

**Course Syllabus and Lesson Plan**  
**SCBM 321**  
**Medical Genetics**  
**Academic Year 2021: August 15, 2022 – December 19, 2022**

**Course Title:** Medical Genetics  
**Course Code:** SCBM 321  
**Total Credit:** 2(2-0-4)  
**Pre-Requisite:** -  
**Duration:** First semester

**Course Description:**

Fundamental concepts of genes, chromosomes and their inheritance, features of human genome, organization, expression and regulation of genes on chromosomes, genetic variation, polymorphism and natural selection, types of selection and factors affecting human evolution including mutations, mapping of human genome, molecular tools for analysis of genetic diseases, biochemical mechanism and molecular biology of genetic diseases including both single gene disorders and multifactorial disorders, carcinogenesis at the molecular level, treatment of genetic diseases, epidemiological study for prevention and therapy, genetic counseling and ethical conduct involving human research.

**Course Objectives:**

At the end of this course, the students will be able to

1. explain how DNA is packaged into a form of chromosome, how cells transfer the genetic material to daughter cells, differences between Mendelian versus non-Mendelian inheritances, and Mendelian/non-Mendelian diseases
2. emphasize fundamental and biomedical aspects of gene regulation and their relevance in genetic diseases
3. describe genetic cause of metabolic syndromes, developmental disorders and cancers, and point out therapeutic, intervention and prevention strategies
4. discuss current concerns regarding translation of gene technology toward societies

**Course Outlines:**

See schedule on page 3

**Teaching Methods**

Lecture and group discussion

**Teaching Media**

- Text book: Emery's Elements of Medical Genetics. 14th Edition (2012) Elsevier Churchill Livingstone. Edited by Peter D Turnpenny and Sian Ellard
- CAI, VDO, PowerPoint and/or transparency presentation

**Lecture Room**

Room B301, Phayathai Campus

**Evaluation of Student Achievement**

Grading system from midterm and final examination

- |                                 |      |
|---------------------------------|------|
| • Class participation           | 10%  |
| • Report or presentation        | 20%  |
| • Examination I (short answer)  | 35%  |
| • Examination II (short answer) | 35%  |
| Total                           | 100% |

Students who get a total grade more than **50%** are considered successful for this course. A-F grading scheme will be applied based on the group score.

**Course Evaluation**

Questionnaire about contents, teaching processes, examinations and instructor performance.

**Required Textbook**

- Text book Emery's Elements of Medical Genetics. 14th Edition (2012) Elsevier Churchill Livingstone. Edited by Peter D Turnpenny and Sian Ellard

**Other References**

- Other equivalent Medical Genetics textbooks.

**Instructors**

Lecturers from Department of Biochemistry, Faculty of Science including;

Dr. Kornkamon Lertsuwan (KL)  
Dr. Mikhail Khvochtchev (MK)  
Dr. Patompon Wongtrakoongate (PW)  
Dr. Waraporn Komyod (WK)

**Course Coordinator**

Dr. Patompon Wongtrakoongate  
Department of Biochemistry, Faculty of Science, Mahidol University  
Tel: 0-2201-5376

<b>Date</b>	<b>Time</b>	<b>Topic</b>	<b>Lecturer</b>
Aug 15	13.30-13.40	Course Orientation	PW
Aug 15	13.40-15.30	L1: Molecular and Developmental Genetics	PW
Aug 22	13.30-15.30	L2: Genetic Inheritance	MK
Aug 29	13.30-15.30	L3: Genetic variation: principles and methods of detection	MK
Sep 5	13.30-15.30	L4: Biochemical Genetics and Pharmacogenetics	KL
Sep 12	13.30-15.30	L5: Hemoglobin and Hemoglobinopathies	KL
Sep 19	13.30-15.30	L6: Genetic Factors in Common Diseases	WK
Sep 26	13.30-15.30	<b>EXAMINATION I (L1-L6)</b>	PW
Oct 3	13.30-15.30	L7: Single-Gene and Chromosomal Disorders	PW
Oct 10	13.30-15.30	L8: Immunogenetics	WK
Oct 17	13.30-15.30	L9: Cancer Genetics	WK
Oct 31	13.30-15.30	L10: Gene and Cell Therapy	PW
Nov 7	13.30-15.30	L11: RNA Therapeutics and mRNA Medicines	PW
Nov 14	13.30-15.30	L12: Epigenetic Therapy	PW
Nov 21	13.30-15.30	L13: Paper discussion in medical genetics I	PW
Nov 28	13.30-15.30	L14: Paper discussion in medical genetics II	PW
Dec 19	13.30-15.30	<b>EXAMINATION II (L7-L12)</b>	PW