



Course Syllabus

Name of Institution Walailak University

School/Institute/college International College of Dentistry **Department** Oral Bioscience

Program Master of Science Program in Dentistry (International Program)

General Information

1. Course Code and Course Title

DST61-600 Research Methodology and Data Analysis

2. Number of Credits

3 (2-2-5)

3. Curriculum and Type of Subjects

This is the required major courses of Master of Science Program in Dentistry (International Program).

4. Course Coordinators and Lecturers

Course coordinators' names Dr. Panomwat Amornphimoltham

Lecturers' names Prof. Dr. Sittichai Koontongkaew

Asst. Dr. Kusumawadee Utitapan

Dr. Irin Sirisoontorn

Dr. Dinesh Rokaya

Dr. Bishwa Bhattarai

5. Trimester / Year of Study

Trimester (1st) year of study (1st)

6. Pre-requisites (if any)

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7. Co-requisites (if any)

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8. Venue of Study

Lecture and Practice: Monday to Friday 9.00-12.00 pm and 1.00-4.00 pm Room: 1

9. Date of the Latest Revision

..23/06/20.....

10. Updated details of the course

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Note: this course syllabus template is based on dimensions designed by The United Kingdom Professionals framework (UKPSF)

Design and plan learning activities and/or programs of study (A1, UKPSF)

Design and plan learning activities learning activities and/or programs of study. (TQF 3, teaching and learning process and activities, etc.)

1. Philosophy, Vision, and Mission of Walailak University

Vision

To be an institution of good governance, a source of knowledge for critical problems facing the nation, to unflinchingly address community needs, and to strive for international recognition for excellence.

The university has 4 major commitments as follows:

1. To provide high level training for students, based on world standards, consistent with socio-economic development of the South of Thailand and Thailand as a whole;
2. To conduct research in order to develop new knowledge that can be of benefit to national progress, and help enhance international competitiveness of Thailand;

3. To provide and share expertise and technical services to organizations, both private and government sectors, including research and training and technological transfers in areas that help develop the region and country;
4. To act as a center for the conservation and restoration of art and culture.

2. Walailak University Graduate Attributes

Walailak University aims to discover, seek, maintain and disseminate knowledge and academic excellence for the progress of society. At the heart of its obligation is to develop individuals who are both professionally-competent and morally upright.

Philosophy, Vision, and Mission of the Program

Our Master of Science Program in Dentistry aims to foster students to achieve high degree of professional competence in dental specialists interfaced with research focus. Graduates are expected to be able to independently construct dental science knowledge and achieve academic research impact in the international level. We encourage students to collaborate and integrate oral health science to other disciplines while maintaining personal moral and professional ethics.

Program Graduate Attributes

1) Achieve professional excellence and apply current and emerging science and technology to construct scientific knowledge in advanced dental specialties. Graduate roles as educational and research leader in the field are recognized both national and international stages.

2) Integrate scientific research methods with the dental specialties to service and improve community dental health.

3) Develop research for academic excellence which benefit to national science and technology development. The students are encouraged to publish in the well-recognized international peer review platform and patent the discoveries.

In addition to attributes specific to program the 21st skills are also featured in the program, including skills in communication, collaboration, critical thinking and creative thinking.

3. Course Objectives (Use the Bloom's Taxonomy as a guide to structure your course objectives) **(Put in the black dots in the curriculum mapping in the TQF 2)**

At the end of the trimester or semester, students should be able to:

- 3.1 Describe overall process of research methodology in dentistry and critical appraisal of scientific articles.
- 3.2 Familiar with conducting a search of biomedical database and design a good concept proposal.
- 3.3 Apply the appropriate statistical analysis to research proposal development.
- 3.4 Analyze, critique and screen the peer-review international research literatures.

- 3.5 Familiar with human and animal ethics application and laboratory biosafety process and write funding proposal.
- 3.6 Critique research literatures and scientific presentations and apply toward owns scientific writing, presentation and thesis.
- 3.7 Respect to others' opinions and accepting the differences in individual both in academia and profession.
- 3.8 Exhibit responsibility in self and group.

Teach and/or support learning (A2, UKPSF)
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Identify teaching methods/approaches to support learning

1. Course Description

Course includes research methodology in oral biology research, laboratory research, clinical research and epidemiology. How to apply the methodology process in research design from literatures review, generating research hypothesis, sample size consideration, population sampling, power of test, data collection, data analysis to writing research proposal, research grant application, report, data presentation, analysis and critical appraisal of scientific articles, research quality control and disease screening and laboratory diagnostic evaluation.

2. Credit Hours/Trimester or Semester

Lecture and other teaching activities (hours)			Total hours	Laboratory/ Field Study/ Internship (hours)	Self-study (hours)
Lecture (hours)	Active learning for Formative assessment				
	small class teaching (hours)	Other teaching activities (hours)			
12 (25%)	12 (25%)	0	24 (50%)	24 (50%)	No less than 60

* small class teaching or other learning activities to support learning. These activities are additional to large class lecture.

Teaching methods: You can choose more than 1 method by put ✓ in .

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|---|--|
| <input checked="" type="checkbox"/> Lecture-based | <input checked="" type="checkbox"/> Discussion-based |
| <input type="checkbox"/> Demonstration-based | <input type="checkbox"/> Project-based |
| <input type="checkbox"/> Experimental-based | <input type="checkbox"/> Laboratory |

Date/Time	Mon	Tue	Wed	Thu	Fri
	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17
9.00-10.00 am.	Course orientation/Overview of research process/Type of research	Study design/ Population & sample	Critical reading/Literature reading	Variable and measurement	Mann Whitney U /Wilcoxon Signed rank Test
10.00-11.00 am.					
11.00-12.00 am.	Practice	Practice	Practice	Practice	Practice
Instructor	Panomwat	Panomwat	Dinesh	Kusumawadee	Panomwat
	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2
12.00-1.00 pm.	Lunch Break				
1:00-2.00 pm.	Problem identification	Research Hypothesis Development	Citation and reference writing	T-Test/estimation/ANOVA	Kruskal-Wallis test/Friedman test
2.00-3.00 pm.					
3.00-4.00 pm.	Practice	Practice	Practice	Practice	Practice
Instructor	Sittichai	Panomwat	Bishwa	Kusumawadee	Panomwat
	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2
Date/Time	Mon	Tue	Wed	Thu	Fri
	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24
9.00-10.00 am.	Correlation and Regression	Ethics in research (Human/Animal)	Scientific Presentation (Oral & Poster Presentation)	Research Proposal Development	
10.00-11.00 am.					
11.00-12.00 am.	Practice	Practice		Practice	
Instructor	Sittichai	Panomwat	Irin	Sittichai	
	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	
12.00-1.00 pm.	Lunch Break				
1:00-2.00 pm.	Statistical Practice	Biosafety in Laboratories	Scientific Presentation Practice	Concept Proposal Discussion	
2.00-3.00 pm.					
3.00-4.00 pm.		Practice			
Instructor	Sittichai/ Panomwat/Kusumawadee	Panomwat	Irin	All Instructors	
	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	Smart Classroom 2	
Date/Time	Mon	Tue	Wed	Thu	Fri
	Jul 27	Jul 28	Jul 29	Jul 30	Jul 31
9.00-10.00 am.	Government Holiday	King's Birthday	Final examination		

10.00-11.00 am.					
11.00-12.00 am.					
12.00-1.00 pm.					
1.00-2.00 pm.					
2.00-3.00 pm.					
3.00-4.00 pm.					

Teaching Plan and Evaluation

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
1/1 (3 hours) July 13, 2020	Course orientation/ Overview of research process/ Type of research 1. What is research? 2. What is the type of research? 3. Steps in research process Lecturer Panomwat	1. Definition of research 2. Give examples types of research 3. Explain the steps and their basic components in the research process?	1,3,5,7	-Interactive lecture -Q&A	-TQF3 -Concept proposal template -Overview of research process http://samples.jbpub.com/9781449627843/Chapter1.pdf	Read TQF3	-Formative assessment after class (80% passed criteria) -Summative evaluation: Short answer questions (passing criteria 80%)
2/1 (3 hours) July 13, 2020	Problem identification 1. Developing a research question 2. Characteristics of a good research question (FINER) 3. Problems and solutions in developing the research question Lecturer Sittichai	1. Explain how to develop a research question 2. Explain characteristics of a good research question (FINER) 3. Explain problems and solutions in developing the research question	1,3,5,7	-Interactive lecture -Practice/activities -Q&A	a. Sundaram KR. (2012) Principle of writing research protocol http://www.ksos.in/ksosjournal/journalsub/Journal_Article_27_471.pdf b. Farrugia P. <i>et al.</i> (2009) Research questions, hypotheses and objectives https://canjsurg.ca/wp-content/uploads/2013/12/53-4-278.pdf	Read material assignment and practice after class	-Formative assessment after class (80% passed criteria) -Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
3/2 (3 hours) July 8, 2019	Study design -Classification of study design -Types of observational and experimental studies Population and sample -concepts -parameters -Random sampling -non-probability sampling -Sample size Lecturer Panomwat	1. Distinguish between an observational study and a randomized experiment. 2. Explain how and why placebos and blinding are used in experiments. 3. Distinguish between a sample and a population 4. Recognize when it is, and is not, appropriate to use sample data to infer information about a population.	1,2,3,4 ,7,8	-Reading assignment -Interactive lecture -In-class discussion	Study design -Chapter 2, "Study designs in medical research" in B Dawson, RG Trapp (2004) <i>Basic & Clinical Biostatistics</i> , 4 th Ed. Population and sample -Chapter 3&4, "Population&Sample" p.26-40 in G.F. Dawson (2008) <i>Easy Interpretation of Biostatistics</i> , 1 st Ed.	-Read the assignment -Come prepared with questions about topics that are unfamiliar or confusing -Participate in the class discussion	-Formative assessment during class (80% passed criteria) -Summative evaluation: Short answer questions (passing criteria 80%)
4/2 (3 hours) July 8, 2019	Research Hypothesis Development - Definition of research hypotheses - How to formulate research hypotheses - Different types of hypotheses Lecturer	1. Distinguish differences between research question, research objective and research hypotheses. 2. Formulate a good research hypotheses.	1,2,3,4 ,7,8	-Reading assignment -Interactive lecture	-Chapter 6 "Constructing hypotheses" p. 237-262. Kumar R. <i>Research methodology: a step-by-step guide for beginners</i> . 2 nd ed. London: Sage Publications, (2005).	-Read the assignment -Come prepared with questions about topics that	-Formative assessment during class (80% passed criteria)

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	Panomwat			-In class discussion		are unfamiliar or confusing -Participate in the class discussion	-Summative evaluation: Short answer questions (passing criteria 80%)
5/2 (3 hours) July 9, 2019	Literature reading/Critical reading 1. Why read papers at all? 2. Structure of research article 3. Searching the literature 4. Reading analysis and how to synthesize conclusion from research paper 5. Assessing literature quality and selection as reference of interesting research Lecturer Dinesh	1. Explain significance of reading in research process 2. Explain types of literature 3. Use EndNote in searching and managing of literature 4. Explain concept of critical reading, synthesis and conclusion of knowledge 5. Evaluate research article	1,3,5,6,7,8	-Interactive lecture -Practice/activities -Q&A	a. Ader HJ and Mellenbergh GJ. Research methodology in the social, behavioural and life sciences. London: Sage Publications, 1999. b. Downs F. Readings in research methodology. 2 nd ed. Philadelphia: Lippincott, 1999.	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: writing paper critique (passing criteria 80%)

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6/2 (3 hours) July 9, 2019	Citation and reference writing 1. Principle of citation 2. Characteristic of reference and bibliography 3. Types of reference 4. Using EndNote for citation and reference writing Lecturer Bishwa	1. Explain principle of citation 2. Understand characteristic of reference and bibliography 3. Explain types of reference 4. Use EndNote for citation and reference writing	3,7,8	-Interactive lecture -Practice/activities -Q&A	a. https://www.scientificstyleandformat.org/Tools/SSF-Citation-Quick-Guide.html b. Nigam, A. & Nigam, P. Citation Index and Impact factor. <i>Indian J. Dermatology, Venereol. Leprol.</i> 78 , 511 (2012).	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)
7/2 (3 hours) July 10, 2019	Variable and measurement 1. General perspectives on measurement in scientific research – definition, levels of measurement, types of variables in research, operational definitions of research variables 2. Data collection 3. Quality of the measurement – validity & reliability	1. Definition and types of variables in research, and operational definitions of research variables 2. Levels of measurement and statistical analysis 3. Principle of data collection 4. Quality of the measurement 5. The errors in research	2,3,4,5 ,7	-Interactive lecture -Practice/activities -Q&A	a. Kumar R. Research methodology: a step-by-step guide for beginners. 2 nd ed. London: Sage Publications, 2005. b. Ader HJ and Mellenbergh GJ. Research methodology in the social, behavioral and life sciences. London: Sage Publications, 1999	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
	4. Errors in research: systematic VS random errors and how to prevent or limit both types of errors Lecturer Kusumawadee						
8/2 (3 hours) July 10, 2019	T-Test/ Estimation/ANOVA 1. Point estimation 2. Interval estimation with confidence interval 3. Hypothesis setting for two and more groups comparison (dependent and independent sample) 4. Assumption of unpaired t-test and paired t-test 5. Assumption of Analysis of Variance (ANOVA); One-way ANOVA, One-way repeated ANOVA and Two-way ANOVA	1. Principle of inferential statistics to estimate population parameters from sample statistics 2. Principle of hypothesis setting for two and more groups comparison (dependent and independent sample) 3. Assumption of unpaired t-test and paired t-test 4. Assumption of ANOVA; One-way ANOVA, One-way repeated ANOVA and Two-way ANOVA	2,3,4,5 ,7,8	-Interactive lecture -Practice/activities -Q&A	a. Mitchell K and Glover T. An introduction to biostatistics. Boston: McGraw-Hill, 2002. b. Bernard R. Fundamentals of biostatistics. 3 rd ed. Boston: PWS-KENT, 1990. c. SPSS program	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
	6. Interpretation of the result analyzed by t-test and ANOVA 7. Assumption and method of post-hoc comparison (conservative and liberal tests) 8. The statistical errors (type I and type II errors) Lecturer Kusumawadee	5. Concept of result interpretation when analyzed by t-test and ANOVA 6. Assumption and method of post-hoc comparison 7. Definition and differentiation of statistical errors (type I and type II errors), and the prevention process					
9/2 (3 hours) July 11, 2019	Mann Whitney U /Wilcoxon Signed rank Test -nonparametric statistical techniques -basic properties of nonparametric statistical techniques - nonparametric statistical techniques for one sample - nonparametric statistical techniques for independent two samples	1. Explain basic properties of nonparametric statistical techniques 2. Compare and contrast parametric and nonparametric test 3. Identify multiple applications where nonparametric approaches are appropriate 4. Perform and interpret the Mann Whitney U Test	1,2,3,4 ,5,7,8	-Reading assignment -Interactive lecture -In-class discussion	a. Siegel and Castellan. (1988). "Nonparametric Statistics for the Behavioral Sciences," 2nd edition, New York: McGraw-Hill. b. Conover WJ. (1999) Practical Nonparametric Statistics, 2 nd edition, New York: John Wiley and Sons c. Dederichs M, Fahmy MD, Kuepper H, Guentsch A. Comparison of Gingival	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
	- nonparametric statistical techniques for dependent two samples Lecturer Panomwat	5. Perform and interpret Wilcoxon Signed rank Test			Retraction Materials Using a New Gingival Sulcus Model. J Prosthodont. 2019 Jun 17		
10/2 (3 hours) July 11, 2019	Kruskal-Wallis test/Friedman test 1. nonparametric statistical techniques for independent K samples 2. nonparametric statistical techniques for dependent K samples Lecturer Panomwat	1. Perform and interpret the Kruskal Wallis test 2. Perform and interpret Friedman test.	1,2,3,4 ,5,7,8	-Reading assignment -Interactive lecture -In-class discussion	a. Siegel and Castellan. (1988). "Nonparametric Statistics for the Behavioral Sciences," 2nd edition, New York: McGraw-Hill. b. Conover WJ. (1999) Practical Nonparametric Statistics, 2 nd edition, New York: John Wiley and Sons	Reading assignment and practice after class	-Formative assessment during class (80% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)
11/2 (3 hours) July 12, 2019	Ethics in research Human -Basic principle of bioethics -Nuremburg Code -Helsinki Declaration -Principle of Good Clinical Practice	-Understand basic principle of bioethics -Know Nuremberg Code and Declaration of Helsinki. -Apply for WU human ethics committee.	1,2,3,7 ,9	-Flipped-Classroom -Interactive lecture -Case-based discussion	-The World Medical Association Declaration of Helsinki -Human Subjects Regulations Decision Chart https://www.hhs.gov/ohrp/sites/default/files/full-2016-decision-charts.pdf	-Reading assignment to prepare for class discussion	-Formative assessment during class (60% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
	-WU human ethics application Animal -The 3Rs and animal welfare -Thai IACUC -SOP -Animal Protocol -WU Animal Ethics Committee application Lecturer Panomwat	-Explain The 3Rs and animal welfare -Explain SOP and animal protocol - Apply for WU animal ethics committee. -Take part in Ethics case discussion			-Human Research Ethics Committee of Walailak University application form - Guide for the care and use of laboratory animals 8 th Ed https://www.nap.edu/catalog/12910/guide-for-the-care-and-use-of-laboratory-animals-eighth -Animal Ethics Committee of Walailak University application form - Chapter3 Ethics in Human and Animal studies p53-82 in Laake P., Benestad H.B., Olsen B.R. (2007) Research Methodology in the Medical and Biological Sciences. Academic Press,		
12/2 (3 hours) July 12, 2019	Biosafety in Laboratories 1. Principle of biological safety 2. Biosafety level		1,2,3,7,9	-Flipped-Classroom -Interactive lecture	a. Laboratory Biosafety Manual, WHO b. WU Laboratory Biosafety Regulation c. WU BSL form	-Reading assignment to prepare for class discussion	-Formative assessment during class (60% passed criteria)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
	3. Safe work practices in laboratory environment 4. PPE 5. Waste management 6. WU regulation Lecturer Panomwat						- Summative evaluation: Short answer questions (passing criteria 80%)
13/3 (3 hours) July 15, 2019	Correlation and Regression 1. The principle of correlation and linear regression 2. Pearson's correlation coefficient 3. Spearman's rank correlation coefficient 4. Regression equation and regression coefficient 5. Linear regression fit model Lecturer Sittichai	1. Principle of correlation and simple linear regression analysis 2. How correlation analysis is different from regression analysis 3. Differences between Pearson's correlation coefficient and Spearman's rank correlation coefficient	2,3,4,5 ,7,8	-Interactive lecture -Practice/activities -Q&A	a. Bland M. An Introduction to Medical Statistics. 2 nd ed. New York: Oxford University Press, 1995. b. Kim JS & Dailey RJ. Biostatistics for oral healthcare: chapter 2&3. Blackwell. 2008.	Reading assignment and practice after class	-Formative assessment during class (60% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
14/3 (3 hours) July 15, 2019	Statistical Practice Lecturers Sittichai Panomwat Kusumawadee	<ol style="list-style-type: none"> 1. Use basic analytical techniques to generate results. 2. Interpret results of commonly used statistical analyses in written summaries 3. Demonstrate statistical reasoning skills correctly and contextually. 	2,3,4,5,8	-Practicing participation	-Practice problem in biostatistics.	-Revised all statistical test before class.	-Class participation.
15/3 (3 hours) July 18, 2019	Proposal Development/Proposal Presentation- <ol style="list-style-type: none"> 1. Elements of a proposal 2. Characteristics of good proposals 3. Writing and presenting research proposal Lecturer Sittichai	<ol style="list-style-type: none"> 1. Explain significance of proposal 2. Explain principle of proposal writing and presentation 3. Develop a concept proposal 	3,5,7,8	-Interactive lecture -Practice/activities -Q&A	<ol style="list-style-type: none"> a. Lawrence F. Locke, Waneen Wyrick Spirduso, Stephen J. Silverman. Proposals that work: A guide for planning dissertations and grant proposals 4th edition. Sage Publications, Inc. 1999. b. Paul D. Leeds, Jeanne Ellis Ormrod. Practical research: Planning and 	Reading assignment and practice after class	- Concept Proposal Report (20% of LO assessment plan)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management (K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)	Materials and Resources (K1, UKPSF: The subject materials)	Assignments/ Guided reading	Evaluation/ Criteria (K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)
					designing 8 th edition. Pearson Education, Inc. 2005.		
16/3 (3 hours) July 18, 2019	Concept Proposal Discussion Lecturers Sittichai Panomwat Kusumawadee	1. Participate in discussion of concept proposals. 2. Communicate the research plan professionally.	1,2,3,4 ,5,6,7, 8,9,10	-Small group discussion			Concept Proposal Presentation (10% of LO assessment plan)
17/3 (3 hours) July 19, 2019	Research Presentation (Oral & Poster Presentation) 1. Discussion of presentation techniques. 2. Develop visual scientific presentations incorporating a logical structure and coherent design. 3. Revision and practice for presentations Lecturer irin	1. Design, prepare and orally present research findings to a scientific audience and effectively respond to questions and critique.	1,3,4,5 ,6,7,8	-Flipped Classroom -Interactive lecture -small group discussion			-Formative assessment during class (60% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

Session No./ Week No. (Hours) Date	Topics Lecturer/Instructor	Learning Objectives (Students are able to...)	The 21 st Century Skills	Teaching Methods/ Activities/Class management <i>(K3, UKPSF: How students learn, both generally and within their subject/ disciplinary area)</i>	Materials and Resources <i>(K1, UKPSF: The subject materials)</i>	Assignments/ Guided reading	Evaluation/ Criteria <i>(K2, UKPSF: Appropriate methods for teaching, learning and assessing in the subject area and at the level of the academic program)</i>
18/3 (3 hours) July 19, 2019	Research Presentation (Scientific Report/Manuscript) 1.Basic writing rules 2.Outline of scientific paper 3.Design scientific figures Lecturer Irin	1. Write and edit a manuscript within a team. 2. Effectively use and provide peer feedback to quickly develop a rough draft.	1,2,3,4 ,5,6,7, 8,9,10	-Flipped Classroom -Interactive lecture -small group discussion			-Formative assessment during class (60% passed criteria) - Summative evaluation: Short answer questions (passing criteria 80%)

As mentioned above, generic skills on the 21st skills are emphasized across curricular. Details are as follows:

1. Literacy
2. Numeracy
3. Reasoning
4. Problem Solving
5. Critical Thinking
6. Collaboration
7. Communication
8. Computing
9. Career and Life skills
10. Cross-Cultural Skills

Textbook (The subject material (K1, UKPSF))

1. Required Textbooks

1. Kumar R. **Research methodology: a step-by-step guide for beginners**. 2nd ed. London: Sage Publications, (2005).
<https://drive.google.com/file/d/1OPsf7SiKFIUNvIOhsmM9T3rvLybOUCo/view?usp=sharing>
2. Jay S Kim & Ronald J Dailey **Biostatistics for Oral Healthcare** Blackwell Munksgaard (2008).
<https://drive.google.com/file/d/18-R3rmEgOPiM4Rj6A6uEMGtC1pucB9ru/view?usp=sharing>

2. Recommended Textbooks

1. Ader HJ and Mellenbergh GJ. **Research methodology in the social, behavioral and life sciences**. London: Sage Publications, (1999).
2. Beth Dawson, Robert Trapp **Basic and Clinical Biostatistics** Publisher: McGraw-Hill Medical; 4th ed. (2004). Lange basic science paperback ISBN-10: 0071410171, ISBN-13: 978-0071410175.
3. Downs F. **Readings in research methodology**. 2nd ed. Philadelphia: Lippincott, (1999).
4. Mitchell K and Glover T. **An introduction to biostatistics**. Boston: McGraw-Hill, (2002).
5. Bernard R. **Fundamentals of biostatistics**. 3rd ed. Boston: PWS-KENT, (1990).
6. H. Motulsky (1995) **Intuitive biostatistics : a nonmathematical guide to statistical thinking**. New York : Oxford University Press.
7. Siegel and Castellan. (1988). **Nonparametric Statistics for the Behavioral Sciences**, 2nd edition, New York: McGraw-Hill.
8. Conover WJ. (1999) **Practical Nonparametric Statistics**, 2nd edition, New York: John Wiley and Sons
9. Laake P., Benestad H.B., Olsen B.R. (2007) **Research Methodology in the Medical and Biological Sciences**. Academic Press.

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10. Bland M. **An Introduction to Medical Statistics**. 2nd ed. New York: Oxford University Press, (1995).
 11. Lawrence F. Locke, Waneen Wyrick Spirduso, Stephen J. Silverman. **Proposals that work: A guide for planning dissertations and grant proposals** 4th edition. Sage Publications, Inc. (1999).
 12. Paul D. Leeds, Jeanne Ellis Ormrod. **Practical research: Planning and designing** 8th edition. Pearson Education, Inc. (2005).
 13. The World Medical Association Declaration of Helsinki. (<https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>)
 14. Guide for the care and use of laboratory animals 8th Ed. National Research Council (US) Committee for the Update of the Guide for the Care and Use of Laboratory Animals. Washington (DC): [National Academies Press \(US\)](#); 2011. ISBN-13: 978-0-309-15400-0 ISBN-10: 0-309-15400-6.

3. Scholarly articles (There must always be journal articles as additional resources.)

1. Nigam, A. & Nigam, P. **Citation Index and Impact factor**. *Indian J. Dermatology, Venereol. Leprol.* **78**, 511 (2012).
2. K.R. Baumgardner (1997) **A review of key research design and statistical analysis issues**, *Oral Surgery Oral Medicine Oral Pathology*, 84(5), 550-556.
3. Harrison JE. **Evidence-based orthodontics—how do I assess the evidence?** *J Orthod* 2000; 27.
4. Sundaram KR. (2012) **Principle of writing research protocol**.
5. Farrugia P. *et al.* (2009) **Research questions, hypotheses and objectives**.

Develop effective learning environments and approaches to student support and guidance (A4, UKPSF)

1. Consultation hours per week for individual students

Lecturing Team	Lecturer	Phone Number	Email, LINE, Facebook, etc.	Consultation Time*
Lecturer	Prof. Dr. Sittichai Koontongkaew		koontongkaew@gmail.com	By appointment
Course Coordinator	Dr. Panomwat Amornphimoltham	086-367-6222	pa79wa@gmail.com	By appointment
Guest Lecturer	Asst. Dr. Kusumawadee Utispan		kusumawadee.utispan@gmail.com	By appointment
Lecturer	Dr. Irin Sirisoontorn	092-505-3535	irin.sirisoontorn@gmail.com	By appointment
Lecturer	Dr. Dinesh Rokaya		dineshrokaya115@hotmail.com	By appointment
Lecturer	Dr. Bishwa Bhattarai	092-790-8294	bishwa052@gmail.com	By appointment

* Or other times as agreed by both student and lecturer.

Learning Supported Technologies/Applications (K4, UKPSF: The use and value of appropriate learning technologies)

- WU E-learning
 Facebook
 Google Education
 LINE applications
 ClassFlow Platform
 SPSS v. 22 up free trial version 14 days <https://www.ibm.com/th-en/products/spss-statistics>
 Endnote X9 available from library https://docs.google.com/forms/d/e/1FAIpQLSfoM72-M_YwMfmz-_6HVUoIMQskuUfqQZ6Kwh2BJ7P4D26i9A/viewform?vc=0&c=0&w=1

Diverse Learners Support (V1, UKPSF: Respect individual learners and diverse learning communities, V2, UKPSF: Promote participation in higher education and equality of opportunity for learners) (E.g. Learners' diversities are background knowledge and experience, ethnic, religion, etc. Learners' special needs are the visually impaired, the physically impaired, or those with the needs for technological support, etc.)

Types of Learners with special needs: (Please specify)(Optional)

Support plans and actions (Optional)

Online activities and discussion (Optional)

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Learning skills advice (To encourage lifelong learning and enhance the students’ learning strategies.)
(Optional)

- 1.
- 2.

Course Policy/Regulations

- **Attendance & Participation**

All students are expected to attend every class session and to participate. Exceptions must be made in advance.

Plagiarism

Plagiarism occurs when writers claim ownership of written words or ideas that are not their own. Plagiarism is a form of cheating and any instances of plagiarism will be dealt with promptly according to University procedures. Plagiarism is a form of academic dishonesty that is considered a serious offense and carries severe penalties ranging from failing an assignment to suspension from school. You are guilty of plagiarism any time you attempt to obtain academic credit by presenting someone else’s ideas as your own without appropriately documenting the original source.”

Assess and give feedback to learners (A3, UKPSF)

The 21st Century Skills Enhancement

1. **Morality and ethics** (Include both black and white dots as appeared in the TQF 2. Those with black dots must be evaluated. Those with white dots should be introduced in the course but not necessary to be evaluated. Present each sub-topic in the different line.) (Must be conformed with the 21st Century Skills, WU graduate attributes, (A1, A3, and K2, UKPSF))

Morality and ethics skills/characteristics to be developed	Assessment methods
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○ 1.1 Exhibit discipline, punctuality, honesty and responsibility. Respecting to rules and laws of organizations and societies.	Class activities and evaluation in all topics and from assignments and presentations.
○ 1.2 Demonstrate ethical behavior in academic and research. No plagiarism	Class activities and evaluation in all topics and from assignments and presentations.
● 1.3 Respect to others' opinions and accepting the differences in individual both in academia and profession.	Class activities and evaluation in all topics.

2. Knowledge

(Follow TQF 2, Explain the overall picture then go into detail for each unit's content, activities, teaching and learning methods, and assessment methods. Each line, each topic)

Knowledge skills/characteristics to be developed	Assessment methods
○ 2.1 Truly understand in theories and practices of research methodology. Develop self-learning skill and seek new knowledge.	Class activities and evaluation in topics 5,6,15,16
● 2.2 Advance and translate bodies of knowledge in dental science to society or commercial benefits.	Class activities and evaluation in topics 15,16

3. High order thinking

(Each topic, each line)

skills/characteristics to be developed	Assessment methods
○ 3.1 Systematically analyze and integrate knowledge from both theories and practices.	Class activities and evaluation in topics 5,6,15,16

skills/characteristics to be developed	Assessment methods
● 3.2 Initiate, analyze, systematic plan and conduct dental research.	Class activities and evaluation in topics 5,6,15,16
○ 3.3 Synthesize information from research and develop a new knowledge.	Class activities and evaluation in topics 5,6,15,16

4. Interpersonal relationship and responsibility

(Each topic, each line)

Interpersonal relationship and responsibility skills/characteristics to be developed	Assessment methods
○ 4.1 Creatively collaborate and appropriately interact to others.	Class activities and evaluation in all topics.
○ 4.2 Accept the differences in academic opinions and well demonstrate both leadership and followership.	Class activities and evaluation in all topics which have group discussion and group-work assignment.
● 4.3 Exhibit responsibility in self and group.	Class activities and evaluation in all topics which have assignments and presentations.

5. Numeracy, communication, and information literacy skills

(Each topic, each line)

5. Numeracy, communication, and information literacy skills to be developed	Assessment methods
● 5.1 Adequately apply the Mathematics and Statistics in data analysis, interpretation and presentation.	Class activities and evaluation in topics 3,4, 5,6,7,8,9,10,13,14
● 5.2 Appropriately apply information technology in data searching, collecting, processing, interpretation and presentation	Class activities and evaluation in topics 5,6,15,16
○ 5.3 Effectively apply communication skills (speaking, listening and writing) in academic environment both formal and informal situation.	Class activities and evaluation in topics 15,16 and from assignments and presentations.
○ 5.4 Use English to Skillfully communicate in academic presentation, thesis and research both in formal and informal setting.	Class activities and evaluation in topics 15,16 and from assignments and presentations.

Learning Outcome Assessment Plan (Every black dot in the TQF 2)

No.	Learning Outcomes (PLO)	Assessment Methods	Assignment submission deadline	Assessment Proportion (Percentage)
1	1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 5.4	Concept proposal presentation		10
2	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 4.3, 5.1, 5.2, 5.4	Concept proposal	July 23, 2020 after discussion	20
3	1.1, 2.1, 5.1	Formative assessment in class		10

No.	Learning Outcomes (PLO)	Assessment Methods	Assignment submission deadline	Assessment Proportion (Percentage)
4	1.1, 1.2, 1.3 , 2.1, 2.2 , 3.1, 3.3, 4.1, 4.2, 4.3 , 5.1 , 5.2 , 5.3, 5.4	Paper critique		10
5	2.1, 3.1, 5.1	Final exam	July 29, 2020 9-12 a.m.	40
6	1.1, 1.3 , 4.1, 4.2, 4.3	Class participation and classroom behavior		10

Assignment Criteria/Rubrics (Set the learning objectives. Is it group or individual work? Score proportion, assignment requirements and deadline, feedback, etc.)

Assessment form of Concept Proposal Presentation

Learning Objective	3.2 Familiar with conducting a search of biomedical database and design a good concept proposal. 3.3 Apply the appropriate statistical analysis to research proposal development. 3.5 Familiar with human and animal ethics application and laboratory biosafety process and write funding proposal. 3.6 Critique research literatures and scientific presentations and apply toward owns scientific writing, presentation and thesis. 3.7 Respect to others' opinions and accepting the differences in individual both in academia and profession. 3.8 Exhibit responsibility in self and group.		
Individual / Group Assignment	Individual		
Score Proportion	10		
assignment requirements and deadline			
Submission Deadline			
Requirements	Scale		
	5 Excellent	3 Fair	1 Need improvement
1. Delivery	<ul style="list-style-type: none"> Holds attention of entire audience with the use of direct eye contact, seldom looking at notes 	<ul style="list-style-type: none"> Consistent use of direct eye contact with audience, but still returns to notes 	<ul style="list-style-type: none"> Displays minimal eye contact with audience, while reading mostly from the notes.

	<ul style="list-style-type: none"> Speaks with fluctuation in volume and inflection to maintain audience interest and emphasize key points 	<ul style="list-style-type: none"> Speaks with satisfactory variation of volume and inflection 	<ul style="list-style-type: none"> Speaks in uneven volume with little or no inflection
2. Content/Organization	<ul style="list-style-type: none"> Demonstrates full knowledge by answering all class questions with explanations and elaboration Provides clear purpose and subject; pertinent examples, facts, and/or statistics; supports conclusions/ideas with evidence 	<ul style="list-style-type: none"> Is at ease with expected answers to all questions, without elaboration Has somewhat clear purpose and subject; some examples, facts, and/or statistics that support the subject; includes some data or evidence that supports conclusions 	<ul style="list-style-type: none"> Is uncomfortable with information and is able to answer only rudimentary questions Attempts to define purpose and subject; provides weak examples, facts, and/or statistics, which do not adequately support the subject; includes very thin data or evidence
3. Enthusiasm/ Audience Awareness	<ul style="list-style-type: none"> Demonstrates strong enthusiasm about topic during entire presentation Significantly increases audience understanding and knowledge of topic; convinces an audience to recognize the validity and importance of the subject 	<ul style="list-style-type: none"> Shows some enthusiastic feelings about topic Raises audience understanding and awareness of most points 	<ul style="list-style-type: none"> Shows little or mixed feelings about the topic being presented Raises audience understanding and knowledge of some points
4. Vocabulary	Uses a wide range of vocabulary and no repetition	Uses quite a wide range of vocabulary and not a lot of repetition.	Uses some new vocabulary and a few new expressions.
5. Pronunciation, Rhythm and intonation	Pronunciation is nice and both rhythm and intonation correspond to the expected in a presentation, easy to follow.	Pronunciation is often nice and both rhythm and intonation usually correspond to the expected in a presentation, quite easy to follow.	Pronunciation must improve quite a lot. Presenter makes an effort for adopting the adequate rhythm and/or intonation but does not often match that expected in an interview.

Assessment form of Concept Proposal

Learning Objective	<p>3.2 Familiar with conducting a search of biomedical database and design a good concept proposal.</p> <p>3.3 Apply the appropriate statistical analysis to research proposal development.</p> <p>3.4 Analyze, critique and screen the peer-review international research literatures.</p> <p>3.5 Familiar with human and animal ethics application and laboratory biosafety process and write funding proposal.</p> <p>3.6 Critique research literatures and scientific presentations and apply toward owns scientific writing, presentation and thesis.</p> <p>3.8 Exhibit responsibility in self and group.</p>
Individual / Group Assignment	Individual
Score Proportion	20

assignment requirements and deadline			
Submission Deadline	July 24, 2019		
Requirements	Scale		
	5 Excellent	3 Fair	1 Need improvement
1. Subject Matter	Student shows a deep understanding of the subject matter and its greater implications. Proposal or plan shows integration of some advanced or researched concepts.	Student shows an understanding of the subject matter and it is evident in the execution of the proposal or plan.	Student shows little understanding of the subject matter but confusion is evident in some aspects of the proposal or plan.
2. Creativity/Ambition	The project proposed is very original, creative and ambitious. The student is highly motivated, and the project has a good potential for success.	The project proposed is original, creative and somewhat ambitious. The student is motivated about the project, and the project has a good potential for success	The project proposed is not creative, original or ambitious, the student is uninspired, project has a low potential for success
3. Final Product	Shows excellent effort, care and creativity. Final product is complete and well-presented. Shows excellent research, careful planning, and excellent execution.	Shows some effort, care and creativity. Proposal or plan is finished and turned in on time. Shows some good research, some planning, vision, and execution.	Shows some effort, care and creativity. Proposal or plan is finished and turned in, but is rushed and is poorly presented.
4. Structure and Flow	Proposal is clear, concise, and has a logical structure and flow. Work shows deep consideration of the execution of the project after the proposal's approval.	Proposal makes general sense but requires some work to organize and structure in a logical and sensible manner. Minor elements may need clarification but otherwise well-made and ready for execution.	Proposal or plan is vague, disjointed, and shows no sense, structure, or flow. Confusing to read, difficult to understand.

Assessment form of Paper critique

Learning Objective	<p>3.4 Analyze, critique and screen the peer-review international research literatures.</p> <p>3.6 Critique research literatures and scientific presentations and apply toward owns scientific writing, presentation and thesis.</p> <p>3.7 Respect to others' opinions and accepting the differences in individual both in academia and profession.</p> <p>3.8 Exhibit responsibility in self and group.</p>
Individual / Group Assignment	Individual

Score Proportion	10		
assignment requirements and deadline			
Submission Deadline	July 24,2019		
Requirements	Scale		
	5 Excellent	3 Fair	1 Need improvement
1. Summary of article's major points	Presents a thorough summary of the article that is succinct and correct in both major points and supporting details.	Shows an understanding of the information in the article, but has not included some major points and/or supporting details.	Understanding of the article major points is incomplete or many misconceptions are demonstrated.
2. Critique of the literature review and conceptual framework	Addresses all elements and offers a complete and clear critique of weak or missing elements.	Constructs a judgment about the article; however, important elements are omitted or not supported.	Judgments are not constructed or are not supported by the facts contained within the article.
3. Critique of the study design and methods	Addresses all elements and offers a complete and clear critique of weak or missing elements.	Constructs a judgment about the article; however, important elements are omitted or not supported.	Judgments are not constructed or are not supported by the facts contained within the article.
4. Critique of the results and discussion	Addresses all elements and offers a complete and clear critique of weak or missing elements.	Constructs a judgment about the article; however, important elements are omitted or not supported.	Judgments are not constructed or are not supported by the facts contained within the article.
5. Conclusion	Strengths and limitations are clearly and thoroughly summarized with appropriate supporting details. Clinical relevance of the article is clearly addressed and convincing rationale presented.	Strengths and limitations are discussed, but not appropriately supported with supporting details. Clinical relevance is addressed, but a convincing rationale for clinical practice implications is omitted.	Strengths and limitations of the article and study are not discussed, or are too limited to provide a conclusion regarding the evidence. No or very limited reflection on the clinical relevance of the article.

Feedback: (Compulsory for every assignment. This is an important tool for lecturers to check if students meet the learning objectives. If not, lecturers should help students so they can achieve the learning objectives. (A3, UKPSF))

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Grading Criteria

Using the eight levels fixed rate assessment as shown in the following table

Grade Level	Meaning	Score	Grade Value
A	Excellent	85-100	4.0
B+	Very Good	80-84	3.5
B	Good	74-79	3.0

Grade Level	Meaning	Score	Grade Value
C+	Fairly Good	68-73	2.5
C	Fair		2.0
D+	Poor		1.5
D	Very Poor		1.0
F	Fail		0.0

I refers to "Incomplete Assessment"

W refers to "Withdraw"

Lecturer's use only: For Future Improvement of the Course

Engage in continuing professional development in subjects/disciplines and their pedagogy, incorporating research, scholarship and the evaluation of professional practices (A5, UKPSF)

Course Evaluation and Future Improvement (Conform to K5, UKPSF: Methods for evaluating the effectiveness of teaching and K6, UKPSF: The implications of quality assurance and quality enhancement for academic and professional practice with a particular focus on teaching)

1. **Teaching Evaluation Strategy** (Please put ✓ in . You can choose more than 1 methods.)
 - Every student evaluates
 - By examining students' results
 - Comments from examiner's meeting
 - Others.....
2. **Strategies for course effectiveness evaluation by students**
 - 2.1 Post-course students' anonymous evaluation and comment.
 - 2.2 Course committee discussion and propose the improvement plan to the curriculum committee.
3. **Teaching Future improvement**
 - 3.1 Organization of meeting and/or seminars among teaching staff and the curriculum committee at the end of the course to discuss on how to improve the course contents and/or teaching methods based on course assessment by the students and evaluation by the curriculum committee.
 - 3.2 Proposing the improvement plan to the curriculum committee for further discussion and approval.
4. **Evaluation of students' success in learning**
 - 4.1 Verify the quality of the examination and the students' scores by the course coordinator and bring the results to the course committee and the curriculum committee seminars to discuss how to improve the students' learning outcomes.
5. **Plans and actions for course improvement**
 - 5.1 Revise and analyze the examinations by the course committee.

5.2 Verify the quality of examination and the students' scores by the course coordinator and bring the results to the course committee and the curriculum committee seminars to discuss how to improve the students' learning outcomes.

----- Lecturer's use only -----

6. Experience sharing on teaching and learning participation

6.1 Please select how you share your teaching and learning experiences by put ✓ in . You can choose more than 1 methods.

Participate in the university's monthly Teaching and Learning colloquium

Please specify the month

Publish an article in an online newsletter

Please specify the newsletter detail

Summarized the teaching and learning result in the template from

to be gathered in Walailak Digital Learning Repository (WDLR)

Publish in national or international journal

Please specify the journal detail

Presented in national or international conferences

Please specify the conference's detail

6.2 Sharing results from 6.1

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