KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS BRAWIJAYA
FAKULTAS KEDOKTERAN
PROGRAM MAGISTER ILMU BIOMEDIK
Jalan Veteran, Malang 65145, Jawa Timur – Indonesia
Telp. (62)(341) 569117; 567192 Pes. 134, 135 – Fax. (62)(341) 564755
E-mail: sekr.fk@ub.ac.id Website: http://biomedical.fk.ub.ac.id

Teaching Plan

Course Title : **Molecular Genetics**
Course Code : **MAB6201**
Credits : **2**
Course Coordinator : **Dra. Diana Lyrawati, Apt., MS., Ph.D.**
(Phone: 08179640968, email: eldi_7_98@yahoo.com)

Course Description

This course was designed with overall goal is to give basic knowledge of common molecular mechanism and management of genetic diseases. The key objective is to understand and analyze the basic molecular mechanism of genetic diseases and their management, to appraise critically molecular genetics journal article, and also to internalize the moral/religious/cultural beliefs regarding challenging and complex issues surrounding prenatal diagnosis and available options. Subject areas covered include chromosome and cell division; the cellular, biomolecular and molecular basis of inheritance; the pattern of inheritance; prenatal diagnosis of genetic disease; population screening and community genetics, and treatment of genetic disease and gene therapy.

Course Learning Outcomes

On successful completion of this course students will (be):		Bloom's Taxonomy
CLO1	Demonstrate a comprehensive understanding of the principles of genetics and genomics; human genome and chromosomal basis of heredity; cell division; the cellular, biomolecular, and molecular basis of inheritance; the pattern of inheritance; prenatal diagnosis of genetic disease; population screening and community genetics; and also the treatment of genetic disease and gene therapy.	Level 2. Understanding
CLO2	Able to relate concepts of inheritance pattern to common genetic diseases.	Level 4. Analyzing
CLO3	Able to critically appraise the molecular genetics journal article relevant to student's interest and communicate it through oral presentation.	Level 5. Evaluating
CLO4	Demonstrate self-directed learning and ethical standards for the intellectual activities.	Level 3. Applying
CLO5	Internalize the moral/religious/cultural beliefs regarding challenging and complex issues surrounding prenatal diagnosis and available options.	Affective domain: Level 5. Characterization

Links between CLOs and PLOs

	PLO1.1	PLO1.2	PLO2.1	PLO2.2	PLO2.3	PLO3.1	PLO3.2	PLO3.3	PLO3.4	PLO4
CLO1	√									
CLO2	√		√							
CLO3	√		√			√	√			
CLO4							√			√
CLO5										√

Topic and Schedule

Week	Topics	Competencies	Lecturer
1	Introduction of Chromosome	Able to explain: 1. Genetics and genomics (Human Genome Project) in medical genetics 2. Human genome and chromosomal basis of heredity	Team
2	Cell division	Able to explain: 1. Cell Division 2. Medical relevance of mitosis and meiosis 3. Cytogenetics *(assignments)*	Team
3	The cellular, biomolecular, and molecular basis of inheritance	Able to explain: 1. The kinds of mutations: missense, insertion, nonsense, null, frame shift, triplet repeat expansion, and deletion 2. Principles of molecular disease: lessons from hemoglobinopathies	Team

KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS BRAWIJAYA
FAKULTAS KEDOKTERAN
PROGRAM MAGISTER ILMU BIOMEDIK
Jalan Veteran, Malang 65145, Jawa Timur – Indonesia
Telp. (62)(341) 569117; 567192 Pes. 134, 135 – Fax. (62)(341) 564755
E-mail: sekr.fk@ub.ac.id Website: http://biomedical.fk.ub.ac.id

		3. The concept of, and the molecular basis for, anticipation	
4	Pattern of inheritance	Able to explain: 1. Genotype, phenotype, homozygous, heterozygous, locus, allele, haplotype 2. Standard pedigree symbols and how they are used *(assignments)*	Team
5	Pattern of inheritance	Able to explain the characteristics of the different Mendelian patterns of inheritance and able to identify the following patterns in pedigrees: autosomal dominant, X-linked dominant, autosomal recessive, mitochondrial, X-linked recessive	Team
6	Pattern of inheritance	1. Able to explain and determine examples of allelic heterogeneity, incomplete penetrance, locus heterogeneity, germline mosaicism, variable expressivity 2. Able to relate such concepts to common genetic diseases *(assignments)*	Team
7	Written-Exam (Open/Close-book)		Team
8	Prenatal diagnosis of genetic disease	1. Able to determine that child may be born with a medical problem or birth defect that will require intervention 2. Able to explain ethnocultural, moral, and/or religious backgrounds that may strongly influence an individual's or couple's choice surrounding prenatal diagnosis, selective termination of pregnancy, and the use of reproductive technologies 3. Internalize the moral/religious/cultural beliefs regarding challenging and complex issues surrounding prenatal diagnosis and available options *(assignments)*	Team
9	Prenatal diagnosis of genetic disease	1. Able to explain the major kinds of prenatal diagnostic techniques 2. Able to explain the indications, applications, benefits and limitations of the different types of prenatal diagnostic techniques 3. Able to explain the general differences between the commonly applied techniques of amniocentesis and chorionic villus sampling (CVS) 4. Able to explain the potential utility and limitations of fetal ultrasounds in evaluating a fetus for structural birth defects 5. Able to explain the existing and emerging assisted reproductive technologies, e.g. ART, IVF, preimplantation diagnosis *(assignments)*	Team
10	Population screening and community genetics	Able to explain: 1. The genetic screening in populations 2. Screening for genetic susceptibility to disease	Team
11	Population screening and community genetics	Able to explain the genetic counseling and ethics	Team
12	Treatment of genetic disease and gene therapy	Able to explain: 1. Considerations, strategies, and treatment of genetic disease 2. Approach to child with birth defects	Team
13	Treatment of genetic disease and gene therapy	Able to explain the molecular treatment of diseases *(assignments)*	Team
14	Journal critical appraisal and oral presentation	Able to critically appraise the molecular genetics journal article relevant to student's interest and communicate it through oral presentation	Team
15	Journal critical appraisal and oral presentation	Able to critically appraise the molecular genetics journal article relevant to student's interest and communicate it through oral presentation	Team
16	Written-Exam (Open/Close-book)		Team

KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS BRAWIJAYA
FAKULTAS KEDOKTERAN
PROGRAM MAGISTER ILMU BIOMEDIK
Jalan Veteran, Malang 65145, Jawa Timur – Indonesia
Telp. (62)(341) 569117; 567192 Pes. 134, 135 – Fax. (62)(341) 564755
E-mail: sekr.fk@ub.ac.id Website: http://biomedical.fk.ub.ac.id

Lecturers:

DL : Diana Lyrawati, Dra., Apt., MS., Ph.D.*
TY : Tri Yudani M. Raras, Dr.rer.nat., M.App.Sc.
HS : Hidayat Suyuti, dr., Sp.M., Ph.D.
LEF : Loeki Enggar Fitri, Dr. dr., M.Kes., Sp.ParK.
TAN : Tommy Alfandy Nazwar, Dr.med. dr., Sp.BS. (for Dual Degree Class with Pediatrics)
MSR : Mohammad Saifur Rohman, dr., Sp.JP., Ph.D. (for International Class)

Teaching and Learning Strategy

Core material will be delivered through lectures, group discussion, written assignments, completed with an oral presentation of scientific journal critical appraisal.

Assessment Methods

Type	Weighting	CLO Assessed	Description
Journal critical appraisal and oral presentation	20%	1, 2, 3, 4	Journal critical appraisal is basically for the students to read articles from recent journals, and then appraise them critically in written form. This assessment includes a 15 minutes presentation on the highlights of the journal followed by 10 minutes of discussion.
Written assignment	20%	1, 2, 4, 5	The written assignment is individually given to enhance the comprehensive understanding of discussed topics.
Written exam (mid)	30%	1, 2, 4	The examination will be a test on the discussed topics and a brief examination of knowledge on genetics.
Written exam (final)	30%	1, 4, 5	The examination will be a test on the discussed topics and a brief examination of knowledge on genetics.

Learning Sources

Essential reading/resources	Thompson & Thompson Genetics in Medicine, 7th ed. 2007. Elsevier (Nussbaum RL, McInness RR, Willard HF).
Further reading/resources	Relevant journal articles

Additional Information

A lecturer is a person who holds acknowledged expertise in one or several aspects of Molecular Genetics. This person's contribution may be restricted to these areas of expertise.
Lecturers are expected to provide appraisal and assessment of progress. An appraisal consists of sorting out what is needed and what is the evidence that this has been acquired. Assessment concentrates on what is needed. Student assessment should be provided regarding achievements related to the teaching plan. Assessment should be undertaken to state competencies achieved and to allow progress within the teaching program. Reports will be submitted to the Course Coordinator.

Course Coordinator,

Diana Lyrawati, Dra., Apt., MS., Ph.D.