



General Education Course
 Course Title: Logic, Analysis and Critical Thinking
 Mahidol University International College
 Course Code: ICGH 103
 Division: HLD

Bachelor's Degree Program: Humanities

TQF3 Course Specification

Section 1 General Information

1. Course Code and Title

Thai	ICGH103: ตรรกวิทยา การวิเคราะห์ และการการคิดวิพากษ์วิจารณ์: การอ้างเหตุผลที่ดีและไม่ดี
English	ICGH103: Logic, Analysis and Critical Thinking: Good and Bad Arguments

2. Number of Credits

(Theory 4 hrs. Self-study 0 hrs Practice 8 hrs. / week)

3. Curriculum and Course Type

3.1 Program of Study International Bachelor's Degree

3.2 Course Type General Education

3.3 Please Specify Course's Literacy

- ☐ MU Literacy (Core Values, SEP, GE for Human Development)
- ☐ Health Literacy (Health, Sport)
- ☐ Digital Literacy (ICT, Applied Mathematics)
- ☒ Social and Humanity Literacy (Social, Humanity, Law, Ethics, Arts)
- ☐ Communication Literacy (language, Academic Communication)
- ☐ Science and Environmental Literacy (Applied Science for Life, Environmental Responsibility)
- ☐ Finance and Management Literacy (Finance, Management, Entrepreneur)

3.4 Please Specify Relationship between course and corporate

culture

- ☒ M - Mastery รู้แจ้ง รู้จริง สมเหตุ สมผล
- ☒ A - Altruism มุ่งผลเพื่อผู้อื่น
- ☒ H - Harmony กลมกลืนกับสรรพสิ่ง
- ☐ I - Integrity มั่นคงยิ่งในคุณธรรม
- ☒ D - Determination แน่วแน่ทำ กล้าตัดสินใจ
- ☒ O - Originality สร้างสรรค์สิ่งใหม่
- ☐ L - Leadership ใฝ่ใจเป็นผู้นำ

4. Course Coordinator and Instructor

4.1 Course Coordinator: Asst. Prof. York Gunther -- HLD -- phone: 082-220-1072 -- email: yorkgun@mahidol.ac.th

4.2 Instructor: Aj. Barbara Ekamp



General Education Course
Course Title: Logic, Analysis and Critical Thinking
Mahidol University International College
Course Code: ICGH 103
Division: HLD

Bachelor's Degree Program: Humanities

5. Trimester/Class Level

5.1 Trimester: 1-3/ Class Level: undergraduate GE

5.2 Number of Students Allowed: approximately 40 Students

6. Pre-requisite

- none

7. Co-requisites

- none

8. Study Site Location

- MUIC

Section 2 Aims and Objectives

1. Course Goals

Making students intellectually aware and capable of recognizing and using arguments in theory and practice. Both qualitative and quantitative techniques will be utilized from formal predicate logic and a strong emphasis will be placed on communication: both generating arguments and recognizing them in natural language settings.

Course Goals: From the overview perspective of the course instructor, based on the principles, knowledge and skills related to the Program, describe the learning skill the students can develop and apply for further study or work in the future according to the goals set by the instructor in-charge. This has to correspond to MU-GE Module LOs to equip the students with MU-Graduate Attributes.

2. Objectives of Course Development/Revision

2.1 Course Objectives

Students will become intellectually aware and capable of recognizing and using arguments in theory and practice. With qualitative and quantitative techniques, they will be able to utilize formal predicate logic in communication settings, being able to both generate arguments and recognize them in natural language settings.

Course Objectives: Describe in detail the knowledge, understanding, skills and abilities of students after the course learning achievement, from the perspective of the course instructor in-charge. The objectives can be written based on the domains of learning (cognitive, affective, psychomotor, etc.)

2.2 Course-level Learning Outcomes: CLOs

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

CLO1 To fine-tune deductive and inductive skills.

CLO2 To efficiently identify obvious errors in reasoning.

CLO3 To achieve an in-depth understanding of theoretical logical frameworks to apply it effectively in the evaluation of natural language arguments.

CLO4 To achieve rigor in the critical analysis of English arguments under multiple contexts and

subject-matters.

CLO5 To successfully translate arguments from English to symbolic logic and vice versa.

Remarks:

- A. "The course-level expected learning outcomes (CLOs)": Based on the course objectives, explain the knowledge, abilities and skills of students that can be measured and evaluated to make sure that the students get the learning experience, pass the course evaluation based on criteria defined, and achieve the objectives in section 2.1 and the performance based on the standards defined.
- B. A good CLO should consist of 3 structural components:
 - 1. AN ACTION VERB: Identify the ability or skill that the students must perform to be observed or measured.
 - 2. LEARNING CONTENT: Identify the knowledge that the students will gain and apply for other courses in the program or for future work.
 - 3. CRITERIA OR STANDARD: Identify the criteria or standards of competency defined in the course to judge the students' achievement.
- C. In a CLO, more than one learning domain can be included.
- D. Each course should have about 4 – 8 CLOs.

Section 3 Course Description and Implementation

1. Course Description

Basic formal tools from sentential and predicate logic. Logical structures of arguments used in the everyday contexts of life and analysis of their strengths and weaknesses. Common fallacies in reasoning, including reasoning involving determining probabilities. Construction of good arguments using principles of informal reasoning.

เครื่องมือพื้นฐานอย่างเป็นทางการตั้งแต่ตรรกะที่ว่าด้วยประพจน์จนถึงตรรกะที่ว่าด้วยภาคขยาย
โครงสร้างตรรกะของการอ้างเหตุผลที่ใช้ในบริบทของชีวิตประจำวัน การวิเคราะห์จุดเด่นและจุดด้อย
ตรรกะวิบัติที่พบบ่อยในการให้เหตุผล รวมถึงการให้เหตุผลเกี่ยวกับการกำหนดความเป็นไปได้
การคิดค้นการอ้างเหตุผลที่ดีโดยใช้หลักการของการให้เหตุผลอย่างไม่เป็นทางการ

2. Number of Hours Per Trimester

Theory (hours)	Practice (hours)	Self-study (hours)
48	0	96

3. Number of Hours per Week for Individual Advice

- 4 hours/week
- Students can requests for appointments anytime in the term

Identify the following information: The process or method that the person in-charge uses and time allocated for individual students.

Section 4: Development of the expected learning outcomes

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

2.2 Course-level Learning Outcomes: CLOs

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

CLO1 To fine-tune deductive and inductive skills.

CLO2 To efficiently identify obvious errors in reasoning.

CLO3 To achieve an in-depth understanding of theoretical logical frameworks to apply it effectively in the evaluation of natural language arguments.

CLO4 To achieve rigor in the critical analysis of English arguments under multiple contexts and subject-matters.

CLO5 To successfully translate arguments from English to symbolic logic and vice versa.

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

	Teaching methods	Evaluation Methods
CLO1	Lecture, Class Discussion, Text Analysis	Quizzes, Individual Assignment, Final Examination
CLO2	Lecture, , Class Discussion, Text Analysis	Quizzes, Individual Assignment, Final Examination
CLO3	Lecture, Class Discussion, Text Analysis	Quizzes, Individual Assignment, Final Examination
CLO4	Lecture, Class Discussion, Text Analysis	Quizzes, Individual Assignment, Final Examination
CLO5	Lecture, Class Discussion, Text Analysis	Quizzes, Individual Assignment, Final Examination

Section 5 Lesson Plan and Evaluation

1. Teaching plan

Week	Topic/Activity	Number of Hours		Teaching Activities/Media	Lecturer
		Lecture Hours	Lab/Field Trip/Internship Hours		
1	Introduction: Status and Scope of Inductive and Deductive Logic Part 1. Truth-Functional Logic Concepts & Transformation: Truth Values and Connectives	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	Barbara Ekamp
2	Part 1. Truth-Functional Logic Concepts & Transformation: Truth Values and Connectives (cont.)	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
3	Part 1. Truth-Functional Logic Concepts & Transformation: Schemata, Instances, Equivalence	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	

Week	Topic/Activity	Number of Hours		Teaching Activities/Media	Lecturer
4	Part 1. Truth-Functional Logic Concepts, Transformation & Proof: Validity, Truth-Functional Truth, Inconsistency and Implication Part 1. Truth-Functional Logic Concepts, Transformation & Proof: Summary	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
5	Part 1. Truth-Functional Logic Natural Deduction: Derivation rules; Examples in Symbolic Form	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
6	Part 1. Truth-Functional Logic Natural Deduction: English Arguments *****MIDTERM EXAM*****	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	

Week	Topic/Activity	Number of Hours		Teaching Activities/Media	Lecturer
7	Part 2. Syllogistic Logic Categorical Statements, Venn Diagrams, Basic Inferences	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
8	Part 2. Syllogistic Logic Syllogisms and Enthymemes; Limits of Methods	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
9	Part 3. Critical Thinking Editorial and Argument Analysis Fallacies Good and Bad Arguments	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
10	Part 3. Critical Thinking Editorial and Argument Analysis Fallacies Good and Bad Arguments	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	

Week	Topic/Activity	Number of Hours		Teaching Activities/Media	Lecturer
11	Part 3. Critical Thinking Quantification and Translation Exercises; Tying Everything Together	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
12	Part 3. Final Review	4		Lecture, Class Discussion, Analysis, Videos, PowerPoint	
13	Final Examination				
	Total	48			

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

Problem analysis with concepts maps

Construction of both informal and formal arguments

b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)	
CLO3	Assignment	20	40
	Midterm Exam	5	
	Final Exam	15	
CLO1, 2, 4 and 5	Final Exam	30	60
	Midterm Exam	30	
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)

- students with legitimate medical or personal emergencies may re-examine with the lecturer's and PD's permission

3. Student Appeals

- students may appeal to the lecturer, PD, chair or OAA.

Section 6 Teaching Resources

1. Texts and main documents

- 1) Textbook: W.V.Q. Quine, **Elementary Logic**, Harvard UP: 1980 (revised Edition).
- 2) Workbook containing definitions of relevant terminology, supporting exercises, and articles for Weeks 1-12 compiled by the instructors.
- 3) Online and multimedia material provided by instructor (Edmodo).

2. Documents and important information

- In-class handouts.
- Reliable internet sources.
- PowerPoint presentations.
- Alternate textbooks available at the MUIC library.

3. Documents and recommended information

(1)(same as above)

Section 7 Evaluation and Improvement of Course Implementation

1. Strategies for evaluating course effectiveness by students

Student evaluation

2. Strategies for evaluating teaching methods

Student evaluation, Peer observation

3. Improvement of teaching methods

Student evaluation, Peer observation, HR development

4. Verification process for evaluating students' standard achievement outcomes in the course

Academic testing and assignments

5. Review and plan for improving the effectiveness of the course

The aforementioned plus alumni feedback

Appendix

Relations between the course and the General Education

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)								
	MLO1	MLO2	MLO3	MLO4	MLO5	MLO6	MLO7	MLO8	MLO9
CLO1		2.2	3.1/2						
CLO2		2.2	3.1/2						
CLO3	1.4	2.2	3.1/2	4.1			7.1	8.1	
CLO4		2.2	3.1/2				7.1		
CLO5		2.2	3.1/2				7.1		

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

MU-GE LOs	Sub LOs
MLO1 Select & use techniques and methods to solve open-ended, ill-defined and multistep problems	1.4 Synthesize information to arrive at logical reasoning

MLO2 Select & use techniques and methods to solve open-ended, ill-defined and multistep problems	2.2 Integrate alternative, divergent, or contradictory perspectives or ideas in the solution of a problem or question
ML03 Acquire specific strategies & skills within a particular discipline and adapt them to a new problem or situation	3.1 Connect, synthesize and/or transform ideas or solutions within a particular framework
	3.2 Integrate alternative, divergent, or contradictory perspectives or ideas in the solution of a problem or question

MU-GE Module LOs: At the end of studying MU-GE Module, successful students will be able to

Competences	LOs:	Sub LOs:
1.Critical thinking & Analysis: Use various sources and methods to collect and manage data & information and make a logical judgement and decision to arrive at a solution or problem solving	1.Create & construct an 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 2. Demonstrate ICT literacy: use appropriate technology to find, evaluate, and ethically used information 3. Collect, analyze, synthesize data, & evaluate information and ideas from multiple sources relevant to issues/problems 4. Synthesize information to arrive at logical reasoning

Competences	LOs:	Sub LOs:
relevant to real-world issues/ problems	2. Select & use techniques and methods to solve open-ended, ill-defined and multi-step problems	1. Apply simple mathematical methods to the solution of 'real-world' problems 2. Make judgement & decision through correct analysis, inferences, and evaluations on quantitative basis and multiple perspectives 3. Apply concept of process management to solve problems
2. Creativity & Innovation: Show capability to initiate alternative/ new ways of thinking, doing things or solving problems to improve his/her or team solutions/ results by applying the evidence-based process management concepts	3. Acquire specific strategies & skills within a particular discipline and adapt them to a new problem or situation	1. Connect, synthesize and/or transform ideas or solutions within a particular framework 2. Integrate alternative, divergent, or contradictory perspectives or ideas in the solution of a problem or question
	4. Create a novel or unique ideas, question, format, or product within a particular framework	1. Create an original explanation or solution to the issues/problems 2. Articulate the rationale for & consequences of his/her solution- identify opportunities & risk 3. Implement innovation through process management approach
	5. Explore and situate oneself in a new physical environment and intellectual perspectives	1. Demonstrate cultural competencies and adaptabilities in different working environments 2. Resort to multi-dimensional settings and tools to acquire knowledge and skills relevant to the problems or situation at hand

Competences	LOs:	Sub LOs:
3. Global perspectives & Ethics: Express one's own ideas, interact with others, guide or lead team, as proper, as an ethically- engaged and responsible member of the society	6. act autonomously within context of relationships to others, law, rules, codes, and values	1. Demonstrate an understanding of the principles upon which sustainable ecosystems and societies are built 2. Identify the national & global challenges associated with current economic, political, and social systems 3. Exhibit characteristics of responsible citizenship 4. Work effectively in diverse team (and multi-cultural settings)
	7. Apply ethical frameworks or principles and consider their implications in his/her decision-making and interacting with others	1. Identify ethical issues and recognize different viewpoint and ideologies 2. Guide & lead others 3. Apply principles of ethical leadership, collaborative engagement, and respect diversity

Competences	LOs:	Sub LOs:
4. Communication: Communicate effectively and confidently using oral, visual, and written language	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. C ommunicate/present ideas effectively both oral & written forms to appropriate audience, such as verbal discussion with peers, and written project reports 2. P repare a purposeful oral presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors. 3. Prepare written documents to express ideas/solutions using different writing technologies, and mixing texts, data, and images. 4. Demonstrate competence in a second or additional language
5. Collaboration and Working with team: Collaborate and work effectively with team to arrive at team goals	9. Collaborate and work effectively as part of a student group/team member to arrive at the team shared-goals in time	1. Collaborate effectively with others as a responsible team member to achieve team goals in time 2. Interact with others respectfully, either as a team member or leader, to create a productive teamwork