



Course Syllabus (Academic Year 2021)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title:** KACB 405 Geo-informatics for Conservation Biology
Credit (study hours): 3 (2-3-5)
2. **Program Name** Bachelor of Science in Conservation Biology
3. **Course Module:** Gen.Edu. course Core course Elective course
Pre/co-requisite: None
4. **Semester:** 1stsemester 2ndsemester 3rdsemester
5. **Class Schedule & Venue:** Lecture: Tuesday 09:00 – 11:00 online via Google Classroom and Webex during August, 10 – September, 21 and onsite (room will be announced later) during October, 12 – November, 23
 Lab: Tuesday 13:00-16:00, online via Google Classroom and Webex during August, 10 – September, 21 and onsite at Computer Lab 2204, Lecture Building during October, 12 – November, 23
6. **Course Coordinator:** Lect. Chutamas Sukhontapatipak
 Tel. 087-495-0560
 Email: chutamas.suk@mahidol.ac.th, chutamas.suk@mahidol.edu

7. Course Description

Principles of geoinformatics, the coordinate system, the geographic information system, the global positioning system, the spatial analysis, the 3D analysis; basics of remote sensing, GIS- data input, output, interpretation and presentation, problem- based learning in conservation biology; using GIS for biodiversity conservation

8. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives/ Course Learning Outcomes (CLOs)	PLOs*
8.1	Explain the basic concepts and functions of the geoinformatics including the geographic information system, the global positioning system, and the remote sensing in short paragraphs	5
8.2	Use geoinformatics as a tool for study problems related to biodiversity conservation	1,2,3,4,5,6,7,8

NOTE: *PLOs = Program Learning Outcomes

PLO 1: Analyze biodiversity value, status, trend, and their threats for monitoring and solving biodiversity problems.

PLO 2: Interrelate biological sciences, relevant social sciences and economics to conserve biodiversity and sustainable development.

PLO 3: Develop the biodiversity conservation management plan with appropriate methods/techniques/practices to implications for solving the biodiversity problems.

PLO 4: Develop and conduct research projects systematically through scientific processes to prevent/solve/relieve problems related to biodiversity.

PLO 5: Use information technology to support effective biodiversity conservation management with morals and ethics.

PLO 6: Use communication to support appropriate biodiversity conservation management.

PLO 7: Collaborate with teammates and stakeholders in biodiversity conservation with responsibility, integrity, and respect the rights of them.

PLO 8: Show the ideas of caring both local and global biodiversity.

9. Class Instructor List

Lect. Yutthana Phankamolsil (YP) ยุทธนา พันธกุลศิลป์	Lect. Chutamas Sukhontapatipak (CS) จุฑามาศ สุขคนธปฏิบัติภาค
Guest Lect. Naruemon Tantipisanuh (NT) นฤมล ตันติพิษณุ	Teaching Assistant Mr. Thanaphat Klubchum (TK) ธนภัทร กลั้วชุ่ม

10. Course Outline

Week	Date	Contents	CLOs	Instructor
1	10/08/21 09:00 – 11:00	Introduction to teaching and learning process ▪ Course Learning Outcomes (CLOS) ▪ Course outline ▪ Course assessment ▪ Grading system Scope and trends in geoinformatics	1	CS YP
	13:00 - 16:00	Introduction to GIS tools	2	YP, CS, TK
2	17/08/21 09:00 – 11:00	Principles of geoinformatics	1	YP
	13:00 - 16:00	Mini project initiation	2	YP, CS, TK
3	24/08/21 09:00 – 11:00	Map and Map Projection ▪ Coordinate System	1	YP

Week	Date	Contents	CLOs	Instructor
		<ul style="list-style-type: none"> ▪ Map Projection ▪ Projection Transformation 		
	13:00 - 16:00	Projection and Transformation	2	YP, CS, TK
4	31/08/21 09:00 - 11:00	Spatial Data (1) <ul style="list-style-type: none"> ▪ Feature Data ▪ Attribute Data 	1	YP
	13:00 - 16:00	Spatial Data Creation	2	YP, CS, TK
5	07/09/21 09:00 - 11:00	Spatial Data (2) <ul style="list-style-type: none"> ▪ Vector Model ▪ Raster Model 	1	YP
	13:00 - 16:00	Spatial Data Editing	2	YP, CS, TK
6	14/09/21 09:00 - 11:00	Data Acquisition <ul style="list-style-type: none"> ▪ Global Positioning System (GPS) ▪ Google Map and Open Layer 	1	YP
	13:00 - 16:00	Spatial Data Acquisition (outdoor)	2	YP, CS, TK
7	21/09/21 09:00 - 11:00	Spatial Analysis (1) <ul style="list-style-type: none"> ▪ Logical Analysis ▪ Overlay Analysis 	1	YP
	13:00 - 16:00	Overlay Analysis (1)	2	YP, CS, TK
8	28/09/21 09:00 - 11:00	Spatial Analysis (2) <ul style="list-style-type: none"> ▪ Spatial Interpolation ▪ Thiessen Polygon 	1	YP
	13:00 - 16:00	Overlay Analysis (2)	2	YP, CS, TK
9	Midterm examination			
10	12/10/21 09:00 - 11:00	Spatial Analysis (3) <ul style="list-style-type: none"> ▪ Proximity Analysis 	1	YP
	13:00 - 16:00	Proximity Analysis	2	YP, CS, TK
11	19/10/21 09:00 - 11:00	Surface Analysis <ul style="list-style-type: none"> ▪ Surface ▪ Basin ▪ 3D Analysis 	1	YP
	13:00 - 16:00	Surface Analysis	2	YP, CS, TK

Week	Date	Contents	CLOs	Instructor
12	26/10/21 09:00 – 11:00	Raster Analysis <ul style="list-style-type: none"> ▪ Raster Model ▪ Reclassify 	1	YP
	13:00 - 16:00	Raster Analysis	2	YP, CS, TK
13	02/11/21 09:00 – 11:00	Remote Sensing (1) <ul style="list-style-type: none"> ▪ Basic principle of Remote Sensing 	1	YP
	13:00 - 16:00	Basic Classification	2	YP, CS, TK
14	09/11/21 09:00 – 11:00	Remote Sensing (2) <ul style="list-style-type: none"> ▪ Tools for Remote Sensing 	1	YP
	13:00 - 16:00	Mini project progress report	2	YP, CS, TK
15	16/11/21 09:00 – 11:00	Remote Sensing (3) <ul style="list-style-type: none"> ▪ Raster Sources Data 	1	YP
	13:00 - 16:00	Mini project practice	2	YP, CS, TK
16	23/11/21 09:00 – 11:00	Geoinformatics as a tool for biodiversity conservation	1, 2	NT
	13:00 - 16:00	Mini Project Final Presentation	2	YP, CS, TK
17	Final examination			

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
1	Midterm examination	<ul style="list-style-type: none"> ▪ Closed book (Lecture) ▪ Open book (Laboratory) ▪ Faculty approved calculator 	1, 2	9	30
2	Final examination	<ul style="list-style-type: none"> ▪ Closed book (Lecture) ▪ Open book (Laboratory) ▪ Faculty approved calculator 	1, 2	17	30
3	Quizzes	Each quiz will be given in class and cover the content from the previous weeks. There will be no make-up quizzes.	1, 2	1-16	10
4	Mini project	Problem - based learning	2	17	20

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
5	Class participation	<ul style="list-style-type: none"> ■ Individual assessment of level of engagement in class, listening skills, disruptive behavior, and preparation. ■ Student must attend class more than 80% of course. 	1, 2	1-16	10
				Total	100

*** Please sign for class attendance. If the students attend in the class less than 80% (12 weeks), they will be announced to disqualification for the later course assessment activities. Thus, the unexpected matters bring to an absence in the class, please contact course coordinator to fill in the application form and attached the evidence of absence.

12. Grading System

Criterion-referenced evaluation

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	≥ 80 %	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

Norm-referenced evaluation

13. References

- ศรีสอาด ตั้งประเสริฐ. 2537. ระบบสารสนเทศภูมิศาสตร์เพื่อการประเมินค่าทรัพยากรที่ดิน. แปลจาก burrough, p.a. 1986. Principles of geographical information systems for land resources assessment. Oxford university press. กรมวิชาการ, กระทรวงศึกษาธิการ., กรุงเทพฯ. 395 น.
- สรโรจ กลิ่นดาว. 2542. ระบบสารสนเทศภูมิศาสตร์: หลักการเบื้องต้น. สำนักพิมพ์มหาวิทยาลัยธรรมศาสตร์, กรุงเทพฯ. 127 น.
- สุเพชร จิระจรกุล. 2551. เรียนรู้ระบบสารสนเทศภูมิศาสตร์ด้วยโปรแกรม arcgis desktop เวอร์ชัน 9.2. คณะวิทยาศาสตร์และเทคโนโลยี, มหาวิทยาลัยธรรมศาสตร์ ศูนย์รังสิต, ปทุมธานี. 616 น.
- हरररชर วรรณานุกิจ. 2547. Gis ระบบสารสนเทศภูมิศาสตร์/ระบบภูมิสารสนเทศ. สำนักพิมพ์ฟิสิกส์เซ็นเตอร์, กรุงเทพฯ. 150 น.

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- Bernhardsen, T. 2002. Geographic information systems: an introduction 3rd ed. John wiley & sons, new york, ny. 428 pp.
- Bonham-carter, G.F. 1994. Geographic information systems for geoscientists: modelling with gis. Pergamon,
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- Heywood, I. *et al.* 1998. An introduction to geographical information system. Longman, new york, ny.
- Worboys, M.F. and M. Duckham. 2004. Gis: a computing perspective. 2nd ed. Crc press, boca raton, fl. 426 pp.