# Course Syllabus

1. Course Number: 3000751
2. Course Credit: 3(1-6-5)
3. Course Title: Research Skills in Biomedical Sciences and Biotechnology
4. Faculty / Department:: Faculty of Medicine, Chulalongkorn University
5. Semester: First
6. Academic Year: 2017
7. Responsible Instructor / Academic Staff:
    - Assoc. Prof. Sunchai Payungporn and Staff.
8. Condition:
    - 8.1 Prerequisite: None
    - 8.2 Corequisite: None
    - 8.3 Concurrent: None
9. Status: Required
10. Curriculum: Doctor of Philosophy Program in Biomedical Sciences and Biotechnology
11. Degree: Ph.D.
12. Hours / Week
    - Lecture 1 hour/week
    - Laboratory 6 hours/week
13. Course Description

    This course focused on fundamental research knowledge and skills such as research ethics, hypothesis, experimental design, research planning, research writing and application of novel technologies in Biomedical Sciences and Biotechnology.

14. Course Outline

    **14.1** Behavioral Objectives: Students should be able to
    - Understand research ethics
    - Propose hypothesis, design experiment and make a plan for a research
    - Write research data for publication
    - Apply novel technologies in Biomedical Sciences and Biotechnology Students

14.2 Learning Contents

**Schedule :**

**Time and venue : Thursday 10.00 – 12.00 Room 218, 2nd Floor, Pattayapat building , Faculty of Medicine or other arrangement by instructors**

| Week | Date | Topics | Instructor |
|---|---|---|---|
| 1 | 17 Aug, 2017 | Orientation & central dogma | Prof. Apiwat Mutirangura |
| 2 | 24 Aug, 2017 | DNA extraction & amplifications | Assoc.Prof. Sunchai Payungporn |
| 3 | 31 Aug, 2017 | DNA sequencing & high-throughput sequencing | Assoc.Prof. Sunchai Payungporn |
| 4 | 7 Sep, 2017 | Metagenomics & microbiomes | Assoc.Prof. Sunchai Payungporn |
| 5 | 14 Sep, 2017 | Epigenetics / Methylome & ChIP-Seq | Asst. Prof. Pattamawadee Yanatatsaneejit |
| 6 | 21 Sep, 2017 | Microarray & Nanostring | Lecturer Kanok Preativatanyou, M.D |
| 7 | 28 Sep, 2017 | RNA-Seq | Lecturer Kanok Preativatanyou, M.D |
| 8 | 5 Oct, 2017 | RNA interference & quantitative real-time PCR | Assoc.Prof. Sunchai Payungporn |
| 9 | 12 Oct, 2017 | Protein extraction & purification | Assoc. Prof. Alain Jacquet |
| 10 | 19 Oct, 2017 | Proteomics & Mass spectrometry | Lecture Trairak Pisitkun, MD |
| 11 | 2 Nov, 2017 | Confocal / Super Resolution Microscope | Dr. Naphat Chantaravisoot |
| 12 | 9 Nov, 2017 | Electron microscope | Asst. Prof. Supang le Grand |
| 13 | 16 Nov, 2017 | Cell lines culture | Assoc. Prof. Alain Jacquet |
| 14 | 23 Nov, 2017 | computational aspect of biomedical research | Dr. Sira Sriswasdi |
| 15 | 30 Nov, 2017 | Flow cytometry | Lecturer Direkrit Chiewchengchol |

**Method**

☑ Lecture 1 hour /week (15%)

☑ Others: Laboratory 6 hours/week (85%)

14.3Media

❒ Transparencies and opaque sheets

☑ Powerpoint media

☑ Electronics and website media

❒ Others ……

15 Assignment through Network System

15.3.1 Assigning and Submitting Method: None

15.3.2 Learning Management System None

**16 Evaluation: Letter Grade (A, $B^+$, B, $C^+$, C, $D^+$, D, F)**

16.3.1 Assessment of academic knowledge 30%

16.3.2 Assessment of work or classroom activities 30%

16.3.3 Assessment of the assigned tasks 40%

16.3.4 อื่นๆ (Others) .....

**19. Reading List**

19.1 Required Text: None

19.2 Supplementary Texts: None

19.3 Research Articles / Academic Articles:

International published research articles related to Biomedical Sciences and Biotechnology

19.4 Electronic Media or Websites

- http://www.ncbi.nlm.nih.gov/

**2.0 Teacher Evaluation**

20.1 Teacher Evaluation: Form 3 of CU-CAS system

20.2 Changes made in accordance with the previous evaluation: None

20.3 Discussion or analysis which creates desirable qualifications of Chulalongkorn University graduates

- Knowledge
- Morality
- Critical thinking and creative (คิดอย่างมีวิจารณญาณ คิดริเริ่มสร้างสรรค์)
- Skillful (solving problem, management and information technology)
- Want to know / know how to learn more
- Leadership