summer session) / for all students in all International College Undergraduate Programs
   - 5.2 Course Capacity Approximately 20-25 students (limited by equipment used in class)
6. Pre-requisite N/A
7. Co-requisites N/A
8. Venue of Study Mahidol University, Salaya campus

## Section 2 Goals and Objectives

1. Course Goals

Students should be able to

1. Understand how Astronomy can be a portal for scientific knowledge.
2. Operate a simple telescope for sky observation.
3. Do research, and observation to answer some basic astronomy questions.

2. Objectives of Course Development/Revision

2.1 Course Objectives

1. Introduce how knowledge in astronomy are relevant in daily life, and how it can improve our scientific knowledge.
2. Learn about basic astronomy concepts.
3. Share the obtained ideas and knowledge with the class.

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

1. CLO1: Develop an intellectual curiosity and a desire for continual learning both within and beyond formal education.
2. CLO2: Explain astronomical events in quantitative aspects.
3. CLO3: Write a meaningful report on various astronomical observation.
4. CLO4: Prepare a presentation to share ideas with the class.

5. CLO5: Operate a simple refractor and reflector telescope to observe night sky.

## Section 3 Course Management

1. Course Description

พื้นฐานความรู้ทางดาราศาสตร์ฟิสิกส์; การเรียนรู้เอกภพของมนุษยชาติและการพัฒนาความเข้าใจจากกระบวนการทางวิทยาศาสตร์; โลก พระจันทร์ และ ระบบสุริยะ; วงจรชีวิตของดวงดาว; กาแลกซี่; หลุมดำ; และการค้นคว้าทางดาราศาสตร์ในปัจจุบัน

Basic ideas of astronomy, astrophysics and cosmology; the progress of human understanding of the universe; the impact of scientific method on astronomical observation; the Earth & Moon; the Solar System; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and future of the universe.

2. Credit hours per trimester

| Lecture (Hour(s)) | Laboratory/field trip/internship (Hour(s)) | Self-study (Hour(s)) |
|---|---|---|
| 36 | 24 | 72 |

3. Number of hours that the lecturer provides individual counseling and guidance.
   2 hour/week

## Section 4 Development of Students' Learning Outcome

1. Short summary on the knowledge or skills that the course intends to develop in students (CLOs)

By the end of the course, students will be able to

1. CLO1: Develop an intellectual curiosity and a desire for continual learning both within and beyond formal education.
2. CLO2: Explain astronomical events in quantitative aspects.
3. CLO3: Write a meaningful report on various astronomical observations.
4. CLO4: Prepare a presentation to share ideas with the class.
5. CLO5: Operate a simple refractor and reflector telescope to observe night sky.

2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation methods of the course learning outcomes

| Course CLO | Teaching methods | Evaluation Methods |
|---|---|---|
| CLO 1 | Lecture, class discussion | Quiz, Written assignment, written examination |
| CLO 2 | Lecture, class discussion | Quiz, Written assignment, written examination |
| CLO 3 | Demonstration by teacher, hand-on activities | Lab Report |
| CLO 4 | Group Discussion | Final Presentation |
| CLO 5 | Demonstration | Lab Report |

## Section 5 Teaching and Evaluation Plans

1. Teaching plan

| Week | Topic | Number of Hours | | Teaching Activities/ Media | Lecturer |
|---|---|---|---|---|---|
| | | Lecture Hours | Lab/ Field Trip/ Internship Hours | | |
| 1 | Astronomy and Civilization | 3 | 2 | Lecture, real-life examples, small-group discussion, class discussion, hands on demonstration, experiment at home. | Surapho ng Yuma |
| 2 | Gravitational Force and Circular motion | 3 | 2 | | |
| 3 | Cycles of the Sun and the Moon | 3 | 2 | | |
| 4 | Surveying the Sky and the origin of modern astronomy | 3 | 2 | | |
| 5 | Optical Instrument | 3 | 2 | | |
| 6 | Spectroscopy of Stars | 3 | 2 | | |
| 7 | The Sun | 3 | 2 | | |
| 8 | The stellar evolution | 3 | 2 | | |
| 9 | The Milky way and galaxies | 3 | 2 | | |

| | | | | | |
|---|---|---|---|---|---|
| 10 | The beginning of Universe | 3 | 2 | | |
| 11 | Life on other worlds | 3 | 2 | | |
| 12 | Review | 3 | 2 | | |
| | Total | 36 | 24 | | |

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

1. Class discussion
2. Reflective question
3. In-class examples

b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

| Learning Outcomes | Assessment Methods | Assessment Ratio (percentage) | |
|---|---|---|---|
| CLO1 Develop an intellectual curiosity and a desire for continual learning both within and beyond formal education. . | Exam | 15 | 25 |
| | Quiz and assignment | 10 | |
| CLO2 Explain astronomical events in quantitative aspects. | Exam | 15 | 25 |
| | Quiz and assignment | 10 | |
| CLO3 Write a meaningful report on various astronomical observation. | Lab report assignment | 20 | 20 |
| CLO4 Prepare a presentation to share ideas with the class. | Final Presentation | 20 | 20 |
| CLO5 Operate a simple refractor and reflector telescope to observe night sky. | Lab Report | 10 | 10 |
| Total | | | 100 |

(2) Grading System

| Grade | Achievement | Final Score (% range) | GPA |
|---|---|---|---|
| A | Excellent | 90-100 | 4.0 |
| B+ | Very good | 85-89 | 3.5 |
| B | Good | 80-84 | 3.0 |
| C+ | Fairly good | 75-79 | 2.5 |
| C | Fair | 70-74 | 2.0 |
| D+ | Poor | 65-69 | 1.5 |
| D | Very poor | 60-64 | 1.0 |
| F | Fail | Less than 60 | 0.0 |

(3) Re-examination (If course lecturer allows to have re-examination)
N/A - (Not applicable with MUIC)

3. Student Appeals
N/A

## Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials
   1. Abell, Morrison, and Wolff, Exploration of the Universe, Saunders College Publishing.
   2. Kaufmann, Discovering the Universe, Freeman and Company.
   3. Seeds, Foundations of Astronomy, Thomson.
2. Recommended textbooks and/or other documents/materials
   As posted on the course's e-learning site
3. Other Resources (If any)
   As posted on the course's e-learning site

## Section 7 Evaluation and Improvement of Course Management

1. Strategies for effective course evaluation by students
   - 1.1. Discussion between course instructor and students
   - 1.2. Questionnaire from students.
2. Evaluation strategies in teaching methods

2.1. Evaluation of effectiveness based on student evaluation scores and comments

2.2. Evaluation through peer observations by co-instructor or other Division faculty

3. Improvement of teaching methods

3.1. Adjustments based on student feedback, personal observations, comments from peer observations and discussions with supervisor and/or other Division faculty in one-on-one and/or group meetings as specified by MUIC guidelines.

4. Verification of students' learning outcomes.

4.1. Verification through student performance on assessments based on MUIC/Division standards

5. Review and improvement for better outcome

5.1. Course instructors (and coordinator/supervisor) will meet to discuss results of student evaluations and student performance based on learning outcomes in order to identify point for improvement

5.2 Strategy for improvement set according to MUIC/Division guidelines

## Appendix
## Alignment between Courses and General Education courses

Table 1 The relationship between CLOs and MU-GE Module LOs (Number in table = Sub LOs)

| (Course Code) | Learning Outcomes in General Education (MU-GE LOs) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CLO1 | 1.1 | | | | | | | | |
| CLO2 | | 2.1 | | | | | | | |
| CLO3 | | | | | | | | 8.1 | |
| CLO4 | | | | | | | | 8.2 | |
| CLO5 | | | | | | | | | 9.1<br>9.2 |

Table 2 The description of MU-GE LOs and Sub LOs of the course

| MU-GE LOs | Sub LOs |
|---|---|
| MLO1 Create & construct and argument effectively as well as identify, critique and evaluate the logic & validity of arguments | 1. Identify concepts related to the context of learned issues/topics |
| MLO2 Select & use techniques and methods to solve open-ended, ill-defined and multistep problems | 1. Apply simple mathematical methods to the solution of real world problems |
| MLO 8 Use a variety of means/ technologies to communicate effectively and purposefully e.g., share information/ knowledge, express ideas, demonstrate or create individual & group product, etc. | 1. communicate/present ideas effectively both oral & written forms, proper to a range of audience groups, such as verbal discussion with peers, project report<br>2. prepare a purposeful oral presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, beliefs, or behaviors. |
| MLO 9 Collaborate and work effectively as part of a student group/team member to arrive at the team shared-goals. | 1. Collaborate effectively with others as a responsible team member to achieve team goals in time<br>2. interact with other respectfully, whether as a team member or leader, to create a productive teamwork. |