

## Announcement on the Course on Research Methodology Offered by Graduate School

Graduate School offers the course on research methodology for PhD and master students in the first semester of year 2023 (starting at Jun 26, 2023). Those interested in the course please find more information below. Both international and Thai students are welcome to register in the course.

**Course title:** 950-500 research methodology

**Credit:** 1-3 credit, the course consists of 2 modules (see below). Students can select the modules of their interest with the total credit of 1-3, Please select one of the interests.

- 950-500 Research Methodology : 1 (1-0-2) Credit : (Module 4)
- 950-500 Research Methodology : 2 (1-2-3) Credit : (Module 5)
- 950-500 Research Methodology : 3 (3-0-6) Credit : (Module 4 & Module 5)

**Student:** Both international and Thai student are welcome to register to the course. Students from all fields of study (natural sciences, biological sciences, social sciences etc.) could register because course modules cover a wide range of methodology of various fields. Students can select the modules of their interest.

**Language:** courses offered in English

**Perquisite course:** No

**Course coordinator:** Miss Niramon Sulaiman, E-mail: niramon.l@psu.ac.th or Tel 6982.

**Modules:**

Module	Credit (s)	Module coordinator
Module 4: Statistics for Research	1	- Assoc. Prof Dr. Apiradee Lim (and team)
Module 5: Experimental Design	2	- Dr.Sasiwimon Iwsakul

Please find more information on the modules from the following pages.

**FAQ:**

- No extra tuition fee will be charged for students taking these courses, because the fee is already included in the tuition fee you paid this semester.
- The names of the modules you take will not be appeared in your transcript. The course will appear as “950-500 research methodology” instead.
- Students can register the course for “audit” or “credit”. For those in research only program, please register the course for “audit” (grading is in S or U, satisfied or unsatisfied) during Jun 20 – Jul 2, 2023. URL: <https://sis-hatyai3.psu.ac.th/Default.aspx>
- If you are a student of Pattani Campus, please contact your faculty and registration department of Pattani Campus for registering in these courses (you may need to fill the RF1 general request form before online registration) in order to transfer student data to allow students to register from different campuses, (page7).

**เค้าโครงรายวิชา (Course Outline)**

**Course title:** 950-500 Research Methodology

**Module 4:** Statistics for Research 1(0-2-1) Credit

**Perquisite course:** No

**Course coordinator:** Assoc. Prof Dr. Apiradee Lim and team

**Office phone& E-mail:** 1890, apiradee.s@psu.ac.th

**Couse objectives:**

After the course, the participants are able:

1. To use the open-source non-commercial R statistical software and epiDisplay package for statistical analyses;
2. To conduct data exploration and cleaning for data management before data analyses;
3. To explain the concept of basic data analyses for continuous and categorical outcomes;
4. To use the appropriate basic statistical analysis for the research and present the relevant research results of the analyses;
5. To apply the appropriate sample size calculation for the research using epiDisplay package in R software and n4Studies mobile application.

**Course description:**

The course covers the use of open-source R statistical software and epiDisplay package for data analysis, introduction to basic statistics of research, data exploration and cleaning, descriptive statistics, hypothesis testing for means and proportions, correlation and linear regression, chi-squared test, odds and odds ratio calculation, confounding and interaction and logistic regression as well as sample size calculation.

## Course outlines:

Date and time (tentative)	Topics	Number of hours			Lecturers
		lecture	practice	Self-study	
Aug 21, 2023 9.00-12.00	- Introduction to statistics - The application of non-commercial statistical program for data analysis <ul style="list-style-type: none"> <li>▪ Introduction to R</li> <li>▪ Data analysis with R</li> </ul>	-	3	6	- Mayuening Eso
Aug 21, 2023 13.00-16.00	Descriptive statistics - Practicing with data exploration, summarization - Data manipulation and data cleaning - Table and graph	-	3	6	- Mayuening Eso
Aug 23, 2023 9.00-12.00	Inferential statistics <ul style="list-style-type: none"> <li>▪ Application the method to research</li> <li>▪ Interpretation of the results</li> </ul> Analysis of variance	-	3	6	- Rhysa McNeil -
Aug 23, 2023 13.00-16.00	- t-test <ul style="list-style-type: none"> <li>▪ Application the method to research</li> <li>▪ Interpretation of the results</li> </ul>	-	3	6	- Rhysa McNeil -
Aug 25, 2023 9.00-12.00	- Chi-square test <ul style="list-style-type: none"> <li>▪ Application the method to research</li> </ul>	-	3	6	- Arinda Ma-a-lee
Aug 25, 2023 13.00-16.00	- Interpretation of the results - Linear regression <ul style="list-style-type: none"> <li>▪ Application the method to research</li> </ul> - Interpretation of the results	-	3	3	- Arinda Ma-a-lee -
Aug 26-27, 2023	Assignment (reading paper and appraisal of statistical analysis with result interpretation)	-	-	9	-
Aug 28, 2023 9.00-12.00	- Odd ratios - Confounding and interaction	-	3	3	- Apiradee Lim -
Aug 28, 2023 13.00-16.00	- Logistic regression <ul style="list-style-type: none"> <li>▪ Application the method to research</li> </ul> - Interpretation of the results	-	3	6	- Apiradee Lim -
Aug 30, 2023 9.00-12.00	- Sample size calculation Assignment's discussion	-	3	3	- Nurin Duereh
Aug 30, 2023 13.00-16.00	- Application of the statistical methods with example data - Exercise and quiz	-	3	6	- Nurin Duereh
<b>Total</b>			<b>30</b>	<b>60</b>	

**Venue:** Online via Zoom

**Teaching methods:** Practice 60% of teaching hours  
Demonstration and discussion 40% of teaching hours

**Assessment:** Assignment and quiz 40%  
Class attention and participation 10%  
Examination 50%

Evaluation:	$\leq 80.00\%$	A
	75.00-79.9%	B+
	70.00-74.9%	B
	65.00-69.9%	C+
	60.00-64.9%	C
	55.00-59.9%	D+
	50.00-54.9%	D
	< 50%	E

## Reference

- Agresti A. 2002. *Categorical Data Analysis*. 2002. New York: John Wiley & Sons.
- Chongsuvivatwong, V. 2008. *Analysis of Epidemiological Data Using R and Epicalc*. Epidemiology Unit, Prince of Songkla University..
- Kleinbaum, D.G. 2002. *Logistic Regression: A Self-Learning Text*. New York: Springer-Verlag.
- Maindonald, J. and Braum, W.J. 2010. *Data Analysis and Graphics Using R - An example-Based Approach* Third Edition. New York: Cambridge University Press.
- McNeil, D.R. 2002. *Modern Statistics: A graphical Introduction*. New South Wales: Pearson SprintPrint.
- McNeil. 1996. *Epidemiological Research Methods*. New York: John Wiley.
- Murrell, P. 2005. *R Graphics*. Boca Raton: Chapman & Hall/CRC Press.
- R Core Team. 2016. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. URL <https://www.R-project.org/>.
- Venables, W.N. and Ripley, B.D. 2002. *Modern Applied Statistics with S-PLUS*. Fourth Edition. New York: Springer.

### เค้าโครงรายวิชา (Course Outline)

1. ชื่อ module : module 5 ออกแบบการทดลอง (Experimental Design) จำนวน credit : 2(1-2-3) หน่วยกิต  
หัวข้อที่ศึกษา: Principles of experimental designs; completely randomized designs; sample size determination; randomized complete block designs; factorial designs; multiple comparisons; model checking; computer applications)

2. หัวข้อเนื้อหา จำนวนชั่วโมงที่สอนแต่ละหัวข้อ:

Date and time (tentative)	Topic	Number of hours		
		lecture	practice	Self-study
Jul 3, 2022 Jul 4, 2022	Principles of experimental designs and introduction to R program	1	3	3
Jul 10, 2022 Jul 11, 2022 Jul 17, 2022	Completely randomized designs and sample size determination	2	3	6
Jul 18, 2022 Jul 24, 2022 Jul 25, 2022 Jul 31, 2022	Model checking	2	6	6
Aug 7, 2022 Aug 8, 2022 Aug 15, 2022	Multiple comparisons	2	4	6
to be decided	<b>Midterm Examination</b>			
Aug 21, 2022 Aug 22, 2022 Aug 28, 2022	Randomized complete block designs	2	5	6
Aug 29, 2022 Sep 4, 2022 Sep 5, 2022 Sep 11, 2022 Sep 12, 2022 Sep 18, 2022 Sep 19, 2022 Sep 25, 2022	Factorial designs	6	10	18
to be decided	<b>Final Examination</b>			

**Remark:**

1. The timetable might be adjusted due to any inconvenience.
2. Midterm and final examinations will be informed to the students a week before.

3. กระบวนการจัดการเรียนรู้ของรายวิชาตามหน่วยกิตของภาคทฤษฎี

- |   |                                   |
|---|-----------------------------------|
| 1) การจัดการเรียนการสอนโดยวิธีบรรยาย (lecture)          | ร้อยละ 50 (50% of teaching hours) |
| 2) การฝึกปฏิบัติการวิเคราะห์ข้อมูลตัวอย่าง (Case study) | ร้อยละ 30 (30% of teaching hours) |
| 3) ซักถามและแสดงความคิดเห็นในชั้นเรียน (Discussion)     | ร้อยละ 40 (40% of teaching hours) |
| 4) ทำโจทย์ (Exercise)                                   | ร้อยละ 10 (10% of teaching hours) |

#### 4. วิธีการวัดและประเมินผลของรายวิชา

วิธีการ	ร้อยละ
- สอบกลางภาค (Midterm)	35
- สอบปลายภาค (Final)	35
- การมีส่วนร่วมในชั้นเรียน (Class attention and participation)	10
- รายงานและ/หรือชิ้นงาน (Assignment)	20
<b>รวม</b>	<b>100</b>

#### 5. ชื่ออาจารย์ผู้สอน: ดร.ศศิวิมล อิวสกุล (Dr.Sasiwimon Iwsakul)

#### 6. วัน-เวลา เรียน : เรียนทุกวันจันทร์ และ วันอังคาร เวลา 10.00 – 11.50 น. โดยเริ่มเรียนวันที่ 3 กรกฎาคม – 25 กันยายน 2566 ณ ห้อง m211 ตึกคณิตศาสตร์ คณะวิทยาศาสตร์ หรือ ห้องประชุมบัณฑิตา ชั้น 10 บัณฑิตวิทยาลัย อาคาร LRC หรือ เรียน Online โปรแกรม Microsoft Team

Class will be on every Monday and Tuesday at 10.00 – 11.50 a.m. starting from Jul 3 to Sep 25, 2023 at m211 room, Mathematic Building, Faculty of Science, or Pundidta room, 10<sup>th</sup> floor, Graduate School, LRC2, PSU Hatyai Campus or online through Microsoft Team applications.

#### 7. เครื่องมือและอุปกรณ์ที่ใช้ประกอบการเรียนการสอน ได้แก่

- 1) คอมพิวเตอร์
- 2) ทีวีโปรเจกเตอร์ (LCD)
- 3) ตำรา และเอกสารประกอบการสอน

#### 8. หนังสือ ตำรา วารสาร และฐานข้อมูลที่ใช้ประกอบการเรียนการสอน ได้แก่

1. Kuehl, R.O. (2000). Design of Experiments: Statistical Principles of Research Design and Analysis, 2nd edition, Duxbury Press.
2. Montgomery, D. C. (2005). Design and Analysis of Experiments, 6th edition. John Wiley & Sons, Inc., New York.
3. R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <http://www.R-project.org/>

RF1 general request form (*for student of Pattani Campus*, Please fulfill before Jun 20, 2023 )



RF 1

General Request Form

Date.....Month.....Year.....

Request for.....

Dear Dean of the Graduate School,

Mr./Mrs./Miss..... a student of the Program.....

.....Faculty.....Student ID.....

would like to request for.....

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Please kindly proceed as requested.

Yours sincerely,

.....

Supervisor/Advisor's recommendation (Please pass your faculty)

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Signature.....

(.....)

<p>1. Registration Officer (Pattani Campus)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>2. Graduate School</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>3. Registration Officer (Hat Yai Campus)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
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