Course Description

International college
Program Information and Communication Technology
Program Bachelor of Science Information and Communication Technology
Academic Year 2568 (2025)

1. General Information

ICT 402		**Research Methodology in Information and Communication Technology**			3	(3-0-6)
Co-requisite course(s)		-				
Pre-requisite course(s)		-				
Semester		S/2568				
Section		130, 131, 132, 133				
Curriculum	☐	Preparatory Courses				
	☐	General Education Courses				
	■	Specialized Core Courses				
	☐	Free Elective Courses				
Responsible faculty member				Full-time Lecturers		
Instructors		Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso	■	Full-time Lecturers	☐	Guest Lecturers
Place of study			■	Onsite	☐	Off-site
Date of preparation		7 June 2025				

2. Course Objectives and Components

1. Learning objectives

- CLO 1: Understand the research process and its significance in Information and Communication Technology (ICT) contexts, including the roles of researchers and key actors involved
- CLO 2: Demonstrate proficiency in conducting literature seeking, literature review, and scientific reading in the field of ICT, including understanding reference and citation practices and avoiding plagiarism

- CLO 3: Develop skills in ICT article writing, research proposal development, research report writing, and data analysis and statistics relevant to ICT research methods

2. **Course description**

Definitions and significance of research; research process; research practices, literature seeking and literature review; reference and citation; plagiarism and research ethics; information and communication technology article writing; development of research proposals; research report writing, data analysis; and statistics for information technology research

3. Number of weekly hours for advising and academic counseling for individual students.

.....3.....hours/week

☐ e-mail:…….
☐ Facebook:……
■ Line:……
☐ Other Specify.....

4. **Course Learning Outcomes (CLOs):**

CLO 1: Understand the research process and its significance in Information and Communication Technology (ICT) contexts, including the roles of researchers and key actors involved
CLO 2: Demonstrate proficiency in conducting literature seeking, literature review, and scientific reading in the field of ICT, including understanding reference and citation practices and avoiding plagiarism
CLO 3: Develop skills in ICT article writing, research proposal development, research report writing, and data analysis and statistics relevant to ICT research methods

3. Student Learning Outcomes

Development of subject learning outcomes following the desired learning standards for each domain is as follows:

1. Knowledge

PLOs	Course Learning Outcomes (CLOs)	Teaching methods	Assessment methods
1	Understand the research process and its significance in Information and Communication Technology (ICT) contexts, including the roles of researchers and key actors involved	• Group discussions (Week 1: importance of ICT research; brainstorming project topics). • Workshops (Weeks 4–5: introduction	• Attendance & Participation (20%): Active engagement in discussions (PLO 3.1, 3.4). • Weekly Exercises (25%): Quality

		chapter; Weeks 6–7: research questions, problem statements).	of exercises on research process (PLO 1.1, 2.1, 3.1, 3.4). Final Project (45%): Research proposal and conference paper quality (PLO 1.1, 2.1, 3.1, 3.4).
1,3	Demonstrate proficiency in conducting literature seeking, literature review, and scientific reading in the field of ICT, including understanding reference and citation practices and avoiding plagiarism	• Group discussions (Weeks 2–3: literature review process, summarizing papers). • Workshops (Weeks 12–13: references management software, academic writing). • Case studies (Week 14: ethical dilemmas, plagiarism).	• Literature Review Assignment (10%): Critical literature review (PLO 1.2, 3.1, 3.3). • Final Project (45%): Literature review chapter quality (PLO 1.2, 3.1, 3.3).

2. Skills

PLOs	Course Learning Outcomes (CLOs)	Teaching methods	Assessment methods
3	Develop skills in ICT article writing, research proposal development, research report writing, and data analysis and statistics relevant to ICT research methods	• Workshops (Weeks 4–5: introduction chapter; Weeks 6–7: research questions; Week 9: survey/ML design; Weeks 10–11: data collection tools, Python/R; Weeks 12–13: research paper structure). • Group discussions (Weeks 1, 4–7, 9–	• Attendance & Participation (20%): Engagement in workshops (PLO 3.1, 3.4). • Weekly Exercises (25%): Data collection and analysis tasks (PLO 1.1, 2.1, 3.1, 3.4). • Final Project

		13, 15–16: project development, peer review).	(45%): Research proposal and paper quality (PLO 1.1, 2.1, 3.1, 3.4).

3. Ethics

PLOs	Course Learning Outcomes (CLOs)	Teaching methods	Assessment methods
1,3	Demonstrate proficiency in conducting literature seeking, literature review, and scientific reading in the field of ICT, including understanding reference and citation practices and avoiding plagiarism	• Group discussions (Weeks 2–3: literature review process, summarizing papers). • Workshops (Weeks 12–13: references management software, academic writing). • Case studies (Week 14: ethical dilemmas, plagiarism).	• Literature Review Assignment (10%): Critical literature review (PLO 1.2, 3.1, 3.3). • Final Project (45%): Literature review chapter quality (PLO 1.2, 3.1, 3.3).

4. Characteristics

PLOs	Course Learning Outcomes (CLOs)	Teaching methods	Assessment methods
3	Develop skills in ICT article writing, research proposal development, research report writing, and data analysis and statistics relevant to ICT research methods	• Workshops (Weeks 4–5: introduction chapter; Weeks 6–7: research questions; Week 9: survey/ML design; Weeks 10–11: data collection tools, Python/R; Weeks 12–13: research paper structure). • Group discussions (Weeks 1, 4–7, 9–13, 15–16: project	• Attendance & Participation (20%): Engagement in workshops (PLO 3.1, 3.4). • Weekly Exercises (25%): Data collection and analysis tasks (PLO 1.1, 2.1, 3.1, 3.4). • Final Project (45%): Research

		development, peer review).	proposal and paper quality (PLO 1.1, 2.1, 3.1, 3.4).

4. Course Planning and Assessment

1. Course planning

Week	Topics/Details	Learning Activities/Media	Hours	Instructor
1	Course Description	Overview and importance of research in ICT Group discussion on the importance and role of research in ICT; Begin brainstorming topics for the final project (quantitative survey, deep learning techniques, or improving a ML algorithm) Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
2-3	Literature Review and Critical Evaluation in ICT Research	Importance and process of literature review in ICT research; Skills to critically evaluate existing literature Literature review assignment on an ICT topic; Start work on Literature Review chapter of the final project (quantitative survey, deep learning techniques, or improving a ML algorithm); Read and summarize key research papers Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
4-5	Constructing the Introduction Chapter	Elements of the introduction chapter; Writing clear research objectives, questions, and hypotheses Workshop on writing an introduction chapter; Start work on Introduction chapter of the final project (quantitative survey, deep learning techniques, or improving a ML algorithm); Write and peer-review introduction drafts Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
6-7	The Research Question and Problem Statement	Refining the research question; Understanding the importance of context; Overcoming research obstacles like data availability, time, and resources Workshop on formulating and refining research questions; Refine Research Question for the final project (quantitative survey, deep learning techniques, or improving a ML algorithm); Develop a research problem statement Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
8	Team Break			
9	Role of Statistics in ICT Research & Quantitative and Qualitative	Introduction to statistics in ICT research; Understanding quantitative and qualitative research in ICT Workshop on designing a quantitative	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak

	Research in ICT	survey, deep learning techniques, or improving a ML algorithm; Develop research methodology for the final project; Analyze sample data sets Group discussion		Jantavongso
10-11	Designing Data Collection Tools & Introduction to Data Analysis Software (Python/R)	Learning about designing effective data collection tools; Introduction to data analysis software commonly used in ICT research Assignment: Design a data collection tool and conduct basic data analysis using MATLAB, SPSS, Python, or R; Develop data collection tools for the final project (quantitative survey, deep learning techniques, or improving a ML algorithm); Practical sessions on data analysis software Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
12-13	Writing ICT Research Papers & References Management Software	Learning the structure of an ICT research paper; Introduction to references management software Assignment: Write an outline of an ICT research paper and a tutorial on a chosen references management software; Begin writing the final project paper (quantitative survey, deep learning techniques, or improving a ML algorithm); Workshop on academic writing techniques Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
14	Ethical Principles in ICT Research	Understanding ethical principles in ICT research; Examination of ethical dilemmas in ICT research Case study analysis on ethical dilemmas in ICT research; Finalize ethical considerations for the final project (quantitative survey, deep learning techniques, or improving a ML algorithm); Debate on ethical case studies Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
15-16	Final Project Presentation	Students present their research projects (quantitative survey, deep learning techniques, or improving a ML algorithm) Group discussion	3	Dr. Billel Arbaoui Assoc.Prof. Dr. Suttisak Jantavongso
Total			**45**	

2. Assessment

PLO(s)	CLO(s)	Assessment Method	Weightage
1	CLO3	Based on regular attendance and active participation in all class discussions and activities	20%
1 and 3	CLO1, CLO3	Completion and quality of weekly exercises and activities	25%
1 and 3	CLO2	Thorough and critical review of relevant literature for the chosen research topic	10%
1 and 3	CLO1, CLO2, CLO3	Quality and clarity of the final project presentation, submission of three well-developed chapters, and an academic conference paper	45%

3. The alignment of Course Learning Outcomes (CLOs) with learning results.

CLOs	1. Knowledge	2. Skills	3. Ethics	4. Characteristics
	PLO 1	PLO 1	PLO 3	PLO 3
Understand the research process and its significance in Information and Communication Technology (ICT) contexts, including the roles of researchers and key actors involved	✓	✓		
Demonstrate proficiency in conducting literature seeking, literature review, and scientific reading in the field of ICT, including understanding reference and citation practices and avoiding plagiarism	✓		✓	
Develop skills in ICT article writing, research proposal development, research report writing, and data analysis and statistics relevant to ICT research methods			✓	✓

5. Course Resources

1. Main textbooks and documents

Peffers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A Design Science Research Methodology for Information Systems Research. *Journal of Management Information Systems*, *24*(3), 45–77. https://doi.org/10.2753/MIS0742-1222240302
Williamson, K., & Johanson, G. (Eds.). (2018). *Research methods: Information, systems, and contexts* (2nd ed.). Chandos Publishing.
"Research Design: Qualitative, Quantitative, and Mixed Methods Approach" by John W. Creswell and J. David Creswell (any of the last three editions is acceptable)
"Ethics for the Information Age (8th Edition)" by Michael J. Quinn. This book provides a broad overview of ethical considerations in information technology and research.
"Research Methods in Information Systems" by John W. Creswell and Vicki L. Plano Clark.

2. Essential documents and information

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3. Recommended documents and information

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6. Course Feedback and Improvement

1. Course evaluation by students

- ☐ Student evaluation of teaching effectiveness
- ☐ Course evaluation form
- ☐ Group discussions between instructors and learners
- ☐ Reflections based on learners' behavior
- ☐ Suggestions through online channels prepared by the instructor for communication with students
- ☐ Others (please specify) .....

2. Other methods of course evaluation

- ☐ Instructor evaluation form
- ☐ Reflected by students
- ☐ Exam results
- ☐ Review of the assessment of learning outcomes
- ☐ Evaluation by the academic standards oversight committee
- ☐ Observation of teaching by the teaching team members
- ☐ Others (please specify) .....

3. Course development and improvement

- ☐ Seminar on teaching management
- ☐ Research inside and outside the classroom
- ☐ Others (please specify) .....

4. The process of reviewing students' learning outcomes for a course.

- ☐ Committees are established in the department to review students' learning outcomes by examining exam reports, grading methods, and behavioral assessments.
- ☐ Review of grading for student work by the department and faculty committee.
- ☐ Review of grading based on random inspections of student work by instructors or other qualified individuals who are not regular course instructors.

☐ Others (please specify) .....

5. Course revision and development plan

☐ Revise the course annually based on suggestions and the review results per section 4.

☐ Revise the course annually based on the instructor evaluation results by students.

☐ Others (please specify) .....