

Faculty of Nursing

Course Syllabus

Section 1: General Description

1. Code and Course Title: 641-814 Advanced Statistics and Quantitative Research
in Nursing
2. Credit: 3(2-2-5) Lecture/Discussion 30 hours
Lab/Practice/Presentation 30 hours
Self study 75 hours
3. Program: Doctor of Philosophy Program in Nursing Science
(International Program)
4. Course Coordinator: Assoc. Prof. Dr. Busakorn Punthmatharith
Coordinator Assistant: Asst. Prof. Dr. Umaporn Boonyasopun
5. Semester/Year/Academic Year: 1/1/2018
6. Classroom: Room 3203, 3rd Building

Section 2: Course Objectives

1. Course Objectives

After completion of this course, students will be able to

- 1.1 Explain nature of science and research in nursing, verification and
development of nursing knowledge using quantitative approach correctly
- 1.2 Design advanced quantitative research in nursing based on each step of
nursing research methodology correctly and appropriate with the topic
and research framework in the area of interest
- 1.3 Develop a quantitative research proposal in the area of interest and
identify statistics use correctly and appropriate with research questions
- 1.4 Evaluate psychometric properties of instruments correctly
- 1.5 Criticize ethical issues in nursing research and statistics use correctly
- 1.6 Criticize and evaluate value of research articles and dissemination and
utilization of nursing research correctly
- 1.7 Analyze and interpret the findings using advanced statistics correctly

2. Objectives of a Course Revision

- 2.1 Curriculum revision

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2.2 To fulfill the requirement of the higher educational standards

2.3 To change the content by focusing on research process, use of research findings, and advanced statistics interpretation

Section 3: Course Description and Design

1. Course Description

Advanced quantitative research in nursing; verification and development of nursing knowledge using advanced quantitative approach; development of framework, research question/hypothesis; quantitative research designs, validity of research; advanced research methodology, power analysis, data collection, and evaluation of properties of instruments; using advanced statistics in data analysis and statistical inference, analysis of variance and covariance, multiple regression, logistic regression, factor analysis and discriminant analysis; testing of statistical assumptions and theory in guiding the analysis; critique of published research; using of statistics in the area of interest

2. Number of Hours per Semester

Lecture /Discussion	Lab	Self-Study	Field Practice	Tutorial
30	30	75	-	-

3. Number of Hours per Week for Consultation

This course will provide 1 hour/week only for the student who needs consultation. This information will inform to the student in the course orientation session. The student must make appointment with the course coordinator in advance or come to see the instructor as the following schedule.

Name	E-mail	Week	Day	Time
Assoc. Prof. Dr. Busakorn Punthmatharith	p.busakorn@gmail.com	1-8	Thursday	9.00-10.00 a.m.
Asst. Prof. Dr. Umaporn Boonyasopun	uboonyasopun@yahoo.com	9-16	Thursday	9.00-10.00 a.m.

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Section 4: Learning Outcomes

1. Morality and Ethics

1.1 Analyze how to solve ethical issues regarding statistics and nursing research

2. Knowledge

2.3 Develop a research proposal in order to create new knowledge

2.4 Apply knowledge searching technique to develop accepted conclusion in nursing

3. Cognitive Skills

3.1 Evaluate and create new knowledge from research and theory by integrating concepts in nursing, eastern wisdom, and others related

3.3 Design an advanced quantitative nursing research proposal

4. Interpersonal Skills and Responsibility

4.1 Analyze, creative critique in issues regarding performing quantitative nursing research, and accept other ideas

4.3 Create positive relationships in group activities and demonstrate outstanding as a research leader

5. Numerical Analysis, Communication and Information Technology Skills

5.1 Screen the numerical data and statistics for quantitative nursing research use

5.3 Present reports regarding research and statistics

Section 5: Course Plan and Evaluation

5.1 Course Plan (Schedule) Room 3203

Week/Date	Time (Duration)	Topics	T/L	Lecturer
1/ Tuesday 21 August, 2018	08.00-08.30 am. (L0.5)	Course orientation	Discussion	Assoc. Prof. Dr. Busakorn Punthmatharith Asst. Prof. Dr. Umaporn Boonyasopun
1/ Tuesday 21 August, 2018	08.30-09.30 am. (L1)	Introduction to the course and course assignments - Nature of science and research in nursing	Discussion	Asst. Prof. Dr. Umaporn

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Week/Date	Time (Duration)	Topics	T/L	Lecturer
		- Verification and development of nursing knowledge using quantitative approach		
1/ Tuesday 21 August, 2018	09.30-11.00 am. (L1.5)	- Proposal writing - Development of research framework, question/hypothesis, data collection	Discussion	Assoc. Prof. Dr. Busakorn
1/ Tuesday 21 August, 2018	11.00 am.-12.00 N (L1.5)	Critique of quantitative nursing research in the area of interest	Discussion	Assoc. Prof. Dr. Busakorn
2/ Tuesday 28 August, 2018	08.30-10.30 am. (L2)	Consultation on critique & proposal papers (1)	Practice/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
2/ Tuesday 28 August, 2018	10.30 am.-12.00 N (L1.5)	Quantitative research designs - Non-experimental design	Discussion	Asst. Prof. Dr. Wipa Sae Sia
3/ Tuesday 4 September, 2018	08.00-10.00 am. (L2)	Quantitative research designs (Cont'd) - Experimental and quasi-experimental design	Discussion	Assoc. Prof. Dr. Busakorn
3/ Tuesday 4 September, 2018	10.00 am.-12.00 N (L2)	- Types of validity and threats to validity	Discussion	Asst. Prof. Dr. Umaporn
3/ Tuesday 4 September, 2018		Submit draft 1 (2 papers)		Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
4/ Tuesday 11 September, 2018	09.00-10.00 am. (P1)	Exercise 1: An example of a critique threat to validity in a selected research article	Practice/ Discussion	Asst. Prof. Dr. Umaporn
	10.00-11.30 am. (L1.5)	- Statistical power and sample estimation	Discussion	Assoc. Prof. Dr. Busakorn
5/ Tuesday 18 September, 2018	08.00-10.00 am. (P2)	Exercise 2: Performing sample size estimation and power analysis	Practice/ Discussion	Assoc. Prof. Dr. Busakorn
	10.00 am.-12.00 N (P2)	Consultation on a critique paper (2)	Practice/ Presentation/ Discussion (title/outline)	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
6/ Tuesday 25	08.00-10.00 am. (L2)	Evaluation of psychometric properties of instruments	Discussion	Asst. Prof. Dr. Umaporn

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Week/Date	Time (Duration)	Topics	T/L	Lecturer
September, 2018				
6/ Tuesday 25 September, 2018	10.00-11.00 am. (L1)	Rights and ethical issues in human subject research	Discussion	Assoc. Prof. Dr. Wandee
6/ Tuesday 25 September, 2018	11.00 am.-12 N (P1)	Assignment I (3-4 students/ group): Analysis of ethical issues in nursing research and statistics	Practice/ Discussion	Assoc. Prof. Dr. Wandee
7/ Tuesday 2 October, 2018	08.00-09.00 am. (L1)	Dissemination and utilization of nursing research	Discussion	Asst. Prof. Dr. Khomapak
7/ Tuesday 2 October, 2018	09.00-10.00 am. (P1)	Assignment II (individual): Analysis of utilization of nursing research from research articles	Practice/ Discussion	Asst. Prof. Dr. Khomapak
7/ Tuesday 2 October, 2018	10.00-11.30 am. (P1.5)	Consultation on a proposal paper (3)	Practice/ Presentation/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
8/ Tuesday 9 October, 2018	08.00-10.00 am. (P2)	Presentation of critique papers	Students' presentation/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
8/ Tuesday 9 October, 2018	10.00 am.-12.00 N (L2)	Data screening, outlier management, missing data analysis, and imputation	Discussion	Dr. Charuwan Kritpracha
9/ Tuesday 16 October, 2018	08.00-09.00 am. (P1)	Assignment III: Perform data screening, outlier management, missing data analysis, and imputation	Practice/ Discussion	Dr. Charuwan Kritpracha
9/ Tuesday 16 October, 2018	09.00-11.00 am. (L2)	Testing assumptions of univariate and multivariate data analysis and management	Discussion	Dr. Charuwan Kritpracha
9/ Tuesday 16 October, 2018	11.00 am.-12.00 N (P1)	Exercise 3: Perform testing assumptions and management	Practice/ Discussion	Dr. Charuwan Kritpracha
9/ Tuesday 16 October, 2018		Submit critique paper		Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn

Week/Date	Time (Duration)	Topics	T/L	Lecturer
10/ 23 October, 2018	No class	Holiday: King Chulalongkorn Memorial Day		
11/ Tuesday 30 October, 2018	09.00-11.00 am. (L2)	Multiple and logistic Regression	Discussion	Dr. Charuwan Kritpracha
11/ Tuesday 30 October, 2018	11.00 am.-12.00 N (P1)	Exercise 4: Perform multiple and logistic regression and interpret	Practice/ Discussion	Dr. Charuwan Kritpracha
12/ Tuesday 6 November, 2018	09.00 am.-12.00 N (L3)	t-test, Analysis of variance and repeated measures analysis	Discussion	Prof. Dr. Sasitorn
13/ Tuesday 13 November, 2018	08.00-9.30 am. (P1.5)	Exercise 5: Perform t-test, ANOVA and repeated measures analysis and interpret	Practice/ Discussion	Prof. Dr. Sasitorn
13/ Tuesday 13 November, 2018	09.30-11.00 am. (L1.5)	Analysis of covariance	Discussion	Prof. Dr. Sasitorn
13/ Tuesday 13 November, 2018	11.00 am.-12 N (P1)	Exercise 6: Perform ANCOVA and interpret	Practice/ Discussion	Prof. Dr. Sasitorn
14/ Tuesday 20 November, 2018	09.00-11.00 am. (L2)	Factor analysis: EFA	Discussion	Asst. Prof. Dr. Umaporn
14/ Tuesday 20 November, 2018	11.00 am.-12.00 N (P1)	Exercise 7: Perform EFA and interpret	Practice/ Discussion	Asst. Prof. Dr. Umaporn
15/ Tuesday 29 November, 2018	01.00 – 03.00 pm. (L2)	Discriminant analysis	Discussion	Dr. Noodchanath Kongchouy
15/ Tuesday 29 November, 2018	03.00 – 04.00 pm. (P1)	Exercise 8: Perform discriminant analysis and interpret	Practice/ Discussion	Dr. Noodchanath Kongchouy

Week/Date	Time (Duration)	Topics	T/L	Lecturer
2018				
16/ Tuesday 4 December, 2018	08.00 am.-12.00 N (P4)	Presentation of research proposals	Students' presentation/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
17/ Tuesday 11 December, 2018	08.00 am.-12.00 N (P4)	Presentation of research proposals (cont'd)	Students' presentation/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
17/ Thursday 13 December, 2018	09.00-11.00 am. (P2)	Presentation of research proposals (cont'd)	Students' presentation/ Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
17/ Thursday 13 December, 2018	11.00-11.30 am. (L0.5)	Course evaluation and reflection	Discussion	Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn
18/ Monday 17 December, 2018		Submit proposal paper		Assoc. Prof. Dr. Busakorn Asst. Prof. Dr. Umaporn

5.2 Evaluation Plan of the Learning Outcomes

Learning Outcomes	Methods of Evaluation	Week	Weight (Total = 100%)
1.1	Assignment I (3-4 students/group)	6	10%
2.3, 2.4	Assignment II (individual)	7	10%
5.1	Assignment III (3-4 students/group)	9	10%
2.3, 2.4, 4.1, 4.3, 5.1, 5.3	- A critique paper presentation (3-4 students/group)	8	10%
	- A research proposal presentation (individual)	16-17	15%
2.3, 2.4, 3.1, 3.3, 5.1, 5.3	- A critique paper (3-4 students/group)	9	15%
	- A research proposal (individual)	18	20%
4.1, 4.3	Discussion	1-17 except 10	10%

Note. Students can request for disclosure of an unexpected or a surprised mark/grade within the next following semester only.

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Section 6: Learning Resources

6.1 Required Textbooks/Books

- Grove, S. K., Gray, J. R., & Burns, N. (2015). *Understanding nursing research: Building an evidence-based practice* (6th ed.). St. Louis, MO: Elsevier Saunders.
- Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River, NJ: Pearson.
- Polit, D. F. (2010). *Statistics and data analysis for nursing research* (2nd ed.). Upper Saddle River, NJ: Pearson.
- Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Polit, D. F., & Beck, C. T. (2014). *Essentials of nursing research: Appraising evidence for nursing practice* (8th ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson/Allyn & Bacon.
- Vik, P. (2014). *Regression, ANOVA, and the general linear model: A statistics primer*. Thousand Oaks, CA: SAGE.
- Wood, M. J., & Ross-Kerr, J. C. (2011). *Basic steps in planning nursing research: From question to proposal* (7th ed.). Sudbury, MA: Jones and Bartlett.

6.2 Suggest Books and Other Resources

6.2.1 Books

- Abbott, M. L. (2017). *Using statistics in the social and health sciences with SPSS and Excel*. Hoboken, NJ: John Wiley & Sons.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Psychology Press.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Plichta, S. B., Elizabeth A. Kelvin, E. A. (2013). *Munro's statistical methods for health care research* (6th ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Stevens, J. (2002). *Applied multivariate statistics for the social sciences* [electronic resource] (4th ed.). Mahwah, NJ: Erlbaum.

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6.2.2 Journal

- Nursing Research
- Research in Nursing and Health

6.2.3 Electronic databases or websites

- <http://spss.en.softonic.com/>
- <http://www.statsoft.com/textbook/power-analysis/>
- http://en.wikipedia.org/wiki/Human_subject_research

Critique Paper Guideline:

A Critique of a Selected Quantitative Nursing Research Publication

1. Do a literature search on a well-studied nursing phenomenon of interest to you. Identify and obtain 5-10 scholarly works (theoretical and empirical studies), which form the basis of knowledge about the phenomenon. Select one quantitative study, which you consider to be the best of the set of studies. A study must be some type of experiment, i.e., an independent variable was manipulated. Studied variables must represent abstract variables linked to middle-range theory or grand theory of nursing of useful in nursing.

2. Submit a selected research article (1 hard copy) to Assoc. Prof. Dr. Busakorn, a course coordinator, on Tuesday, August 28, 2018.

3. Work on your paper with either Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn (will be assigned later) on the assigned dates

4. To critique a selected article, please follow guidelines for conducting a research critique such as Burns, N., & Groves, S. K. (2007). *Understanding nursing research: Building an evidence-based practice* (4th ed.). St. Louis, MO: Saunders Elsevier. (Chapter 13, pp. 444-497.) or Grove, S. K., Gray, J. R., & Burns, N. (2015). *Understanding nursing research: Building an evidence-based practice* (6th ed.). St. Louis, MO: Elsevier Saunders.

5. Submit a critique paper (draft 1) to your advisor (Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn) on Tuesday, September 4, 2018.

6. Submit a complete critique paper (1 copy) to your advisor (Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn) on Tuesday, October 16, 2018.

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Outline of the paper should have, but are not limited to, the following topics:

1. Introduction (relating to writing this paper)
2. Selection process of the research paper to be critiqued (why you want to critique this article? or significance of the phenomena of interest and how? based on what? including process of searching, retrieving, lists of retrieved articles, and decision making etc.)
3. Steps in conducting a research critique (Burns & Groves, 2007; Grove, Gray, & Burns, 2015).

3.1 Phase 1: Comprehension

Brief discussion of the manuscript including title, abstract, background, framework, research question/hypotheses, designs, major findings (do not copy the abstract), discussion, limitations, threats to validity of the selected study (such as threats to internal validity, construct validity, external validity including the analysis of statistics being used in relation to statistical conclusion validity), and ethical considerations identified in the selected study (step of comprehension)

3.2 Phase 2 and 3: Comparison and analysis

After understanding all the content in the selected research article, make comparison and analysis each topic shown in the selected research article with the theory.

3.3 Phase 4: Evaluation

Based on the results from Phase 2 and 3, develop a summary of the study's quality.

4. Recommendations for a replication study
5. Conclusion
6. Lesson learned
7. References

Research Proposal Paper Guideline

1. Do a literature search and write a research title regarding nursing phenomenon of interest to you. The study must be some type of advanced quantitative nursing research.

2. Submit a research title to Assoc. Prof. Dr. Busakorn, a course coordinator, on Tuesday, August 28, 2018.

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3. Work on your research proposal paper with either Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn (will be assigned later) on the assigned dates.
4. Submit a research proposal paper (draft 1) to your advisor (Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn) on Tuesday, September 4, 2018.
5. Present a complete research proposal paper to class according to the course schedule.
6. To write a research proposal, please follow guidelines for writing a research proposal from nursing research textbooks as shown in 6.1 Required Textbooks/Books (pp. 6-7).
7. Submit a complete research proposal paper (1 copy) to your advisor (Assoc. Prof. Dr. Busakorn or Asst. Prof. Dr. Umaporn) on Tuesday, December 17, 2018.

Outline of the paper should have, but are not limited to, the following topics:

1. Background and significance of the problem
2. Objective(s) of the study
3. Research question of the study
4. Theoretical/conceptual framework of the study
5. Hypothesis (es)
6. Definition of terms
7. Significance of the study
8. Research methodology
 - 8.1 Research design
 - 8.2 Population and setting
 - 8.3 Sample and sampling
 - 8.4 Instrumentation
 - 8.5 Ethical consideration
 - 8.6 Data collection
 - 8.7 Data analysis
9. References
10. Appendices
 - 10.1 Informed consent
 - 10.2 Instrument(s)
 - 10.3 Administration and time table
 - 10.4 Budget

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Note. Writing style (e.g., format, citation, reference) of critique and research proposal papers based on the APA format [American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.].

Executive Notes: Plagiarism

Before submitting all reports or assignments, please check for plagiarism with Turnitin program. The guideline for plagiarism management is based on the graduate committees' resolutions regarding plagiarism (10/2012, October 11, 2012). The details are as follows.

1. If the students commit plagiarism for the first time of the draft report, they will be warned by a verbal/written document.
2. If the students commit plagiarism of the real report, their marks will be deducted 20% of the report score and need to revise that report. If the revised report has no plagiarism, the students will get the Grade no more than Grade B.
3. If the students still commit plagiarism after the second revision, their marks will be deducted 40% of the report score and need to revise that report. If the revised report has no plagiarism, the students will get the Grade no more than Grade C.
4. If the students still commit plagiarism after the third revision, they will fail in that subject (get Grade E).

Guideline for work feedback of graduate students

The guideline for work feedback (e.g., report, exercise, assignment, etc.) of graduate students by the instructor is based on the graduate committees' resolutions regarding work feedback (2/2017, February 6, 2017). The details are as follows.

1. Feedback all works of the students in 1-2 weeks after they submit.
2. Each student must submit the final version of work in advance as the schedule. The instructor must read and make comments or feedback the report, exercise or assignment in the class of presentation.

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