AUN-QA

SELF-ASSESSMENT REPORT

Doctor of Philosophy Program

in

Clinical Epidemiology

(International Program)

Section for Clinical Epidemiology and Biostatistics

Ramathibodi Hospital,

Mahidol University

Contents

INTRODUCTION

Executive summary

The original Ph.D. program in Clinical Epidemiology initially enrolled students from 1995 to 1996, but it was paused to build-up staff capacity. The program was then revised in 2007 and the current program has enrolled students continuously from 2008. Since then, the first revision took place in 2012, and the current program is on the process of second revision to begin next academic year 2017.

While some universities in Thailand offer Ph.D. in Epidemiology, not all are international programs. Our program differentiates itself by the high level of support provided to students throughout from application to graduation. Also our program provides essential Clinical Epidemiology and Evidence-Based Medicine (EBM) topics lacking in other programs such as Randomised Controlled Trials, Research Protocol Design, and Systematic Review and Meta-analysis.

Student enroll to Plan I research only or Plan II coursework and research depending on their qualifications, experience in research, and communication skills. The coursework consists of 8 required and 2 elective subjects which are taught in the first year with a total of 24 credits. The research variedly takes 2-4 years according to the topic and study design with a total of 48 credits. Students are also required to get their researches published in international peer-reviewed journals. The program has been revised every five years to improve its quality, match it to stakeholders' requirements, and keep up to date with trends in Epidemiology.

Until preparing this document (December 2016), we have 5 alumni from our program. Two are assistant professors in their specialties, one is a hospital director, one is a unit head, instructor and practicing doctor in their specialty, and one is a clinical practitioner and researcher.

Organization of the self-assessment

This self-assessment consists of this introduction, the content and organization of our program and how it satisfies the AUN-QA requirements, how our program's quality produces graduates to international standard, the high level of support provided to students, our outputs, and our strengths, limitations and improvements. Detailed appendices of supporting information have been provided.

Overview of University, Faculty, Department

Mahidol University

Vision: Mahidol University is committed to be a world class university.

Mission: To excel in health, sciences, arts and innovation with integrity for the betterment of Thai society and the benefit of mankind.

Faculty of Medicine, Ramathibodi Hospital

Vision: To become a leader in national health advocacy and one of the foremost academic institutions in Thailand with an established international reputation.

Mission:

- To educate and generate medical graduates and specialists to meet high international standards.
- To provide high quality of medical care with modern facilities and technology to the public.
- To be the research centre for medical innovations and public healthcare services.

Section for Clinical Epidemiology and Biostatistics

The Section for Clinical Epidemiology and Biostatistics (CEB) had been established since 1987 under the name of Clinical Epidemiology Unit, and since then was expanded to be the Section for Clinical Epidemiology and Biostatistics in 2004. To comply with our Faculty's mission in leading research, our main responsibilities are to educate and facilitate the Faculty's members in doing research. For education, the CEB Section provides teaching in EBM for Medical student's in years 3-6, M.Sc. in Medical Epidemiology, and Ph.D. in Clinical Epidemiology. In addition, the CEB Section also regularly provides short-course training in Research Methodology, Systematic review and Meta-analysis, Data Management, and Biostatistics for researchers of our Faculty and other Institutes.

The Ph.D. program in Clinical Epidemiology was developed in 1994 and firstly enrolled students during 1995 to 1996. Since then, the program did not enrol students due to infra-structure in build-up of staffs' capacity in this area. The program has been revised and re-

activated to enrol students since 2008 until the present (2016 academic year) with a total of 27 and 7 Ph.D. and Master students, 5 and 2 graduates, respectively.

As for our Faculty's vision, the Ph.D. program in Clinical Epidemiology has the following mission:

- To produce health care graduates (e.g. medical doctors, pharmacists, dentists, etcetera.) who are able to integrate knowledge including Clinical Epidemiology, Evidence-Based Medicine (EBM), Biostatistics, Health Social Science, Health Economics, and Information Technology in clinical/public health practice, and health policy
- To produce graduates who are able to produce good quality researches which lead to national and/or international health advocacy with ethical manner.
- To produce graduates who are able to teach and infer knowledge in health science research.

AUN-QA CRITERIA REQUIREMENTS

1. Expected learning outcomes (ELOS)

1.1 The ELOs have been clearly formulated and aligned according to the visions and missions of the Faculty of Medicine and Mahidol University

As for the University's and Faculty's visions and missions of being the world class university, excellence in health sciences, and a leader in national health advocacy, the graduates should possess the following characteristics:

Expected learning outcomes (ELOs)	
Doctor of Philosophy Program in Clinical Epidemiology	
ELOs 1.	Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information technology in their clinical/public health practice
ELOs 2.	Be able to apply EBM skills for various questions in routine clinical practice
ELOs 3.	Be able to perform advanced statistical analysis for various clinical and health science researches
ELOs 4.	Be able to develop research protocol in clinical and health science researches using various study designs
ELOs 5.	Be able to conduct research complying with international ethical standards and collaborate with research teams
ELOs 6.	Be able to disseminate and communicate research findings or evidences to public by apply information technology

1.2 The ELOs cover both specific and generic learning outcomes

The ELOs consist of specific and generic outcomes. The specific outcomes include knowledge, skills, and experiences in Clinical Epidemiology, EBM, Biostatistics, Health Economics, Ethical consideration, and Research Methodology. The general outcomes focus on general skills in management, communication, problem-solving, critical thinking, teamwork, and leadership. Our ELOs described above are classified according to specific and generic outcomes as described below:

Table 1.1 Description of classification of ELOs

ELOs	Specific-ELOs	Generic-ELOs
1. Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information technology in their clinical/public health practice	X	
2. Be able to apply evidenced-based medicine skills for various questions in routine clinical practice	X	X
3. Be able to perform advanced statistical analysis for various clinical and health science researches	X	
4. Be able to develop research protocol in clinical and health science researches using various study designs	X	
5. Be able to conduct research complying with international ethical standards and collaborate with research teams	X	X
6. Be able to disseminate/communicate research findings or evidences to public by apply information technology		X

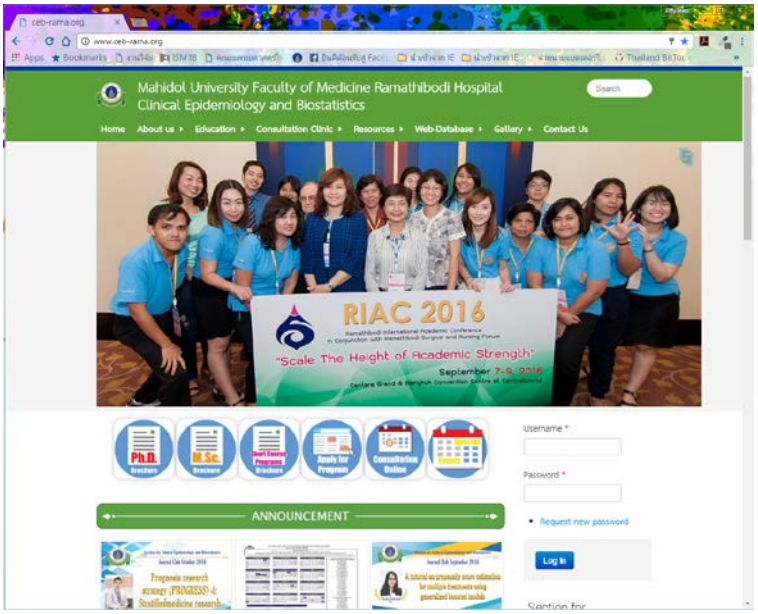
1.3 The expected learning outcomes clearly reflect the requirements of the Stakeholders

The Faculty of Graduates regularly conducts surveys to assess students' and employers' needs and satisfactions. We have used results of these surveys to improve our program quality but these data are not sufficient considering the outcome-based education approach. We therefore performed additional employers' expectation and requirement survey, and plan to conduct regularly every two years. Feedbacks from various stakeholders were taken into consideration. We defined our stakeholders as follows: 1) academic staffs within the department/program, 2) current students, 3) alumni, and 4) graduate/potential graduate employers. Results of surveys from students, alumni, and employers were described in Appendix 1.

The program's ELOs as well as program specification were drafted by taking into consideration all feedbacks from stakeholders (Appendix 1), and University/Faculty's vision/mission. From the survey, employers of our (potential) graduates and current students expect high technical knowledge and skills with high ethical standard. In addition, there are expectations of good communication skills in verbal, graphics and writing. Practicality and initiative are also expected. From result of alumni survey, our current program has met their expectation. With these results, our program ELOs and program structure were specifically designed to produce graduates who will meet stakeholders' expectations. In addition, the program's ELOs are concordant with University's vision/mission regarding integrity and serving betterment of mankind with ethical standard and EBM. Our program ELOs are aligned with international ethical standard to align with Faculty's vision/mission of high international standard.

2. Program Specification

For prospectus details about our program, please see www.ceb-rama.org



Award details

Title and name of final award(s)

Doctor of Philosophy (PhD) in Clinical Epidemiology

Level of the programme

All modules and awards offered under the Programme are approved by Thailand Quality Framework (TQF) (Appendix 2)

The award of PhD is based on evidence of the student's proven demonstration of capability in five distinct areas:

1. The creation and interpretation of novel knowledge/finding, through original research which are proven by publications in international journals
2. The systematic acquisition and understanding of a substantial body of knowledge
3. The ability to conceptualise, design and implement a research project for the generation of new knowledge, applications or understanding of own specialty
4. The ability to adjust/manage for problem solving in case of unforeseen obstacles
5. The ability to integrate knowledge about Clinical Epidemiology, EBM, Biostatistics, and other related areas into research, and clinical practice

Relevant subject benchmark

There are very few programs in the world which offer PhD in Clinical Epidemiology, most programs are Masters' degrees. Currently, there is no authority that proposes standard training program in Clinical Epidemiology. The closest program is from Perelman School of Medicine, University of Pennsylvania, USA. The benchmark Table 2.1 is as follows:

Table 2.1 Benchmark of our program and Ph.D. program in Clinical Epidemiology at Perelman School of Medicine, University of Pennsylvania

PhD Programme in Clinical Epidemiology **Perelman School of Medicine, University of Pennsylvania* (Credits)**	**Doctor of Philosophy (PhD) in Clinical Epidemiology** **Faculty of Medicine Ramathibodi Hospital, Mahidol University (Credits)**
EPID 510: Introduction to Epidemiology (1)	RACE 612: Study Designs and Measurements (3)
EPID 640: Advanced Topics in Epidemiology I (1)	
EPID 542: Measurement of Health in Epidemiology (1)	
EPID 526: Biostatistics for Epidemiologic Methods I (1)	RACE 615: Introduction to Medical Statistics (3)
EPID 527: Biostatistics for Epidemiologic Methods II (1)	RACE 616: Advanced Analysis in Medical Research (3)
EPID 523: Database Management for Clinical Epidemiology (0.5)	RACE 614: Research Informatics and Data Management (3)
EPID 633: Advanced Database Management (0.5)	
EPID 710: Research Design Consultation (1)	RACE 603: Research Protocol Design (2)
EPID 690: Empirical Bioethics (1)	RACE 608: Social Science in Clinical Practice and Research (2)
EPID 805: Practical Applications of Clinical Research Methods (1)	RACE 611: Clinical Epidemiology and Evidence-Based Medicine (3)
	RACE 607: Clinical Economics (3)

PhD Programme in Clinical Epidemiology Perelman School of Medicine, University of Pennsylvania* (Credits)	Doctor of Philosophy (PhD) in Clinical Epidemiology Faculty of Medicine Ramathibodi Hospital, Mahidol University (Credits)
	RACE 617: Randomized Controlled Trial (2)
	RACE 618: Systematic Review & Meta-Analysis (3)

*** http://www.med.upenn.edu/cceb/epi/edu/phd/curriculum.shtml**

Awarding body: Faculty of Medicine Ramathibodi Hospital, Mahidol University

- *Registering body:* Faculty of Graduate Studies, Mahidol University
- *Examination body:* Faculty of Graduate Studies, Mahidol University

Accreditation by professional or statutory body (if applicable)

Not accredited by any other body

Language of study and assessment: English

Admission Requirement

General entrance requirements

Applicants must qualify according to study Plan with satisfied English requirement. The requirements are as follows:

Plan 1: Research based

(1) Graduated Doctor of Medicine, Pharmacy, Dentistry, other related disciplines and Graduated Master's degree (e.g. Clinical Epidemiology, Epidemiology, Biostatistics, Clinical Economics or other related disciplines), or graduated in medical specialty certificate. (Diploma of Fellowship of the Royal College of Physicians).

(2) Grade point average ≥ 3.50

(3) Have at least 3 publications in peer-reviewed international journals, as the first or corresponding author.

(4) If an applicant does not meet the above criteria, but has other suitable qualifications and experience, s/he may be considered to apply for admission under the program committee.

Plan 2: Course work based and research

(1) Graduated Doctor of Medicine, Pharmacy, Dentistry, and other related disciplines.
(2) Grade point average ≥ 3.50
(3) If an applicant does not meet the above criteria, but has other suitable qualification and experience, s/he may be considered to apply for admission under the program committee.

English language requirements

It is essential to have an excellent command of the English language to benefit from studying in the programme. All students will be required to obtain an acceptable score in an approved English language test. Acceptable tests and scores are as follows:

Test	**Score**
TOEFL (paper-based)	500
TOEFL (iBT)	61
IELTS	5

Other English Language Proficiency Assessments, i.e. Mahidol English Proficiency Examination or TOEFL IPT, may be considered by Program Committee.

Intake quota

The numbers admitted are limited to 3-8 students per year. Applications for places are reviewed and any offer letters are issued in the order in which they arrive. Prospective students are therefore encouraged to apply as early as possible. Applicants wishing to be considered for scholarships are advised to apply no later than the end of March for studies starting in August. For information about sources of funding and scholarships, please see http://www.grad.mahidol.ac.th/grad/scholarship/index_en.php

Expected learning outcomes

By the end of the programme, students will usually be expected to achieve the following learning outcomes by drawing on material taught across different elements and assessments in a variety of ways.

Plan I: Research based

ELOs	Subject/Activity	Learning method	Assessment
1. Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information technology in their clinical/public health practice	RACE 603, RACE 611, RACE 617, RACE 616, RACE 618 Optional: RACE 607, RACE 608, RACE 612, RACE 614, RACE 615	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments - Self-study - Literature review	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
2. Be able to apply EBM skills for various questions in routine clinical practice.	RACE 611	- Lecture - Class discussion - Presentation - Hand on practice - Assignments	Rubrics of assignments, participations, presentations, and qualifying examination
3. Be able to perform advanced statistical analysis for various clinical and health science researches.	RACE 616	- Lecture - Class discussion - Assigned readings - Hand on practice - Assignments	Rubrics of assignments, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
4. Be able to develop research protocol in clinical and health science researches using various study designs.	RACE 603, RACE 617, RACE 618	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments - Literature review	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication

ELOs	Subject/Activity	Learning method	Assessment
5. Be able to conduct research complying with international ethical standards and collaborate with research teams.	RACE 618, RACE 898	- Class discussion - Presentation - Assigned readings - Assignments - Terms of reference of research progression	EC approval, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication
6. Be able to disseminate/communicate research findings or evidences to public by apply information technology.	Journal club	- Class discussion - Presentation - Assigned readings	Rubrics for journal club,
	Mini workshop	- Class discussion - Presentation - Assigned reading - Hand on practice	Rubrics for mini workshop, satisfaction evaluation
	E-Zine	- Writing practice and coaching	E-zine publication
	Manuscript	- Writing practice and coaching	Manuscript publication

Plan II: Coursework based and Research

ELOs	Subject/Activity	Learning method	Assessment
1. Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information technology in their clinical/public health practice	RACE 603, RACE 607, RACE 608, RACE 611, RACE 612, RACE 614, RACE 615, RACE 616, RACE 617, RACE 618	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments - Literature review	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
2. Be able to apply EBM skills for various questions in routine clinical practice.	RACE 611	- Lecture - Class discussion - Presentation - Hand on practice - Assignments	Rubrics of assignments, participations, presentations, and qualifying examination
3. Be able to perform advanced statistical analysis for various clinical and health science researches.	RACE 615, RACE 616	- Lecture - Class discussion - Assigned readings - Hand on practice - Assignments	Rubrics of assignments, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
4. Be able to develop research protocol in clinical and health science researches using various study designs.	RACE 603, RACE 617, RACE 618	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments - Literature review	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication

ELOs	Subject/Activity	Learning method	Assessment
5. Be able to conduct research complying with international ethical standards and collaborate with research teams.	RACE 618, RACE 799	- Class discussion - Presentation - Assigned readings - Assignments - Terms of reference of research progression	EC approval, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication
6. Be able to disseminate/communicate research findings or evidences to public by apply information technology.	Journal club	- Class discussion - Presentation - Assigned readings	Rubrics for journal club,
	Mini workshop	- Class discussion - Presentation - Assigned reading - Hand on practice	Rubrics for mini workshop, satisfaction evaluation
	E-Zine	- Writing practice and coaching	E-zine publication
	Manuscript	- Writing practice and coaching	Manuscript publication

Distinctive features of the Program

The Program aims to build up health care providers (e.g. medical doctors, pharmacists, and dentists, etcetera.) who are able to integrate knowledge including Clinical Epidemiology, EBM, Biostatistics, Economics, and Information Technology in their clinical practice and research. In addition, graduated health care providers should be able to produce good quality research that can answer health problems of our country and internationally with ethical manner.

Distinctive features of our PhD Program are the opportunity to work with experienced instructors, to learn by hands-on experience with close supervision, and to access the outstanding resources. The Program offers a very interdisciplinary research environment. Students are encouraged to develop their own research questions with supervision from research, methodological and content expertise. Furthermore, our Program is designed to focus on developing skills in statistical analysis, database management, and research management. Students are required to attend scheduled hours of self-study and complete assignments to develop such skills.

Most of our students could publish their first manuscript in international peer-reviewed journals within the first two years. In addition, some students have published in high impact factor journals in their specialty, see Appendix 3.

Program structures and requirements

The program aim is training for research which involves completion of an independent piece of original research. It is carried out under the guidance of advisers, and involves additional support usually provided by program faculty members. The program includes opportunities for acquiring, developing and enhancing the full range of skills and knowledge needed to carry out their research.

There are two plans for our program:

Plan I: Research based (48 credits)

Students will have to enrol in some subjects that are relevant to their research, take qualifying examination, and concomitantly develop research proposal in years one to two.

Plan II: Coursework based (27 credits) and research (48 credits)

The coursework will be taken in year one of enrolment, qualifying examination, and research proposal development will be performed in year two under supervision of the program committee.

For both study plans, after passing qualifying examination and defending research proposal, a major group of advisers consisting of Clinical Epidemiologists, Biostatisticians, and/or Health Economists will be appointed. In addition, content experts may be appointed as appropriate. If research is involved in patients, students will have to apply for ethics approval from the ethics committee of Ramathibodi Hospital and collaborating institutions before conducting studies. Students will also have to apply for a research grant for conducting their studies. During conducting their research, students must formally report and present their progressions according to their terms of reference (TOR) and timeline to the program committee every six months. In addition, the TOR and timeline for the next six-month period will be constructed and committed. For evaluation, their progressions are graded as 'satisfactory', 'in progress' or 'unsatisfactory' if their tasks have progressed ≥ 60%, 40% - 59%, <40%, respectively. If students are 'In Progress' three consecutive times, this will be equal to one 'Unsatisfactory'. If the students are 'Unsatisfactory' two consecutive times, they are considered by the program committee to fail or convert to the M.Sc. program.

Our program organizes a monthly journal club, in which every student is assigned as presenter, commentator, and moderator. The journal club topics are focused on special issues of research methods and Biostatistics that are relevant to students' research. Students also contribute regularly to our E-zine. In addition, students will have to organize and conduct at least one mini workshop to teach and share their experiences obtained from conducting their research. Furthermore, a special lecture/conference is organized each year with international speakers to expose students to an international perspective.

Students should complete studies within three to five years depending on how large their research studies are. After completing their research studies, students will write up, defend, and submit their thesis. In order to graduate, students must have at least two and one publication in peer-reviewed international journals for plan I and plan II, respectively.

Mode of study

The normal course of study leading to a PhD is 3 years full-time or 5 years part-time. Students in Plan II are required to spend full time study of coursework in their first year. Students in Plan I will be recommended some courses which will supplement to their exiting skills. After completion of Qualifying Examination which is held twice a yearly in April and November, students are self-responsible in organizing their time for thesis preparation and conducting research. Students are encouraged to meet regularly with adviser team during thesis preparation period. Our program will organize a formal public progression report every 6 months. Students are required to present their progression and will be evaluated by Program Committee according to each student's TOR, which is developed based on agreement between students and advisers.

The minimum period of registration for PhD students is normally two academic years for both full-time and part-time study; and the maximum recommended period is five academic years.

Estimated number of study hours

For Plan I, it is expected that full-time students will spend on average 20 hours a week on their research, including face-to-face meetings with advisers and private study. Our program requires students who apply for Plan I study to be available to study/work for at least three full-days per week. For Plan II, students will spend on average of 40 hours a week on attending classes, completing assignments, and self-study in the first year. From second year onward, students' expectation will be the same as Plan I.

ASSESSMENT REQUIREMENTS

Research Thesis

Students complete a written research thesis. The thesis must consist of the candidate's own account of their investigations and indicate how these advance the field of study. It must form a distinct contribution to the knowledge of the subject and afford evidence of originality, shown by the discovery of new facts and/or add more power/confidence to the application of current facts. It must be an integrated whole and present a coherent argument. It must give a critical assessment of the relevant literature, describe the method of research and its findings, and include a discussion of those findings. It must indicate in what respects they appear to the candidate to advance the study/knowledge of the subject. Finally, it must be written in English with satisfactory literary presentation, include a full reference list, and not exceed 100,000 words in length.

Marking of Research Thesis

The thesis is read by two or more examiners who then examine the candidate in person. There are three options open to examiners in determining the result of the examination of a Ph.D., as follows:

(i) If the thesis fulfils the criteria set and the candidate satisfies the examiners in all other parts of the examination, the examiners will report that the candidate has satisfied them in the examination for the Ph.D. degree;

(ii) If the thesis otherwise fulfils the criteria but requires minor amendments, and if the candidate satisfies the examiners in all other parts of the examination, the examiners may require the candidate to make amendments specified by them within three months. The amended thesis will then be resubmitted to the examiners, or one of their number nominated by them for confirmation that the amendments are satisfactory;

(iii) If, after completion of the examination including the oral examination or re-examination for the Ph.D. degree, the examiners determine that a candidate has not reached the standard required for the award of the degree nor for the re-submission of the thesis in a revised form for that degree, they consider whether the thesis does or might be able to satisfy the criteria for the award of the M.Phil. degree. If they so decide, the examiners submit a report which demonstrates either (a) how the criteria for the MPhil degree are satisfied, or (b) what action would need to be taken in order for these criteria to be satisfied.

Calendar and Curriculum

Study calendar

The academic year is broken up into three semesters. Students are expected to continue their research during the breaks between semesters.

Semester 1 August until December.

Semester 2 January to April.

Semester 3 May to July.

Examination, and award of overall degree

For Plan II, students need to pass each subject with minimum grade B. All Ph.D. students (Plan I and II) are required to attend a Qualifying Examination in November or April which comprises of oral and written examinations.

After passing the Qualifying Examination, students are required to defend their research proposal for thesis to the program committee. This will make sure that their research are both scientific and ethical standards.

The final examination is thesis defence. Students need to submit written thesis draft to all examiners and attend oral examination. Once the examiners have reported that the candidate has satisfied them in the examination for the Ph.D. degree students will be officially informed of the result by the Faculty of Graduate Studies.

Final Ph.D. results are not given until a hard copy of the final thesis (including any revisions) has been received by Registry of the Faculty of Graduate Studies. Degree award will be officially issued only if students submit evidences of publication acceptance either letter of acceptances, or copy of published articles with reference number which is required by the program.

2.1 The information in the Program specification is comprehensive and up-to-date

The program has officially restarted since 2008. Along the way, there were changes both at national and global levels. Communicable and non-communicable diseases have changed and treatments have become more complex. There has been a rapid development in medications, treatments, diagnosis, and technologies. In addition, there have been dramatic increases in healthcare information. The accessibility of health information and related

technologies greatly impacts to program development. Program development committee realize that the program must adapt according to such changes. There are monthly program committee meetings which discuss and make minor changes to the program as needed.

Our program has been consecutively revised in 2012 and 2017 to make contents in each course up-to-date, especially information technology related contents. Our program specifications are contained in program syllabus as mandated by Thailand Quality Framework (TQF) and also summarized for students in our website and student manual. Minor adaptations are added to the program specification every year to make information clearer in response to students' comments.

2.2 The information in the course specification is comprehensive and up-to-date

Similar to the Programme specifications, the course specifications are scheduled for revision every five years as mandated by the TQF. However, the Program Administrative Committee regularly takes students' comments and other changes from new knowledge into account. Thus, minor adaptations are allowed and added to course specifications each year, and implemented in the next academic year.

2.3 The Programme and course specifications are communicated and made available to the stakeholders

Both program and course specifications are available to all stakeholders, especially prospective students, on the website of the program at www.ceb-rama.org. For staffs including instructors and support staffs, the program and course specifications are announced in the program committee meeting and seminar to let them know and understand well about our expectations outcomes. Students will be informed about the ELOs and program specifications on the orientation day. In addition, the course specification will be informed for every course at the beginning of that course. Furthermore, the program and course specifications will be sent to alumni and employers every two years.

3. Program Structure and Content

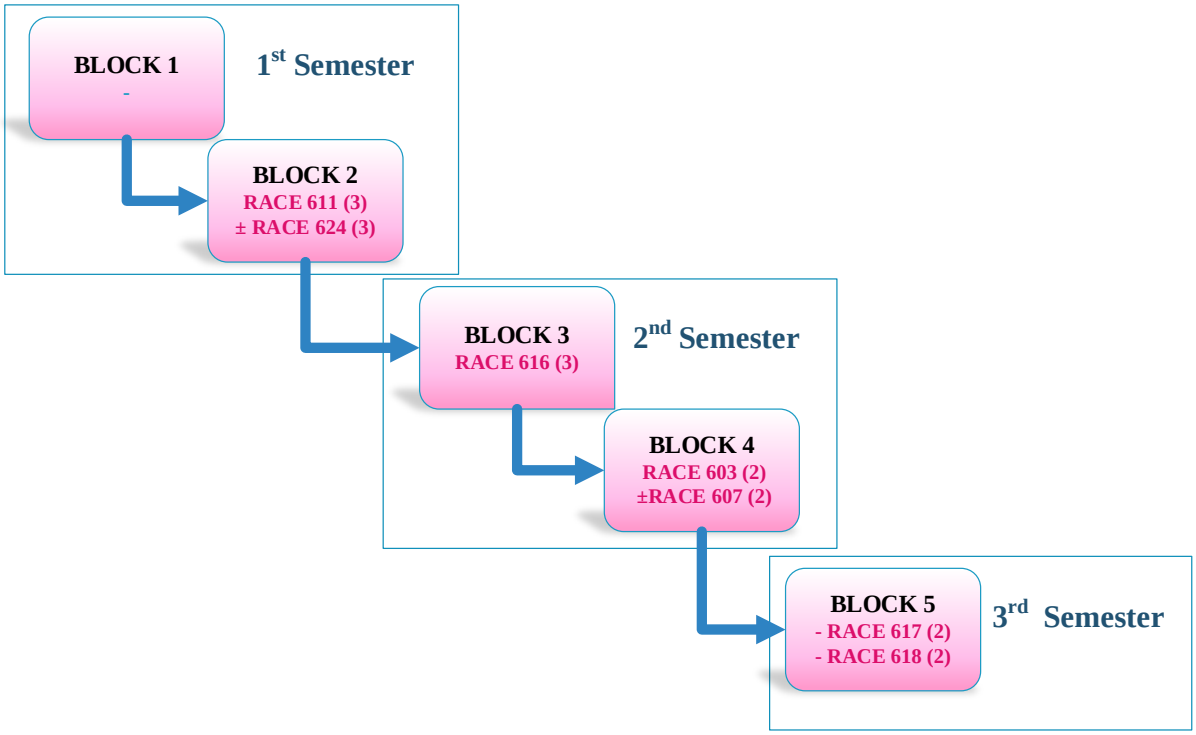
We present here an overview of the program and structure of our International Ph.D. in Clinical Epidemiology. The detailed program curriculum has been supplied in Appendix 4.

Both Thai and foreign applicants are welcome to join our program provided they have the requisite qualifications and background. For Plan I applicants should have graduated in Doctor of Medicine and Master degree in relevant fields (e.g., Clinical Epidemiology, Epidemiology, Biostatistics, Health Sciences Clinical Economics or other related disciplines) or graduated in medical specialty certificate (e.g., Diploma of Fellowship of The Royal College of Physicians). Outstanding applicants with experience in research with international publications may also join with Plan I by the consideration and approval of the program committee. All applicants must meet the entry requirements of the Faculty of Graduate Studies, Mahidol University. Program structure of the two plans are described below.

Plan I: Research based (48 credits)

Students will have to enrol in some subjects that are relevant to their research, take qualifying examination, and parallelly develop their research proposal in years one to two.

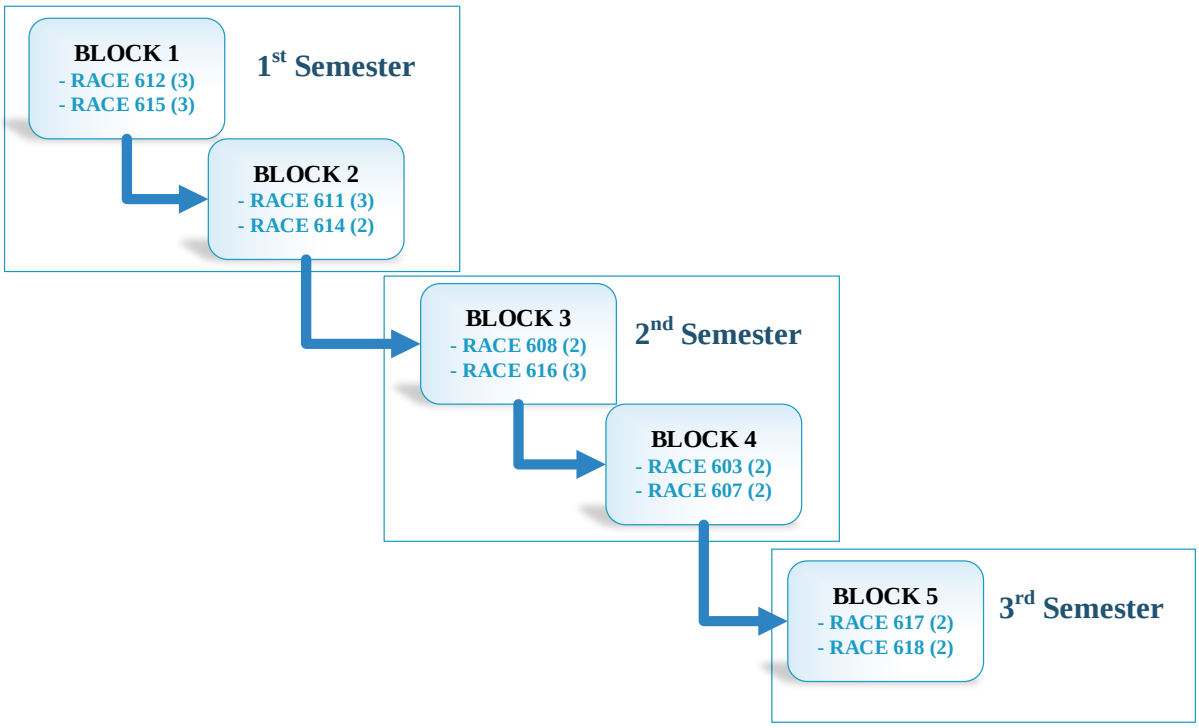
Figure 1. Structure of the coursework for plan I



Plan II: Coursework based (27 credits) and research (48 credits)

The coursework will be taken in year one of enrolment, qualifying examination and research proposal development will be performed in year two under supervision of the program committee. The structure for the coursework is shown in Figure 1:

Figure 2. Structure of the coursework for plan II



For both study plans, after passing qualifying examination and defending research proposal, a major group of advisers consisting of Clinical Epidemiologists, Biostatisticians, and/or Health Economists will be appointed and allocated. In addition, content experts may be appointed as appropriate. If research is involved in patients, students will have to apply for ethics approval from the ethics committee of Ramathibodi hospital and collaborating institutions before conducting studies. If required, students will also need to apply for a research grant for conducting their studies.

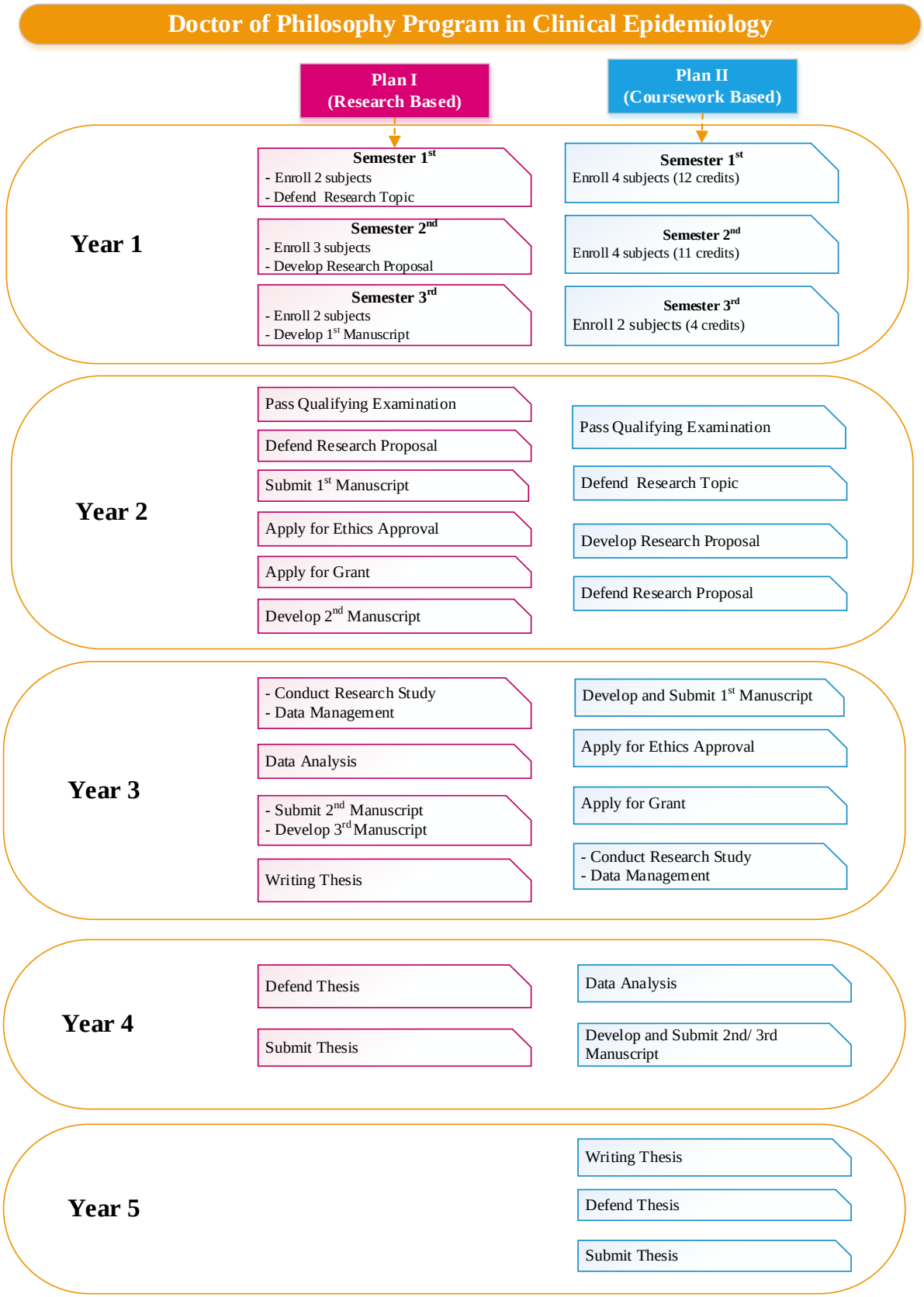
During conducting their research, students must formally report and present their progressions according to their terms of reference (TOR) and timeline to the program committee every six months. In addition, the TOR and timeline for the next six-month period will be constructed and committed. For evaluation, their progressions are graded as satisfactory, in progress, and unsatisfactory if their works are progressed ≥ 60%, 40% - 59%,

<40%, respectively. If students are ‘in progress’ three consecutive times, this will be equal to one ‘Unsatisfactory’. If the students are ‘Unsatisfactory’ two consecutive times, they are considered by the program committee to fail or convert to the M.Sc. program.

Our program organizes a monthly journal club, in which students are assigned as presenter, commentator, and moderator. The journal club topics are focused on special issues of research methods and Biostatistics that are relevant to students’ research. Students contribute regularly to our E-zine. In addition, students will have to organize and conduct at least one mini workshop to teach and share their experiences obtained from conducting their research. Furthermore, special lecture/conference is organized each year with international speakers to expose students to an international perspective.

Students should complete studies within three to five years depending on how large their research studies are. After completing their research studies, students will write up, defend, and submit their thesis. In order to graduate, students must have at least two and one publication in peer-reviewed international journals for plan I and plan II, respectively.

Figure 2. Structure of the Program



Remark: 1st manuscript should be a part of RACE 618 or research proposal

3.1 The curriculum is designed based on constructive alignment with the expected learning outcomes

The ELOs have been defined in Table 1. The table 3.1 below shows how they constructively align with ELOs

Table 3.1 Constructive Alignment of Curriculum

ELOs	Learning method	Assessment
1. Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information technology in their clinical/public health practice	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
2. Be able to apply evidenced-based medicine skills for various questions in routine clinical practice.	- Lecture - Class discussion - Presentation - Hand on practice - Assignments	Rubrics of assignments, participations, presentations, and qualifying examination
3. Be able to perform advanced statistical analysis for various clinical and health science researches.	- Lecture - Class discussion - Assigned readings - Hand on practice - Assignments	Rubrics of assignments, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, manuscript publication
4. Be able to develop research protocol in clinical and health science researches using various study designs.	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments	Rubrics of assignments, student participations, student presentations, examinations, qualifying examination, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication

ELOs	Learning method	Assessment
5. Be able to conduct research complying with international ethical standards and collaborate with research teams.	- Class discussion - Presentation - Assigned readings - Assignments - Terms of reference research progression	EC approval, terms of reference research progression/evaluation, direct feedback, defending thesis, and manuscript publication
6. Be able to disseminate/communicate research findings or evidences to public by apply information technology.	- Class discussion - Presentation - Assigned readings	Rubrics for journal club,
	- Class discussion - Presentation - Assigned reading - Hand on practice	Rubrics for mini workshop, satisfaction evaluation
	- Writing practice and coaching	E-zine publication
	- Writing practice and coaching	Manuscript publication

3.2 The contribution made by each course to achieve the expected learning outcomes

The various activities which contribute to our program contribute to the achievement of our program's ELOs. Table 3.2 below shows how the activities in our program are evaluated to determine our students' achievement of the ELOs.

Table 3.2 Expected Learning Outcomes (ELOs) and achievement

●Completely related to ELO 1 means integrating at least two subjects

○Partially related to ELO

Code	Items	Credits	ELOs					
			1	2	3	4	5	6
Core course								
RACE 612	Study Designs and Measurements	3	●		○	●	○	
RACE 615	Introduction to Medical Statistics	3	●		○	○		
RACE 611	Clinical Epidemiology and Evidence-based Medicine	3	●	●	○			●

Code	Items	Credits	ELOs					
			1	2	3	4	5	6
RACE 624	Research Informatics and Data Management	3	●			○	○	○
RACE 616	Advanced Statistical Analysis in Medical Research	3	●		●	○	○	
RACE 618	Systematic Review and Meta-analysis	3	●	○	●	●	●	○
RACE 603	Research Protocol Design	2	●	○	○	●	●	●
RACE 607	Clinical Economics	3	●		○	○	○	
Elective course								
RACE 617	Randomised Controlled Trial	2	●		○	●	●	
RACE 608	Social Science in Clinical Practice and Research	2	●			○		○
Dissertation								
RACE 898	Dissertation (Plan I) - Defend Thesis - Writing Thesis	48	●	●	●	●	●	●
RACE 799	Dissertation (Plan II)	48	●	●	●	●	●	●
	Qualifying Examination		●	●	●	●		
	Defend Research Proposal		●		●	●	●	●
	Research Progression (Every six month)						●	●
	Ethics approval					●	●	
	Journal Club		●		○	○		●
	Mini Workshop		●		○	○		●
	Conference		●					
	Publish 2-4 manuscripts		●		●	●	●	●

3.3 The curriculum is logically structured, sequenced, integrated and up-to-date

The program is structured into two plans, which are plan I (Research based) and plan II (Coursework based and research). This flexibly allows students to enrol in a program matching their background, experience and qualifications. For plan I, students will enrol in some subjects relevant to their research interests in year one, see Figure 1. They will focus on conducting research from year one and be encouraged to get manuscripts published about two to four.

For plan II, students will take ten coursework subjects arranged into teaching blocks during the first year, see Figure 2. Four to ten electronic teaching modules are provided for each subject.

We use the block system, which is designed sequentially form basic to advance knowledge. The block system will also let students more focus on learning and archiving specific course learning outcomes and the program's ELOs . There are five blocks and each block consists of two subjects with details as follows: The block 1 consists of fundamental subjects in Study Design and Measurements (RACE 612) and Medical Statistics (RACE 615), which will lead students to have good background knowledge in Epidemiology and Medical Statistics. The block 2 is focused on Clinical Epidemiology/EBM (RACE 611) and Research Informatics and Data management (RACE 624). Students will learn how to construct clinical questions to lead to identify relevant evidences. How to identify relevant evidences and organizing evidences is taught in the RACE 624. Knowledge from these two blocks should bring students to intermediate-advance courses in the block 3, which is focused on Advance Statistical Analysis in Medical Research (RACE 616) and Social Science in Clinical Practice and Research (RACE 608). Students will learn how to analyse data applying advance statistical analysis methods that most commonly applied in medical research including Logistic Regression, Poisson Regression, Survival Analysis, and Longitudinal Data Analysis. Real research data form our instructors' research will be used for teaching and assignments. In addition, social issues in clinical practice and research such as health-related quality of life which are commonly used in clinical research are also taught in RAC 608. The block 4 consists of Clinical Economics (RACE 607) and Research Design Protocol (RACE 603). The RACE 607 will bring students to understand what Economic evaluations in Clinical practice/research are about and how to perform properly. The RACE 603 will let student to integrate and use all of their knowledge learning previously in developing research protocol for their research thesis. Finally, the block 5 consists of two advance courses, i.e., Randomized Controlled Trial (RACE 617) and Systematic Review/Meat-analysis (RACE 618). The special issues for Randomized Controlled

Trail will be taught and discussed. Knowledge from here can bring students to apply in their research thesis if their topics are fitted with this design. Finally, the RACE 618 will let students learn how to conduct a systematic review and meta-analysis. This course will again let student apply and integrate all knowledge learning from previous courses. Each student will have to finish one review and should be able to submit for publication from good peer review journal. In addition, skill for doing systematic review should be able to apply to their research thesis.

Although the last formal revision was in 2012, throughout the year our instructor team reviews and revises the curriculum after completing each subject according to feedback and problem solving. In addition, an annual seminar is organised to bring the curriculum up to date with the latest, concepts, ideas and trends. New case studies and recent relevant articles are integrated into the subject teaching to present the latest approaches to students. Every year instructors participate in international conference and a conference is organised to bring well-known international speakers to share their knowledge and experience. Every five years the program is revised according to the regulation of the Commission of Higher Education

Relevant: Subjects which are introduced in the curriculum, discussions, presentations and workshops are chosen to develop student's insight into the importance of evidence-based medicine and how the results of research can be applied to provide better medical treatment.

Practical: Research studies use data collected from clinical practice, to ensure the data is representative of the real medical issues and questions which need to be answered. Students are required to show how their research findings can be integrated into routine clinical practice.

4. Teaching and learning approach

4.1 The educational philosophy is well articulated and communicated to all stakeholders

Our program has following philosophy:

- We should provide the state of the art of knowledge in Clinical Epidemiology, EBM, Biostatistics, Clinical Economics, and Clinical Research Methodology with updated contents
- We should provide interactive and practical learning process
- We should encourage and build up self-learning ability

More detail of our Ph.D. in Clinical Epidemiology program is in our prospectus (see Appendix 2) and also available on our website (www.ceb-rama.org). The program's educational philosophy is formally informed to all candidate applicants during interview. In addition, the program's educational philosophy is formally informed to new students on the orientation day. As mentioned above, the ELOs and educational philosophy will be sent to alumni and employers every two years.

4.2 Teaching and learning activities are constructively aligned to the achievement of the expected learning outcomes

Teaching and learning activities are designed to achieve the ELOs as shown in Table 2 and 3.1. Cognitive knowledge is gained from lectures, assigned reading, self-study and literature review. Technical skills are acquired through hand-on practices, assignments, presentations, discussions and mentoring during coursework, practical sessions, mini workshop and research. Students acquire the ability to integrate, transfer and apply knowledge through the interactive nature of lessons, using relevant up to date course materials, articles, real cases studies, self-studying, assignments, and research. For attitude, students gain from on-class discussion, direct feedback from instructor, research protocol development, submission protocol for ethical approval and manuscript submission. In addition, we require students to participate and lead journal clubs and mini workshops and contribute to E-zine. We encourage our students to present their research at international conferences.

In some of our subjects students learn by iteratively doing and presenting their works, then receiving feedbacks, suggestions, and comments from methodological and content experts.

4.3 Teaching and learning activities enhance life-long learning

The subjects RACE 611: Clinical Epidemiology and Evidence-based in Medicine, RACE 603: Research Protocol Design and RACE: 618 Systematic Review and Meta-Analysis lead students to become life-long learners for both Plan I and Plan II. For RACE 611, with various clinical scenarios, students will learn how to structure answerable question, be able to perform biomedical literature searching to identify relevant evidences, do critical appraisal of research evidences, and applying to solve each clinical scenario. Student can apply these skills to their real life clinical practice and research. For RACE 603 and RACE 618, both Plan I and Plan II students will develop skills to identify gaps in current knowledge, identify their research

question(s), rationale for conducting research, and plan their research method. The skills acquired from learning and coaching will lead them to achieve their academic goals. Those skills are management of a large/series research study, leading and managing a research team, collecting and analysing large data, and disseminating research findings internationally.

5. Student Assessment

5.1 The student assessment is constructively aligned to the achievement of the expected learning outcomes

During coursework for both Plan I and plan II, each subject is evaluated by assignments, presentations, and examinations. These are designed to match with ELOs as shown in Table 3.1. During their research for thesis, both Plan I and Plan II students are evaluated by research proposal defence, ethics approval, applying grant, adviser mentoring, research progressions, active participation in journal clubs and mini workshops, contributions to E-zine, publication of manuscripts in international peer-reviewed journals and research thesis defence.

5.2 The student assessments includin timelines, methods, regulations, weight distribution, rubrics and grading are explicit and communicated to students

The coursework, subject documentations are provided via our website www.ceb-rama.org. The method of evaluations for each subject are clearly described how they will be marked with the proportional weighting for each step. Marks with feedback are given individually/confidentially to students through our website. After coursework completion, students need to commit to their TOR and Timeline, which are jointly developed by students and advisor teams. These contain targeted achievement and the assessment criteria. Feedbacks from research progression are discussed with students and results are provided individually/ confidentially through our website.

5.3 Methods including assessment rubrics and marking schemes are used to ensure validity, reliability and fairness of student assessment

The subject coordinator and instructor team clearly provide rubric of assessments including rubrics of assignments, student participations, student presentations, examinations,

qualifying examination, terms of reference research progression, defending proposal and thesis., see Appendix ? Marking guides for each course are clearly described. In addition, the methods of marking for each subject will be present and discussed in the monthly program meeting before running the course. As a result, marking methods are clear, transparent, and also standardized for those subjects/classes that required a team evaluator. Marks with feedback are given individually/confidentially to students through our website

5.4 Feedback of student assessment is timely and helps to improve learning

Each subject contains 4–11 assignments, presentations and/or examinations. For assignments, students will submit their work on time, results and feedback are provided via our website within 2 – 4 weeks depending on the sizes of assignments. After submission of students' work within 2-4 weeks. This will let students learn from comments and feedback, and lead them to improve their next assignments. Students with low marks are called for a meeting with the course coordinator or advisor team along with program director where appropriate. For presentations, students will immediately receive feedback. For examinations, results and feedback are confidentially provided via our website within 2 – 4 weeks.

After the coursework, the adviser team regularly meets (i.e., 1 – 4 weeks) with each student to continuously feedback for thesis development. Research progressions are evaluated every 6 months and results are provided within 1 – 2 weeks. During the research progression meeting students receive suggestions and problem solving. At research proposal/thesis defence, feedback is provided individually to each student the same day by the examining team.

5.5 Students have ready access to appeal procedure

Students can request or appeal for a meeting with a subject coordinator to explain a grade if they do not satisfy with grade results by lodge appeal form via our CEB website. In cases that students are dissatisfied with the meeting result, they can appeal to the program director. The program director will set a panel which includes at least 3 independent faculties to evaluate the appeal within 1 month. During research study students' can discuss their Research Progression grading with their adviser team. Students who cannot resolve their appeal through these means may use the Faculty of Graduate Studies appeal procedure available at http://www.grad.mahidol.ac.th/grad/complain/HelpLogin.php?lang=en.

6. Academic staff quality

The academic team of instructors are of international standard qualifications. They are all active researchers in their specialities by applying their knowledge in Clinical Epidemiology, Biostatistics, Clinical Economic, and other relevant areas, with experiences ranging from 5 to 15 years. They regularly publish their research in international peer-reviewed journals, which can be seen at our website (http://med.mahidol.ac.th/ceb/about/aboutus). Their experiences and skills will lead to teach students using the real research examples. In addition, experiences in project managements will lead them coach students effectively.

6.1 Academic staff planning (considering succession, promotion, re-deployment, termination and retirement) is carried out to fulfil the needs for education, research and service

Academic staff planning is an ongoing regular process. This covers both capacity and competency. Capacity is reviewed annually to determine the numbers and positions of academic staffs required to work and support our program. Competency is the qualifications and experience needed to provide instruction and support students. The factors affecting capacity and competency planning are our current and future curricula, demand for our program, current and future workloads, staff/student ratios and students' and stakeholders' requirements and expectations. The target student to staff ratio of our program is 5:1. Requests for new staff are handled by the Department of Human Resources and our CEB Section conducts the selection process and submits its choice to the Faculty of Medicine Ramathibodi Hospital and Mahidol University for approval. Our CEB Section regularly reviews academic staff capacity to improve and strengthen our program and Section. Requirements of new staff arise from assessment of workload, staff to student ratio, new areas of research, and teaching; these issues are annually discussed in CEB seminar.

6.2 Staff to student ratio and workload are measured and monitored to improve quality of education, research and service

According to the Commission on Higher Education's regulation, 'Standard Criteria for Graduate Studies 2005' and the Faculty of Graduate Studies regulation, the student to staff ratio must not exceed 5:1. Our program complies with this requirement by maintaining a

suitable ratio. The current numbers of active students and instructors accumulative since 2008 to 2016 academic year are 33 and 9 (see Table 6.1 and Table 6.2), respectively. Five students graduated and 4 students had withdrawn, resulted in 24 students remained until 2016 academic year. The full time equivalent (FTE) based on 9 instructors during 2014-2016 academic year is 5.5, see Table 6.3 and Appendix 5. As a result, the students/staff ratio is 3.6 see Table 6.4.

Table 6.1 Numbers of student enrolment by academic year

Academic Year	Number of students enrolment	Graduate	Withdraw/Convert	Cumulative students
2008	4	0	0/0	4
2009	2	0	0/0	6
2010	4	0	0/0	10
2011	3	0	0/0	13
2012	4	0	0/0	17
2013	1	2	3/0	13
2014	6	1	1/1	18
2015	3	2	0/-1	18
2016	6	3	1/0	20
Total	**33**	**8**	**5/0**	**20**

Table 6.2 Staff of our International Ph.D. in Clinical Epidemiology

Academic Year	Number of staff
2012	7
2013	9
2014	9
2015	9
2016	9

Table 6.3 Describe numbers and qualification of academic staffs

Academic Year	Category	M	F	Total		% of PhDs
				Headcounts	FTEs	
2012 - 2013	Professors	0	0	0	0	100%
	Associate Professors	0	3	3	2+1 x 0.3 = 2.3	100%
	Assistant Professors	1	1	2	1+1 x 0.3 =1.3	100%
	Instructors	2	0	2	2x 0.3 = 0.6	100%
	Total	**3**	**4**	**7**	**4.2**	
2014 – 2016	Professors	0	0	0	0	100%
	Associate Professors	0	3	3	2+1 x 0.3 = 2.3	100%
	Assistant Professors	3	2	5	2+3 x 0.3 = 2.9	100%
	Instructors	1	0	1	1 x 0.3 = 0.3	100%
	Total	**4**	**5**	**9**	**5.5**	

Note: Please see Appendix 5 for details of how Full Time Equivalents are calculated.

Table 6.4 Student to staff ratio by academic year

Academic year	Total FTEs of academic staff	Total cumulative FTEs of students	Staff-to-student ratio
2012	4.2	17	4.0
2013	4.2	13	3.1
2014	5.5	18	3.3
2015	5.5	18	3.3
2016	5.5	20	3.6

6.3 Recruitment and selection criteria including ethics and academic freedom for appointment, deployment and promotion are determined and communicated

Recruitment of high quality staff is very important to ensure that there are sufficient personnel with necessary skills, experience and knowledge to provide high quality teaching and student mentoring. Recruitment policies and procedures of the Program are as the followings

- Recruitment announcement is posted widely on the mass media, Faculty's website, and popular job finding website.
- Candidates are invited for in-person interviewed if his/her qualification is met with Program's criteria
- Program have to present the recruitment to the Faculty Board for approval.
- Faculty's Board assess quality of applicants, make the final consideration and issue the employment decision. Probationary period usually takes approximately six months to one year.

Criteria for recruitment cover the following major conditions:

- Education and academic activities (40%)
- English languages proficiency (10%)
- Research activities (20%)
- Interview results including communication skill, personality and emotional maturity (30%)

After successful recruitment, new staff will be oriented by Human Resource Department about welfares, evaluation, and promotion. There are two types of promotions for academic staff: career and academic. Career promotion is depended on performance agreement which is the agreement between staff and Program covering deliverables at each evaluation period. Deliverables are including hours of teaching, mentoring students, research consultation for Faculty staffs, number of research article published, and other administrative responsibilities. Career promotion will result in salary raising and continuation of employment contact. Academic promotion is the advancement of professorship. This advancement will be screened by faculty and making decision by University Board. Academic promotion is based on teaching experience, textbook writing and research article publication.

Program allow academic staffs to pursue their research interests within boundary of performance agreement made. Deployment of academic staff to be advisor or course coordinator is based on their research interests and availability.

6.4 Competencies of academic staffs are identified and evaluated

During the recruitment and selection process, the teaching and research competencies of instructors are evaluated. Teaching competencies are further evaluated after every taught subject and also annually based on students' feedback. For junior/new instructors, the program committee usually allocate senior instructors to coach the new instructors. Class attention by the senor staff is assigned to make sure that the new instructors can teach properly. In addition, our program regularly take video recording for every teaching session, which primarily aims to allow students to review and re-learning that session. The course coordinators and Program Director can also use these videos to evaluate teaching competencies and students' participations.

Our CEB instructors and staffs are evaluated twice a budget year. For each budget year, they will have to make performance agreements with the Head of the CEB Section and evaluation team. Instructors are required to regularly work on research and get at least one publication being as first/corresponding author per year. In addition, they are required to present their research at the International Conference in Clinical Epidemiology, Biostatistics, or other relevant areas at least once a year. This will let them expose to international experts in our area, and also update their knowledge that will be useful for teaching and research. Our Faculty has supported by providing a grant for joining the International Conference which covers travel, accommodation, and registration fee, if the instructors have been accepted for presentations of their research.

Instructors are also expected to apply for being professorships as Assistant Professor, Associate Professor, and Professor when appropriate as for the University and Faculty guidelines. For instance, we encourage young instructors applying for Assistant Professor within after 2-3 years of working. Once they got promotions, they should apply for being Associate Professor and Professor after 2-3 and 5-6 years, respectively. These performance agreements should be able to build up our instructors' competency in short and also long terms.

6.5 Training and development needs of academic staffs are identified and activities are implemented to fulfil them

For the new instructors, the Faculty provides teaching training for all included staffs at the first year of their recruitment, and participate in continuous refresh course every year. Basic training composes of teaching methods, mentoring system, feedback, student assessment, and grading system. All academic staffs have to pass the basic teaching examination, and have to attend the advanced and update schemes at least 10 credits each year. This process will ensure the teaching competency of our academic staffs.

In addition, Mahidol University provides also workshops to train and educate academic staff in the philosophy of the University, rules and regulations, responsibilities and promotion track. In addition, we encourage academic staff to attend/participate in international conference in Clinical Epidemiology/Biostatistics or other relevant area at least once a year. Faculty will support travel grant up to 100,000 bath/year for attending international conference if staff has poster/oral presentation.

6.6 Performance management including rewards and recognition is implemented to motivate and support education, research and service

Mahidol University provides awards to recognize academic staff whose achievements meet and exceed expected outcomes. Also the potential for academic promotion with Mahidol University is set out in the rules and regulations at: www.op.mahidol.ac.th/orpr/newhrsite/HREng/careerpath/careerpath.html.

6.7 The types and quantity of research activities by academic staff are established, monitored and benchmarked for improvement

The research grants gained and manuscript publications in international peer-reviewed journals are the parts of evaluation criteria. A ratio of international publication number versus academic staff is describe Table 6.5 During 2012 to 2016, our instructors have published about 6 international publications/person/year.

Table 6.5 Research manuscripts published in international peer-reviewed journals by year.

Academic year	Manuscript publications in international peer-reviewed journals	Number of academic staff	Number of publications per staff
2012	21	4.2	5.0
2013	28	4.2	6.7
2014	32	5.5	5.8
2015	39	5.5	7.1
2016	36	5.5	6.5
Average			**6.2**

7. Support staff quality

7.1 Support staff planning

General staff support: Our Faculty provides facilities for supporting staff in terms of:

7.1.1 Educational administrative services

7.1.2 Research facilities including grants, data management team, consultation team, manuscript development team, and rewards

7.1.3 Library

7.1.4 Information technology infrastructure

7.1.5 Laboratory

7.1.6 Health service

7.1.7 Sport and fitness centre

Program staff support: Our instructors and academic support staffs work together to support students and create a conducive research environment. Academic support staffs mainly consist of educational staffs, Biostatisticians, and information technology staffs. For educational support staffs, they work on preparing electronic learning materials, classrooms, upload videos of classes, administer assignments, handle routine communications, provide a mini learning resource centre and maintain our website www.ceb-rama.org. In addition, they will have to organize a meeting between students and instructors/or advisor team. Any enquiry has to be administered and organized by educational staffs.

The CEB Section has 3 Biostatisticians who graduated Master degree in Biostatistics or Applied Statistics. They have experienced in working on clinical research for 2 to 30 years . They support and help students in doing research for thesis including data management (e.g., construct databases, data entry, data cleaning and checking, data storage, and backup) and data analysis techniques. Information technology staffs support students on information technology related issues such as installation of statistical software, assessing internet and solving computer malfunction.

The Faculty's staffs such as librarians staffs are also provide assistance in books/journal finding and loan, accessing electronic databases and resources, and training of reference management software. The Faculty also provide sport centre facility to encourage staffs and students taking exercise regularly. This facility is introduced and demonstrated how to use the service on the orientation day. Qualification of academic support staffs are described in Table 7.1 below:

Table 7.1 Describe number and qualification of academic support staff during 2012 to 2016 academic years

Support staff	**Highest education attainment**				**Total**
	High school	**Bachelor's**	**Master's**	**Doctoral**	
Educational administrative services	1	4	1	-	6
IT personnel	-	-	2	-	2
Research support personnel	-	2	3	-	5
Library personnel	12	25	5	-	42
Health service	25	23	1	-	49
Sport and fitness centre	-	12	-	-	12
Total	**38**	**66**	**12**	**-**	**116**

7.2 Recruitment and selection criteria for appointment, deployment and promotion

For our program, supporting staffs are recruited by:

7.2.1 Qualification

7.2.2 Experience

7.2.3 Interview

Deployment of staffs are based on their educational background and skills. Job swabbing is allowed if there is necessity and their skills are suitable.

After successful recruitment, new support staff will be oriented by Human Resource Department about welfares, evaluation and promotion. Career promotion of support staff is depended on half-yearly performance agreement which is the agreement between each staff and Program director covering deliverables at each evaluation period. Deliverables are including achievement of assigned responsibilities, attitude, and professional skill advancement. Career promotion will result in salary raising and continuation of employment contact.

The selection criteria for each position are shown in Table 7.2 below:

Table 7.2 Competencies of support staff

Support staff	**Qualification**		**Experience**	**Interview**
	Bachelor's	**Master's**		
Educational administration	X		Education environment, IT Office environment	Communication, Personality
Head of educational staff		X	Supervisory, IT Office environment	Leadership
Educational staff	X	X	Bilingual environment, IT Office environment	Communication, Personality
Biostatistician	X	X	Biostatistics, STATA program, Bilingual environment	Communication, Biostatistics abilities, Personality

The faculty provides a happinometer survey every year in order to evaluate support staffs' satisfaction to the organisation, workplace, family, and health.

7.3 Competencies of support staff are identified and evaluated

The competencies of support staff are shown in table 7.3 below:

Table 7.3 Competencies of support staff

Support staff	Competency	Qualification	Experience	Number
Educational administration	IT Office environment	Bachelor's or Master's	IT Office environment, ≥ 2 years	3
Head of educational staff	Leadership	Master's	≥ 5 years	1
Educational staff	Team work, Educational environment	Bachelor's or Master's	≥ 2 years	4
Biostatistician	Team work, Biostatistics and STATA program,	Bachelor's or Master's	≥ 2 years	4

For the main CEB support staffs, their competencies are evaluated by CEB team twice a year according to their performance agreements. In addition, survey and feedback from students, clients who use our services will lead to improve their skills and supports. Furthermore, the CEB Section encourages and allow our staffs attending conference that is relevant to their work once a year. For educational staffs, they encourage to improve their knowledge and skill in how to write curriculum and evaluations, how to setup and prepare for e-learning, etc. In addition, the CEB Section has a policy that the head of educational staff for each program should hold at least Master degree. Thus, we encourage them to continue study.

For junior Biostatisticians, they have to attend classes about Clinical Epidemiology, Advance Statistical Analysis in Medical research, Systematic review and Meta-analysis, Data Management, and Research Methodology during the first year of their work at the CEB Section. This aims to standardize their knowledge and skill in data analysis for clinical research. Senior Biostatisticians are also encouraged and welcome to attend our classes to update their knowledge and skills that relevant to what they are working on. In addition, they are encouraged to attend national/international conference once a year, which is sponsored by the Faculty given that they will have to present their research findings. Furthermore, the CEB Section has provided English courses every year for 2-3 months to improve their English skill in communication and writing.

For the Faculty's staffs, the Program Director will forward comments/complains to proper Faculty units which are responsible for such issues.

7.4 Training and development needs of support staff

Needs for training and development of support staffs can arise anytime due to changes in requirements or responsibilities. As mentioned above that the Faculty provide scholarship for national/international conference once a year to let support staffs enhance their competencies. At the annual review of each staff their training and development needs are discussed to prepare staff for higher responsibility. The career development for support staff is to promote to a position of higher responsibility with more salary. There is Faculty's requirement that educational administrative staff to be trained on academic education every two years.

7.5 Performance management, rewards, recognition and motivation

Performance management including rewards and recognition are evaluated by the CEB head and program director under supporting of the Human Resources (HR) as bonus, or percentage of raising salary every year. There are two aspects of evaluation. The criteria for performance evaluation are quality, quantity, timelines, satisfaction, and productivity. In addition, the criteria for competency evaluation are integrity, achievement motivation, responsibility, team work, and systematic job planning.

8 Student quality and support

8.1 Student intake policy and admission criteria

Our program recruits national and international students from various countries Indonesia, Nepal, Burma, Bangladesh, etcetera. Students should have obtained at least 2 years clinical experience in a health care setting to apply for our program in addition to having suitable qualifications. The numbers of applications and acceptances are shown in Table 8.1. The percentages of offer and admission range from 50% to 100% and 33% to 100%, respectively. Accumulated numbers of students for the last 5 years are shown in Table 8.2.

Table 8.1 The intake of first year students in the last 5 academic years

Academic year	Applicants		
	No. applied	No. offered (%)	No. admitted/enrolled (%)
2012	8	4 (50)	4 (50)
2013	3	2 (67)	1 (33)
2014	7	6 (86)	6 (86)
2015	8	5 (63)	3 (38)
2016	14	10 (79)	6(43)

Table 8.2 Total number of students in last 5 academic years

Academic year	Students					Total
	1st year	2nd year	3rd year	4th year	>4th year	
2011	3	4	2	4	0	13
2012	4	3	4	2	4	17
2013	1	4	0	4	4	13
2014	6	1	4	0	7	18
2015	3	6	1	2	6	18
2016	6	2	6	1	5	20

8.2 The methods and criteria for the selection of students

The admission criteria are qualifications, experience in clinical practice, teaching and research, draft research outline, English proficiency, referees and financial viability. The process of selection includes reviews and evaluation of these provided documents and interview by program committee. During interview each program committee member individually marks each student by interview performance, brief proposal, curriculum vitae and English communication skill. Those students must pass the threshold mark of 60% to be offered a place. This evaluation enables us to select those students with potential and capability to succeed.

8.3 Monitoring of student progress, academic performance and workload

The student quality process during coursework includes interactive teaching, assignments, presentations, and examinations with individual feedback. Students' works are promptly assessed and marked so that students can receive feedback quickly for self-improvement. A student with low performance directly receives comments, discussion, and suggestions in order to improve study performance. The GPA of our students during academic years 2012 – 2015 ranged from 3.00 to 3.90 with a median of 3.67

After coursework students are simultaneously mentored to prepare for the qualifying examination, the first manuscript submission, and research proposal development. From 2012 – 2015, 10/12 students passed the first examination, and 2/12 passed retake examination.

In parallel, an advisor team is properly and promptly allocated to students. This team regularly meets each student every 2 – 4 weeks to develop the research proposal. Education administration team arrange and schedule these meetings, which is the agenda for discussing in the program committee meeting monthly in order to make sure that students have met advisor team regularly. Students are provided with a research proposal template to help them develop a comprehensive proposal. Out of 12 students, 5 could defend their research within year two. Our students are encouraged to develop and submit their first manuscript from their systematic review course within year two. We setup investigator team including national and international co-authors to coach and work closely with students to produce good quality manuscripts.

Students must apply for ethics approval and grant for conducting their research after their proposal is accepted. Both the ethics and grant approval processes act as external quality audit for a student's research and reassure that their research meets international standard. Additional advisers will be added to a student's adviser team to support their research study, including content experts external to the program.

Students are coached by their advisers to set up and train a research collaboration team for data collection. Our CEB section also provides support facilities such as web-based applications for subject allocation, data management, data monitoring, research administration, English support, and etcetera.

The adviser team closely follows the research meeting regularly every 2-4 weeks with each student to review progress, give praise/suggestions as appropriate, and assist in solving problems. The outputs of these meetings are recorded and circulated to academic and education

support team within 1 week. Each student develops a terms of reference showing their achievement plan for the next six months with timeline. This enables a student and adviser team to keep the research on track to complete these targets. Every six months a formal research progression will be held to formally assess achievement and set the terms of reference for the next six months. During 2012 – 2016 academic year, 5 students graduated taking 3 to 5 years to complete (mean 3.6 publications/student) with impact factor range from 0.87 to 37.7

8.4 Academic advice, co-curricular activities and student activities

Throughout the training and research for Ph.D., students have adviser team to take care of them and give advice when they need help. All academic and education support staffs are in a state of readiness to help students when they need support. Every effort is made to provide help and advice to students promptly. All students must regularly meet with their adviser(s) every 2-4 weeks.

Every month a journal club is arranged at which students are scheduled in rotation to be presenter, commentator, and moderator to share, update, and help each other understand more difficult areas in Epidemiology and Biostatistics in relation to carefully selected recent journal articles. One instructor is usually allocated to supervise and look after each journal club. All students are actively encouraged to attend, their statistics for attentions are reported in the program committee meeting monthly. If a percentage of attention is low, that student will be contacted and remind to attend more. Students also regularly contribute to our E-zine. Each academic year the final year students conduct a workshop to share their experiences and advice on selected relevant areas with other students.

A welcome and orientation party is organised to welcome all new students at the start of each academic year. A special Christmas and New Year party is organised to bring students together socially mid-academic year. Towards the end of each academic year a celebration graduation party is organised for graduating students at which they share their individual advice for success to ongoing students.

8.5 The physical, social and psychological environment for education and research

We provide an education support office, where students can meet to work together during normal working hours. Our website www.ceb-rama.org has the emails of all our academic and education support staff, students and alumni facilitating students to easily communicate with each other. Our monthly journal clubs and 3 annual parties (welcome and orientation, Christmas and New Year, and graduation) provide social events at which meals are provided to encourage students to come together to meet socially. Students can approach their advisers for non-academic advice whenever they have a problem. Our education support staff arrange nearby reasonably priced accommodation for those students requiring it. Our Faculty also has a sport centre as mentioned above for fitness and recreation and an on-site clinic to take care of students' health and fitness.

Although we would like to provide each student with an individual learning station where they can work and keep their things, we are limited by the space provided to us by the Faculty of Medicine Ramathibodi Hospital which is mainly designed for staff working.

9 Facilities and Infrastructure

We have several facilities and infrastructures provided by CEB section, and the Faculty of Medicine Ramathibodi Hospital and Mahidol University. These facilities and infrastructure are described below.

9.1 The teaching and learning facilities and equipment are modern and effective for teaching and research

Our International Ph.D. program uses the Medical and Education Laboratory Center of the Faculty of Medicine Ramathibodi Hospital. This provides modern fully equipped classrooms in a variety of sizes and seating arrangements. In additional there are computer laboratories with relevant software where students can learn and practice. Our education support unit provides a student office environment where students can work and gather together. Students report good satisfaction with these facilities and equipment.

9.2 The library and its resources are effective and modern to support learning and research

Faculty of Medicine Ramathibodi Hospital has a modern well-resourced library. This includes traditional learning and research resources in the form of books and journals in both Thai and English as well as modern electronic information resources. Faculty spend more than 30 million Thai baht per year on databases and electronic resources. Through Mahidol University these library facilities are extended by subscription to major international online journals, textbooks, and databases. Students report good satisfaction with these facilities and resources.

9.3 The statistical consultation clinic and data management centre are effective and responsive to support learning and research

Our CEB section provides a statistical consultation clinic to help students with research methodology, data management, and data analysis to facilitate and support students' research These services are regularly monitored to ensure they are responsive to students' needs. Students report good satisfaction with these services.

9.4 The IT facilities are effective and modern to support learning and research

All our students have Wi-Fi/Lan access throughout the campus accessible by Mahidol University login provided upon registration. Mahidol University provides online access to library facilities and electronic resources. In addition, our CEB section provides the intranet servers where students can access and backup their data. We also have IT technicians to assist student requirements. All students are provided with legal software which we install on their own computer to support their learning and research. Our CEB section has our own system analyst staff to provide technical support to students. Students report good satisfaction with these facilities, software and services.

9.5 The environmental, health and safety, and access for students with special needs standards are provided throughout the campus.

As a tertiary teaching hospital, the highest environmental, health and safety standards are provided all through the campus. Additionally all buildings have access ramps for the

handicapped. Security staff patrol all day and night, every day. All buildings have full fire safety devices and fire-fighting equipment fitted, with emergency lighting and fire exits. Regular fire-fighting training is provided to all staff. Students report good satisfaction with these facilities and standards.

All students have access to our hospital facilities and services within normal working hours and emergency facilities and services are provided all day and night, every day. All international students are provided with health insurance. The Faculty of Medicine Ramathibodi Hospital has provided an outpatients clinic for staff and students within normal working hours. Emergency services are provided at all times.

10 Quality enhancement

10.1 Feedbacks serve as input to curriculum design and development

A student satisfaction and expectation survey is performed annually in February to March each year by the Faculty of Graduates, Mahidol University, see Appendix1. In addition, our Faculty also conducts a survey once a year to ask about how satisfied students are with our Faculty, see Appendix 1. Furthermore, our program has performed expectation and requirement survey for employers and we plan to do so every two years. . The latest survey feedback is shown below in Table 10.1. The survey focuses on stakeholders' expectations of student capabilities on graduation. The results are reviewed and discussed in the annual program seminar. The curriculum is revised and improved to meet these stakeholder requirements. However, we have not yet done an alumni survey and we is on the process of developing questionnaire of this survey while preparing this document.

During and after each subject, feedback and students' performances are received from instructors and discussed in the monthly program meeting. In addition, we use information from end-of-course student evaluations, together with yearly student satisfaction surveys from the Faculty of Graduate Studies for continuous development.

Each year an annual program seminar is conducted to review stakeholders' expectations, students', alumnus', and staff feedbacks together with student performances to revise and improve the curriculum to keep up to date. The latest coursework review and development is shown below in table 10.2.

Table 10.1 The summary of our latest 2016 stakeholders' expectations survey

Feedback contents	Feedback from Students' Employers	Follow up
Generic skills		
Interpersonal skills	- Have a good relationship with colleagues - Have good teamwork skills - Know how to interact with co-workers to be trusted	- Set up research team - Assign specific roles providing training by advisers team - Regular research team meeting and interactions within and between team members
Team player	- Be able to perform assigned work well - Able to work well with a team, always listens, respects team's opinions - Able to work with health personnel in various fields, especially in Epidemiology and Public Health	- Team work schedules, planning, communication, management
Information and technology literacy	- Able to learn and apply IT in their work - IT in research is moderate, and statistics is excellent - Able to use IT and modern technology and always shares their knowledge - Effectively uses modern technology in research and everyday life	- Improve and update relevant curriculums - Organise mini workshops about new technology/software in Epidemiology and data analysis

Feedback contents	Feedback from Students' Employers	Follow up
Oral, written and graphic communication	- Good to excellent communication skills - Can explain clearly, particularly epidemiology knowledge - Write a concise summary, and illustrate to make something more easily understood - Excellent in manuscript writing with international standard - Use modern technology to produce graphics to aid good communication	- Improve and increase presentation courses - Encourage students to present their work in international conferences - Encourage students to contribute to E-zine - Encourage students to publish 2-3 manuscripts in international peer-reviewed journals
Problem solving skills, especially in research management	- Can apply Plan, Do, Check, Action (PDCA) - Can develop their career path on their skill - Good problem solving skill in research management and good ability to solve problems - Be ready to solve research problems by applying thinking process and problem solving systematically	- Regular meeting, monitoring and coaching with students - Setup regular (2-4 weeks) meeting schedule
Other comments / suggestions	- Have good morals - Participates in the academic activity about Clinical Epidemiology - Can be adviser in research methodology for fellows and academic staff	- Emphasise ethical considerations in curriculum - Encourage students to participate in other ongoing research in relevant career path

Feedback contents	Feedback from Students' Employers	Follow up
	- Be a leader and expert in Dentistry Clinical Epidemiology both nationally and internationally	
Specific Skills		
Evidence based medicine	- Use proven evidences and knowledge in patient care - Good to excellent in teaching Evidenced-based Medicine - Clearly understands Evidenced-based Medicine and can apply it to career path and other relevant organizations	- Revise and update Evidence-based medicine curriculum regularly
Design and conduct health science research	- Good to excellent consultant in research methodology - Can initiate research in their specialties with good design, research plan, and management	- Assign students to work in consultation clinic for 1 month during years 2 to 4 - Mentoring doing good quality research for thesis
Statistical Analysis	- Can analyse complex data and interpret the results appropriately - Good to excellent knowledge, skill interpretations, and report results in statistical analysis	- Improve Statistics curriculum with more practical real data - Assign data management team to coach students during research
Ethical standards in health science research	- Conducting research with ethical standards	- Apply and obtain ethics approval for their research

Feedback contents	Feedback from Students' Employers	Follow up
	- Able to guide colleagues to comply with good ethical considerations	
Other specific skills you would like to see	- Can create multidisciplinary national and international research networks - Active in doing, consulting, and leading research - Able to apply research results in clinical practice - Be happy in their work	- Encourage students to conduct multicenter studies which involve multidisciplinary international collaborations

Table10.2 Coursework review and development

Coursework before revision		Coursework after revision		Development
RACE 611 Clinical Epidemiology and Evidence-Based Medicine	3(3-0-6)	RACE 611 Clinical Epidemiology and Evidence-Based Medicine	3(1-4-4)	Hours of Lecture, Practice, Self-study
RACE 612 Study Designs and Measurements	3(2-2-5)	RACE 612 Study Designs and Measurements	3(2-2-5)	Minor change
RACE 603 Research Protocol Design	2(1-2-3)	RACE 603 Research Protocol Design	2(1-2-3)	Minor change
RACE 614 Medical Informatics and Database Management	2(1-2-3)	RACE 624 Research Informatics and Data Management	3(2-2-5)	Name of course, Code and Credits
RACE 615 Introduction to Medical Statistics	3(1-4-4)	RACE 615 Introduction to Medical Statistics	3(2-2-5)	Hours of Lecture, Practice, Self-study

Coursework before revision		Coursework after revision		Development
RACE 616 Advanced Analysis in Medical Research	3(1-4-4)	RACE 616 Advanced Analysis in Medical Research	3(2-2-5)	Hours of Lecture, Practice, Self-study
RACE 607 Clinical Economics	2(1-2-3)	RACE 607 Clinical Economics	3(2-2-5)	Credits
RACE 608 Social Science in Clinical Practice and Research	2(1-2-3)	RACE 608 Social Science in Clinical Practice and Research	2(1-2-3)	Move to Elective course
RACE 617 Randomized Controlled Trials	2(1-2-3)	RACE 617 Randomized Controlled Trials	2(1-2-3)	Minor change
RACE 618 Systematic review and Meta-analysis	2(1-2-3)	RACE 618 Systematic review and Meta-analysis	3(1-4-4)	Move to Required course, Credits

10.2 The curriculum design and development process is established and subjected to evaluation and enhancement

Our curriculum design and development process is constructed under the regulation of Mahidol University. Every 5 years we appoint a Curriculum Development Committee (CDC) consisting of members of our program and at least 2 external committee from outside Mahidol University. The CDC drafts the programs' ELOs as well as program specification in the TQF2 document considering feedbacks received from each course, comments, students' performances, and stakeholder expectations. The draft curricula are discussed and approved by the program committee and the Faculty of Medicine, Ramathibodi Hospital before submission to the Faculty of Graduate Studies for reviewing TQF requirement. Then, the Faculty of Graduate Studies submits it to a Peer Review Committee appointed by Mahidol University Council. The CDC makes further revision according to the Peer Review Committee comments before approval by Mahidol University Council and final approval by the Higher Education Commission of Thailand.

10.3 Teaching and learning activities are continuously evaluated and revised to ensure they meet the Expected Learning Outcomes (ELOs)

After each coursework subject is completed, our students complete online surveys to provide feedback. These are reviewed within one month of completion by our program committee to revise and improve each subject accordingly. Our students' performances on each subject are also reviewed within one month of completion by our program committee to ensure the ELOs have been met.

10.4 Research output contributes to our learning and research

Our academic team and students conduct a lot of research in various areas including Orthopedics, General/Plastic Surgery, Non-communicable diseases (e.g. Renal disease, Cardio vascular disease, Diabetes, Hypertension, etcetera), Emergency Medicine, and Pediatrics. They produce publications in international peer-reviewed journals with an average of 0.57 publications/student. In addition, academic staff publish on average 6 manuscripts/year in international peer-reviewed journals with impact factor ranging from 0.868 to 37.684 with median 2.4. Our program use data from these published researches to teach students. In statistical classes, students use real clinical research to practice various statistical analysis skills. In some courses such as Randomised Controlled Trials and Systematic Review, instructors use real published research design and data as learning materials in these courses.

10.5 Quality of support services and facilities are regularly reviewed and improved

Learning modules are prepared in advance for coursework and these are uploaded to our website in advance of classes, to enable students to pre-read to prepare themselves for class. During each class a video is made and this is uploaded to our website within two working days to enable students to review and clarify their understanding after the class. Also we have a mini-library of specific textbooks in Epidemiology and Biostatistics available in our office.

Our section provides information technology support to help students when they have a problem with their computer or software. We also set up a data management team to provide support/advice in data management when students conduct their research. We regularly meet with students to make sure that their work progresses as planned and resolve any problems.

10.6 Stakeholder's feedback mechanism is systematic and regularly evaluated for review

Students' employers' feedback is surveyed and data are collected/analysed annually. The questionnaires are sent off by post and emailed and followed up by telephone and email, if they do not respond as planned with our timeframe. Current students and alumnus satisfaction surveys are regularly performed by Faculty's post-graduation office as a quality assurance policy. Results of these are considered in program committee meeting and annual seminar to revise and improve our program.

11 Output

11.1 Pass and withdrawal rate monitoring

We annually monitor several parameters which include, yearly new student recruitment, number of international students, annual pass, conversion and withdrawal. These are reviewed at the monthly academic meetings, and the annual program review for program development and improvement.

These are shown for each year in Table 11.1

Table 11.1 Yearly recruitment, number of international students, annual graduates and withdrawal

Year	Recruitment	Graduated	Conversion*	Withdrawal
2008	4	-	-	-
2009	2	-	-	-
2010	4	-	-	-
2011	3	-	-	-
2012	4	-	-	-
2013	1	2	-	3
2014	6	1	+1	1
2015	3	2	-1	0
2016	6	3	-	1
Total	**33**	**8**	**0**	**5**

*Students convert to/from Ph.D. and M.Sc. program – move from Ph.D. to M.Sc, + move from M.Sc to Ph.D.

Withdrawal can occur anytime during the program and currently 3 reasons with actions have been identified as shown in Table 11.2. Students who withdraw return to their previous position/work prior to study in their institution.

Table 11.2 Reasons for withdrawal and actions

Reason for Withdrawal	Actions
Student could not complete coursework due to lack of ability / time	- Counselling student to identify and resolve problem - Careful selection of student
Student cannot pass qualifying examination	- Explain reasons why students failed - Offer the tutor to help students
Student has inability in time management and priorities	- Setup regular meeting every 2-4 weeks - Construct terms of reference and closely monitor

11.2 Average time to graduation

The times to graduate for our program or withdraw or convert are shown in Table 11.3 below. The time to graduate ranges from 3 to 5 years with a median of 4 years. The time to withdraw ranges from 4 to 7 years with the median of 4 years. The students have a conversion option in year 2 to convert from Ph.D. to M.Sc. or from M.Sc. to Ph.D.

After students have defended their research proposal it can take a considerable time obtaining funding for their research study which extends the time to graduate. The funding agency may request revision of the proposal, which can also extend the time. Also, if the research is prospective involving collecting patient data, fluctuations in recruitment rate can affect the time to graduate. All of these factors are outside the program's control. From our experience those students conducting research on retrospective data finish earlier. We request students to take at least three years study leave for their Ph.D., but this is often not enough. Additionally, scholarships for Ph.D. are often time limited which can pressure students toward doing retrospective rather than prospective research studies.

Table 11.3 Average time to graduation, withdrawal or convert

Academic year	Student enrolment	Completed Ph.D.		Withdrawal		Conversion*
		3 years	5 to 8 years	≤ 4 years	≥ 5 years	Ph.D.>M.Sc.
2008	4		2 (50%)		1 (25%)	
2009	2		2 (100%)			
2010	4		2 (50%)			
2011	3			3 (100%)		
2012	4	1 (25%)				-1 (25%)
2013	1					
2014	7					-1 (25%) +1 (25%)
2015	3			1 (33%)		

*Students convert from Ph.D. to M.Sc. program – move from Ph.D. to M.Sc, + move from M.Sc to Ph.D.

11.3 Career potential of graduates from our program

Our program aims to produce graduates who are ready to take up roles as instructors in clinical research methodology/evidence-based medicine in schools of medicine, hospitals and government service sections. Our four graduates so far include assistant professor (1), instructor / doctor in school of medicine (2), and instructor in medical association (1). We annually survey students' employers' stakeholders to monitor their requirements. Stakeholders have indicated their expectation that graduating students can take up a leadership/teaching role in Epidemiology in their department. Three of our four graduates have met this expectation.

11.4 The type and quantity of research activities by students is supervised and evaluated.

The number of research publications and ratio per student actively conducting research are shown in the following Table 11.3. Students are encouraged to produce a manuscript for publication from their systematic review and 2-4 from their research and thesis and aim for publication in international peer-reviewed journals with good impact factor. However, in our

experience it can take several submissions to different journals before acceptance, so there is a long delay between manuscript completion and publication. In fact, the final manuscript publication may occur after graduation.

Table 11.3 The number of research publications and ratio per student conducting research.

Academic Year	No. of student enrollments	No. of candidates to conduct research	Accumulative no. of candidates to conduct research	Publications	Publication/ Student/Year
2009	2	4	4	2	0.50
2010	4	3	7	3	0.43
2011	3	3	10	4	0.40
2012	4	3	13	9	0.69
2013	1	4	12	6	0.50
2014	6	1	12	10	0.83
2015	3	6	16	10	0.63
Average					**0.57**

11.5 Satisfaction of all Stakeholders

Staff: each month a meeting with all staff is held to receive feedback and solve problems. Also an annual survey is conducted by the Faculty of Medicine and followed up to achieve staff satisfaction. An occasional outside staff seminar is also held to motivate staff.

Students: After each subject has been taught students complete an online feedback form, and an informal meeting with students is held every semester for discussion. Any student comment/request/complaint is taken into the monthly program committee meeting for discussion and action.

Alumni: Graduating students are required to present their advice to incoming students each year.

Labour Market: Every year students' employers are surveyed by questionnaire, and from the feedback they appreciate the ability of students to share their new knowledge by helping others to conduct better research.

STRENGTHS, LIMITATIONS AND IMPROVEMENTS OF PROGRAM

Strengths

The strengths of our program are that ours is one of the very few Ph.D. programs in Clinical Epidemiology available worldwide, and the curriculum is well differentiated from other programs with the high level of support provided to our students. For instance, our program makes students stronger in Epidemiological studies, Randomised Controlled Trials, Research Protocol Design, and Systematic Review and Meta-analysis which differentiates it from others. These subjects will lead students to become excellent instructors/researchers to international standard.

Our support starts since a student's application. Our website www.ceb-rama.org gives full information to the student with download links. Students can apply online, and for oversea applicants we interview by Skype. We search for nearby accommodation on request for students from outside Bangkok. On arrival we provide a Welcome and Orientation party to help new students meet our academic and support staff and ongoing students and learn how we learn. All necessary licensed software is installed on students' computers by our IT staff. Website access to all learning resources is provided.

During coursework our academic staff produces learning modules based on a synthesis of their experiences and leading modern texts. We also supply cases, assignments and relevant up to date articles which are made available on our website 2 to 4 weeks before the class. We provide relevant textbooks and previous student theses, which are kept in our education support office for ready reference by students. We video each class session and upload to our website within 2 working days, so students can review what was learnt in the class, whenever and wherever they want. Student submit assignments via our website www.ceb-rama.org and individual results and feedback are provided through our website. The evaluation of coursework is mostly by assignment and student presentation. Coursework is marked and feedback given to students within 2 to 4 weeks.

After finishing coursework in year one, we tutor students to ensure their readiness for qualifying examination. We also guide students to develop their research proposal, defend it, obtain ethics approval, and apply for grant. Our staff encourage and coach students to complete these activities within year two by setting up regular meetings every 2 to 4 weeks with adviser

teams. In addition, students will complete and submit their first manuscript relevant to their research proposal in year two.

During conducting research, an adviser team and our education staff support and facilitate students. We guide students to conduct research including collaborative meetings, training for data collection, site monitoring, data management, and budget management. We set up regular meetings for students and advisers' teams every 2 to 4 weeks. We discuss results of their progress including recruitment of subjects as planned, protocol violations, data collection issues, and other problems arising, at which meeting solutions and suggestions will be provided. All research meetings are documented. Additionally, a data management team is set up for each student to manage their data, including construction of databases, cleaning, checking, and validation of their data. Furthermore, we set up special events to lead students learning and updating relevant knowledge, e.g., journal club and mini workshop.

Limitations

There are only a few scholarships available for students. This limits the international students who can take our program and excludes some fine potential epidemiologist researchers.

To study the coursework, conduct a full 48 credits research study and publish at least 2 manuscripts takes 3 to 5 years. Unfortunately, some organisations are unwilling to give students full study leave for 3 to 5 years to study their Ph.D. Consequently many students find themselves under time pressure from their research, their job and their family/social life to achieve everything and experience some stress to complete their study in a timely manner.

We would like to provide each student with individual learning stations, equipped with an online computer set and storage for their study materials. Unfortunately due to severe space limitations and budget from the Faculty of Medicine we are unable to do so. We try to use a hot desking approach as much as possible to alleviate this problem.

Improvements

The Faculty of Medicine Ramathibodi Hospital has allocated various scholarships for International students from low income countries including full scholarship, research scholarship, and research assistant scholarship. These scholarships should increase the number of international students in the future.

We provide research support materials on our website (www.ceb-rama.org)/applications (ceb application) and arrange regular meetings with adviser team to keep students on track. We identify students with slow progression as soon as possible and call for adviser team meeting to solve the problem. Action plan, close monitoring/ follow up, and encouragement are used to improve progression.

We use hot desking to provide students with a study/research environment including table/desk with lan/wifi access, electronic library, software, and server. Educational staff will organise meetings when students request.

APPENDICES

Appendix 1:

Survey and Feedback from students, and Stakeholders's survey

ผลการสำรวจความต้องการและความคาดหวังของนักศึกษาต่อการจัดการเรียนการสอนของหลักสูตรและการให้บริการของบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

ระยะเวลาการสำรวจ วันปฐมนิเทศนักศึกษาใหม่ วันที่ 3 สิงหาคม 2557

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี

ความต้องการของนักศึกษาต่อการจัดการเรียนการสอนของหลักสูตรและการให้บริการของบัณฑิตวิทยาลัย	ปริญญาเอก					ปริญญาโท													
	พยาธิวิทยาคลินิก	ระบาดวิทยาทางคลินิก (นานาชาติ)	เวชศาสตร์ปริวรรต (นานาชาติ)	ภาพรวมปริญญาเอก	ค่าเฉลี่ยรวมระดับปริญญาเอก	การเจริญพันธุ์และวางแผนประชากร	การผดุงครรภ์	การพยาบาลจิตเวชและสุขภาพจิต	การพยาบาลเด็ก	การพยาบาลผู้ใหญ่	การพยาบาลเวชปฏิบัติชุมชน	ความผิดปกติของการสื่อความหมาย	พยาธิวิทยาคลินิก	พยาบาลศาสตรมหาบัณฑิต (นานาชาติ)	ฟิสิกส์การแพทย์	ภาพรวมปริญญาโท	ค่าเฉลี่ยรวมระดับปริญญาโท	ค่าเฉลี่ยรวมรายคณะ	ค่าเฉลี่ยรวมระดับบัณฑิตศึกษา
จำนวนผู้ตอบแบบสอบถาม	1	4	1	6	162	4	9	6	7	9	5	7	8	4	6	65	941	71	1,157
ด้านอาจารย์ผู้สอน																			
1.มีความเชี่ยวชาญและประสบการณ์ตรงในรายวิชาที่สอน	4.00	5.00	5.00	4.83	4.83	5.00	4.89	4.67	4.86	4.67	4.60	4.86	5.00	4.75	4.50	4.78	4.74	4.79	4.75
2.สามารถถ่ายทอดความรู้และประสบการณ์เชื่อมโยงความรู้ภาคทฤษฎีและปฏิบัติ	4.00	5.00	5.00	4.83	4.82	5.00	4.78	4.67	4.86	4.67	4.80	4.71	4.88	4.75	4.67	4.77	4.76	4.77	4.76
3.ใช้เทคนิควิธีการสอนทำให้ผู้เรียนเกิดความกระตือรือร้นและสนใจเรียน	4.00	5.00	5.00	4.83	4.68	5.00	4.89	4.83	4.57	4.67	4.80	4.86	4.75	4.75	4.67	4.77	4.69	4.77	4.69
4.ใช้วิธีการสอนและสื่อการสอนที่เหมาะสมกับเนื้อหารายวิชา	5.00	5.00	5.00	5.00	4.70	5.00	4.89	4.83	4.57	4.67	4.80	4.86	4.63	4.75	4.50	4.74	4.68	4.76	4.68
5.มีการจัดระบบ/ตารางเวลาให้นักศึกษาได้พบอย่างสะดวก	5.00	4.75	5.00	4.83	4.71	4.75	4.78	4.67	4.57	4.67	4.80	4.71	4.63	4.75	4.33	4.66	4.65	4.68	4.66
6.ให้ความช่วยเหลือนักศึกษาในการวางแผนและแก้ไขปัญหา	4.00	4.75	5.00	4.67	4.72	5.00	4.89	5.00	4.57	4.67	5.00	4.71	4.75	5.00	4.67	4.80	4.71	4.79	4.70
7.มีความเอาใจใส่และติดตามความก้าวหน้าในการเรียนของนักศึกษา	4.00	5.00	5.00	4.83	4.69	5.00	4.89	4.83	4.71	4.67	4.80	4.71	4.75	5.00	4.67	4.78	4.68	4.79	4.68
ด้านการจัดการเรียนการสอนของหลักสูตร																			
1.ความเพียงพอด้านทรัพยากรประกอบการเรียน/การวิจัย	5.00	5.00	5.00	5.00	4.72	5.00	4.89	5.00	4.71	4.56	4.80	4.14	4.75	4.75	4.33	4.68	4.69	4.70	4.69
2.ความเพียงพอและเหมาะสมของห้องเรียนหรือห้องปฏิบัติการ	4.00	4.75	5.00	4.67	4.64	5.00	4.78	4.83	4.57	4.67	4.80	4.14	4.63	5.00	4.33	4.65	4.62	4.65	4.63
3.การได้รับข้อมูลที่จำเป็นต่อการเรียนตลอดหลักสูตร	5.00	4.75	5.00	4.83	4.73	5.00	4.89	4.83	4.71	4.67	4.80	4.43	4.75	5.00	4.33	4.72	4.68	4.73	4.68
4.หลักสูตรจัดให้มีอาจารย์ที่ปรึกษา เพื่อให้คำแนะนำเกี่ยวกับการเรียนและการใช้ชีวิตส่วนตัว	4.00	4.75	5.00	4.67	4.49	4.50	4.89	5.00	4.29	4.56	4.80	4.43	4.63	4.50	4.33	4.60	4.54	4.61	4.52
ด้านการจัดกิจกรรมและการเรียนการสอนที่ส่งเสริมให้นักศึกษามี Altruism และมีผลการเรียนรู้ 5 ด้านตาม มคอ.																			
1. เป็นผู้ที่มีความเสียสละ มีน้ำใจ ช่วยเหลือผู้อื่น และรักษาผลประโยชน์ของส่วนรวม	5.00	4.50	5.00	4.67	4.57	4.75	4.89	4.83	4.57	4.56	4.40	4.43	4.50	4.50	4.17	4.57	4.60	4.58	4.59
2.เป็นผู้ที่มีวินัยและตรงต่อเวลา	4.00	4.75	5.00	4.67	4.54	4.75	4.89	5.00	4.71	4.56	4.40	4.57	4.75	4.75	4.33	4.68	4.61	4.68	4.60
3.เป็นผู้ที่มีความซื่อสัตย์ต่อตนเองและผู้อื่น	4.00	4.75	5.00	4.67	4.60	4.75	4.89	5.00	4.57	4.56	4.40	4.57	4.75	4.75	4.33	4.66	4.66	4.66	4.65
4.สามารถคิด วิเคราะห์ และวางแผนการทำงานอย่างเป็นระบบ	5.00	4.50	5.00	4.67	4.74	5.00	4.78	4.83	4.29	4.67	4.80	4.43	4.75	5.00	4.17	4.65	4.65	4.65	4.65
5.สามารถประมวลความรู้จากการเรียน และนำไปสังเคราะห์เป็นความรู้ใหม่	4.00	4.50	5.00	4.50	4.77	4.75	4.67	4.83	4.43	4.67	4.80	4.57	4.75	5.00	4.50	4.68	4.67	4.66	4.68
6.มีความกระตือรือร้นและสนใจศึกษาหาความรู้เพื่อพัฒนาตนเองอย่างต่อเนื่อง	4.00	4.75	5.00	4.67	4.72	4.75	4.78	4.83	4.57	4.56	4.40	4.29	4.63	4.75	4.50	4.60	4.61	4.61	4.61
7.มีภาวะผู้นำและผู้ตาม สามารถทำงานร่วมกับผู้อื่นได้ดี	4.00	4.75	5.00	4.67	4.63	4.75	4.78	4.67	4.43	4.56	4.40	4.29	4.50	4.50	4.50	4.54	4.59	4.55	4.59
8.มีความรับผิดชอบต่อหน้าที่และภาระงานทั้งของตนเองและงานกลุ่ม	4.00	4.75	5.00	4.67	4.65	4.75	4.67	4.83	4.57	4.56	4.60	4.43	4.75	4.75	4.33	4.62	4.66	4.62	4.65
9.รับฟังความคิดเห็นของผู้อื่น	4.00	4.75	5.00	4.67	4.67	4.75	4.89	4.83	4.43	4.56	4.60	4.43	4.63	4.75	4.50	4.63	4.64	4.63	4.64
10.เป็นผู้ที่มีทักษะในการฟัง พูด อ่าน เขียน และการสรุปประเด็นได้ดี	5.00	4.75	5.00	4.83	4.72	5.00	4.89	4.83	4.29	4.67	4.80	4.43	4.75	5.00	4.33	4.68	4.63	4.69	4.64
11.มีความสามารถในการใช้เทคโนโลยีสารสนเทศเพื่อการเรียนและการสืบค้นข้อมูล	5.00	4.50	5.00	4.67	4.62	5.00	4.78	4.83	4.43	4.44	4.80	4.43	4.50	5.00	4.17	4.60	4.59	4.61	4.58
12.มีความสามารถในการใช้ภาษาอังกฤษในการเรียนและการติดต่อสื่อสาร	5.00	4.75	5.00	4.83	4.70	5.00	4.67	5.00	4.29	4.56	4.80	4.71	4.63	5.00	4.17	4.65	4.63	4.66	4.63
ด้านการให้บริการของบัณฑิตวิทยาลัย																			
1.ข้อมูลในเว็บไซต์มีความทันสมัย ครบถ้วน และระบบสารสนเทศง่ายต่อการใช้งาน	4.00	4.75	5.00	4.67	4.68	4.50	4.78	4.67	4.57	4.56	4.80	4.57	4.75	4.75	4.83	4.68	4.64	4.68	4.64
2.พัฒนาศักยภาพด้านภาษาอังกฤษ โดยกำหนดให้มีรายวิชาภาษาอังกฤษสำหรับผู้ที่สอบภาษาอังกฤษไม่ผ่าน	4.00	4.50	5.00	4.50	4.63	5.00	4.89	4.83	4.57	4.33	4.80	4.43	4.50	4.75	4.83	4.66	4.62	4.65	4.61
3.จัดให้มีรายวิชาเสริมทักษะการใช้ภาษาอังกฤษ เช่น การเขียนบทความวิจัย การเขียนวิทยานิพนธ์	4.00	4.75	5.00	4.67	4.69	4.75	4.89	4.83	4.57	4.44	4.80	4.71	5.00	4.75	4.50	4.72	4.69	4.72	4.67
4.เจ้าหน้าที่ให้บริการด้วยความรวดเร็ว	5.00	4.75	5.00	4.83	4.62	4.75	4.89	4.67	4.43	4.56	4.80	4.71	4.63	4.75	4.50	4.66	4.67	4.68	4.66
5.เจ้าหน้าที่ให้คำแนะนำในการดำเนินการต่างๆ ได้อย่างถูกต้อง	5.00	4.75	5.00	4.83	4.67	4.75	4.89	4.83	4.43	4.56	4.80	4.71	4.75	5.00	4.50	4.71	4.69	4.72	4.68
6.เจ้าหน้าที่ให้บริการด้วยความเต็มใจและสุภาพ	4.00	4.75	5.00	4.67	4.67	4.75	4.89	4.83	4.43	4.56	4.80	4.57	4.88	5.00	4.50	4.71	4.70	4.70	4.69

ผลการสำรวจความต้องการและความคาดหวังของนักศึกษาต่อการจัดการเรียนการสอนของหลักสูตรและการให้บริการของบัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล

ระยะเวลาการสำรวจ วันปฐมนิเทศนักศึกษาใหม่ วันที่ 3 สิงหาคม 2557

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี

ความต้องการของนักศึกษาต่อการจัดการเรียนการสอนของหลักสูตรและการให้บริการของบัณฑิตวิทยาลัย	ปริญญาเอก					ปริญญาโท													
	พยาธิวิทยาคลินิก	ระบาดวิทยาทางคลินิก (นานาชาติ)	เวชศาสตร์ปริวรรต (นานาชาติ)	ภาพรวมปริญญาเอก	ค่าเฉลี่ยรวมระดับปริญญาเอก	การเจริญพันธุ์และวางแผนประชากร	การผดุงครรภ์	การพยาบาลจิตเวชและสุขภาพจิต	การพยาบาลเด็ก	การพยาบาลผู้ใหญ่	การพยาบาลเวชปฏิบัติชุมชน	ความผิดปกติของการสื่อความหมาย	พยาธิวิทยาคลินิก	พยาบาลศาสตรมหาบัณฑิต (นานาชาติ)	ฟิสิกส์การแพทย์	ภาพรวมปริญญาโท	ค่าเฉลี่ยรวมระดับปริญญาโท	ค่าเฉลี่ยรวมรายคณะ	ค่าเฉลี่ยรวมระดับบัณฑิตศึกษา
จำนวนผู้ตอบแบบสอบถาม	1	4	1	6	162	4	9	6	7	9	5	7	8	4	6	65	941	71	1,157
ค่าเฉลี่ยรวมรายด้าน																			
ด้านอาจารย์ผู้สอน	4.29	4.93	5.00	4.83	4.74	4.96	4.86	4.79	4.67	4.67	4.80	4.78	4.77	4.82	4.57	4.76	4.70	4.76	4.70
ด้านการจัดการเรียนการสอนของหลักสูตร	4.50	4.81	5.00	4.79	4.64	4.88	4.86	4.92	4.57	4.61	4.80	4.29	4.69	4.81	4.33	4.66	4.63	4.67	4.63
ด้านการจัดกิจกรรมและการเรียนการสอนที่ส่งเสริมให้นักศึกษามี Altruism และมีผลการเรียนรู้ 5 ด้านตาม มคอ.	4.42	4.67	5.00	4.68	4.66	4.83	4.80	4.86	4.46	4.57	4.60	4.46	4.66	4.81	4.33	4.63	4.63	4.63	4.63
ด้านการให้บริการของบัณฑิตวิทยาลัย	4.33	4.71	5.00	4.69	4.66	4.75	4.87	4.78	4.50	4.50	4.80	4.62	4.75	4.83	4.61	4.69	4.67	4.69	4.66
ค่าเฉลี่ยรวมความต้องการของนักศึกษา	4.38	4.76	5.00	4.74	4.68	4.85	4.84	4.83	4.54	4.59	4.72	4.55	4.71	4.82	4.45	4.68	4.65	4.76	4.65

สรุปผลการสำรวจความพึงพอใจของนักศึกษารามาธิบดี ปีการศึกษา 2556

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี

ภาพรวมทุกระดับหลักสูตร

ก. ข้อมูลผู้ตอบแบบสอบถาม	จำนวน	ร้อยละ
1.จำนวนผู้ตอบแบบสอบถาม	2334	94.42
2. ชั้นปีที่กำลังศึกษา		
ปีที่ 1	439	18.81
ปีที่ 2	393	16.84
ปีที่ 3	647	27.72
ปีที่ 4	449	19.24
ปีที่ 5	233	9.98
ปีที่ 6	167	7.16
มากกว่าชั้นปีที่ 6 ขึ้นไป	6	0.26
3. เพศ (ก.) เพศชาย	737	31.58
(ข.) เพศหญิง	1597	68.42
4. สถานภาพการศึกษา		
ก.กำลังศึกษาอยู่	173	37.45
ข.อยู่ระหว่างการทำวิทยานิพนธ์/สารนิพนธ์ (จบ coursework)	289	62.55

หมายเหตุ : ร้อยละผู้ตอบแบบสอบถาม 94.42 %
1. จำนวนนักศึกษาทั้งหมดเท่ากับ 2472 คน
2. จำนวนผู้ตอบแบบสอบถามผ่านระบบออนไลน์ เท่ากับ 2334 คน

5. ระดับการศึกษา	จำนวนหลักสูตรทั้งหมด	จำนวนหลักสูตรที่ดำเนินการ	ร้อยละของหลักสูตรที่ดำเนินการ	จำนวนนักศึกษาทั้งหมด	จำนวนนักศึกษาที่ตอบแบบสำรวจ	ร้อยละของนักศึกษาที่ตอบแบบสำรวจ
ก. หลักสูตรปริญญาตรี	3	3	100.00	1200	1122	93.50
ข. หลักสูตรปริญญาโท	16	16	100.00	378	377	99.74
ค. หลักสูตรปริญญาเอก	5	5	100.00	111	85	76.58
ง. หลักสูตรหลักสูตรการฝึกอบรมแพทย์ประจำบ้าน	28	28	100.00	575	552	96.00
จ. หลักสูตรหลักสูตรการฝึกอบรมแพทย์ประจำบ้านต่อยอด/ต่อยอด (ตอร.) 1ปี/ แพทย์ผู้ช่วยอาจารย์	62	62	100.00	208	198	95.19
รวมทุกระดับหลักสูตร	114	114	100.00	2472	2334	94.42

ข. ความพึงพอใจของนักศึกษา/ผู้ฝึกอบรม

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ไม่พอใจมาก (1) จำนวน	%	ไม่พอใจ (2) จำนวน	%	เฉยๆ (neutral) (3) จำนวน	%	พอใจ (4) จำนวน	%	พอใจมาก (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	พอใจ-พอใจมาก (4-5) จำนวน	%	ไม่พอใจ-ไม่พอใจมาก (1-2) จำนวน	%
ข. ภาพรวมของคณะฯ																									
1. สภาพแวดล้อมทางกายภาพในคณะฯ (ความสะอาด ภูมิทัศน์ การรักษาสิ่งแวดล้อม ฯลฯ)	2045	2045	289	14	0.68	80	3.91	421	20.59	1140	55.75	390	19.07							3.82	0.83	1530	74.82	94	4.60
2. ความปลอดภัยในคณะฯ (ระบบรักษาความปลอดภัย ป้องกันอัคคีภัย ระบบการกำจัดขยะ/น้ำเสีย ฯลฯ)	2045	2045	289	6	0.29	57	2.79	354	17.31	1172	57.31	456	22.30							3.98	0.76	1628	79.61	63	3.08
ค. การดำเนินงานที่เกี่ยวข้องกับการจัดการศึกษาของหลักสูตร																									
1. ความพึงพอใจในการจัดการศึกษาของหลักสูตร	2334	2334	0	6	0.26	97	4.16	564	24.16	1329	56.94	338	14.48							3.83	0.73	1667	71.42	103	4.41
2. ประสิทธิภาพการสอนของอาจารย์ในภาพรวม	2334	2334	0	8	0.34	28	1.20	298	12.77	1377	59.00	623	26.69							4.10	0.70	2000	85.69	36	1.54
3. ระบบการวัดและประเมินผล (สอดคล้องกับสิ่งที่เรียน ยุติธรรม โปร่งใส มีมาตรฐาน)	2045	2045	289	10	0.49	55	2.69	492	24.06	1205	58.92	283	13.84							3.87	0.71	1488	72.76	65	3.18

1/4

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ไม่พอใจมาก (1) จำนวน	%	ไม่พอใจ (2) จำนวน	%	เฉยๆ (neutral) (3) จำนวน	%	พอใจ (4) จำนวน	%	พอใจมาก (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	พอใจ-พอใจมาก (4-5) จำนวน	%	ไม่พอใจ-ไม่พอใจมาก (1-2) จำนวน	%
4. การได้รับการปฏิบัติ (แนะนำ ดูแล ช่วยเหลือ)																									
4.1 จากอาจารย์ที่ปรึกษาประจำรายวิชา	2334	2334	0	9	0.39	36	1.54	450	19.28	1136	48.67	703	30.12							4.05	0.79	1839	78.79	45	1.93
4.2 จากบุคลากร/เจ้าหน้าที่สนับสนุนด้านการศึกษา	2334	2334	0	8	0.34	39	1.67	482	20.65	1283	54.97	522	22.37							4.01	0.72	1805	77.34	47	2.01
5. การได้รับคำแนะนำจากอาจารย์ที่ปรึกษาในการทำวิทยานิพนธ์/ สารนิพนธ์																									
5.1 Major Advisor	289	289	2045	1	0.35	0	0.00	11	3.81	82	28.37	195	67.47							4.60	0.61	277	95.85	1	0.35
5.2 Co - Advisor	289	289	2045	2	0.69	0	0.00	16	5.54	87	30.10	184	63.67							4.52	0.71	271	93.77	2	0.69
6. การให้คำปรึกษา/ การแนะนำ																									
6.1 ระบบอาจารย์ที่ปรึกษาประจำสายรหัส	1053	1053	1281	19	1.80	56	5.32	352	33.43	352	33.43	274	26.02							3.74	0.90	626	59.45	75	7.12
6.2 การได้รับความช่วยเหลือ/คำปรึกษาแนะนำ																									
ก. ด้านการเรียน/ด้านวิชาการ	2045	1798	289	8	0.44	51	2.84	441	24.53	777	43.21	521	28.98			247	12.08			3.98	0.83	1298	72.19	59	3.28
ข. ด้านการปรับตัว/การใช้ชีวิตการเป็นนักศึกษา	2045	1719	289	7	0.41	48	2.79	492	28.62	767	44.62	405	23.56			326	15.94			3.88	0.84	1172	68.18	55	3.20
ค. ด้านปัญหาส่วนตัว	2334	1664	0	10	0.60	38	2.28	642	38.58	596	35.82	378	22.72			670	28.71			3.75	0.83	974	58.53	48	2.88
ง. ด้านทำวิทยานิพนธ์/ สารนิพนธ์/วิจัย	1212	1157	1122	2	0.17	20	1.73	155	13.40	544	47.02	436	37.68			55	4.54			4.19	0.74	980	84.70	22	1.90
จ. ด้านสถิติในการทำวิทยานิพนธ์/สารนิพนธ์/วิจัย	1212	1123	1122	4	0.36	28	2.49	219	19.50	542	48.26	330	29.39			89	7.34			4.03	0.81	872	77.65	32	2.85
7. ระบบสนับสนุนการเรียนรู้ ได้แก่																									
7.1 ห้องเรียน ห้องปฏิบัติการ (เหมาะสมต่อกิจกรรม อุปกรณ์มีประสิทธิภาพ พอเพียง)	2045	2045	289	15	0.73	85	4.16	463	22.64	1161	56.77	321	15.70							3.84	0.80	1482	72.47	100	4.89
7.2 แหล่งฝึกปฏิบัติการในคณะฯ เช่น OPD, ward, OR, ER, ห้อง lab, ความเหมาะสมของผู้ป่วย	2045	1987	289	11	0.55	73	3.67	404	20.33	1075	54.10	424	21.34	42	2.05			16	0.78	3.88	0.80	1499	75.44	84	4.23
7.3 แหล่งฝึกปฏิบัติภายนอกคณะฯ เช่น โรงพยาบาลสมทบ โรงพยาบาลชุมชน โรงพยาบาลส่งเสริมสุขภาพตำบล	2045	1686	289	3	0.18	24	1.42	358	21.23	788	46.74	513	30.43	121	5.92			238	11.64	4.04	0.77	1301	77.16	27	1.60
7.4 ห้องสมุดของคณะฯ (สถานที่ บรรยากาศ คุณภาพการให้บริการหนังสือ/ วารสารตอบสนองต่อความต้องการ)	2334	2334	0	13	0.56	74	3.17	414	17.74	1280	54.84	553	23.69							4.00	0.77	1833	78.53	87	3.73
7.5 สื่อการเรียนรู้ (handouts, VDO, textbook, e-learning, skills lab ฯลฯ)	2045	2045	289	20	0.98	77	3.77	573	28.02	1106	54.08	269	13.15							3.73	0.78	1375	67.24	97	4.74
7.6 การเชื่อมต่ออินเตอร์เน็ต /wifi (การเข้าถึง คุณภาพสัญญาณ ความเร็ว)	2334	2334	0	55	2.36	214	9.17	608	26.05	1091	46.74	366	15.68							3.63	0.92	1457	62.43	269	11.53
7.7 ระบบการลงทะเบียนและทะเบียนประวัติ ผ่านระบบเครือข่าย/ online (เข้าถึงได้ง่าย สะดวก คล่องตัว)	2045	2045	289	13	0.64	58	2.84	519	25.38	1158	56.63	297	14.52							3.83	0.72	1455	71.15	71	3.47
7.8 สวัสดิการด้านการรักษาอนามัยและการรักษาพยาบาล	2334	2334	0	11	0.47	79	3.38	628	26.91	1246	53.36	370	15.85							3.77	0.79	1616	69.24	90	3.86
7.9 สวัสดิการอื่นๆ (พาหนะรับส่ง ชุดผู้ป่วย)	2334	2334	0	34	1.46	147	6.30	760	32.56	1117	47.86	276	11.83							3.57	0.83	1393	59.68	181	7.76
7.10 สถานที่ออกกำลังกาย /ศูนย์กีฬา (ระบบบริการ)	2045	2045	289	10	0.49	28	1.37	450	22.00	1088	53.20	469	22.93							3.97	0.73	1557	76.14	38	1.86
7.11 ความพึงพอใจต่อร้านอาหารของคณะฯ ([illegible]) (ความสะอาด ราคาเหมาะสม เวลาให้บริการเหมาะสม)	2045	2045	289	38	1.86	135	6.60	536	26.21	1080	52.81	256	12.52							3.66	0.84	1336	65.33	173	8.46
7.12 ร้านอาหารอื่นๆ (ความสะอาด ราคาเหมาะสม เวลาให้บริการเหมาะสม)	2045	2045	289	31	1.52	153	7.48	611	29.88	1052	51.44	198	9.68							3.59	0.84	1250	61.12	184	9.00
7.13 หอพัก (ความสะอาด ความปลอดภัย)	1803	1803	531	72	3.99	222	12.31	597	33.11	761	42.21	151	8.37							3.37	0.97	912	50.58	294	16.31
7.14 กิจกรรมเสริมหลักสูตร (มีความหลากหลาย ส่งเสริมการเรียนรู้ และพัฒนาทักษะ)	2045	2045	289	17	0.83	53	2.59	783	38.29	1012	49.49	180	8.80							3.61	0.73	1192	58.29	70	3.42
7.15 การเผยแพร่ข้อมูลข่าวสารที่สำคัญและเป็นประโยชน์ (มีระบบ ทันต่อเหตุการณ์)	2334	2334	0	13	0.56	53	2.27	802	34.36	1220	52.27	246	10.54							3.69	0.70	1466	62.81	66	2.83

2/4

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ความคิดเห็นของนักศึกษา/ผู้ฝึกอบรม: ไม่พอใจมาก (1) จำนวน	%	ไม่พอใจ (2) จำนวน	%	เฉยๆ (neutral) (3) จำนวน	%	พอใจ (4) จำนวน	%	พอใจมาก (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	พอใจ-พอใจมาก (4-5) จำนวน	%	ไม่พอใจ-ไม่พอใจมาก (1-2) จำนวน	%
8. ภาระงานที่ได้รับมอบหมาย (ปริมาณเหมาะสม ส่งเสริมการเรียนรู้)	750	750	1584	10	1.33	46	6.13	216	28.80	425	56.67	53	7.07							3.61	0.67	478	63.73	56	7.47
9. บรรยากาศการเรียนรู้ในภาพรวม (สิ่งแวดล้อม หลักสูตร สิ่งอำนวยความสะดวก ผู้สอน)	2334	2334	0	11	0.47	46	1.97	468	20.05	1456	62.38	353	15.12							3.85	0.72	1809	77.51	57	2.44
10. คุณภาพชีวิตการเป็นนักศึกษาในปัจจุบัน	2045	2045	289	38	1.86	159	7.78	612	29.93	1028	50.27	208	10.17							3.54	0.90	1236	60.44	197	9.63
11. การแจ้งข้อร้องเรียนด้านการศึกษา																									
11.1 หลักสูตรมีช่องทางในการแจ้งข้อร้องเรียน (เข้าถึงได้หลากหลายช่องทาง)	2334	2334	0	18	0.77	89	3.81	1048	44.90	979	41.95	200	8.57							3.48	0.75	1179	50.51	107	4.58
				เคย		ไม่เคย																			
11.2 ท่านเคยใช้ช่องทางการแจ้งข้อร้องเรียนของหลักสูตรหรือไม่	2334			117	5.01	2217	94.99																		
11.3 ภายหลังจากท่านแจ้งข้อร้องเรียน ปัญหาของท่านได้รับการแก้ไข หรือตอบสนองเป็นที่น่าพอใจ	117	117	2217	3	2.56	13	11.11	45	38.46	50	42.74	6	5.13							3.61	0.82	56	47.86	16	13.68

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ความคิดเห็นของนักศึกษา/ผู้ฝึกอบรม: น้อยที่สุด (1) จำนวน	%	น้อย (2) จำนวน	%	ปานกลาง (3) จำนวน	%	มาก (4) จำนวน	%	มากที่สุด (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	มาก-มากที่สุด (4-5) จำนวน	%	น้อย-น้อยที่สุด (1-2) จำนวน	%
ง. สิ่งที่ได้รับจากการศึกษา																									
1. การบรรลุวัตถุประสงค์ตามเป้าหมายของหลักสูตร																									
ก. ด้านคุณธรรม จริยธรรม	2334	2334	0	9	0.39	28	1.20	481	20.61	1287	55.14	529	22.66							3.97	0.73	1816	77.81	37	1.59
ข. ด้านความรู้	2334	2334	0	6	0.26	29	1.24	557	23.86	1311	56.17	431	18.47							3.87	0.72	1742	74.64	35	1.50
ค. ด้านทักษะทางปัญญา (การแก้ปัญหา)	2334	2334	0	5	0.21	44	1.89	586	25.11	1308	56.04	391	16.75							3.86	0.73	1699	72.79	49	2.10
ง. ด้านทักษะความสัมพันธ์ระหว่างบุคคลและความรับผิดชอบ	2334	2334	0	6	0.26	38	1.63	433	18.55	1350	57.84	507	21.72							3.96	0.72	1857	79.56	44	1.89
จ. ด้านทักษะในการวิเคราะห์เชิงตัวเลข การสื่อสาร และการใช้เทคโนโลยีสารสนเทศ	2334	2334	0	8	0.34	47	2.01	778	33.33	1187	50.86	314	13.45							3.74	0.72	1501	64.31	55	2.36
ฉ. ด้านทักษะพิสัย (ทักษะทางหัตถการ)	1872	1872	462	17	0.91	86	4.59	598	31.94	948	50.64	223	11.91							3.64	0.79	1171	62.55	103	5.50
2. ทักษะด้านภาษาอังกฤษ	2334	2334	0	62	2.66	270	11.57	1051	45.03	773	33.12	178	7.63							3.34	0.83	951	40.75	332	14.22
3. ท่านมีคุณลักษณะตามอัตลักษณ์ของนักศึกษา / มีจิตอาสา ในการมุ่งผลเพื่อผู้อื่น (Altruism)	2334	2334	0	6	0.26	36	1.54	661	28.32	1305	55.91	326	13.97							3.76	0.68	1631	69.88	42	1.80

3/4

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ความคิดเห็นของนักศึกษา/ผู้ฝึกอบรม: ไม่พอใจมาก (1) จำนวน	%	ไม่พอใจ (2) จำนวน	%	เฉยๆ (neutral) (3) จำนวน	%	พอใจ (4) จำนวน	%	พอใจมาก (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	พอใจ-พอใจมาก (4-5) จำนวน	%	ไม่พอใจ-ไม่พอใจมาก (1-2) จำนวน	%
จ. ความคิดเห็นในภาพรวม																									
1. ความพึงพอใจในการเป็นนักศึกษาของคณะแพทยศาสตร์โรงพยาบาลรามาธิบดี	2334	2334	0	3	0.13	22	0.94	261	11.18	1161	49.74	887	38.00							4.22	0.72	2048	87.75	25	1.07

หัวข้อที่สอบถาม	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-8)	ตอบระดับ 1-5	NA	ความคิดเห็นของนักศึกษา/ผู้ฝึกอบรม: ไม่เห็นด้วยอย่างยิ่ง (1) จำนวน	%	ไม่เห็นด้วย (2) จำนวน	%	ไม่แน่ใจ (3) จำนวน	%	เห็นด้วย (4) จำนวน	%	เห็นด้วยอย่างยิ่ง (5) จำนวน	%	ประเมินไม่ได้ (6) จำนวน	%	ไม่มีปัญหาที่ต้องการความช่วยเหลือ (7) จำนวน	%	ไม่มีแหล่งฝึกปฏิบัติ (8) จำนวน	%	Mean	Sd	เห็นด้วย - เห็นด้วยอย่างยิ่ง (4-5) จำนวน	%	ไม่เห็นด้วย - ไม่เห็นด้วยอย่างยิ่ง (1-2) จำนวน	%
2. หากย้อนเวลากลับไปได้เมื่อแรกเข้าศึกษา ท่านยังคงเลือกเรียนที่รามาธิบดี	2334	2334	0	21	0.90	58	2.49	346	14.82	1043	44.69	866	37.10							4.14	0.83	1909	81.79	79	3.38
3. หากมีผู้ขอคำปรึกษาในการเรียนต่อ ท่านจะแนะนำให้มาศึกษาที่รามาธิบดี	2334	2334	0	19	0.81	33	1.41	361	15.47	1166	49.96	755	32.35							4.07	0.80	1921	82.31	52	2.23

4. ความคิดเห็นต่อการจัดการศึกษาของรามาธิบดีเทียบกับสถาบันอื่น	จำนวนผู้ตอบแบบสอบถาม: จำนวนผู้ตอบแบบสอบถามทั้งหมด (ระดับ 1-4)	ตอบระดับ 1-4	NA	ความคิดเห็นของนักศึกษา/ผู้ฝึกอบรม: รามาดีกว่า (1)		ใกล้เคียงกัน (2)		รามาด้อยกว่า (3)		ไม่มีความเห็น (4)	
ก. คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	1436	1436	898	119	8.29	655	45.61	85	5.92	577	40.18
ข. คณะแพทยศาสตร์ศิริราชพยาบาล	1436	1436	898	98	6.82	628	43.73	133	9.26	577	40.18
ค. คณะพยาบาลศาสตร์ศิริราชพยาบาล	367	367	1967	55	14.99	226	61.58	6	1.63	80	21.80
ง. คณะพยาบาลศาสตร์มหาวิทยาลัยเชียงใหม่	367	367	1967	71	19.35	133	36.24	3	0.82	160	43.60

หมายเหตุ :

1. ค่าของสีที่แสดงร้อยละในระดับพึงพอใจ-พอใจมาก (ระดับ4-5) :	25%	>25-<50%	50%	>50-<75%	75%
2. ค่าของสีที่แสดงร้อยละในระดับไม่พอใจ-ไม่พอใจมาก (ระดับ1-2) :	5%	>5-<10%	10%	>10-<20%	20%

4/4

ผลการสำรวจความคิดเห็นของนักศึกษารามาธิบดี ปีการศึกษา 2553 - 2558 (ค่าที่แสดง คือ ร้อยละผู้ตอบแบบสอบถามในระดับพึงพอใจ - พอใจมาก)

หัวข้อ	ภาพรวมคณะฯ ระดับหลักสูตรปริญญาเอก						ภาพรวมคณะฯ ระดับหลักสูตรเทียบเท่าปริญญาเอก (หลักสูตรการฝึกอบรมแพทย์ประจำบ้าน)						ภาพรวมคณะฯ ระดับหลักสูตรหลังปริญญาเอก (หลักสูตรแพทย์ประจำบ้านต่อยอด/ แพทย์ประจำบ้านต่อยอด(คณะ) 1 ปี)					
ปีการศึกษา	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558
ข. ภาพรวมของคณะฯ																		
1. สภาพแวดล้อมภายในคณะฯ (ความสะอาด ภูมิทัศน์ การรักษาสิ่งแวดล้อม ฯลฯ)	67.57	40.00	88.89	73.68	91.30	88.00	29.98	29.23	67.30	68.99	67.29	71.01	32.72	32.23	79.87	78.09	71.07	70.20
2. ความปลอดภัยในคณะฯ (ระบบรักษาความปลอดภัย ป้องกันอัคคีภัย ระบบการกำจัดขยะ/น้ำเสีย ฯลฯ)	56.76	60.00	94.44	73.68	91.30	92.00	51.18	50.00	70.46	72.76	74.91	79.53	60.49	58.68	81.71	83.71	73.10	77.27
ค. การดำเนินงานที่เกี่ยวข้องกับการจัดการศึกษาของหลักสูตร																		
1. ความพึงพอใจในการจัดการศึกษาของหลักสูตร	75.68	65.00	85.71	63.46	86.75	82.35	50.75	58.47	74.47	68.39	69.89	70.11	69.75	79.34	87.25	84.83	83.76	85.35
2. ประสิทธิภาพการสอนของอาจารย์ในภาพรวม	86.49	87.50	91.07	80.77	98.80	92.94	62.74	67.34	80.80	78.92	79.76	78.26	81.48	84.50	92.62	91.57	92.99	92.93
3. ระบบการวัดและประเมินผล (สอดคล้องกับสิ่งที่เรียน ยุติธรรม โปร่งใส มีมาตรฐาน)	72.97	62.50	77.78	78.95	82.61	84.00	42.83	52.42	59.92	61.43	66.73	75.54	58.64	58.68	77.85	74.72	74.11	86.87
4. การได้รับการปฏิบัติ (แนะนำ ดูแล ช่วยเหลือ)																		
4.1 จากอาจารย์ที่ปรึกษาประจำรายวิชา	86.67	87.50	88.89	86.54	93.98	96.47	63.38	73.19	75.32	72.56	76.02	75.91	74.69	80.99	92.62	93.26	89.85	89.90
4.2 จากบุคลากร/เจ้าหน้าที่สนับสนุนด้านการศึกษา	80.00	72.50	83.33	75.00	87.95	77.65	65.10	73.39	71.94	73.76	78.62	76.27	73.46	79.34	83.22	87.64	81.73	88.89
5. การได้รับคำแนะนำจากอาจารย์ที่ปรึกษาในการทำวิทยานิพนธ์/ สารนิพนธ์																		
5.1 Major Advisor	86.36	72.50	91.07	86.54	98.33	98.33												
5.2 Co - Advisor	72.73	62.50	83.93	82.69	95.00	91.67												
6. การให้คำปรึกษา/การแนะนำ																		
6.1 ระบบอาจารย์ที่ปรึกษาประจำสายรหัส - ตอบเฉพาะพบ./ ระบบอาจารย์ที่ปรึกษา - ตอบเฉพาะพยน.																		
6.2 การได้รับความช่วยเหลือ/คำปรึกษาแนะนำ																		
ก. ด้านการเรียน/ด้านวิชาการ	70.27	67.50	88.89	87.50	100.00	95.45	44.33	58.87	72.36	75.41	77.12	75.90	64.20	61.98	81.88	92.77	84.78	89.95
ข. ด้านการปรับตัว/การใช้ชีวิตการเป็นนักศึกษา	62.16	55.00	72.22	82.35	90.48	84.21	45.18	52.82	66.24	69.49	69.53	70.44	56.79	61.98	72.48	84.38	80.00	80.57
ค. ด้านปัญหาส่วนตัว	45.95	42.50	70.00	61.76	79.69	86.48	38.76	46.37	56.12	60.58	55.84	59.63	48.15	54.55	65.10	77.78	65.28	75.48
ง. ด้านทำวิทยานิพนธ์/ สารนิพนธ์/ วิจัย - ตอบเฉพาะหลักสูตรปโท/ป.เอก/RES & FEW	77.27	47.50	85.45	77.55	87.34	87.18			68.14	69.80	77.25	78.37			75.17	82.25	87.36	86.77
จ. ด้านสถิติในการทำวิทยานิพนธ์/สารนิพนธ์/วิจัย - ตอบเฉพาะหลักสูตรปโท/ป.เอก/RES & FEW	31.82	35.00	71.15	60.42	81.33	79.45			61.18	63.77	71.15	68.16			70.47	77.98	82.61	78.80

หัวข้อ	ภาพรวมคณะฯ ระดับหลักสูตรปริญญาเอก						ภาพรวมคณะฯ ระดับหลักสูตรเทียบเท่าปริญญาเอก (หลักสูตรการฝึกอบรมแพทย์ประจำบ้าน)						ภาพรวมคณะฯ ระดับหลักสูตรหลังปริญญาเอก (หลักสูตรแพทย์ประจำบ้านต่อยอด/ แพทย์ประจำบ้านต่อยอด(คณะ) 1 ปี)					
ปีการศึกษา	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558
7. ระบบสนับสนุนการเรียนรู้ ได้แก่																		
7.1 ห้องเรียน ห้องปฏิบัติการ (เหมาะสมต่อกิจกรรม อุปกรณ์มีประสิทธิภาพ พอเพียง)			83.33	78.95	86.96	68.00			70.89	69.38	73.98	70.65			85.91	73.60	76.65	74.24
7.2 แหล่งฝึกปฏิบัติภายในคณะฯ เช่น OPD, ward, OR, ER, ห้อง lab, ความเหมาะสมของผู้ป่วย			61.54	80.00	91.30	73.68			64.98	71.60	71.02	73.84			77.85	82.94	82.20	80.73
7.3 แหล่งฝึกปฏิบัติภายนอกคณะฯ เช่น โรงพยาบาลสมทบ โรงพยาบาลชุมชน โรงพยาบาลส่งเสริมสุขภาพตำบล (รพ.สต.)			53.85	90.00	85.71	94.12			50.00	71.14	75.75	73.33			61.07	83.67	76.79	74.19
7.4 ห้องสมุดของคณะฯ (สถานที่ บรรยากาศ คุณภาพ การให้บริการหนังสือ/ วารสารตอบสนองต่อความต้องการ)	70.27	80.00	85.95	84.62	83.13	88.24	44.75	59.68	75.63	65.01	71.56	72.83	57.41	69.42	79.87	77.53	80.20	80.30
7.5 สื่อการเรียนรู้ (handouts, VDO, textbook, e-learning, skills lab ฯลฯ)	72.97	47.50	72.22	78.95	82.61	96.00	35.97	45.97	66.03	60.83	63.94	66.67	56.79	61.98	75.84	74.72	73.10	77.27
7.6 การเชื่อมต่ออินเตอร์เน็ต /wifi (การเข้าถึง คุณภาพสัญญาณ ความเร็ว)	75.68	50.00	66.07	53.85	66.27	57.65	33.83	39.52	45.57	64.93	66.17	71.20	51.23	49.59	48.32	44.38	56.85	67.17
7.7 ระบบการลงทะเบียนและทะเบียนประวัติ ผ่านระบบเครือข่าย/ online (เข้าถึงได้ง่าย สะดวก คล่องตัว)			83.33	68.42	95.65	76.00			51.27	49.11	59.29	66.30			49.66	53.93	53.30	66.16
7.8 สวัสดิการด้านการรักษาอนามัยและการรักษาพยาบาล			51.79	57.69	67.47	61.18			56.96	48.31	57.62	62.32			54.36	56.18	50.76	63.13
7.9 สวัสดิการอื่นๆ (พาหนะรับส่ง ชุดอยู่เวร)	20.00	45.00			49.40	54.12	23.13	45.36	55.91	49.30	56.51	55.98	34.57	39.67	52.35	44.94	44.67	44.44
7.10 สถานที่ออกกำลังกาย /ศูนย์กีฬา (ระบบบริการ)	46.67	52.50	50.00	52.63	60.87	72.00	57.39	60.89	79.32	74.95	76.77	78.80	48.77	54.55	73.83	65.73	69.04	71.72
7.11 ความพึงพอใจต่อร้านอาหารของคณะฯ (คาเฟ่ทีเรีย-อกร.) (ความสะอาด ราคาเหมาะสม เวลาให้บริการเหมาะสม)				73.68	73.91	68.00				53.68	60.78	62.32				56.74	63.96	66.67
7.12 ร้านอาหารอื่นๆ (ความสะอาด ราคาเหมาะสม เวลาให้บริการเหมาะสม)	33.33	60.00	88.89	68.42	73.91	76.00	28.63	42.54	67.30	54.47	58.92	57.25	37.04	48.76	71.14	56.18	64.97	65.66
7.13 หอพัก (ความสะอาด ความปลอดภัย) - ตอบเฉพาะพบ./พยบ./RES&FEW							10.06	12.10	68.14	62.03	65.43	66.67	16.67	19.01	34.23	40.45	38.58	44.95
7.14 กิจกรรมเสริมหลักสูตร (มีความหลากหลาย ส่งเสริมการเรียนรู้ และพัฒนาทักษะ)	40.00	40.00	50.00	68.42	65.22	60.00	34.26	46.17	57.81	49.70	54.46	55.62	50.62	52.89	53.02	62.36	60.41	62.63
7.15 การเผยแพร่ข้อมูลข่าวสารที่สำคัญและเป็นประโยชน์ (ชัดเจน ทันต่อเหตุการณ์)	27.03	45.00	62.50	61.54	72.29	74.12	35.55	40.93	56.75	50.10	53.72	58.51	38.89	49.59	73.83	66.29	59.39	67.17
8. ภาระงานที่ได้รับมอบหมาย (ปริมาณเหมาะสม ส่งเสริมการเรียนรู้)									44.73	47.32	51.67	39.78			67.79	69.66	70.05	74.75

หัวข้อ	ภาพรวมคณะฯ ระดับหลักสูตรปริญญาเอก						ภาพรวมคณะฯ ระดับหลักสูตรเทียบเท่าปริญญาเอก (หลักสูตรการฝึกอบรมแพทย์ประจำบ้าน)						ภาพรวมคณะฯ ระดับหลักสูตรหลังปริญญาเอก (หลักสูตรแพทย์ประจำบ้านต่อยอด/ แพทย์ประจำบ้านต่อยอด(คณะ) 1 ปี)					
ปีการศึกษา	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558
9. บรรยากาศการเรียนรู้ในภาพรวม (สิ่งแวดล้อม หลักสูตร สิ่งอำนวยความสะดวก ผู้สอน)	64.86	70.00	75.00	71.15	85.54	89.41	46.90	52.42	60.55	63.22	65.80	69.20	56.79	63.64	81.88	85.96	80.20	83.33
10. คุณภาพชีวิตการเป็นนักศึกษาในปัจจุบัน	46.67	50.00	83.33	78.95	73.91	80.00	35.33	45.36	51.69	53.88	54.28	57.79	50.62	64.46	73.83	73.03	70.05	74.75
11. การแจ้งข้อร้องเรียนด้านการศึกษา																		
11.1 หลักสูตรมีช่องทางในการแจ้งข้อร้องเรียน (เข้าถึงได้หลากหลายช่องทาง)				42.31	62.65	61.18				38.57	41.45	47.46				58.99	46.70	56.06
11.2 ท่านเคยใช้ช่องทางการแจ้งข้อร้องเรียนของหลักสูตรหรือไม่																		
- เคย				11.54	9.64	8.24				7.75	3.90	3.80				3.37	2.54	2.53
- ไม่เคย				88.46	90.36	91.76				92.25	96.10	96.20				96.63	97.46	97.47
11.3 ภายหลังจากท่านแจ้งข้อร้องเรียน ปัญหาของท่านได้รับการแก้ไข หรือตอบสนองเป็นที่น่าพอใจ				33.33	75.00	57.14				35.90	30.00	47.62				16.67	60.00	80.00
ง. สิ่งที่ได้รับจากการศึกษา																		
1. การบรรลุวัตถุประสงค์ตามเป้าหมายของหลักสูตร																		
ก. ด้านคุณธรรม จริยธรรม	86.49	75.00	87.50	78.85	87.95	84.71	61.67	69.15	78.06	67.99	66.36	72.10	79.01	80.99	93.96	86.27	78.17	86.36
ข. ด้านความรู้	75.68	80.00	91.07	80.77	93.98	89.41	46.90	53.83	69.83	61.43	56.51	60.87	69.14	78.51	88.59	82.02	75.13	84.85
ค. ด้านทักษะทางปัญญา (การแก้ปัญหา)	81.08	72.50	91.07	80.77	92.77	88.24	52.25	60.08	72.78	69.78	61.90	67.39	74.07	80.17	91.28	85.39	78.66	87.88
ง. ด้านทักษะความสัมพันธ์ระหว่างบุคคลและความรับผิดชอบ				76.92	92.77	89.41				73.16	69.14	71.92				86.52	85.28	89.39
จ. ด้านทักษะในการวิเคราะห์เชิงตัวเลข การสื่อสาร และการใช้เทคโนโลยีสารสนเทศ				63.46	90.36	85.88				57.26	54.28	53.80				70.22	66.50	77.27
ฉ. ด้านทักษะพิสัย (ทักษะทางหัตถการ)										56.66	53.16	56.52				76.97	74.11	83.33
2. ทักษะด้านภาษาอังกฤษ	62.16	47.50	69.64	44.23	73.49	72.94	31.69	35.48	50.63	29.42	30.86	34.06	37.04	40.50	61.07	36.52	43.65	49.49
3. ท่านมีคุณลักษณะตามอัตลักษณ์ของนักศึกษา/ บัณฑิตมีจิตในการมุ่งผลเพื่อผู้อื่น (Altruism)				61.54	77.11	80.00				51.89	55.02	59.78				65.17	66.50	77.78
จ. ความคิดเห็นในภาพรวม																		
1. ความพึงพอใจในการเป็นนักศึกษาของคณะแพทยศาสตร์โรงพยาบาลรามาธิบดี	72.97	75.00	78.57	78.85	91.57	92.94	52.03	61.29	78.06	77.34	77.88	80.98	66.05	82.64	89.26	91.01	85.28	87.37
2. หากย้อนเวลากลับไปได้เมื่อแรกเข้าศึกษา ท่านยังคงเลือกเรียนที่รามาธิบดี	78.38	72.50	69.64	75.00	86.75	90.59	59.96	75.20	77.64	76.14	75.28	78.99	67.90	89.26	91.95	92.70	85.28	87.88
3. หากมีผู้ขอคำปรึกษาในการเรียนต่อ ท่านจะแนะนำให้มาศึกษาที่รามาธิบดี	72.97	70.00	78.57	76.92	84.34	87.06	54.18	71.57	73.63	70.97	70.07	73.55	61.11	83.47	84.56	89.33	81.73	84.34

หัวข้อ	ภาพรวมคณะฯ ระดับหลักสูตรปริญญาเอก						ภาพรวมคณะฯ ระดับหลักสูตรเทียบเท่าปริญญาเอก (หลักสูตรการฝึกอบรมแพทย์ประจำบ้าน)						ภาพรวมคณะฯ ระดับหลักสูตรหลังปริญญาเอก (หลักสูตรแพทย์ประจำบ้านต่อยอด/ แพทย์ประจำบ้านต่อยอด(คณะ) 1 ปี)					
ปีการศึกษา	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558	2553	2554	2555	2556	2557	2558
4. ความคิดเห็นต่อการจัดการศึกษาของรามาธิบดีเทียบกับสถาบันอื่น																		
ก. คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย - ตอบเฉพาะพบ./ ป.โท/ป.เอก/RES &FEW																		
- รามาดีกว่า				21.21	22.73					17.50	14.31	8.51				20.22	18.78	8.08
- ใกล้เคียงกัน				18.18	27.27					38.57	42.75	48.01				43.82	45.18	54.55
- รามาด้อยกว่า				3.03	2.27					13.32	11.90	5.62				7.87	8.63	3.54
- ไม่มีความเห็น				57.58	47.73					30.62	31.04	37.86				28.09	27.41	33.84
ข. คณะแพทยศาสตร์ศิริราชพยาบาล - ตอบเฉพาะพบ./ ป.โท/ป.เอก/RES &FEW																		
- รามาดีกว่า				6.06	13.64					11.93	9.85	5.98				18.54	14.21	7.58
- ใกล้เคียงกัน				30.30	34.09					38.17	39.22	47.64				42.70	42.13	52.53
- รามาด้อยกว่า				6.06	13.64					20.87	18.96	7.07				11.24	14.72	5.05
- ไม่มีความเห็น				57.58	38.64					29.03	31.97	39.31				27.53	28.93	34.85
ค. คณะพยาบาลศาสตร์ศิริราชพยาบาล - ตอบเฉพาะ พยบ./ป.โท-เอก(พยบ.)																		
- รามาดีกว่า				15.79	15.38													
- ใกล้เคียงกัน				63.16	64.10													
- รามาด้อยกว่า				5.26	5.13													
- ไม่มีความเห็น				15.79	15.38													
ง. คณะพยาบาลศาสตร์ มหาวิทยาลัยเชียงใหม่ - ตอบเฉพาะ พยบ./ป.โท-เอก(พยบ.)																		
- รามาดีกว่า				26.32	20.51													
- ใกล้เคียงกัน				63.16	15.38													
- รามาด้อยกว่า				10.53	2.56													
- ไม่มีความเห็น				0.00	61.54													
ร้อยละผู้ตอบแบบสอบถาม	46.25	44.94	60.87	52.53	74.11	76.58	85.69	87.63	92.22	95.81	99.08	96.00	89.50	88.32	90.30	96.74	97.52	95.19
จำนวนผู้ตอบแบบสอบถาม/ จำนวนที่แจก [ฉบับ]	37/80	40/89	56/92	52/99	83/112	85/111	467/545	496/566	474/514	503/525	538/543	552/575	162/181	121/137	149/165	178/184	197/202	198/208

หมายเหตุ : ค่าของสีที่แสดงร้อยละในระดับพึงพอใจ-พอใจมาก (ระดับ4-5) : 25% | >25-<50% | 50% | >50-<75% | 75%

Employers' Expectations Survey

This survey is about expectations that employers would like to see from graduates from the International Ph.D. in Clinical Epidemiology, by the Section for Clinical Epidemiology and Biostatistics, Faculty of Medicine Ramathibodi Hospital, Mahidol University. There are two domains (i.e., general and technical/specific skills' domains in Clinical Epidemiology, Biostatistics, research, and related fields) with 11 questions. Please answer the following questions (in Thai or English) as much as you can in the role of employer. Please do not leave any question blank.

We really appreciate your help and spending your time to make this review complete.

Generic skills

1) Interpersonal skills – ability to relate well with others	
Ortho	- Have a good relationship with colleagues
Med	- Have good teamwork skills
FM	- Excellent
ER	- He has good important skills to work with colleagues
Dentist	- Know how to interact with co-workers to be trusted
2) Team player – ability to work well in a team	
Ortho	- Be able to perform assigned work well
Med	- Good
FM	- Excellent
ER	- Able to work well with a team, always listens, respects team's opinions
Dentist	- Able to work with health personnel in various fields, especially in Epidemiology and Public Health
3) Information and technology literacy – ability to use modern technology effectively	
Ortho	- Able to learn and apply IT in their work
Med	- Quite good (Med)

FM	- IT in research is moderate, and statistics is excellent
ER	- Able to use IT and modern technology and always shares their knowledge
Dentist	- Effectively uses modern technology in research and everyday life
4) Oral, written and graphic communication – ability to communicate effectively	
Oral:	
Ortho	- Good to excellent communication skills
Med	- Good
FM	- Excellent
ER	- Good oral communication skill
Dentist	- Can explain clearly, particularly epidemiology knowledge
Written:	
Ortho	- Write a concise summary, and illustrate to make something more easily Understood
Med	- Quite good
FM	- Excellent in manuscript writing
ER	- Good written
Dentist	- Excellent in manuscript writing with international standard
Graphic:	
Ortho	- Writing a good illustration to make something more easily understood.
Med	- N/A
FM	- Excellent
ER	- Good graphics
Dentist	- Use modern technology to produce graphics to aid good communication
5) Problem solving skills, especially in research management – ability to solve problems	
Ortho	- Can apply Plan, Do, Check, Action (PDCA)
Med	- Can develop their career path on their skill
FM	- Excellent
ER	- Good problem solving skill in research management and good ability to solve problems
Dentist	- Be ready to solve research problems by applying thinking process and problem solving systematically

6) Other comments / suggestions – additional abilities you would like to see	
Ortho	- Have good morals
Med	- Participates in the academic activity about clinical epidemiology
Med	- Can be advisor in research methodology for fellows and academic staffs
Dentist	- Be a leader and expert in Dentistry Clinical Epidemiology both nationally and internationally

Specific Skills

1) Evidence based medicine – ability to apply evidence to health care management and public health	
Ortho	- Use proven evidences and knowledge in patient care
Med	- Good
FM	- Good to excellent in teaching Evidenced-based Medicine
ER	- Good ability to apply evidence to health care management, in his research and Public health
Dentist	- Clearly understand Evidenced-based Medicine and can apply it to career path and other relevant organizations
2) Design and conduct health science research – ability to design, conduct, and manage research study	
Ortho	- Good to excellent consultant in research methodology
Med	- Good
FM	- Excellent and is consultant for others to conduct and design research
ER	- Good ability to design, and conduct research study (ER)
Dentist	- Can initiate research in their specialties with good design, research plan, and management
3) Statistical Analysis – ability to properly apply statistics, analyse data, and report results	
Ortho	- Can analyse complex data and interpret the results appropriately
Med	- Good
FM	- Excellent
ER	- Good statistical analysis data and reporting of results
Dentist	- Good to excellent knowledge, skill interpretations, and report results in statistical analysis

4) Ethical standards in health science research – ability to ethically conduct research	
Ortho	- Conducting research with ethical standards
Med	- Good
FM	- Excellent ability. It would be nice if she can persuade someone who goes wrong the best way to get back on track
ER	- Good ethics in health science research
Dentist	- Able to guide colleagues to comply with good ethical considerations
5) Other specific skills you would like to see – additional abilities in specific skills you need	
Ortho	- Be happy in their work
Med	- As in the general skills
ER	- Good specific skill in emergency medicine (ER)
Dentist	- Can create multidisciplinary national and international research networks - Active in doing, consulting, and leading research - Able to apply research results in clinical practice

Appendix 2: Program Structure and Specification

Doctor of Philosophy Program in Clinical Epidemiology

International Program

(Adjusted in Academic Year 2017)

1. Program Title: Doctor of Philosophy Program in Clinical Epidemiology
(International Program)

2. Name of Degree and Field of Study

Full name: Doctor of Philosophy (Clinical Epidemiology)

Abbreviation: Ph.D. (Clin.Epidemiol.)

3. Responsible Units:

Instruction: Section for Clinical Epidemiology and Biostatistics
Faculty of Medicine Ramathibodi Hospital

Graduation: Faculty of Graduate Studies Mahidol University

4. Philosophy and Expected Learning Outcomes of the Program

4.1 Philosophy of the Program

The Doctor of Philosophy Program in Clinical Epidemiology (International Program), Faculty of Medicine Ramathibodi Hospital, Mahidol University aims to build up health care providers (e.g. medical doctors, pharmacists, dentists, and etcetera) who are able to process knowledge including Clinical Epidemiology, Biostatistics, Economics, and clinical research in applying to clinical practice. In addition, graduated health care providers should be able to produce good quality research that can answer health problems of our country and internationally with ethical manner.

4.2 Program Learning Outcomes (PLOs)

The PLOs have been clearly formulated and aligned according to the visions and missions of the Faculty of Medicine and Mahidol University.

As for the University's and Faculty's visions and missions of being the world class university, excellence in health sciences, and a leader in national health advocacy, the graduates should possess the following characteristics:

(1) Be able to integrate and apply knowledge in clinical epidemiology, EBM, Biostatistics, Health Social Science, Health Economics, and Information Technology in their clinical/public health practice.
(2) Be experienced in health science research with international standard, which is proven by international publications
(3) Be health science researchers upholding international ethical standards which is approved by the Institutional Review Board and international publications
(4) Be a leader of health science research team with fully practical skills in research methods (i.e., study design, statistical analysis, data management, and manuscript)
(5) Be an instructor in health science who is able to both teach and integrate all principles of EBM in their professions (e.g. Public health, Pharmacy, Medical, Dental)
(6) Be able to disseminate/communicate research findings or evidences to public by applying information technology
(7) Be lifelong learners through Evidence-based Practice

5. Admission Requirements

Plan I

(1) Graduated Doctor of Medicine, Pharmacy, Dentistry, other related disciplines and Graduated Master's degree (e.g. Clinical Epidemiology, Epidemiology, Biostatistics, Clinical Economics or other related disciplines) or graduated in medical specialty certificate. (Diploma of Fellowship of the Royal College of Physicians).
(2) Grade point average ≥ 3.50.
(3) Have at least 3 publications in peer-reviewed international journals, as the first or corresponding author.

(4) If an applicant does not meet the above criteria, but has other suitable qualification and experience, s/he may be considered to apply for admission by the program committee.

Plan II

(1) Graduated Doctor of Medicine, Pharmacy, Dentistry, other related disciplines.

(2) Grade point average ≥ 3.50.

(3) If an applicant does not meet the above criteria but has other suitable qualifications and experience, s/he may be considered to apply for admission by the program committee.

6. Method for selecting students

Our program recruits national and international students from various countries such as ASEAN, Asia, Africa, and etcetera. Students must have obtained at least 2 years clinical experience in a health care setting to apply for our program in addition to having suitable qualifications.

7. Academic System

7.1 Study calendar

The academic year is broken up into three semesters. Students are expected to continue their research during the breaks between semesters.

Semester 1 runs from Early August until November.

Semester 2 runs from January to April.

Semester 3 runs from May to August.

7.2 Credit assignment

The number of credits is equivalent to:

7.2.1 Lecture or discussion: 15 hours per semester equals 1 credit hour

7.2.2 Self-study: 30 hours per semester equals 1 credit hour

7.2.3 Thesis research: 30 hours per semester equals 1 credit hour

8. Language of study and research

International English is used in classroom study, research, meetings, modules, journal clubs, conferences, and all program processes and documents.

9. Registration

All students register as full time students every semester. Where students has special circumstances they may drop a semester with the permission of the program committee and the Faculty of Graduate Studies.

10. Criteria for Student Assessment and Graduation

Regulations or criteria for the grading system:

Evaluation and grading conform to the regulations of Mahidol University and the Faculty of Graduate Studies.

10.1 Verification Process for Student's Achievement

(1) In the course, students evaluate the way they are taught and are examined. The Program Committee considers that the quality of the evaluation used, is in line with the objectives of the Course

(2) In the course, students learn how to evaluate how other students present oral assignments. Assessment and learning outcomes will be settled in the form of consensus and the decision is effective.

(3) For the evaluation of the method of learning, responsible faculty define indicators for the evaluation of each piece of work clearly.

10.2 Graduation Requirements

Study Plan: Plan 1

(1) For graduates with a master's degree admission to doctoral degree, the course of time throughout must not exceed 6 years.

(2) The total number of credits required throughout the course for a Ph.D. thesis is not less than 48 credits.

(3) Must pass the English proficiency examination for graduates of Mahidol University or equivalent IELTS / TOEFL score.

(4) Must pass the qualifying examination for graduates of Mahidol University

(5) Must submit thesis for examination following the regulations of the Faculty of Graduate Studies.

(6) Portfolio or part of the thesis must have been published or accepted for publication in international peer-reviewed journals by at least 2 manuscripts following the Faculty of Graduate Studies regulation or 3 manuscripts following our program's academic regulation.

Study Plan: Plan 2

(1) For graduates with a bachelor degree admission to doctor degree, the course of time throughout must not exceed 8 years.

(2) Subjects studied according to the structure of the coursework for not less than 24 credits and 48 credits for thesis, with minimum total of 72 credits and must have a minimum cumulative grade point average of 3.00.

(3) Must pass the English proficiency examination for graduates of Mahidol University or IELTS / TOEFL equivalent.

(4) Must pass the qualifying examination for graduates of Mahidol University

(5) Must submit thesis for examination following the regulations of the Faculty of Graduate Studies.

(6) Portfolio or part of the thesis must have been published or accepted for publication in an international peer-reviewed journal by at least 1 manuscripts following the Faculty of Graduate Studies regulation or 2 manuscripts following our program's academic regulation.

11. Library

On the second floor of the Medication and Education Laboratory Centre there is a well-equipped library of traditional and e-materials representing leading textbooks and journals in appropriate fields of study.

12. Program Structure

12.1 Curriculum

The number of credits required for the program not less than:

- Graduates with a master degree or equivalent enroll to doctoral degree not less than 48 total credits are required.
- Graduates with a bachelor degree enroll to doctoral degree require at least 72 credits.

Curriculum Structure:

The program is set according to the Ministry of Education Announcement titled Standard Criteria for Graduate Studies 2015. Doctor of Philosophy Program which has plan I and Plan II as follows:

	Plan I	**Plan II**
(1) Required course	-*	23 credits
(2) Elective course not less than	-	≥ 4 credits
(3) Dissertation	48 credits	48 credits
Total number of credit not less than	**48 credits**	**75 credits**

*Extra credits for plan I are required based on consideration by program.

12.2 Course requirements

(1) Required subjects (23 Credits) Credits (Lecture-Practice- Self-study)

RACE 611	Clinical Epidemiology and Evidence-Based Medicine	3(1-4-4)
RACE 612	Study Designs and Measurements	3(2-2-5)
RACE 603	Research Protocol Design	2(1-2-3)
RACE 624	Research Informatics and Data management	3(2-2-5)
RACE 615	Introduction to Medical Statistics	3(2-2-5)
RACE 616	Advanced Analysis in Medical Research	3(2-2-5)
RACE 607	Clinical Economics	3(2-2-5)
RACE 618	Systematic Review & Meta-Analysis	3(1-4-4)

(2) Elective course (not less than 4 Credits)

RACE 608	Social Science in Clinical Practice and Research	2(2-0-4)
RACE 617	Randomized Controlled Trial	2(1-2-3)

Elective Courses are in addition to the above course requirements. Students can enroll for other courses, offered by the Faculty of Graduate Studies of Mahidol University, or

from other universities according to their interests, and the program committee, or advisors see fit.

12.3 Dissertation **Credits (Lecture-Practice- Self-study)**

(1) Study Plan: Plan I

For graduates with a master's degree admission to doctor degree

RACE 898 Dissertation 48(0-192-0)

(2) Study Plan: Plan II

For graduates with a bachelor degree admission to doctor degree

RACE 799 Dissertation 48(0-192-0)

12.4 Course Code Explanation

Four main alphabets are defined as follows:

The first two alphabets refer to the faculty responsible for teaching.

RA means The Faculty of Medicine Ramathibodi Hospital

The last two alphabets describe the program responsible for teaching.

CE means Clinical Epidemiology

3 digit numbers 5XX identify the subject coding given by Faculty of Graduate Studies.

12.5 Study Plan – Plan I

Year	Semester 1	Semester 2
1	- Qualifying examination - Course work (If required) - Defend Research Topic	RACE 898: Dissertation 8(0-32-0) - Defend Topic - Seminar **Total 8 Credits**
2	RACE 898: Dissertation 10(0-40-0) - Develop Proposal **Total 10 Credits**	RACE 898: Dissertation 10(0-40-0) - Defend Thesis Proposal - Apply EC **Total 10 Credits**

Year	Semester 1	Semester 2
3	RACE 898: Dissertation 10(0-40-0) - Apply EC - Apply Grant - Pilot Study (If required) **Total 10 Credits**	RACE 898: Dissertation 10(0-40-0) - Data Collection - Data Management - Writing Manuscript #1 **Total 10 Credits**
4	- Data Analysis - Thesis Writing - Writing Manuscript #2	- Thesis writing
5	- Thesis Defense - Submission of Thesis	-

12.6 Study Plan – Plan II

Year	Semester 1	Semester 2
1	RACE 612: Study Designs and Measurements 3(1-4-4) RACE 615: Introduction to Medical Statistics 3(2-2-5) RACE 611: Clinical Epidemiology and Evidence-Based Medicine 3(1-4-4) RACE 624: Research Informatics and Data management 3(2-2-5) **Total 12 credits**	RACE 616: Advanced Analysis in Medical Research 3(2-2-5) RACE 603: Research Protocol Design 2(1-2-3) RACE 607: Clinical Economics 3(2-2-5) RACE 618: Systematic review and Meta-analysis 3(1-4-4) **Total 11 Credits**
	Summer	
	Elective course **Total ≥4 credits**	
2	- Qualifying examination - RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**	RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**
3	RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**	RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**
4	RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**	RACE 799: Dissertation 8(0-32-0) **Total 8 Credits**

13. Qualifying Examination

13.1 Before taking the Qualifying Examination students must have satisfied the English requirement of the Faculty of Graduate Studies.

13.2 Before taking the Qualifying Examination Plan II students must have completed all coursework with no individual subject less than grade B.

13.3 The Qualifying Examination has the following structure:

Oral examination	Part I: Study Design and Evidence-based Medicine Part II: Biostatistics
Written examination	Study Design, Evidence-based Medicine and Biostatistics

13.4 A student failing any part may retake that part not more than two times.

14. Research Proposal Defense

14.1 To proceed to Research Proposal Defense a student must have passed the Qualifying Examination.

14.2 To proceed to Research Proposal Defense a student must have successfully defended their research topic.

14.3 The program will set up a Research Proposal Defense Committee with approval from the Faculty of Graduate Studies.

14.4 The program will set the arrangements for the Research Proposal Defense and announce.

14.5 After successful Research Proposal Defense a student may register their Thesis.

15. Thesis Defense

15.1 When the student has completed their thesis to the satisfaction of their adviser team the program will set up a Thesis Defense Committee with approval from the Faculty of Graduate Studies.

15.2 The program will set the arrangements for the Thesis Defense and announce.

15.3 After successful oral defense of their Thesis if the Thesis needs revision the Thesis Defense Committee will set the time allowed between 30 to 90 days for the revision to complete and submit to the Faculty of Graduate Studies.

16. Manuscripts

16.1 Before a student can graduate they must have obtained 2-4 manuscripts published in approved international peer-reviewed journals as corresponding or first author.

16.2 Typically at least one of these manuscripts will be from their Systematic Review and Meta-analysis and at least one from their Thesis.

17. Career Potential of Graduates

At the end of the course graduates will have knowledge and be able to:

17.1 Plan I (Research Only)

(1) Become a medical researcher applying good moral and ethics in doing research

(2) Build up medical research team capacity with effective management of a research project.

(3) Produce good clinical research integrating in Clinical Epidemiology, Biostatistics, Clinical Economics and Health Social Sciences in planning research projects.

(4) Apply information technology to research, as well as effectively disseminate research results.

(5) Use the principles of Clinical Epidemiology and Evidence Based Medicine to analyze health problems. This will lead to develop a process of diagnosis, treatment and effective prevention of illness.

17.2 Plan II (Coursework and Research)

(1) Specialize in teaching Clinical Epidemiology, Biostatistics, Clinical Economics, etcetera.

(2) Become a medical researcher applying good moral and ethics in doing research.

(3) Build up medical research team capacity with effective management of a research project

(4) Produce good clinical research integrating Clinical Epidemiology, Biostatistics, Clinical Economics and Health Social Sciences in planning research projects.

(5) Apply information technology to research, as well as effectively disseminate research results.

(6) Use the principles of Clinical Epidemiology and Evidence Based Medicine to analyze health problems. This will lead to develop a process of diagnosis, treatment and effective prevention of illness.

Appendix 3: List of Publications by students

Year	Publications
2009	**Kamanamool N**, McEvoy M, Attia J, Ingsathit A, Ngamjanyaporn P, Thakkinstian A. Efficacy and adverse events of mycophenolate mofetil versus cyclophosphamide for induction therapy of lupus nephritis: systematic review and meta-analysis. Medicine (Baltimore). 2010 Jul;89(4):227-35.
	Anothaisintawee T, Rattanasiri S, Ingsathit A, Attia J, Thakkinstian A. Prevalence of chronic kidney disease: a systematic review and meta-analysis. Clin Nephrol. 2009 Mar;71(3):244-54.
2010	**Arj-Ong S**, Thakkinstian A, McEvoy M, Attia J. A systematic review & meta-analysis of Tumor Necrosis Factor alpha-308 polymorphism and Kawasaki disease. Pediatr Int. 2010 Aug;52(4):527-32.
	Anothaisintawee T, Attia J, Nickel JC, Thammakraisorn S, Numthavaj P, McEvoy M, Thakkinstian A et al. Management of chronic prostatitis/chronic pelvic pain syndrome: a systematic review and network meta-analysis. JAMA. 2011 Jan 5;305(1):78-86.
	Anothaisintawee T, Attia J, Nickel JC, Thammakraisorn S, **Numthavaj P**, McEvoy M, Thakkinstian A. Management of chronic prostatitis/chronic pelvic pain syndrome: a systematic review and network meta-analysis. JAMA. 2011 Jan 5;305(1):78-86.
2011	**Numthavaj P**, Thakkinstian A, Dejthevaporn C, Attia J. Corticosteroid and antiviral therapy for Bell's palsy: a network meta-analysis. BMC Neurol. 2011;11:1.
	Anothaisintawee T, Teerawattananon Y, Wiratkapun C, Kasamesup V, Thakkinstian A. Risk prediction models of breast cancer: a systematic review of model performances. Breast Cancer Res. Treat. 2012 May;133(1):1–10.
	Kongtharvonskul J, Attia J, Thamakaison S, Kijkunasathian C, Woratanarat P, Thakkinstian A. Clinical outcomes of double- vs single-bundle anterior cruciate ligament reconstruction: A systematic review of randomized control trials. Scand J Med Sci Sports. 2012 Jan 31.

Year	Publications
	Vejakama P, Thakkinstian A, Lertrattananon D, Ingsathit A, Ngarmukos C, Attia J. Reno-protective effects of renin-angiotensin system blockade in type 2 diabetic patients: a systematic review and network meta-analysis. Diabetologia. 2012;55(3):566-78.
2012	Ingsathit A, **Kamanamool N**, Thakkinstian A, Sumethkul V. Transplantation. 2013 Apr 15;95(7):943-8. Survival advantage of kidney transplantation over dialysis in patients with hepatitis C: a systematic review and meta-analysis.
	Numthavaj P, Tanjararak K, Roongpuvapaht B, McEvoy M, Attia J, Thakkinstian A. Efficacy of Mitomycin C for postoperative endoscopic sinus surgery: a systematic review and meta-analysis. Clin Otolaryngol. 2013 Jun;38(3):198-207.
	Thakkinstian A, Attia J, **Anothaisintawee T**, Nickel JC. a-blockers, antibiotics and anti-inflammatories have a role in the management of chronic prostatitis/chronic pelvic pain syndrome. BJU Int. 2012 Oct;110(7):1014-22.
	Rattanasiri S, McDaniel DO, McEvoy M, **Anothaisintawee T**, Sobhonslidsuk A, Attia J, Thakkinstian A. The association between cytokine gene polymorphisms and graft rejection in liver transplantation: a systematic review and meta-analysis. Transpl Immunol. 2013 Jan;28(1):62-70.
	Wilasrusmee C, Sukrat B, McEvoy M, Attia J, Thakkinstian A. Systematic review and meta-analysis of safety of laparoscopic versus open appendicectomy for suspected appendicitis in pregnancy. Br J Surg. 2012 Nov;99(11):1470-8.
	Wilasrusmee C, **Sukrat B**, McEvoy M, Attia J, Thakkinstian A. Systematic review and meta-analysis of safety of laparoscopic versus open appendicectomy for suspected appendicitis in pregnancy. Br J Surg. 2012 Nov;99(11):1470–8.
	Siribumrungwong B, Noorit P, Wilasrusmee C, Attia J, Thakkinstian A. A systematic review and meta-analysis of randomised controlled trials comparing endovenous ablation and surgical intervention in patients with varicose vein. Eur J Vasc Endovasc Surg. 2012 Aug;44(2):214–23
	Siribumrungwong B, Noorit P, **Wilasrusmee C**, Attia J, Thakkinstian A. A systematic review and meta-analysis of randomised controlled trials comparing endovenous ablation and surgical intervention in patients with varicose vein. Eur J Vasc Endovasc Surg. 2012 Aug;44(2):214–23

Year	Publications
	Vejakama P, Thakkinstian A, Ingsathit A, Dhanakijcharoen P, Attia J. Prognostic factors of all-cause mortalities in continuous ambulatory peritoneal dialysis: a cohort study. BMC nephrology. 2013;14:28.
2013	**Siribumrungwong B**, Srikuea K, Thakkinstian A. Asian J Surg. 2014 Jul;37(3):120-4. Comparison of superficial surgical site infection between delayed primary and primary wound closures in ruptured appendicitis.
	Sukrat B, Wilasrusmee C, **Siribumrungwong B**, McEvoy M, Okascharoen C, Attia J, Thakkinstian A.Biomed Res Int. 2013;2013:769057 Hemoglobin concentration and pregnancy outcomes: a systematic review and meta-analysis.
	Anothaisintawee T, Wiratkapun C, Lerdsitthichai P, Kasamesup V, Wongwaisayawan S, Srinakarin J, Hirunpat S, Woodtichartpreecha P, Boonlikit S, Teerawattananon Y, Thakkinstian A. Risk factors of breast cancer: a systematic review and meta-analysis. Asia-Pacific journal of public health / Asia-Pacific Academic Consortium for Public Health. 2013;25:368-87.
	Sukrat B, Wilasrusmee C, Siribumrungwong B, McEvoy M, Okascharoen C, Attia J, Thakkinstian A.Biomed Res Int. 2013;2013:769057 Hemoglobin concentration and pregnancy outcomes: a systematic review and meta-analysis.
	Atiksawedparit P, Rattanasiri S, McEvoy M, Graham CA, Sittichanbuncha Y, Thakkinstian A. Crit Care. 2014 Jul 31;18(4):463 Effects of prehospital adrenaline administration on out-of-hospital cardiac arrest outcomes: a systematic review and meta-analysis.
	Sukrat B, **Wilasrusmee C**, Siribumrungwong B, McEvoy M, Okascharoen C, Attia J, Thakkinstian A.Biomed Res Int. 2013;2013:769057 Hemoglobin concentration and pregnancy outcomes: a systematic review and meta-analysis.
2014	**Siribumrungwong B**, Noorit P, Wilasrusmee C, Thakkinstian A. World J Emerg Surg. 2014 Sep 6;9(1):49. A systematic review and meta-analysis of randomised controlled trials of delayed primary wound closure in contaminated abdominal wounds.
	Vallipakorn SA, Plitapolkarnpim A, Suriyawongpaisal P, Techakamolsuk P, Smith GA, Thakkinstian A. Risk prediction score for death of traumatised and injured children. BMC pediatrics. 2014;14:60.

Year	Publications
	Kongtharvonskul J, Anothaisintawee T, McEvoy M, Attia J, Woratanarat P, Thakkinstian A. Efficacy and safety of glucosamine, diacerein, and NSAIDs in osteoarthritis knee: a systematic review and network meta-analysis. European journal of medical research. 2015;20:24.
	Wilasrusmee C, Marjareonrungrung M, Eamkong S, Attia J, Poprom N, Jirasisrithum S, Thakkinstian A. Maggot therapy for chronic ulcer: a retrospective chohort and a meta-analysis Asian J Surg. 2014 Jul;37(3):138-47.
	Siribumrungwong B, Noorit P, **Wilasrusmee C**, Thakkinstian A. World J Emerg Surg. 2014 Sep 6;9(1):49. A systematic review and meta-analysis of randomised controlled trials of delayed primary wound closure in contaminated abdominal wounds.
	Vejakama P, Ingsathit A, Attia J, Thakkinstian A. Epidemiological study of chronic kidney disease progression: a large-scale population-based cohort study. Medicine. 2015;94(4):e475.
	Sansanayudh N, Anothaisintawee T, Muntham D, McEvoy M, Attia J, Thakkinstian A. Mean platelet volume and coronary artery disease: a systematic review and meta-analysis. International journal of cardiology. 2014;175(3):433-40.
	Anothaisintawee T, Teerawattananon Y, Wiratkapun C, Srinakarin J, Woodtichartpreecha P, Hirunpat S, et al. Development and validation of a breast cancer risk prediction model for Thai women: a cross-sectional study. Asian Pacific journal of cancer prevention : APJCP. 2014;15(16):6811-7.
	Sansanayudh N, **Anothaisintawee T**, Muntham D, McEvoy M, Attia J, Thakkinstian A. Mean platelet volume and coronary artery disease: a systematic review and meta-analysis. International journal of cardiology. 2014;175(3):433-40.
	Kongtharvonskul J, **Anothaisintawee T**, McEvoy M, Attia J, Woratanarat P, Thakkinstian A. Efficacy and safety of glucosamine, diacerein, and NSAIDs in osteoarthritis knee: a systematic review and network meta-analysis. European journal of medical research. 2015;20:24.

Year	Publications
2015	**Sansanayudh N**, Numthavaj P, Muntham D, Yamwong S, McEvoy M, Attia J, Sritara P, Thakkinstian A. Thromb Haemost. 2015 Aug 6;114(5). Prognostic effect of mean platelet volume in patients with coronary artery disease. A systematic review and meta-analysis.
	Sansanayudh N, Muntham D, Yamwong S, Sritara P, Akrawichien T, Thakkinstian A. The association between mean platelet volume and cardiovascular risk factors. European journal of internal medicine. 2016;30:37-42.
	Sansanayudh N, Thakkinstian A. Author's Reply: Mean Platelet Volume and Cardiovascular Risk Factors. European journal of internal medicine. 2016;31:e16-7.
	Sansanayudh N, **Numthavaj P**, Muntham D, Yamwong S, McEvoy M, Attia J, Sritara P, Thakkinstian A. Thromb Haemost. 2015 Aug 6;114(5). Prognostic effect of mean platelet volume in patients with coronary artery disease. A systematic review and meta-analysis.
	Numthavaj P, Bhongmakapat T, Roongpuwabaht B, Ingsathit A, Thakkinstian A. The validity and reliability of Thai Sinonasal Outcome Test-22. European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies. 2016.
	Seangleulur A, Vanasbodeekul P, Prapaitrakool S, Worathongchai S, Anothaisintawee T, McEvoy M, et al. The efficacy of local infiltration analgesia in the early postoperative period after total knee arthroplasty: A systematic review and meta-analysis. European journal of anaesthesiology. 2016.
	Siribumrungwong B, Noorit P, Wilasrusmee C, Teerawattananon Y, Thakkinstian A. Quality of life after great saphenous vein ablation in Thai patients with great saphenous vein reflux. Asian journal of surgery / Asian Surgical Association. 2015.
	Siribumrungwong B, Noorit P, Wilasrusmee C, Leelahavarong P, Thakkinstian A, Teerawattananon Y. Cost-utility analysis of great saphenous vein ablation with radiofrequency, foam and surgery in the emerging health-care setting of Thailand. Phlebology / Venous Forum of the Royal Society of Medicine. 2016;31(8):573-81.

Year	Publications
	Siribumrungwong B, Noorit P, **Wilasrusmee C**, Teerawattananon Y, Thakkinstian A. Quality of life after great saphenous vein ablation in Thai patients with great saphenous vein reflux. Asian journal of surgery / Asian Surgical Association. 2015.
	Siribumrungwong B, Noorit P, **Wilasrusmee C**, Leelahavarong P, Thakkinstian A, Teerawattananon Y. Cost-utility analysis of great saphenous vein ablation with radiofrequency, foam and surgery in the emerging health-care setting of Thailand. Phlebology / Venous Forum of the Royal Society of Medicine. 2016;31(8):573-81.

Appendix 4: Course Specification

Course Specification
RACE 612: Study Designs and Measurements

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. Course number and name b

Course number: RACE 612

Course name: Study Designs and Measurements

2. Credits: 3(2-2-5)

3. Curriculum and type of course

3.1 Curriculum: Study Designs and Measurements

3.2 Type of course: Require course

4. Instructors

4.1 Course Coordinator: Assoc. Prof. Dr. Atiporn Ingsathit

4.2 Instructors

Assoc.Prof. Dr.Atiporn Ingsathit

Assoc.Prof. Dr. Ammarin Thakkinstian

Assoc.Prof. Dr.Patarawan Woratanarat

Assist.Prof. Dr.Chusak Okascharoen

Assist.Prof. Dr. Saranath Lawpoolsri

Dr. Vijj Kasemsup

5. Semester/Year: ***1st*** Semester, Academic Year 2017,1st year students

6. *Pre-requisite:* None

7. *Co – requisites:* None

8. Classroom: To be announced

9. Revision Date: 11th March 2016 ***By:*** Committee

Note: *Revised evaluation* and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Student can justify appropriate study design for investigation the association of exposure and health outcomes.

1.2 Students can compare the relative strength and weakness of the different study designs.

1.3 Students can determine the appropriate measurement to assess disease frequency, association and potential heath impact.

1.4 Student can discriminate between association and causation by applying the criteria for the causality to the results from the studies.

1.5 Student can describe the concepts of confounding and interaction

Section 3: Course details

1. Course Description

Study design, observational study, i.e., case-control, cross-sectional, cohort, nested case-control, case cohort and experimental study. Epidemiological measurement, health indicators, bias, confounding and interaction.

2. Hours per semester: Lecture 30 hours

Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can justify appropriate study design for investigation the association of exposure and health outcomes	ELOs 1, 4, 5	- Lecture - Class discussion - Assigned readings - Assignments - Self-study	- Rubric assignments - Rubric examination
2. Students can compare the relative strength and weakness of the different study designs	ELOs 1, 4	- Lecture - Class discussion - Assigned readings - Assignments - Self-study	- Rubric assignments - Rubric examination
3. Students can determine the appropriate measurement to assess disease frequency, association and potential heath impact	ELOs 1, 3, 4	- Lecture - Class discussion - Assigned readings - Assignments - Self-study	- Rubric assignments - Rubric examination
4. Student can discriminate between association and causation by applying the criteria for the causality to the results from the studies	ELOs 1	- Lecture - Class discussion - Assigned readings - Assignments - Self-study	- Rubric assignments - Rubric examination
5. Student can describe the concepts of confounding and interaction	ELOs 1	- Lecture - Class discussion - Assigned readings - Assignments - Self-study	- Rubric assignments - Rubric examination

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Overview in Health Science Research	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	
3 Hrs.	Self-study: Overview in Health Science Research			
3 Hrs.	Measurement in Epidemiology	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	Assignment
3 Hrs.	Self-study: Measurement in Epidemiology			
3 Hrs.	Observational studies: Cross - sectional	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	Assignment
3 Hrs.	Self-study & Assignment I: Cross – sectional (15%)			
3 Hrs.	Observational studies: Case - control	Assoc.Prof. Dr.Patarawan Woratanarat	Lecture	Assignment
3 Hrs.	Self-study & Assignment II: Case – control (15%)			
3 Hrs.	Observational studies: Cohort	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	Assignment
3 Hrs.	Self-study & Assignment III: Cohort (15%)			
3 Hrs.	Confounding and Interaction	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	
3 Hrs.	Self-study: Confounding and Interaction			
3 Hrs.	Association and Causality	Assoc.Prof.Dr.Atiporn Ingsathit	Lecture	Assignment
3 Hrs.	Self-study & Assignment IV: Association and Causality (15%)			
3 Hrs.	Genetic association study	Assoc.Prof.Dr.Ammarin Thakkinstian	Lecture	Assignment
3 Hrs.	Self-study: Genetic association study			
3 Hrs.	Modern Epidemiology: Nested case- control and case cohort study	Assist.Prof.Dr.Saranath Lawpoolsri	Lecture	Assignment
3 Hrs.	Self-study & Assignment V: Nested case-control and case cohort study (15%)			
3 Hrs.	Experimental studies	Assist.Prof.Dr.Chusak Okascharoen	Lecture	
3 Hrs.	Self-study: Experimental studies			
3 Hrs.	Health Service Research	Dr.Vijj Kasemsup	Lecture	
3 Hrs.	Self-study: Health Service Research			
3 Hrs.	Final Examination (25%)			

2. Measurement and Evaluation of Student Achievement

2.1 Assignments 75%

- Cohort (15%)
- Cross – sectional (15%)
- Case – control (15%)
- Nested case-control and case cohort study (15%)
- Causality (15%)

2.2 Final Examination 25%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
    - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
    - Assessment of students' learning records
    - Assessment of instructor's teaching by student

3. Improvement of Instruction
    - Consider the students' learning records
    - Consider the students' assessment of instructor's teaching
    - Consider the program committee's comment

4. Verification of student achievement in the subject
    - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
    - Using the results from 1 - 5 as inputs to the instruction improvement

Learning Resources

1. Fletcher RH, Fletcher SW, Fletcher GS. Clinical Epidemiology: the essentials. Fifth ed. Philadelphia, USA: Williams & Wilkins; 2014.
2. Gordis L. Epidemiology. Fifth ed. Philadelphia, Pennsylvania, USA: ELSEVIER SAUNDERS; 2014.
3. Rothman KJ, Greenland S. Modern Epidemiology. Third ed. Philadelphia, Lippincott-Raven Publishers 2008.

Course Specification

RACE 615: Introduction to Medical Statistics

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 615

   Course name: Introduction to Medical Statistics

2. ***Credits: 3(1-4-4)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Introduction to Medical Statistics

   3.2 Type of course: Required course

4. ***Instructors***

   4.1 Course Coordinator: Asst.Prof. Dr. Sasivimol Rattanasiri

   4.2 Instructors: Asst.Prof. Dr. Sasivimol Rattanasiri

5. ***Semester/Year:*** 1st Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** None
7. ***Co – requisites:*** None
8. ***Classroom***: To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

   Note: *Revised evaluation methods* and course contents/outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Can appropriately describe data

1.2 Can appropriately apply basic statistical analysis

1.3 Can use the statistical software (STATA Program) to handle data

1.4 Can interpret results of finding and write a report

Section 3: Course details

1. Course Description

Statistical inference for continuous data: comparison two means, analysis of variance (ANOVA), correlation coefficient and linear regression. Statistical inference for categorical data: Assess association using chi-square test and Fisher exact test, strength of association using odds ratio, risk ratio, and sample size estimation.

2. Hours per semester: Lecture 30 hours

Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Program level learning outcomes	Methods	Assessment
1. Can appropriately describe data	ELOs 1, 3	- Lecture - Hand on practice with real research data - Assignments	- Rubric Assignments
2. Can appropriately apply statistical analysis	ELOs 1, 3	- Lecture - Hand on practice with real research data - Assignments	- Rubric Assignments -

Course level learning outcomes	Program level learning outcomes	Methods	Assessment
3. Can estimate sample size properly according to research objectives	ELOs 1, 3, 4	- Lecture - Hand on practice with real research data - Assignments	- Rubric Assignments -
4. Can use the statistical software (STATA Program) to handle data	ELOs 1, 3	- Lecture - Hand on practice with real research data - Assignments	N/A
5. Can interpret results of finding and write a report	ELOs 1, 3	- Lecture - Hand on practice with real research data - Assignments	- Rubric Assignments

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Basic concepts of medical statistics	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment I: 5%
3 Hrs.	*Self – study & <u>Assignment I</u>: Basic Concepts of Medical Statistics (5%)*			
3 Hrs.	Computer Aids in statistical analysis	Dr. Sasivimol Rattanasiri	Lecture and Practice	N/A
3 Hrs.	*Self – study*: Computer Aids in Statistical analysis			
3 Hrs.	Analysis for categorical data	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment II: 10%
3 Hrs.	*Self – study & <u>Assignment II:</u> Analysis for categorical data (10%)*			
3 Hrs.	Analysis for continuous data I: Comparison of two groups	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment III: 15%
3 Hrs.	*Self – study*: Analysis for Continuous data I			
3 Hrs.	Analysis for continuous data II: Comparison of 3 groups or more	Dr. Sasivimol Rattanasiri	Lecture and Practice	
3 Hrs.	Self – study & Assignment III: Analysis for Continuous data (15%)			

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Correlation & simple linear regression analysis	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment IV: 15%
3 Hrs.	*Self – study & <u>Assignment IV</u>: Correlation & simple linear regression analysis (15%)*			
3 Hrs.	Multiple linear regression I	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment V: 30%
3 Hrs.	*Self – study*: Multiple linear regression I			
3 Hrs.	Multiple linear regression II	Dr. Sasivimol Rattanasiri	Lecture and Practice	
3 Hrs.	*Self – study & <u>Assignment V</u>: Multiple linear regression (30%)*			
3 Hrs.	Sample size estimation I	Dr. Sasivimol Rattanasiri	Lecture and Practice	Assignment VI: 25%
3 Hrs.	*Self – study*: Sample size estimation I			
3 Hrs.	Sample size estimation II	Dr. Sasivimol Rattanasiri	Lecture and Practice	
3 Hrs.	*Self – study*: Sample size estimation II			
3 Hrs.	Sample size estimation III	Dr. Sasivimol Rattanasiri	Lecture and Practice	
3 Hrs.	*Self – study & <u>Assignment VI</u>: Sample size estimation (25%)*			

2. Measurement and Evaluation of Student Achievement

2.1 Six Assignments 100%

- Basic concepts of medical statistics 5%
- Analysis for categorical data 10%
- Analysis for continuous data 15%
- Correlation & regression analysis 15%
- Multiple regression 30%
- Sample size estimation 25%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
    - Evaluation of instructor's teaching by students

2. Strategy to assess the instruction
    - Assessment of students' learning records
    - Evaluation of instructor's teaching by students

3. Improvement of Instruction
    - Consider the students' learning records
    - Consider the students' assessment and evaluation of instructor's teaching
    - Consider the program committee's comments and suggestions

4. Verification of student achievement in the subject
    - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
    - Incorporate results from 1 - 4 as inputs to the instruction improvement

Learning Resources

1. Altman DG. Practical statistics for medical research. London: Chapman & Hall 1991
2. Pagano M and Gauvreau K. Principles of biostatistics. California: Duxbury press 1991
3. Hailpern SM. Teaching statistics to physicians using Stata. The Stata Journal 2005; 5(2): 248-258.
4. Julious SA. Sample sizes for clinical trials with normal data. Stat Med 2004; 23: 1921-86.
5. Lang TA, and Secic M. How to report statistics in medicine: Annotated guidelines for authors, editors, and reviewers. Philadelphia: American College of Physician 1997.
6. Neter J, Wasserman W, and Kutner M. Applied linear statistical models, third edition. Boston: IRWIN 1991.
7. Kleinbaum DG, Kupper L, Muller KE, and Nizam A. Applied regression analysis and thoer multivariable methods. London: Duxbury press 1998.

Course Specification

RACE 611: Introduction to Medical Statistics

Institution Name: Mahidol University

Campus/Faculty/Department: Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies
Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. Course number and name

Course number: RACE 611

Course name: Clinical Epidemiology and Evidenced-based Medicine

2. Credits: 3(3-0-6)

3. Curriculum and type of course

3.1 Curriculum: Clinical Epidemiology and Evidenced-based Medicine

3.2 Type of course: Require course

4. Instructors

4.1 Course Coordinator: Assoc. Prof. Dr. Atiporn Ingsathit

4.2 Instructors

Assoc. Prof. Dr.Atiporn Ingsathit

Assoc. Prof. Dr.Patarawan Woratanarat

Asst. Prof. Chusak Okascharoen

Asst. Prof. Dr.Thunyarat Anothaisintawee

Asst. Prof. Dr. Sakda Arj-Ong Vallipakorn

5. ***Semester/Year:*** 1st Semester, Academic Year 2016,1st year students
6. ***Pre-requisite:*** None
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date:*** 11st March 2016 By: Committee

Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. ***Course Learning Outcomes***

1.1 Student can formulate appropriate answerable clinical question

1.2 Student can justify the most appropriate research designs to address a research question

1.3 Student can critique the articles on diagnosis, therapy, risk/harm, prognosis, systematic review, and clinical practice guideline (CPG).

1.4 Student can describe the concept of prediction tools

1.5 Student can integrate knowledge of Evidence-Based Medicine into clinical decision making

Section 3: Course details

1. Course Description

Formulate clinical question, Evidenced-based medicine critical appraisal of diagnosis study, therapeutic study, risk/harm study prognosis, systematic review, prediction tools and clinical practice guideline.

2. Hours per semester: Lecture 30 hours
Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can formulate appropriate answerable clinical question	ELOs 1, 2	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric - Presentation
2. Student can justify the most appropriate research designs to address a research question.	ELOs 1, 2	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric - presentation
3. Student can critique the articles on diagnosis, therapy, risk/harm, prognosis, systematic review, and clinical practice guideline (CPG).	ELOs 1, 2, 3, 6	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric - presentation
4. Student can describe and critique the concept of prediction tools	ELOs 1, 2, 3	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric - presentation
5. Student can integrate knowledge of Evidence-Based Medicine into clinical decision making	ELOs 1, 2, 3, 6	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric - presentation

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Introduction to Clinical Epidemiology: Formulating clinical question, resources of EBM, Why EBM?	Dr.Atiporn Ingsathit	Lecture	
3 Hrs.	Self-study: Introduction to Clinical Epidemiology			
3 Hrs.	Clinical Epidemiology: Diagnostic study	.Dr.Atiporn Ingsathit	Lecture	- Assignment
3 Hrs.	Self-study & Assignment I: Appraisal of Diagnostic study (20%)			
3 Hrs.	Critical appraisal and scenarios: Diagnostic study	Dr.Atiporn Ingsathit	Practice	- Presentation
3 Hrs.	Clinical Epidemiology: Therapeutic study	Dr Thunyarat Anothaisintawee		- Assignment
3 Hrs.	Self-study & Assignment II: Appraisal of Therapeutic study (20%)			
3 Hrs.	Critical appraisal and scenarios: Therapeutic study	Dr Thunyarat Anothaisintawee	Practice	- Presentation
3 Hrs.	Clinical Epidemiology: Risk study	Dr.Sakda Arj-Ong Vallipakorn	Lecture	- Assignment
3 Hrs.	Self-study & Assignment III: Appraisal of Risk study (20%)			
3 Hrs.	Critical appraisal and scenarios: Risk study	Dr.Sakda Arj-Ong Vallipakorn	Practice	- Presentation
3 Hrs.	Clinical Epidemiology: Prognostic study	Dr.Atiporn Ingsathit	Lecture	- Assignment
3 Hrs.	Self-study & Assignment IV: Appraisal of Prognostic study (20%)			
3 Hrs.	Clinical Epidemiology: Systematic review	Dr.Patarawan Woratanarat	Lecture	- Assignment
3 Hrs.	Self-study & Assignment V: Appraisal Systematic review (20%)			
3 Hrs.	Critical appraisal and scenarios: Prognostic study	Dr.Atiporn Ingsathit	Practice	- Presentation
3 Hrs.	Critical appraisal and scenarios: Systematic review	Dr.Patarawan Woratanarat	Practice	- Presentation
3 Hrs.	Critical appraisal of CPG	Dr.Atiporn Ingsathit	Lecture	
3 Hrs.	Prediction tools	Dr.Chusak Okascharoen	Lecture	- Assignment
3 Hrs.	Self-study & Assignment VI: Appraisal Prediction tools (20%)			
3 Hrs.	Critical appraisal and scenarios: Prediction tools	Dr.Chusak Okascharoen	Practice	- Presentation
3 Hrs.	Self-study & Assignment VII: CAT presentation (20%)			
3 Hrs.	CAT Presentation	Team	Practice	- Presentation

2. Measurement and Evaluation of Student Achievement

- **Seven Assignments 100%**
  - Diagnostic study
  - Therapeutic study
  - Risk study
  - Prognostic study
  - Systematic review
  - Prediction tools
  - CAT Presentation

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student
2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student
3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment
4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee
5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 – 5 as inputs to the instruction improvement

Learning Resources

1. Fletcher RH, Fletcher SW, Fletcher GS. Clinical Epidemiology: the essentials. Fifth ed. Philadelphia, USA: Williams & Wilkins; 2014.
2. Gordis L. Epidemiology. Fifth ed. Philadelphia, Pennsylvania, USA: ELSEVIER SAUNDERS; 2014.
3. Sackett DL, Haynes RB, Guyatt GH, Tugwell P. Clinical Epidemiology: A Basic Science for Clinical Medicine. Second ed. USA; 1991.
4. Sackett DL, Straus SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based Medicine: How to Practice and Teach EBM. Second ed. Churchill Livingstone: Edinburgh; 2000.
5. Guyatt GH, Rennie D. User's Guide to the Medical Literature: Essentials of Evidence-Based Clinical Practice. Second ed; 2008.

Course Specification

RACE 624: Research Informatics and Data Management

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. Course number and name

Course number: RACE 624

Course name: Research Informatics and Data Management

2. Credits: 2(1-2-3)

3. Curriculum and type of course

3.1 Curriculum: Research Informatics and Data Management

3.2 Type of course: Required course

4. Instructors

4.1 Course Coordinator: Dr. Oraluck Pattanaprateep

Asst.Prof.Dr. Sakda Arj-Ong Vallipakorn

4.2 Instructors

Assoc. Prof. Dr. Jaranit Kaewkangwal

Asst. Prof. Dr. Chusak Okascharoen

Asst. Prof. Dr. Sasivimol Rattanasiri

Asst. Prof. Dr. Sakda Arj-Ong Vallipakorn

Dr. Pawin Numthavaj

Dr. Oraluck Pattanaprateep

5. ***Semester/Year:*** 3rd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** RACE 612, RACE 615
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

Note: *Revised evaluation* and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Student can identify a wide variety of medical information sources, do comprehensive and specific literature searching, and organize a large number of citations

1.2 Student can demonstrate understanding of health professionals' uses of medical informatics relevance to clinical research including information storage and management; application of internet to health care and research

1.3 Student can describe process of data management, assuring of data quality, and standard in security and privacy of health information

1.4 Student can create case record form and construct database for clinical research with considering data quality control

1.5 Student can perform data cleaning & checking

1.6 Student can understand the data science, big data and data warehouse concept

1.7 Student can select appropriate data visualization techniques

1.8 Student can explain machine learning algorithm for analysing big data

Section 3: Course details

1. Course Description

Medical informatics for clinical research and clinical practice, advanced literature searching, storage and organization of medical information, data management, designing data collection form, construct databases, data quality control, data validation, data dictionary. Big data management and analysis.

2. Hours per semester: Lecture 30 hours

Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can identify a wide variety of medical information sources, do comprehensive and specific literature searching, and organize a large number of citations	ELOs 1, 4, 6	- Lecture - Hand on practice - Assignment	- Rubric assignment
2. Student can demonstrate understanding of health professionals' uses of medical informatics relevance to clinical research including information storage and management; application of internet to health care and research	ELOs 1, 4	- Lecture - Assigned readings - Class discussion - Assignment	- Rubric assignment
3. Student can describe process of data management, assuring of data quality, and standard in security and privacy of health information	ELOs 4, 5	- Lecture - Assigned readings - Class discussion - Site visit real data management center	-
4. Student can create case record form and construct database for clinical research with considering data quality control	ELOs 4, 5, 6	- Lecture - Hand on practice - Assignment	- Rubric assignment

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
5. Student can perform data cleaning & checking	ELOs 5	- Lecture - Hand on practice - Assignment	- Rubric assignment
6. Student can understand the data science, big data and data warehouse concept	ELOs 1	- Lecture - Assignment	- Rubric assignment
7. Student can select appropriate data visualization techniques	ELOs 1, 6	- Lecture	-
8. Student can explain machine learning algorithm for analysing big data	ELOs 1, 6	- Lecture - Assignment	- Rubric assignment

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Overview of Research Informatics and Data management	Asst.Prof.Dr.Chusak Okascharoen	Lecture	- Post-class assignment
3 Hrs.	Self – study: Overview of Research Informatics and Data management			
3 Hrs.	Research workflow	Dr.Sakda Arj-Ong Vallipakorn	Lecture	- Post-class assignment
3 Hrs.	Self – study: Research workflow			
3 Hrs.	Information searching and organization	Dr.Sakda Arj-Ong Vallipakorn	Lecture	- Post-class assignment
3 Hrs.	Self – study: Information searching and organization			
3 Hrs.	Basic bibliographic management	Dr.Pawin Numthavaj	Lecture	- Post-class assignment
3 Hrs.	Self – study: Bibliographic management			
3 Hrs.	Data management for clinical research	Assist.Prof.Dr.Sasivimol Rattanasiri	Lecture	- Post-class assignment
3 Hrs.	Self – study: Data management for clinical research			
3 Hrs.	Database & Data quality control I: Data registry and cross-sectional survey	Assist.Prof.Dr.Sasivimol Rattanasiri	Lecture	- Post-class assignment
3 Hrs.	Self – study: Data registry and cross-sectional survey			
3 Hrs.	Database & Data quality control II: Longitudinal data and RCT	Assist.Prof.Dr.Sasivimol Rattanasiri	Lecture	- Post-class assignment
3 Hrs.	Self – study: Longitudinal data and RCT			
3 Hrs.	Big data management I: Data science and big data concept	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study Data science and big data concept			
3 Hrs.	Big data management II: Data warehouse and visualization	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Data warehouse and visualization			
3 Hrs	Big data analysis: Algorithm design and techniques	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Big data analysis			
3 Hrs	Site visit DMU	Assoc.Prof.Dr.Jaranit Kaewkangwal	Lecture	

2. Measurement and Evaluation of Student Achievement

2.1 Post-class assignments

- Assignment I: Research workflow 20%
- Assignment II: Bibliographic management 20%
- Assignment III: Database & Data quality control 20%
- Assignment IV: Data warehouse and visualization 20%
- Assignment V: Big data analysis 20%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 9 as inputs to the instruction improvement

Learning Resources

1. Degoulet, P.; Fieschi, M. Introduction to Clinical Informatics. 1999. Springer.
2. McFadden ET, LoPresti F, Bailey LR, Clarke E, Wilkins PC. Approaches to data management. Control Clin Trials. 1995;16(2 Suppl):30S-65S.
3. Mandl KD, Lee TH. Integrating medical informatics and health services research: the need for dual training at the clinical health systems and policy levels. J Am Med Inform Assoc. 2002;9(2):127-32
4. Bennett S, Myatt M, Jolley D, and Radalowicz A. Data management for surveys and trials-A practical primer using EpiData. The EpiData Association, Odense Denmark, 2001

5. McFadden E. Management of data in clinical trials. John Wiley & Sons, New York, 1998.
6. Svend Juul. Take good care of your data. Department of Epidemiology and Social Medicine, University of Aarhus. November 2004.
7. Lauritsen JM and Bruus M. EpiData Help file (Version 3). Data entry and data documentation Http://www.epidata.dk. The EpiData Association, Odense Denmark, 2003.
8. Provost F and Fawcett T. Data science for business. O'Reilly Media, Inc. 2013.
9. Reeves LL. A manager's guide to data warehousing. Wiley Publishing, Inc. 2009.
10. Kimball R and Ross Margy. The data warehouse toolkit: the complete guide to dimensional modeling 2nd ed. Wiley Computer Publishing. 2002.
11. Berka P, Rauch J, and Zighed DA. Data mining and medical knowledge management: cases and applications. Information Science Reference. 2009.
12. Han J and Kamber M. Data mining: concepts and techniques (2nd edition). Morgan Kaufmann Publisher, CA, USA. 2006.

Course Specification

RACE 616: Advanced Statistical Analysis in Medical Research

Institution Name: Mahidol University

Campus/Faculty/Department: Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies
Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 616

   Course name: Advanced Statistical Analysis in Medical Research

2. ***Credits: 3(2-2-5)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Advanced Statistical Analysis in Medical Research

   3.2 Type of course: Required course

4. ***Instructors***

   4.1 Course Coordinator: Assoc.Prof. Dr.Ammarin Thakkinstian

   4.2 Instructors: Assoc.Prof. Dr.Ammarin Thakkinstian

5. ***Semester/Year:*** 2nd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** RACE 615
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

   Note: *Revised evaluation* and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Can apply statistical analysis methods appropriately according to study design and type of data in medical research

1.2 Can construct statistical analysis plan for medical research

1.3 Can interpret and report results of analysis appropriately

Section 3: Course details

1. Course Description

Logistic regression analysis, multi-logit regression, poisson regression, survival analysis, COX regression analysis, longitudinal data analysis.

2. Hours per semester: Lecture 30 hours

Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Can apply statistical analysis methods appropriately according to study design and type of data in medical research	ELOs 1, 3, 4, 5	- Lecture - Assigned readings - Hand on practice with our real research data - Assignments	- Rubric Assignments
2. Can construct statistical analysis plan for medical research	ELOs 4	- Lecture - Assigned readings - Hand on practice with our real research data - Assignments	- Rubric Assignments
3. Can interpret and report results of analysis appropriately	ELOs 1, 3	- Lecture - Assigned readings - Hand on practice with our real research data - Assignments	- Rubric Assignments

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Logistic Regression	Dr. Ammarin Thakkinstian	Lecture and Practice	Assignment I (20%)
3 Hrs.	Self – study: Logistic Regression			
3 Hrs.	Clinical Prediction score I	Dr. Ammarin Thakkinstian	Lecture and Practice	
3 Hrs.	Self – study: Logistic Regression			
3 Hrs.	Clinical Prediction score II	Dr. Ammarin Thakkinstian	Lecture and Practice	
3 Hrs.	Self – study: Logistic Regression			
3 Hrs.	Poisson regression	Dr. Ammarin Thakkinstian	Lecture and Practice	Assignment II (20%)
3 Hrs.	Self – study: Poisson regression			
3 Hrs.	Survival analysis I: Kaplan-Meier & Cox regression	Dr. Ammarin Thakkinstian	Lecture and Practice	N/A
3 Hrs.	Self – study: Survival analysis I			
3 Hrs.	Survival analysis II: Time-varying Cox regression	Dr. Ammarin Thakkinstian	Lecture and Practice	Assignment III (20%)
3 Hrs.	Self – study Survival analysis II			
3 Hrs.	Survival analysis III: Competing risk model & Multi-state model	Dr. Ammarin Thakkinstian	Lecture and Practice	N/A
3 Hrs.	Self – study: Survival analysis III			
3 Hrs.	Survival analysis IV: Sample size estimation	Dr. Ammarin Thakkinstian	Lecture and Practice	Assignment IV (20%)
3 Hrs.	Self – study: Survival analysis IV			
3 Hrs.	Longitudinal data analysis I: Continuous data	Dr. Ammarin Thakkinstian	Lecture and Practice	Assignment V (20%)
3 Hrs.	Self – study: Longitudinal data analysis			
3 Hrs.	Longitudinal data analysis II: Categorical data	Dr. Ammarin Thakkinstian	Lecture and Practice	
3 Hrs.	Self – study: Longitudinal data analysis			

2. Measurement and Evaluation of Student Achievement

2.1 Prediction score	20%
2.2 Poisson regression	20%
2.3 Survival analysis I & II	20%
2.4 Survival analysis III & IV	20%
2.5 Longitudinal data analysis	20%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 3 as inputs to the instruction improvement

Learning Resources

1. Hosmer DW, Lemeshow S. Applied logistic regression. 2nd ed. New York: John Wiley & Sons, Inc; 2000.
2. Klienbaum GD, Kupper LL, Muller EK, et al. Allied regression analysis and other multivariable methods. 3rd ed. Washington: Duxbury Press; 1998.
3. Rodsutti J, Hensley M, Thakkinstian A, et al. A clinical decision rule to prioritize polysomnography in patients with suspected sleep apnea. Sleep 2004;27(4):694-9.
4. Peduzzi P, Concato J, Feinstein AR, et al. Importance of events per independent variable in proportional hazards regression analysis. II. Accuracy and precision of regression estimates. J Clin Epidemiol 1995;48(12):1503-10.

5. Courvoisier DS, Combescure C, Agoritsas T, et al. Performance of logistic regression modelling: beyond the number of events per variable, the role of data structure. J Clin Epidemiol 2011;64(9):993-1000.
6. Pencina MJ, D'Agostino RB, Sr., D'Agostino RB, Jr., et al. Evaluating the added predictive ability of a new marker: from area under the ROC curve to reclassification and beyond. Stat Med 2008;27(2):157-72; discussion 207-12.
7. Cook NR. Use and misuse of the receiver operating characteristic curve in risk prediction. Circulation 2007;115(7):928-35.
8. Cook NR, Paynter NP. Performance of reclassification statistics in comparing risk prediction models. Biom J 2011;53(2):237-58.
9. Agresti A. Categorical data analysis. 2nd edition. New York: John Wiley & Sons INC 2002.
10. Klienbaum GD, Kupper LL, Muller EK, and Nizam A. Applied regression analysis and other multivariable methods. 3rdedition. Washington: Duxbury Press 1998; 687 - 709.
11. Zelterman D. Model for discrete data. Revised edition. Oxford: Oxford University Press 2006
12. Cumming P. Methods for estimating adjusted risk ratios. The STATA Journal 2009; 9: 175-196.
13. Cumming P. Estimating adjusted risk ratios for matched and unmatched data: An update. The STATA Journal 2011; 11: 290-298.
14. Chao A, Tsay PK, Lin SH, Shau WY, Chao DY. The applications of capture-recapture models to epidemiological data. Stat Med 2001 Oct 30;20(20): 3123-57.
15. Hook EB, Regal RR. Internal validity analysis: a method for adjusting capture-recapture estimates of prevalence. Am J Epidemiol 1995 Nov 1;142(9 Suppl): S48-52.

Course Specification

RACE 607: Clinical Economics

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 607

   Course name: Clinical Economics

2. ***Credits: 3(2-2-5)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Clinical Economics

   3.2 Type of course: Required course

4. ***Instructors***

   4.1 Course Coordinator: Dr. Oraluck Pattanaprateep

   Dr. Vijj Kasemsup

   4.2 Instructors: Dr. Phusit Prakongsai

   Dr. Vijj Kasemsup

   Dr. Oraluck Pattanapratee

5. ***Semester/Year:*** 2nd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite***: None
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date:*** 11th March 2016 ***By:*** Committee

   Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Student can explain health determinants and burden of diseases, and be able to relate these knowledge to health system

1.2 Student can critique concepts and practical points of health insurance and difference payment mechanisms that affect utilizations of health care

1.3 Student can explain concepts of equity and practical points of applying equitable issues for medical decision making

1.4 Student can determine the appropriate methodology and apply concepts of economic evaluation in clinical practice

1.5 Student can conduct cost analysis and outcome measurement

1.6 Student can develop economic model, analyze uncertainty and budget impact

1.7 Student can critically appraise economics studies

Section 3: Course details

1. Course Description

Overview of health system, health equity, and health economic. Principles of clinical economic, research methodology in economic evaluation, cost of illness, outcome measurements, modeling (i.e. decision tree, Markov), model uncertainty, budget impact analysis, and critical appraisal of economic article.

2. Hours per semester: Lecture 30 hours

Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can explain health determinants and burden of diseases, and be able to relate these knowledge to health system	ELOs 1	- Lecture - Assigned readings	-
2. Student can critique concepts and practical points of health insurance and different payment mechanisms that affect utilizations of health care	ELOs 1	- Lecture - Assigned readings - Assignments	- Rubric assignment
3. Student can explain concepts of equity and practical points of applying equitable issues for medical decision making	ELOs 1	- Lecture - Assigned readings	-
4. Student can determine the appropriate methodology and apply concepts of economic evaluation in clinical practice	ELOs 1, 4	- Lecture - Class discussion	-
5. Student can conduct cost analysis and outcome measurement	ELOs 1, 5	- Lecture - Hand on practice - Assignments	- Rubric assignment
6. Student can develop economic model, analyze uncertainty and budget impact	ELOs 1, 3	- Lecture - Hand on practice - Assignments	- Rubric assignment
7. Student can critically appraise economics studies	ELOs 1	- Presentation - Assigned reading	- Rubric Presentation

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Overview of Health Systems and Clinical Economics	Dr.Vijj Kasemsup	Lecture	- Post-class assignment
3 Hrs.	Self – study: Overview of health systems			
3 Hrs.	Equity in Health Care	Dr.Phusit Prakongsai	Lecture	- Post-class assignment
3 Hrs.	Self – study: Equity in Health Care			
3 Hrs.	Health Economics and Basic command for modeling	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Basic command for modeling			
3 Hrs.	Research methodology in Economic evaluation	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Research methodology in Economic evaluation			
3 Hrs.	Cost analysis: Cost of illness (CoI)	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Cost of illness			
3 Hrs.	Outcome measurements: Cost utility analysis (CUA)	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Outcome measurements: Cost utility analysis (CUA)			
3 Hrs.	Modeling - Decision tree analysis - Markov analysis	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Model analysis			
3 Hrs.	Uncertainty analysis	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Uncertainty analysis			
3 Hrs.	Budget impact analysis and Policy making in Thailand	Dr.Oraluck Pattanaprateep	Lecture	- Post-class assignment
3 Hrs.	Self – study: Design Markov model			
3 Hrs.	Prepare for presentation			
3 Hrs.	Presentation: Critical appraisal of Economic article	Dr.Oraluck Pattanaprateep/ Dr.Vijj Kasemsup	Lecture	- Presentation

2. Measurement and Evaluation of Student Achievement

- 5 Assignments 85%
  - Assignment I: Overview of health systems 20%
  - Assignment II: Cost of illness 20%
  - Assignment III: Model analysis - Decision tree 20%
  - Assignment IV: Model analysis – Markov model 25%
- 1 Presentation 15%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 7 as inputs to the instruction improvement

Learning Resources

1. Gold MR, Siegel JE, Russell LB, & Weinstein MC. Cost-effectiveness in Health and Medicine. New York: Oxford University Press 1996.
2. Folland S, Goodman A, Stano M.The economics of health and health care. New Jersey: Prentice-Hall 2001.
3. Drummond MF, Sculpher MJ, Claxton K, Stoddart GL, and Torrance GW. Methods for the economic evaluation of health care programmes (4th edition). Oxford university press, New York, 2015.
4. Dranove, D. The economics evolution of American health care: from marcus welby to managed care. Princeton, NJ: Princeton University Press 2000.

5. Tangcharoensathien V., Supachutikul A., & Lerthendumrong, J. The social security scheme in Thailand: what lessons can be drawn? Social Science & Medicine1999, 48, 913-23.
6. Luce BR, Drummond MF, Jonsson B, et al. EBM, HTS, and CER: Clearing the confusion. The Milbank Quarterly. 2010;88(2):256-76.
7. Berger ML, Bingefors K, Hedblom EC, Pashos CL, Torrance GW, and Smith MD. ISPOR book of terms: Health care cost, quality, and outcomes. ISPOR, New Jersey, 2003.
8. Health Intervention and Technology Assessment Program, International Health Policy Program, Thai Health Promotion Foundation, Health Systems Research Institute, Ministry of Public Health. Thai Health Technology Assessment Guideline. Journal of Medical Association of Thailand 2008;91(Suppl.2).
9. Drummond MF and McGuire A. Economic Evaluation in Health Care. Oxford university press, New York, 2001.
10. Mauskopf JA, Sullivan SD, Annemans L, et al. Principles of good practice for budget impact analysis: report of the ISPOR Task Force on Good Research Practices-Budget Impact Analysis. Value in Health 2007;10:336-47.
11. Sullivan SD, Mauskopf JA, Augustovski F, et al. Budget Impact Analysis-Principles of good practice: report of the ISPOR 2012 budget impact analysis good practice II task force. Value in Health 2014;17:5-14.
12. ศุภสิทธิ์ พรรณารุโณทัย. เศรษฐศาสตร์สาธารณสุข . ใน: ยุคปฏิรูประบบสุขภาพ พิษณุโลก : หจก.สุรสีห์ กราฟฟิค 2544.
13. จิรุตม์ ศรีรัตนบัลล์ และ วิชช์ เกษมทรัพย์ การประกันสุขภาพภาคเอกชน : ประสบการณ์ของต่างประเทศ. กรุงเทพ : หน่วยการพิมพ์ ภาควิชาเวชศาสตร์ป้องกันและสังคมคณะแพทยศาสตร์ จุฬาลงกรณ์ มหาวิทยาลัย 2542.
14. http://drug.fda.moph.go.th:81/nlem.in.th.

Course Specification

RACE 603: Research Protocol Design

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 603

   Course name: Research Protocol Design

2. ***Credits: 2(1-2-3)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Research Protocol Design

   3.2 Type of course: Required course

4. ***Instructors***

   4.1 Course Coordinator: Assoc.Prof. Dr. Patarawan Woratanarat

   4.2 Instructors:

   Prof. Dr. Dwip Kitayaporn

   Assoc. Prof. Panuwat Lertsithichai

   Assoc. Prof. Dr. Atiporn Ingsathit

   Asst. Prof. Dr. Charungthai Dejthevaporn

   Asst. Prof. Dr. Chusak Okascharoen

   Assoc. Prof. Dr. Patarawan Woratanarat

   Assoc. Prof. Dr. Ammarin Takkinstian

   Asst. Prof. Dr. Sasivimol Ratanasiri

   Asst. Prof. Dr. Thunyarat Anothaisintawee

   Asst. Prof. Dr.Sakda Arj-ong Vallipakorn

   Dr.Pawin Numthavaj

5. ***Semester/Year:*** 2nd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** None
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Provide a rationale for an appropriate area of research after conducting proper literature review
1.2 Develop testable hypotheses and research questions
1.3 Choose an appropriate and epidemiological study design
1.4 Discuss key methodological issues including inclusion and exclusion criteria, sample size, and study factors and outcome assessment
1.5 Design or select appropriate measures
1.6 Identify appropriate sampling procedures and sample size
1.7 Select appropriate statistical tests for different types of data; and to understand the assumptions underlying different statistical tests (where appropriate)
1.8 Consider ethical and other logistic issues in research
1.9 Prepare an application for ethics approval and a research grant application
1.10 Present a protocol and discuss its strengths, weakness, and implications

Section 3: Course details

1. Course Description

This course will provide knowledge and practice in research proposal writing in which composes of literature review, research question, selection of studied population, measurements, statistical analysis plan, sample size estimation, research proposal presentation, and critique.

2. Hours per semester: Lecture 15 hours
Practice 30 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can provide a rationale for an appropriate area of research after conducting proper literature review	ELOs 1, 4, 6	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment
2. Student can develop testable hypotheses and research questions	ELOs 1, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment
3. Student can appropriately choose epidemiological study design	ELOs 1, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment -
4. 4.Student can discuss key methodological issues including inclusion and exclusion criteria, sample size, and study factors and outcome assessment	ELOs 1, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment -
5. Student can design or select appropriate measures	ELOs 1, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment -
6. Student can identify appropriate sampling procedures and sample size	ELOs 1, 3, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment -
7. Student can select appropriate statistical tests for different data; and to understand the assumptions underlying different statistical tests	ELOs 1, 3, 4	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
8. Student can consider ethical and other logistic issues in research	ELOs 4, 5	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment
9. Student can prepare an application for ethics approval and a research grant application	ELOs 4, 5	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment
10. Student can present a protocol and discuss its strengths, weakness, and implications	ELOs 1, 4, 6	- Lecture - Class discussion - Literature review - Presentation - Assignments	- Rubric presentation - Rubric assignment

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Research proposal	Dr.Patarawan Woratanarat	Lecture	- Assignment
3 Hrs.	Self – study: Research proposal			
3 Hrs.	Advanced bibliographic management	Dr.Pawin Numthavaj	Lecture	- Assignment
3 Hrs.	Self – study: Literature search			
3 Hrs.	Literature review	Dr.Patarawan Woratanarat	Presentation	- Assignment
3 Hrs.	Self - study: Background, rationale, research question and objective			
3 Hrs.	Presentation: Background and rationale & Research question and objective I (Defend Topic I)	Team	Presentation	- Assignment
3 Hrs.	Self – study: Background, rationale, research question and objective			

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Presentation: Background and rationale & Research question and objective II (Defend Topic II)	Team	Presentation	- Assignment
3 Hrs.	Self – study: Study design, study factors, outcomes, and measurement			
5 Hrs.	Presentation: Study design & Study factors, outcomes, and measurement	Dr.Patarawan Dr.Atiporn/ Dr.Ammarin/ Dr.Thunyarat	Presentation	- Assignment
3 Hrs.	Self – study: Data collection and data record form			
5 Hrs.	Presentation: Data collection and data record from	Dr.Patarawan/ Dr.Sasivimol/ Dr.Sakda	Presentation	- Assignment
3 Hrs.	Self – study: Sample size estimation, statistical analysis and dummy tables			
5 Hrs.	Presentation: Sample size estimation & Statistical analysis and dummy table	Dr.Patarawan/ Dr.Ammarin/ Dr.Sasivimol/ Dr.Thunyarat	Presentation	- Assignment
3 Hrs.	Self – study: Budget			
3 Hrs.	Budget	Dr.Atiporn	Lecture	- Assignment
3 Hrs.	Self – study: Ethical consideration			
5 Hrs.	Ethical consideration & successful grant application	Prof.Dr.Dwip Kitayaporn	Lecture	- Assignment
3 Hrs.	Self – study: Budget and ethical consideration			
5 Hrs.	Presentation: Budget & Ethical consideration & successful grant application	Dr.Patarawan / Dr.Panuwat	Presentation	- Assignment
3 Hrs.	Self – study: Final proposal			
3 Hrs.	Final presentation	Team	Presentation	- Assignment
3 Hrs.	Prepare for submission of proposal			
3 Hrs.	Submission of final proposal			

2. ***Measurement and Evaluation of Student Achievement***

Assignments:

- Background & Rationale (10%)
- Research question and objective (5%)
- Study design and study samples (5%)
- Study factors, outcomes, and measurement (10%)
- Data collection and data record form (5%)
- Sample size estimation (5%)
- Statistical analysis and dummy table (10%)
- Ethical consideration and grant application (10%)
- Critique of the proposal (5%)
- Final presentation (15%)

Mark Assignment

- Submit a protocol (20%)

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 10 as inputs to the instruction improvement

Learning Resources

1. Hawe P, Degeling D, Hall J. How to do a literature review. Chapter 8 in Evaluating
2. Health Promotion. Sydney, MacLennan and Petty, 1990.
3. Sackett DL. How to read a clinical journal. In: Sackett DL, Hayes RB, Tugwell P.
4. Clinical Epidemiology: a basic science for clinical medicine. Boston: Little Brown
5. and Company, 1985.
6. Fletcher RH, Fletcher SW, Wagner EH. Clinical Epidemiology. The Essentials, 3rd
7. Edition. Baltimore, Williams & Wilkins, 1996.
8. Greenberg RS, Daniels SR, Flanders WD, Ely JW, Boring JR. Medical
9. Epidemiology. 2nd Edition. Appleton & Lange, Stamford, 1996.
10. Altman DG. Practical statistics for medical research. Chapman & Hall, London, 1991.

Course Specification

RACE 608: Social Science in Clinical Practice and Research

Institution Name: Mahidol University

Campus/Faculty/Department: Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies
Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 608

   Course name: Social Science in Clinical Practice and Research

2. ***Credits: 2(1-2-3)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Social Science in Clinical Practice and Research

   3.2 Type of course: Elective course

4. ***Instructors***

   4.1 Course Coordinator: Assoc.Prof. Dr. Kamolnetr Okanurak

   4.2 Instructors:
   Assoc.Prof. Dr. Kamolnetr Okanurak
   Assoc.Prof. Dr. Jaranit Kaeewkungwal
   Assoc.Prof. Dr. Yupaporn Wattanagoon

5. ***Semester/Year:*** 2nd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** None
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

   Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Student can explain theories of health problem and illness

1.2 Student can describe patient-physician relationship

1.3 Student can describe patient's behavior in treatment seeking and behavior modification

1.4 Student can design research study in health social science

1.5 Student can critically appraise health social science

Section 3: Course details

1. Course Description

Theoretical models in health social science research, health care decision, adherence to medical treatment, medical service, treatment-seeking behavior, patient-physician relationship, human behavioral change, qualitative research

2. Hours per semester: Lecture 30 hours

Practice - hours

3. Pre-test and Assignments feedback: 0.5 hours before each class

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can explain theories of health problem and illness	ELOs 1	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric presentation - Examination
2. Student can describe patient-physician relationship	ELOs 1	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric presentation - Examination

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
3. Student can describe patient's behavior in treatment seeking and behavior modification	ELOs 1	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric presentation - Examination
4. Student can design research study in health social science	ELOs 1, 4	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric presentation - Examination
5. Student can critically appraise health social science	ELOs 1, 6	- Lecture - Class discussion - Presentation - Assigned readings	- Rubric presentation - Examination

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
2 Hrs.	Introduction to Social Science in Clinical practice and research	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
2 Hrs.	Theoretical Model	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
2 Hrs.	Medical pluralism	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
2 Hrs.	Health care decisions	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
2 Hrs.	Adherence to Medical treatment	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
2 Hrs.	Behavioral Modification	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
3 Hrs.	Qualitative Research I	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Qualitative Research II	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
3 Hrs.	Quantitative Research I	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
3 Hrs.	Quantitative Research II	Assoc.Prof.Dr.Kamolnetr Okanurak	Lecture	- Class discussion
3 Hrs.	Reliability and Validity in Health Social Science Research	Assoc.Prof.Dr.Jaranit Kaewkungwal	Lecture	- Class discussion
3 Hrs.	Ethic principles in Health Social Science	Assoc.Prof.Dr.Yupaporn Wattanagoon	Lecture	- Class discussion

2. Measurement and Evaluation of Student Achievement

2.1 lead discussion 20%

2.2 Class discussion 20%

2.3 Final Examination 60%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 4 as inputs to the instruction improvement

Learning Resources

Introduction

Greenhalgh T, Wessely S. 'Health for me': a sociocultural analysis of healthism in the middle classes, British Med Bull 2004; 69: 197-213. DOI: 10.1093/bmb/ldh013.

Marmot M. Social determinants of health inequalities, Lancent 2005; 365: 1099-1104.

Rodriguez LL, De Lombaerde P. Regional and inter-regional economic rules and the enforcement of the right to health: the case of Colombia, Global Social Policy 2015; 15(3): 296-312.

Wade DT, Halligan PW. Do biomedical models of illness make for good healthcare systems? BMJ 2004; 329: 1398-401.

Theoretical models

Meyer SB, Ward PR, Jiwa M. Does prognosis and socioeconomic status impact on trust in physicians? Interviews with patients with coronary disease in South Australia, BMJ Open 2012; 2: e001389.doi: 10.1136/bmjopen-2012-001389.

National Cancer Institute, U.S. Department of Health and Human Service, NIH. Part 2: Theories and applications. In Theory at a Glance A Guide for Health Promotion Practice 2005; p. 9-21.

Reiter PL, Brewer NT, Gottlieb SL, McRee A-L, Smith JS. Parents' health beliefs and HPV vaccination of their adolescent daughters, Soc Sci Med 2009; 69: 475-480.

Snead MC, O'Leary AM, Mandel MG, Kourtis AP, Wiener J, et al. Relationship between social cognitive theory constructs and self-reported condom use: assessment of behavior in subgroup of the safe in the city trial. BMJ Open 2014; 4: e006093. Doi: 10.1136/bmjopen-2014-006093.

Medical pluralism

Chacko E. Culture and therapy: complementary strategies for the treatment of type-2 diabetes in an urban setting in Kerala, India, Soc Sci Med 2003; 56: 1087-1098.

Shih C-C, Su Y-C, Liao C-C, Lin J-G. Patterns of medical pluralism among adults: results from the 2001 national health interview survey in Taiwan, BMC Health Services Research 2010; 10: 191. (http://www.biomedcentral.com/1472-6963/10/191).

Stevenson FA, Britten N, Barry CA, Bradley CP, Barber N. Self-treatment and its discussion in medical consultations: how is medical pluralism managed in practices? Soc Sci Med 2003; 57: 513-537.

Tilburt JC, Mille FG., Responding to Medical Pluralism in Practice: A Principled Ethical Approach, J Am Board Fam Med 2007;20:489–494.

Health care decision

Garfield S, Smith F, Francis SA, Chalmers C. Can patients' preferences for involvement in decision-making regarding the use of medicines be predicted? Patient Education and Counseling 2007; 66: 361-367.

Kremer H, Ironson G, Schneiderman N, Hautzinger M. "It's my body": does patient involvement in decision making reduce decisional conflict? Med Decis Making 2007; 27: 522. Doi: 10.1177/0272989x07306782.

Orton L, Lloyd-Williams F, Taylor-Robinson D, O'Flaherty M, Capewell S. The use of research evidence in public health decision making processes: systematic review, PloS ONE 2011; 6(7): e21704. Doi: 10.1371/journal.pone.0021704.

Winkler EC, Reiter-Theil S, Lange-Riess D, Schmahl-Menges N, Hiddemann W. Patient involvement in decisions to limit treatment: the crucial role of agreement between physician and patient, J Clin Oncol 2009; 27(13): 2225-30. doi: 10.1200/JCO.2008.17.9515. Epub 2009 Mar 23.

Adherence to medical treatment

Lerman I. Adherence to Treatment: The Key for Avoiding Long-Term Complications of Diabetes, Archives of Medical Research 2005; 36(3): 300–306.

Morrison A, Stauffer ME, Kaufman AS. Defining medication adherence in individual patients. Patient Prefer Adherence. 2015 Jul 1;9:893-7. doi: 10.2147/PPA.S86249. eCollection 2015

Pasma A, Hazes JMW, Luime JJ, Busschbach JJV, van 't Spijker A. How to study determinants related to medication adherence in newly diagnosed polyarthritis patients for the development of a prediction instrument**,** Patient Prefer Adherence. 2014; 8: 1437–1447. Published online 2014 Oct 20. doi: 10.2147/PPA.S66922.

Turner AP, Kivlahan DR, Sloan AP, Haselkorn JK. Predicting ongoing adherence to disease modifying therapies in multiple sclerosis: utility of the health beliefs model. Mult Scler. 2007; 13(9):1146-52.

Behavioral modification

Baker MK, Simpson K, Lloyd B, Bauman AE, Singh MA. Behavioral strategies in diabetes prevention programs: a systematic review of randomized controlled trials. Diabetes Res Clin Pract. 2011; 91(1):1-12. doi: 10.1016/j.diabres.2010.06.030. Epub 2010 Jul 23.

Evans WD, McCormack L. Applying social marketing in health care: communicating evidence to change consumer behavior, Med Decis Making. 2008; 28(5):781-92. doi: 10.1177/0272989X08318464. Epub 2008 Jun 12.

Johnson MJ, May CR. Promoting professional behaviour change in healthcare: what interventions work, and why? A theory-led overview of systematic reviews, BMJ Open 2015; 5:e008592 doi: 10.1136/bmjopen-2015-008592.

Katz DL. Behavior modification in primary care: the pressure system model. Prev Med. 2001; 32(1):66-72.

Qualitative research I

Bridges J, Hughes J, Farrington N, Richardson A.Cancer treatment decision-making processes for older patients with complex needs: a qualitative study, BMJ Open 2015; 5: e009674 doi:10.1136/bmjopen-2015-009674.

Kotecha A, Bonstein K, Cable R, Cammack J, Clipston J, et al. Qualitative investigation of patients' experience of a glaucoma virtual clinic in a specialist ophthalmic hospital in London, UK, BMJ Open2015;5:e009463 doi:10.1136/bmjopen-2015-009463.

Mack N, Woodsong C, MscQueen KM, Guest G, Namey E. Module 1: Qualitative Research Methods Overview. *In* Qualitative Research Methods: A Data Collector's Field Guide, USA: Family Health International 2005; p. 1-12.

Mack N, Woodsong C, MscQueen KM, Guest G, Namey E. Module 2: Participant Observation. *In* Qualitative Research Methods: A Data Collector's Field Guide, USA: Family Health International 2005; p. 13-27.

Mack N, Woodsong C, MscQueen KM, Guest G, Namey E. Module 3: In-depth interviews. *In* Qualitative Research Methods: A Data Collector's Field Guide, USA: Family Health International 2005; p. 29-49.

Wijnhoven MN, Terpstra WE, van Rossem R, Haazer C, Gunnink-Boonstra N, et al.

Bereaved relatives' experiences during the incurable phase of cancer: a qualitative interview study, BMJ Open 2015; 5(11): e009009. doi: 10.1136/bmjopen-2015-009009.

Qualitative research II

Abildsnes E, Signe Flottorp S, Stensland P. Case stories in general practice: a focus group study, BMJ Open2012;2:e001208 doi:10.1136/bmjopen-2012-001208.

Kimbell B, Boyd K, Kendall M, Iredale J, Murray SA. Managing uncertainty in advanced liver disease: a qualitative, multiperspective, serial interview study, BMJ Open 2015; 5: e009241 doi:10.1136/bmjopen-2015-009241.

Mack N, Woodsong C, MscQueen KM, Guest G, Namey E. Module 4: Focus groups. *In* Qualitative Research Methods: A Data Collector's Field Guide, USA: Family Health International 2005; p. 51-82.

Mack N, Woodsong C, MscQueen KM, Guest G, Namey E. Module 5: Data documentation and management: organizing and storing your data. *In* Qualitative Research Methods: A Data Collector's Field Guide, USA: Family Health International 2005; p. 83-91.

Sinclair S, McConnell S, Bouchal SR, Ager N, Reanne Booker R, et al. Patient and healthcare perspectives on the importance and efficacy of addressing spiritual issues within an interdisciplinary bone marrow transplant clinic: a qualitative study, BMJ Open 2015; 5: e009392 doi:10.1136/bmjopen-2015-009392

Woolfall K, Young B, Frith L, Appleton R, Iyer A, et al. Doing challenging research studies in a patient-centred way: a qualitative study to inform a randomised controlled trial in the paediatric emergency care setting, BMJ Open2014;4:e005045 doi:10.1136/bmjopen-2014-005045.

Quantitative research I

Boynton PM. Hands-on guide to questionnaire research: Administering, analyzing, and reporting your questionnaire. BMJ 2004; 328:1372-1375.

FAO Corporate Document Repository. Chapter 4: Questionnaire design. In Marketing Research and Information System, Agriculture and Consumer Protection (http://www.fao.org/docrep/w3241e/w3241e05.htm).

Hermsen LAH, Terwee CB, Leone SS, van der Zwaard B, Martin Smalbrugge M. et al.

Social participation in older adults with joint pain and comorbidity; testing the measurement properties of the Dutch Keele Assessment of Participation, BMJ Open2013;3:e003181 doi:10.1136/bmjopen-2013-003181

Ku GMC, Kegels G. Effects of the First Line Diabetes Care (FiLDCare) self-management education and support project on knowledge, attitudes, perceptions, self-management practices and glycaemic control: a quasi-experimental study conducted in the Northern Philippines, BMJ Open2014;4:e005317 doi:10.1136/bmjopen-2014-005317.

Qin L, Pan Y, Zhang M, Xu M, Lao H, et al. Lifelong bound feet in China: a quantitative ultrasound and lifestyle questionnaire study in postmenopausal women, BMJ Open 2015;5:e006521 doi:10.1136/bmjopen-2014-006521

Zheng Y, Yang P, Wu S, Ma C, Seale H, et al. A cross-sectional study of factors associated with uptake of vaccination against influenza among older residents in the postpandemic season in Beijing, China, BMJ Open2013;3:e003662 doi:10.1136/bmjopen-2013-003662.

Quantitative research II

Curry LA, Nembhard IM, Bradley EH. Qualitative and Mixed Methods Provide Unique Contributions to Outcomes Research, Circulation. 2009;119:1442-1452. doi: 10.1161/ CIRCULATIONAHA.107.742775.

Hilderson D, Westhovens R, Wouters C, Van der Elst K, Eva Goossens E, et al. Rationale, design and baseline data of a mixed methods study examining the clinical impact of a brief transition programme for young people with juvenile idiopathic arthritis: the DON'T RETARD project, *BMJ Open*2013;3:e003591 doi:10.1136/bmjopen-2013-003591

Hsu C-C, Sandford BA. The Delphi technique: making sense of consensus, Practical Assessment, Research & Evaluation 2007; 12(10), e-journal.

McNulty C, Joshi P, Butler CC, Atkinson L, Nichols T, et al. Have the public's expectations for antibiotics for acute uncomplicated respiratory tract infections changed since the H1N1 influenza pandemic? A qualitative interview and quantitative questionnaire study, BMJ Open2012;2: e000674 doi:10.1136/bmjopen-2011-000674

O'Cathain A, Murphy E, Nicholl J. Three techniques for integrating data in mixed methods studies, BMJ 2010; 341: c4587.doi: 10.1136/bmj.c4587.

Snape D, Kirkham J, Preston J, Popay J, Britten N, et al. Exploring areas of consensus and conflict around values underpinning public involvement in health and social care research: a modified Delphi study, BMJ Open 2014**;** 4:e004217 doi:10.1136/bmjopen-2013-004217

Course Specification

RACE 617: Randomized Controlled Trials

Institution Name: Mahidol University

Campus/Faculty/Department: Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies
Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 617

   Course name: Randomized Controlled Trials

2. ***Credits: 2(1-2-3)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Randomized Controlled Trials

   3.2 Type of course: Elective course

4. ***Instructors***

   4.1 Course Coordinator: Asst.Prof. Dr. Chusak Okascharoen

   4.2 Instructors:

   Prof. Punnee Pitisutithum

   Assoc. Prof. Dr. Atiporn Ingsathit

   Assoc. Prof. Dr. Jaranit Kaewkangwal

   Assist. Prof. Dr. Chusak Okascharoen

   Dr. Thanyanan Reungwetwattana

5. ***Semester/Year:*** 3nd Semester, Academic Year 2017,1st year students

6. ***Pre-requisite:*** None

7. ***Co – requisites:*** None

8. ***Classroom:*** To be announced

9. ***Revision Date***: 11st March 2016 ***By:*** Committee

   Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 Student can explain the elements of trial designs, analysis and reporting; and evaluate their appropriate uses

1.2 Student can describe distinguished issues in design, statistics, and data management in clinical trial

1.3 Student can design and plan a clinical trial proven by submit a workable protocol

1.4 Student can discriminate unique aspects of ethical issues in clinical trials

Section 3: Course details

1. Course Description

Understand various type of clinical trial. Defining and selecting participants, interventions, comparison groups, and outcome assessments. Randomization, allocation concealment, blinding, maximizing follow-up. Management of multi-center randomize-controlled trial. Consolidated Standards of Reporting Trials (CONSORT). Advance design such as adaptive, non-inferiority factorial, cluster, and cross-over designs Sampling technique.

2. Hours per semester: Lecture 27 hours

Practice 30 hours

3. Pre-test and Assignments feedback: 0.5 hours before each class

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. Student can explain the elements of trial designs, analysis and reporting; and evaluate their appropriate uses	ELOs 1, 4	- Lecture - Class discussion - Assigned readings - Assignments - Literature review	- Pre- class test - Rubric assignment for protocol writing - Rubric participation assessment
2. Student can describe distinguished issues in design, statistics, and data management in clinical trial	ELOs 1, 4	- Lecture - Class discussion - Assigned readings - Assignments - Literature review	- Pre- class test - Rubric assignment for protocol writing - Rubric participation assessment
3. Student can design and plan a clinical trial proven by submit a workable protocol	ELOs 1, 3, 4	- Lecture - Class discussion - Assigned readings - Assignments - Literature review	- Pre- class test - Rubric assignment for protocol writing - Rubric participation assessment
4. Student can discriminate unique aspects of ethical issues in clinical trials	ELOs 1, 4, 6	- Lecture - Class discussion - Assigned readings - Assignments - Literature review	- Pre- class test - Rubric assignment for protocol writing - Rubric participation assessment

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Forming research question and ethical principles for clinical trial	Dr.Chusak Okascharoen	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Forming research question and ethical principles for clinical trial			
3 Hrs.	Defining & selecting participants, Intervention and Comparison group, outcome assessments	Dr.Chusak Okascharoen	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Defining & selecting participants, Intervention and Comparison group, outcome assessments			
3 Hrs.	Randomization, allocation concealment, blinding & maximizing follow up	Dr.Atiporn Ingsathit	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Randomization, allocation concealment, blinding & maximizing follow up			
3 Hrs.	Alternative trial design: Factorial, cross-over and cluster design	Dr.Chusak Okascharoen	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Alternative trial design: Factorial, cross-over and cluster design			
3 Hrs.	Statistical issues in RCT • Randomization list generation • Dealing with protocol violation: ITT, PPA • Interim analysis: Multiple test correction, stopping rule	Dr.Jaranit Kaewkangwal	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Statistical issues in RCT			
3 Hrs.	Conducting Phase I & II Clinical Trial	Dr Thanyanan Reungwetwattana	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Conducting RCTs in Clinical setting			
3 Hrs.	Trial management & Organization in large-scale and Multi-center trials	Prof.Punnee Pitisutithum	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Trial management & Organization in large-scale and Multi-center trials			
3 Hrs.	Good Clinical Practice (GCP) and Auditing	Prof.Punnee Pitisutithum	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Good Clinical Practice (GCP) and Auditing			
3 Hrs.	Trial registration and reporting the result	Dr.Atiporn Ingsathit	Lecture	- Pre-class test - Assignment
3 Hrs.	Self – study: Reporting the result			
3 Hrs.	Final Examination: Submission of protocol (40%)			

2. Measurement and Evaluation of Student Achievement

2.1 Pre-class quiz from reading assignment (short answer questions)	20%
2.2 Post-class assignments (short answer questions)	20%
2.3 Writing a research protocol (assigned topic)	60%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 4 as inputs to the instruction improvement

Learning Resources

Fundamentals of Clinical Trials 4th ed. by Lawrence M. Friedman, Curt D. Furberg, David DeMets Springer 2010

Course Specification

RACE 618: Systematic review and Meta-analysis

Institution Name:	Mahidol University
Campus/Faculty/Department:	Faculty of Medicine Ramathibodi Hospital and Faculty of Graduate Studies Doctor of Philosophy Programme in Clinical Epidemiology

Section 1: General information

1. ***Course number and name***

   Course number: RACE 618

   Course name: Systematic review and Meta-analysis

2. ***Credits: 3(1-4-4)***

3. ***Curriculum and type of course***

   3.1 Curriculum: Systematic review and Meta-analysis

   3.2 Type of course: Required course

4. ***Instructors***

   4.1 Course Coordinator: Assoc.Prof.Dr.Ammarin Thakkinstian

   4.2 Instructors: Assoc.Prof.Dr.Ammarin Thakkinstian

5. ***Semester/Year:*** 3nd Semester, Academic Year 2017,1st year students
6. ***Pre-requisite:*** None
7. ***Co – requisites:*** None
8. ***Classroom:*** To be announced
9. ***Revision Date***: 11st March 2016 ***By:*** Committee

   Note: Revised evaluation and course outline

Section 2: Purpose and objective

1. Course Learning Outcomes

1.1 To know a rational and principle of review methods.

1.2 Be able to develop a review proposal for systematic review and meta-analysis

1.3 Be able to perform and conduct a systematic review and meta-analysis

1.4 Be able to analyse data using basic and advance meta-analyses

1.5 Be able to interpret and report results of systematic review and meta-analysis properly

1.6 Be able to disseminate results of systematic review to public

Section 3: Course details

1. Course Description

Review methodology, formulation of research questions, selection of studies (inclusion and exclusion criteria), identify relevant studies, data extraction, risk of bias assessment, meta-analysis for continuous and dichotomous outcomes, heterogeneity and reporting bias assessments, preferred items for reporting systematic review and meta-analysis (PRISMA)

2. Hours per semester: Lecture 18 hours

Practice 60 hours

3. Assignments feedback: Within Two weeks

Section 4: Course Learning Outcomes

Course level learning outcomes	Programme level learning outcomes	Methods	Assessment
1. To know a rational and principle of review methods	ELOs 1	- Lecture - Class discussion - Assigned readings - Assignments - Literature review	- Rubric assignment
2. Be able to develop a review proposal for systematic review and meta-analysis	ELOs 1, 3, 4	- Class discussion - Presentation - Assigned readings - Assignments - Literature review	- Rubric assignment - Rubric presentation
3. Be able to perform and conduct a systematic review and meta-analysis	ELOs 1, 3, 5	- Lecture - Class discussion - Presentation - Assigned readings - Hand on practice - Assignments	- Rubric assignment - Rubric presentation
4. Be able to analyse data using basic and advance meta-analyses	ELOs 3	- Class discussion - Presentation - Assigned readings - Hand on practice - Assignments	- Rubric assignment - Rubric presentation
5. Be able to interpret and report results of systematic review and meta-analysis properly	ELOs 1, 3, 5, 6	- Class discussion - Presentation - Assigned readings - Assignments	- Rubric assignment - Rubric presentation
6. Be able to disseminate results of systematic review to public	ELOs 6	- Presentation - Assignments	- Rubric assignment - Rubric presentation

Section 5: Lesson plan and assessment

1. Lesson plan

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Review methodology	Dr. Ammarin Thakkinstian	- Lecture - Self-learning	- Assignment I
3 Hrs.	Meta-analysis for dichotomous outcome	Dr. Ammarin Thakkinstian	- Lecture Practice	-
3 Hrs.	Meta-analysis for continuous outcome	Dr. Ammarin Thakkinstian	- Lecture Practice	-
	Self-learning and Practice: Searching for review topic/Literature review			
	Self-learning and Practice: Searching for review topic/ Literature review (Cont.)			
3 Hrs.	Advanced meta-analysis in genetic association studies	Dr.Ammarin Thakkinstian	- Lecture - Practice	-
3 Hrs.	Network meta-analysis	Dr.Ammarin Thakkinstian	- Lecture - Practice	-
3 Hrs.	Individual patient data meta-analysis	Dr.Ammarin Thakkinstian	- Lecture - Practice	-
	Self-learning and Practice: Searching for review topic/ Literature review (Cont.)			
3 Hrs.	Presentation and discussion: Assignment I Review topic, rationale and PICO	Team	Practice	- Rubric Score - Assignment I
3 Hrs.	Present Assignment II round I: Locate and select studies - Search terms and strategies - Inclusion & exclusion criteria	Team	Practice	- Rubric Score - Assignment II
	Self-learning and Practice: Locate and select studies			
	Self-learning and Practice: Locate and select studies (Cont.)			
3 Hrs.	Presentation Assignment II round II: Results of locate and select studies	Team	Practice	- Rubric Score - Assignment II
3 Hrs.	Presentation Assignment III round I: Design data extraction form & risk of bias assessment	Team	Practice	- Rubric Score - Assignment III
	- Self-learning and Practice: Perform design data extraction form & risk of bias assessment			
	- Self-learning and Practice: Perform data extraction & risk of bias assessment			
3 Hrs.	Present assignment III round II: Results of data extraction and risk of bias assessment	Team	Practice	- Rubric Score - Assignment III

Time	Topic	Instructor	Method	Assessment
3 Hrs.	Present assignment IV round I: Statistical analysis plan	Team	Practice	- Rubric Score - Assignment IV
	Self-learning and Practice: Perform data analysis & Register review proposal at PROSPERO			
	Self-learning and Practice: Performing data analysis			
3 Hrs.	Present assignment IV round II: Result of data analysis & RBA	Team	- Practice	- Rubric Score - Assignment IV - Approved protocol registration
	Self-learning and practice: Writing a manuscript			
3 Hrs.	Final presentation	Team	- Practice	- Rubric Score - Assignment V
	- Submission: Assignment V - Final assignment (manuscript) - Submit paper			

2. Measurement and Evaluation of Student Achievement

2.1 Five Assignments 75%

- Assignment I: 15%
- Assignment II: 12.5%
- Assignment III: 12.5%
- Assignment IV: 15%
- Assignment V: 20%

2.2 Presentation 5%

2.3 Submit paper 20%

Section 6: Assessment and improvement of the course operation

1. Strategies to assess the effectiveness of the courses by the students
   - Assessment of instructor's teaching by student

2. Strategy to assess the instruction
   - Assessment of students' learning records
   - Assessment of instructor's teaching by student

3. Improvement of Instruction
   - Consider the students' learning records
   - Consider the students' assessment of instructor's teaching
   - Consider the program committee's comment

4. Verification of student achievement in the subject
   - By program committee and faculty-level academic committee

5. Review and action plan to improve the effectiveness of the course
   - Using the results from 1 - 6 as inputs to the instruction improvement

Learning Resources

1. Hosmer DW, Lemeshow S. Applied logistic regression. 2nd ed. New York: John Wiley & Sons, Inc; 2000.
2. Klienbaum GD, Kupper LL, Muller EK, et al. Allied regression analysis and other multivariable methods. 3rd ed. Washington: Duxbury Press; 1998.
3. Rodsutti J, Hensley M, Thakkinstian A, et al. A clinical decision rule to prioritize polysomnography in patients with suspected sleep apnea. Sleep 2004;27(4):694-9.
4. Peduzzi P, Concato J, Feinstein AR, et al. Importance of events per independent variable in proportional hazards regression analysis. II. Accuracy and precision of regression estimates. J Clin Epidemiol 1995;48(12):1503-10.
5. Courvoisier DS, Combescure C, Agoritsas T, et al. Performance of logistic regression modelling: beyond the number of events per variable, the role of data structure. J Clin Epidemiol 2011;64(9):993-1000.
6. Pencina MJ, D'Agostino RB, Sr., D'Agostino RB, Jr., et al. Evaluating the added predictive ability of a new marker: from area under the ROC curve to reclassification and beyond. Stat Med 2008;27(2):157-72; discussion 207-12.
7. Cook NR. Use and misuse of the receiver operating characteristic curve in risk prediction. Circulation 2007;115(7):928-35.
8. Cook NR, Paynter NP. Performance of reclassification statistics in comparing risk prediction models. Biom J 2011;53(2):237-58.

9. Agresti A. Categorical data analysis. 2nd edition. New York: John Wiley & Sons INC 2002.
10. Klienbaum GD, Kupper LL, Muller EK, and Nizam A. Applied regression analysis and other multivariable methods. 3rdedition. Washington: Duxbury Press 1998; 687 - 709.
11. Zelterman D. Model for discrete data. Revised edition. Oxford: Oxford University Press 2006
12. Cumming P. Methods for estimating adjusted risk ratios. The STATA Journal 2009; 9: 175-196.
13. Cumming P. Estimating adjusted risk ratios for matched and unmatched data: An update. The STATA Journal 2011; 11: 290-298.
14. Chao A, Tsay PK, Lin SH, Shau WY, Chao DY. The applications of capture-recapture models to epidemiological data. Stat Med 2001 Oct 30;20(20): 3123-57.
15. Hook EB, Regal RR. Internal validity analysis: a method for adjusting capture-recapture estimates of prevalence. Am J Epidemiol 1995 Nov 1;142(9 Suppl): S48-52.

Appendix 5: Full Time Equivalent (FTE) calculation

A FTE means that an instructor is engaged for approximately 7 hours a day on working days on tasks related to our course, which can be course preparation, curriculum development, instruction, assessment, examination, research, meetings, etcetera. Full Time instructors are counted as 1 FTE. Our program also uses Joint Department Staffs who provide the equivalent of 30% contributions of their working day to the same tasks. These staff also work for another department related to their specialty to which they also make a contribution of their working day. Therefore, taking the example of current Assistant Professors during 2012-2014 from the Table 6.3, we have one full time and 2 Joint Department Assistant Professors, which is equivalent to 1 + 0.3x2 =1.6 FTE. Our program also uses Guest Lecturers whose contribution is not counted in the Full Time Equivalent calculation.