جامعة أم القرى

كلية الطـــب

الماجستير في الكيمياء الحيوية السريرية

4. Learning and Teaching

4/1 Learning Outcomes and Graduate Specifications

4/1/1 Main tracks or specializations covered by the program:

(a) Medical Genetics

(b)

(c)

4/1/2 Curriculum Study Plan Table

Level	Course Code	Course Title	Required or Elective	Prerequisite Courses	Credit Hours
Level 1	Gen611	1. Scientific Research Methodologies	Required	None	1
	Gen612	2. Medical and research ethics	Required	None	1
	Gen613	3. Molecular Genetics	Required	None	2
	Gen614	4. Mutation and DNA repair	Required	None	2
	Gen615	5. Cytogenetics	Required	None	2
	Gen616	6. Genetic diseases	Required	None	2
	Gen617	7. Genetics of Inborn error of metabolism	Required	None	2
	Gen618	8. Biostatistics	Required	None	2
Level 2	Gen621	9. Bioinformatics	Required	None	2
	Gen622	10. Molecular diagnosis	Required	None	3
	Gen623	11. Population genetics and epidemiology	Required	None	2
	Gen624	12. Cancer genetics	Required	None	2
	Gen625	13. Risk assessment and Genetic counselling	Required	None	2
	Gen626	14. Genomics in the laboratory	Required	None	2
	Gen627	15. Therapeutic approach for the treatment of genetic disorders	Elective	None	1
	Gen628	16. Genetic screening	Elective	None	1
	Gen629	17. Epigenetics	Elective	None	1
Level 3	Gen631	18. Field experience	Required	None	2
Level 3 / Level 4	Gen632	19. Research project	Required	Gen611 Gen612 Gen613 Gen614 Gen615 Gen616 Gen617 Gen618 Gen621 Gen622 Gen623 Gen624 Gen625 Gen626 Gen627	18

				Gen628 **Gen629**	

Include additional levels or courses if needed

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Scientific Research Methodologies.

Course Code: Gen10003711-1

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Scientific Research Methodologies.

2. Credit hours: 1

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Ahmad Mufti

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course aims to prepare students for undertaking the MSc course by providing basic knowledge about research and how to be able to produce high quality posters, abstracts, and presentation in order to help them pass the assignments required by other modules.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course provides basic information and will be updated depending on the evaluation of the students in the subsequent modules and whether they need further introduction or areas to cover before they continue with the rest of the program.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course aims to prepare students for undertaking the MSc course by providing basic knowledge about research and how to be able to produce high quality posters, abstracts, and presentation in order to help them pass the assignments required by other modules.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
MSc Course introduction	1	2
How to search the literature and write literature review?	1	2
Plagiarism	1	1
Referencing and referencing tools	1	2
Critical appraisal	1	2
How to present your work scientifically	1	2
How to prepare an abstract and a poster	1	1

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12					12
	Actual	12					12
Credit	Planed	1					1
	Actual	1					1

3. Additional private study/learning hours expected for students per week. 10

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain the use of different software needed for scientific research	Lectures and computer practical	quiz and presentation
1.2	identify the basics of medical research		
2.0	**Cognitive Skills**		
2.1	Use various computer software	Lectures and computer practical	quiz and presentation
2.2	Write scientifically		
	Search the literature		
3.0	**Interpersonal Skills & Responsibility**		

3.1	Critically analyze of scientific papers	Lectures and practice	Giving presentation on a controversial topic
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Performs presentations	Lectures and practice	presentation
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Multiple Assignments	2-4	60%
2	Oral Presentation	4	30%
3	Quiz	3	10
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks Since this course provides basic information on how to do research, handouts will be provided to students to cover the parts needed. In addition, PowerPoint presentation slides will also be provided to the students only for this course.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. Referencing tool EndNote
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course. In addition, some software's will also be used such as Mendeley for referencing, and Turnitin for checking plagiarism.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Ahmad Mufti

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Medical and research ethics

Course Code: Gen20003712-1

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Medical and research ethics

2. Credit hours: 1

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Neda Bogari

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course aims to prepare students for undertaking the MSc course by providing basic knowledge about medical and research related ethics and the most common ethical issues that faces the researchers in the medical field and how to avoid them.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course provides basic information and will be updated depending on the evaluation of the students in the subsequent modules and whether they need further introduction or areas to cover before they continue with the rest of the program.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Decisions in health care should be affected by ethics. While technical issues are carefully adjusted along with clinical ones, ethical involvement are often overlooked. A mandatory code of conduct issued by law to govern a doctor's decisions and behavior patterns may help in overcoming this difficulty but as such solution provides rigid guidelines for only a portion of the situations. The general aim of this module is to assist medical students in recognizing the significance of their own sensitivity towards their morals within regular clinical involvement and enhance their ability to appropriately weigh the ethical requirements of patients, this includes research participants. Medical genetics ethics has very relevant importance to medical professionals due to many reasons, including an increased litigation, medical genetics practice hardships and the consumer courts involvement. Medical genetics ethics have been continually developing from the time of the Hippocratic oathe and has a number of codes developed including the Helsinki Declaration, World Medical Code and the Belmont Report.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Principle of medical ethics and how to obtain Bio ethics certificate	1	2
Ethics in clinical practice	1	2

Specific ethical issue in genetic test	1	2
Ethical issues in genetic counselling	1	2
overview of requirements for Institutional Review Boards including Research ethics such as plagiarism, Data falsification and fabrication, and conflict of interest.	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12					12
	Actual	12					12
Credit	Planed	1					1
	Actual	1					1

3. Additional private study/learning hours expected for students per week. 10

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably

fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain why ethics is important to medicine	Lectures and computer practical	Assignment and presentation
1.2	Identify the major sources of medical ethics		
	Identify the requirements for institutional review board		
2.0	**Cognitive Skills**		
2.1	demonstrate different approaches to ethical decision-making, including your own.	Lectures	Assignment and quiz
2.2	Identify research related ethical issues and avoid them		
	Draft a consent form		
	Identify ethical requirements in order to obtain research ethical approval		
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Perform presentation	Lectures and practice	Perform presentation
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam	4	30%
2	Oral Presentation	5	40%
3	Assignment	6	30%
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks Since this course provides basic information on how handle ethical issues, handouts will be provided to students to cover the parts needed. In addition, PowerPoint presentation slides will also be provided to the students only for this course.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course. In addition, some software's will also be used such as Mendeley for referencing, and Turnitin for checking plagiarism.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Neda Bogari

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Molecular Genetics

Course Code: Gen30003713-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Molecular genetics

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Mohammad tayeb

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course aims to provide basic information related to the following areas: molecular biology, molecular microbiology, molecular immunology and molecular hematology in order to prepare students to undertake more advanced modules.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course provides basic information about genetics and will be updated depending on new findings in the research field. In addition, students will be assessed and the course will be updated depending on the weaknesses in the students' knowledge identified in subsequent modules.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course is designed to provide basic information related to the following areas: molecular biology, molecular microbiology, molecular immunology and molecular hematology in order to prepare students to undertake more advanced modules.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to cell biology and genetics	1	2
DNA replication	1	2
mRNA transcription	1	2
Protein translation	1	2
Molecular immunology	2	4
Biochemistry of genetic materials	2	4
Microbial Genomics	2	4
Molecular Hematology	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain various cellular processes including DNA replication, DNA transcription, RNA translation and post transcription and post translation processes	Lectures	Exam
1.2	Discus the association between immunity and genetics		
	Identify the importance of the use of genetics in the immunotherapy		

	Define the genetics of the microbes and pathogens		
	Explain the influence of genetics on the hematological and biological functions		
2.0	**Cognitive Skills**		
2.1	Critical appraisal of scientific article		Journal club
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Perform presentation	Lectures	Perform presentation
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam	6	50%
2	Poster Presentation	6	30%
3	Journal club	7	20%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. 2. Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science 3. Gelehrter, T.D., Collins, F.S., Ginsburg, D., 2017 Principles of Medical Genetic Book. SERBIULA (sistema Librum 2.0).
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Mohammad tayeb

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Mutation and DNA repair

Course Code: Gen40003714-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Mutation and DNA repair

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Samar Ekram

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to explain what are the consequences of DNA mutations and to learn how to describe and recognize different types of mutations. In addition, to appreciate the role of major DNA repair machineries and be aware of the major disorders related to DNA repair defect.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and the advances the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course will provide information on the consequences of DNA mutations and to learn how to describe and recognize different types of mutations. In addition, to appreciate the role of major DNA repair machineries and be aware of the major disorders related to DNA repair defect.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Types of Mutations	2	4
Causes of Mutation	1	2
Consequences of Mutation	2	4
Mutation Nomenclature	1	2
DNA repair	2	4
Mechanisms of DNA repair	2	4
DNA repair and human diseases	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain difference between mutation and polymorphism	Lectures	Written exam and presentation
1.2	Describe different types of mutation.		
	Recognize the effect of mutations on the genome and the organism		

	Distinguish between various types of DNA repair mechanism		
	List the major disorders related to DNA repair defect.		
2.0	**Cognitive Skills**		
2.1	Analyzing genetic tests results and variant classification	lectures	Written exam and presentation
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate mutation nomenclature and it is importance in mutation description and recognition	Lectures	Written exam and presentation
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Written exam	7	70%
2	Oral Presentation	8	30%
3			
4			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Robert NUSSBAUM, Roderick MCLNNES, Huntington WILLARD, 2016, Thompson & Thompson Genetics in Medicine. ELSEVIER. 2. Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. 3. Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science 4. Gelehrter, T.D., Collins, F.S., Ginsburg, D., 2017 Principles of Medical Genetic Book. SERBIULA (sistema Librum 2.0).
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Samar Ekram

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Cytogenetics

Course Code: Gen50003715-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Cytogenetics

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr Ahmad Babalgaith

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to provide up to date information on Cytogenetics and on the involvement of Cytogenetics on the risk of developing chromosomal disorder.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course is designed to provide up to date information on Cytogenetics and on the involvement of Cytogenetics on the risk of developing chromosomal disorder.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to Cytogenetics	1	2
Centromeres, kinetochores and the segregation of chromosomes, Telomeres Lampbrush Chromosomes and Polytene chromosomes	2	2
Introduction to karyotype (theory and practical sessions)	1	4
Numerical Chromosomes disease	2	5
Structural Chromosomes disease	2	5
Structural analysis using FISH, microarray and CGH techniques (theory and practical sessions)	2	4
Chromosome engineering and artificial chromosomes	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain basic understanding of Cytogenetics	Lectures	Written assignment and quizes
1.2	Identify broad principles of cytogenetics and karyotyping		
	Explain the Progression of cytogenetics		
	Describe numerical and structural chromosomal abnormalities		

	Identify therapeutics of chromosomal disease.		
	Identify environmental effect may involve in Cytogenetics		
	Identify the characteristics of chromosomal disease		
	Explain hereditary Cytogenetics		
2.0	**Cognitive Skills**		
2.1	Identify genetic changes Karyotype		Written assignment and presentation
2.2	Summarize the methods of chromosomal analyses (chromosome banding, Karyotype analysis, and FISH		
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Written Assignment	8	40%
2	Oral Presentation	9	20%
3	Quizzes	9	40%
4			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Chromosomes, 1st Edition, 2018, by Michael Cumming. Momentum Press. ISBN: 9781946646354. 2. Chromosome Architecture: Methods and Protocols, 1st edition, 2018, Humana Press; Softcover reprint of the original 1st ed. 2016, ISBN: 1493981005 3. Human Molecular Genetics, 3rd edition, 2003, by STRACHAN T. and A. READ. Garland science/Taylor and Francis group. ISBN: 978-0-8153-4182-6 4. 6. Chromosomes: organization and function/Adrian T. Sumner. ISBN 0-632-05407-7
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Ahmad Babalgaith

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Genetic diseases

Course Code: Gen60003716-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Genetic diseases

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr Zohor Azhar

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to provide up to date information on genetic diseases and on the involvement of Inherent diseases on the risk of developing genetic disorder.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and the advances the research field as well as the discovery of common diseases in the Kingdome of Saudi Arabia

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course provide extensive details on various types of genetic disorders and explain in details the most common genetic disorders especially those that are common in the Kingdome of Saudi Arabia.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to Genetic diseases	1	2
Inheritance Patterns, phenotype variability and allele frequencies	2	4
Mendelian inheritance	1	2
Causes of inheritance ambiguity such as reduced penetrance, variable expressivity, pseudo dominance, haploinsufficiency.	1	2
Example of Mendelian inheritance	2	4
Multifactorial disorders	1	2
Example of Multifactorial disorders	2	4
Genome study and single gene disorders and Multifactorial disorders	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain basic understanding of genetic diseases	Lectures	Written assignment
1.2	Recognize the types of genetic diseases		

	Explain the Progression of genetic diseases		
	Identify the characteristics of genetic diseases		
	Identify genetic diseases therapeutics		
2.0	**Cognitive Skills**		
2.1			
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Describe examples of the most common genetic diseases	Lectures	Presentation
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Written Assignment	10	70%
2	Oral Presentation	10	30%
3			
4			
5			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Emery's Elements of Medical Genetics, 13th edition 2007, by Peter TURNPENNY and Sian ELLARD. Churchill Livingstone ELSEVIER. ISBN: 978-0-7020-2917-2 2. Medical Genetics at a Glance, 2nd edition 2008, by Dorian PRITCHARD and Bruce KORF. Blackwell Publishing. ISBN: 978-1-4051-4846-7 3. Elsevier's Integrated Genetics, 2007, by Linda Adkison and Michael Brown. MOSBY ELSEVIER. ISBN: 978-0-323-04329-8 4. Cell Biology and Genetics, Crash Course, 2nd edition 2006, by Manson, Jones, Morris, Michael STEEL and Dan HORTON-SZAR. MOSBY ELSEVIER. ISBN: 0-7234-3248-1 5. Human Molecular Genetics, 3rd edition, 2003, by STRACHAN T. and A. READ. Garland science/Taylor and Francis group. ISBN: 978-0-8153-4182-6 6. Human Genetics: Concepts and Applications, 7th edition 2007, by Ricki LEWIS. McGraw Hill international. ISBN: 978-0-07-110779-2
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Zohor Azhar

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Genetics of Inborn error of metabolism

Course Code: Gen70003717-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Genetics of Inborn error of metabolism

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr Iman Sabri Abumansour

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	80%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	20%

Comments: Some session will be carried out as small group discussion

B Objectives

1. What is the main purpose for this course? This course is designed to provide the principles in the field of biochemical genetics in addition to up to date information on clinical applications of biochemical tests and research advances related to IEM that would prepare the students to embrace fundamental knowledge needed to conduct further studies and researches in the field.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the research field and updates in the clinical application.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course is designed to provide the principles in the field of biochemical genetics in addition to up to date information on clinical applications of biochemical tests and research advances related to IEM that would prepare the students to embrace fundamental knowledge needed to conduct further studies and researches in the field.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to Biochemical Genetics and Inborn error of metabolism	1	2
Principles of Basics technologies used in Biochemical tests	1	2
General overview on common Clinical Diagnostic Biochemcial tests	1	2
Molecular tests in the Diagnosis of Metabolic Disorders	1	2
Advancement in the field: Metaboilomics and genomics	1	2
Disorders causing intoxication	1	2

Disorders involving complex molecules	1	2
Genotype-Phenotype Correlation in IEM	1	2
Disorders involving energy metabolism	1	2
Mitochondrial disorders	1	2
Common IEM Disorders in KSA	1	2
Newborn Screening Program	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Demonstrate knowledge and basic understanding of Inborn errors of metabolism (IEM)	Lectures	Assignment
1.2	Demonstrate knowledge of Clinical Phenotypes commonly seen in Metabolic disorders and the available clinical biochemical tests to diagnose these disorders		
2.0	**Cognitive Skills**		
2.1	Apply the essential elements of Quality Management system within the screening program and/or laboratory	Lectures	Assignment
2.2	Conduct ongoing researches to maintain an advance professional knowledge		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Utilize health care resources effectively	Lectures and small group discussion	Assignment and assessment during small group discussion
3.2	Advocate for appropriate clinical/laboratory services for patients with inborn errors of Metabolism including the introduction of new programs, new technologies, and new treatments		
	Critically analyze research papers in preparation to contribute in the development of		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Participation in small group discussion	11	20%
2	Written assignment	11	50%
3	Project presentation	12	30%
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Jean-Marie Saudubray, Matthias R. Baumgartner, John Walter Eds. Inborn Metabolic Diseases, Diagnosis and Treatment. 6th edition. Springer 2016. 2. Charles R Scriver. Scriver's OMMBID the online metabolic & molecular bases of inherited disease. McGraw-Hill c2001 3. Nenad Blau, Marinius Duran, K. Michael Gibson. Laboratory Guide to the Methods in Biochemical Genetics. Springer Berlin Heidelberg 2008
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Iman Sabri Abumansour

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Biostatistics

Course Code: Gen80003718-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Biostatistics

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Irfan

5. Level/year at which this course is offered: Level A/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	40%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	60%

Comments: computer based lectures will be used so students can get hands on performing statistical tests and analysis of data provided.

B Objectives

1. What is the main purpose for this course? Teach the students the importance of biostatistics and different tests and tools to perform them test. In addition to extensive background on how to analyse data.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course provides basic information and will be updated depending on the evaluation of the students in the subsequent modules and whether they need further introduction or areas to cover before they continue with the rest of the program.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course will provide students with enough knowledge on understanding various statistical tests and how to choose and perform the appropriate tests for the available data. This will get them ready to start with their research projects.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to Biostatistics	1	2
Sampling Techniques	1	2
Data Presentation	1	2
Numerical Measures	1	2
Probability	1	2
Normal Distribution and Sampling Distributions	1	2

Confidence Intervals	1	2
Hypothesis Testing	2	4
Comparison of Means	1	2
Proportions	1	2
Correlation and regression	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe different statistical tests	Lectures and computer practical	Exam
1.2	Explain the importance of biostatistics		
2.0	**Cognitive Skills**		
2.1	Choose and perform the appropriate statistical tests	Lecture and computer practical	Exam
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	Interpret the outcome of statistical tests	Lectures and computer practical	Exam
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exams	12	60%
2	Problem based assignment	13	25%
3	Presentation	13	15%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1 Kuzma JW, Bohnenblust SE. Basic Statistics for the Health Sciences. 5thed. New York McGrawHill 2004 2. Siddiqui MI, Baig LA, Iliyas M, Ahmed N. Health information and biostatistics. In Iliyas M. (Ed) Public Health & Community Medicine. 7thed. Karachi Time publisher 2006. 3 Larsen LR, Marx ML. An Introduction to Mathematical Statistics and the Application.Second Edition New Jersy, Prentice Hall 1986. 4. Glaser AN. High Yield Biostatistics New York John Wiley & Wilkins 1995. 5. Knapp RG Miller MC. Clinical Epidemiology and Biostatistics. Baltimore, Williams and Wilkins. 1992. 6. Isaac R. the pleasure of probability. New York Springer-Verlag 1995.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Computer lab able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course. In addition, statistical software's will also be used such as Graphpad PRISM.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) A computer for each student.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Irfan

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Bioinformatics

Course Code: Gen90003721-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Bioinformatics

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Ahmad Mufti

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	30%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	70%

Comments: Computer based sessions will be mainly used in this course as the course covers the use of web based tools for the analysis of genetic related data

B Objectives

1. What is the main purpose for this course? The main aims of this course is to teach the students the use of the ever-expanding web tools for Bioinformatics web-sites and its uses in the research field to analyse genetic related data.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) Increase the use of IT and web-based tools by updating the course material depending on the availability of new and more useful tools that are useful for medical research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course teach the use of web based tools for the research and analysis of genetic related studies.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to bioinformatics	1	2
Producing Sequence from various data bases	1	2
Analyzing sequences	2	4
Phylogenetic Trees	1	2
Protein structure analysis	2	4
Protein structure visualization and modification	2	4
Prediction tools	1	2
Biological networks	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Demonstrate a good understanding of the use of bioinformatic tools	Computer based sessions	Computer based test to

1.2	Demonstrate a good understanding of various web tools		test student skill
2.0	**Cognitive Skills**		
2.1	Identify web tools used for genetic related analysis	Computer based sessions	Computer based test to test student skill
2.2	Perform various tests online to solve genetic related problem		
	Use online prediction tools to study the effect of a given variant on mRNA and protein structure and function		
	Understand the usage of hapmap data and how it can help in identify important variants on a given data set		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Interpret the outcome of various web tools	Computer based sessions	Computer based test to test student skill
3.2	Perform advanced analysis on genetics data		
	Perform online test on the alignment and how to extract data from the aligned sequences such as the use of BLAST and CLUSTALW		
	Data mining related to SNPs and genes of interest using various online database such as ensemble and ncbi		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Computer based exam	17	60%
2	Assignments to be given throughout the study period to perform certain analysis on a given data	15-16	40%
3			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks

M. Zvelebil and J. O. Baum, Understanding Bioinformatics, Garland Science, 2008. D.E. Krane and M.L. Raymer, Fundamental Concepts of Bioinformatics, Pearson Education, 2003.

N. C. Jones and P. A. Pevzner, An Introduction to Bioinformatics Algorithms, MIT press, 2004.

C.A. Orengo, D.T. Jones and J.M.Thornton, Bioinformatics: Genes, Proteins and Computers, Roultledge, 2003.

A. M. Lesk, Introduction to Bioinformatics, Oxford University Press, 2002.

2. List Essential References Materials (Journals, Reports, etc.)

NA

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Computer lab able to accommodate ~10 students is needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course. In addition, some software's will also be used such as pymole for protein analysis.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) A computer is needed to be available for each student

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Ahmad Mufti

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Molecular diagnosis

Course Code: Gen100003722-3

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Molecular diagnosis

2. Credit hours: 3

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Zohor Azher

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	40%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	60%

Comments: Teaching methods for this modules include laboratory training as well as tutorials

B Objectives

1. What is the main purpose for this course? This course is designed to introduce students to different Molecular technologies used widely to identify variable DNA anomalies that are related to different genetic pathologies.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course is designed to introduce students to different Molecular technologies used widely to identify variable DNA anomalies that are related to different genetic pathologies.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
DNA Technology: Introduction	1	3
Nucleic Acid Extraction and purification	1	3
DNA amplification	2	4
Nucleic acid hybridization	2	4
DNA sequencing: Dideoxy-DNA method	2	4
DNA sequencing: Next generation sequencing	2	4
Detection of Inherited Diseases	2	4
Molecular Oncology	2	4
Guidelines for reporting Molecular Genetics results	1	3
Examples for reporting Molecular Genetics results	1	3

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	8	4	24			36
	Actual	8	4	24			36
Credit	Planed	1	0.5	1.5			3
	Actual	1	0.5	1.5			3

3. Additional private study/learning hours expected for students per week. 30

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain the impact of DNA technology in the diagnosis and improvement of patient's care and management	Lectures	MCQ exam

1.2	Describe the use of the core techniques used widely in diagnostic laboratories.		
2.0	**Cognitive Skills**		
2.1	Explain the principles of a range of molecular techniques and learn how to apply these techniques in the diagnosis of different common and rare genetic diseases.	Lectures	MCQ exam
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	Critically analyze, evaluate, interpret and understand the significance of results of controlled experiments and be able to apply data obtained to solve a clinical or diagnostic problem.	PBL cases	PBL cases assessment
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Use library, electronic and online resources to collect and select information	Lectures and PBL cases	MCQ exam and PBL cases assessment
4.2	Work effectively as part of a team and carry out constructive peer review	PBL cases	PBL cases assessment
5.0	**Psychomotor**		
5.1	Manage time effectively and prioritise tasks appropriately whilst working independently or as part of a team	PBL cases	PBL cases assessment
5.2	Demonstrate an enthusiastic and positive approach to learning	Lectures and PBL cases	MCQ exam and PBL cases assessment

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Laboratory assessment	18	35%
2	MCQ exam	18	25%
3	PBL cases assessment	19	40%
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks • Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. • Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science • Gelehrter, T.D., Collins, F.S., Ginsburg, D., 2017 Principles of Medical Genetic Book. SERBIULA (sistema Librum 2.0). • Pritchard and Korf, 2013. Medical Genetics at a Glance book. Wiley-BLACKWELL.
2. List Essential References Materials (Journals, Reports, etc.) • Journal of Human Genetics • European Journal of Human Genetics • American Journal of Medical Genetics • American Journal of Human Genetics
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. • https://www.omim.org/ • https://www.ncbi.nlm.nih.gov/books/NBK1116/ • https://genome.ucsc.edu/ • https://www.ensembl.org/index.html
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course. In addition, Laboratory able to accommodate ~10 students are needed for this course. In addition to computer lab to perform data analysis.
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Several laboratory equipment will be required including PCR, Gel electrophoresis, qPCR, NGS etc...

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Zohor Azher

Signature:__Zohor Azher__ Date Specification Completed: 23/11/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 23/11/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Population genetics and epidemiology

Course Code: Gen110003723-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department : Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Population genetics and epidemiology

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Prof. Nasser Elhawary

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? The course aims to provide information about population genetics and how specific genetic disorders are spread in specific population. In addition, it will provide details on how national programs can reduce genetic disorders such as premarital screening available in KSA.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) The program will be updated depending on students feedback as well as any development in the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Population genetic is an essential topic for geneticist since it can provide important knowledge to help improve national health system.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
The genetic structure of populations	2	4
The genetics of natural selection	2	4
Genetic drift	2	4
Quantitative genetics	2	4
The molecular of evolution	2	4
Phylogeography	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain what is population genetics	Lectures	

1.2	Describe the use of population genetics in advancing national health care		Assignment and quiz
	Analyze population genetics data		
	Explain the evolution and natural selection and how is this important in adapting with the global changes		
2.0	**Cognitive Skills**		
2.1	Identification of genetic chiasmata	Interactive lectures	Assignment and quiz
2.2	Identification of pathogenetic and/or protective variant within a population		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Review scientific papers	lectures	assignment
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Assignment	20	75%
2	quiz	20	25%
3			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks Hartl, D. and Clark, A. (2007). Principles of population genetics. Sunderland, MA: Sinauer Associates. Hamilton, M. (2009). Population Genetics. Chichester, UK: Wiley-Blackwell. Hedrick, P. (2005). Genetics of populations. Boston: Jones and Bartlett Publishers.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Prof. Nasser Elhawary

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Cancer genetics

Course Code: Gen120003724-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Cancer genetics

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Samar Ekram

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course aims to provide up to date information on cancer in general and on the involvement of genetic factors on the risk of developing cancer.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course provides basic information and will be updated depending on the evaluation of the students in the subsequent modules and whether they need further introduction or areas to cover before they continue with the rest of the program.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: The course will cover topics related to the cancer and how genetics is associated with the development of cancer and how knowledge about genetics can improve the diagnosis and treatment of cancer. Such information is essential for every geneticist.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to cell biology and cancer	1	2
Cancer types and characteristics	2	4
Cancer and the cell cycle	1	2
Epigenetics and cancer	1	2
Genome instability, DNA damage and repair	2	4
Genetic factors associated with cancer development (Oncogenes and Tumor suppressor genes)	2	4
Hereditary Cancer syndrome	2	4
Oncogenic Signaling Pathways	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	24					24
	Actual	24					24
Credit	Planed	2					2
	Actual	2					2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe the relation between cancer and genetics	Lectures	Assignment
1.2	explain use of genetics in the diagnosis and treatment of cancer		

2.0	**Cognitive Skills**		
2.1	Critically analyze scientific paper to identify most appropriate techniques for the diagnosis of cancer	Lectures	Assignment
2.2	Identify genetic changes causing cancer		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Critically analyze research papers	Lectures	Poster presentation
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Present the most appropriate diagnosis and treatment option for specific cancer type	lecture	Poster preparation and presentation
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Assignment	21	50%
2	Poster preparation and presentation	22	50%
3			
4			
5			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. 2. Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science 3. BUNZ, F., 2016. Principles of Cancer Genetics. 4th ed. Dordrecht: Springer. 4. Pasche, B., 2013. Cancer Genetics. 2nd ed. US: Springer.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Samar Ekram

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Genetic risk assessment and counselling.

Course Code: Gen130003725-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Genetic risk assessment and counselling.

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr Iman Sabri Abumansour

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	70%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	30%

Comments: This course will make use of small group discussion as a way of teaching

B Objectives

1. What is the main purpose for this course? This course is designed to equip the students with basics knowledge and mindset to understand the integral roles of genetic counsellors as an inter-disciplinary team that works across a broad range of health care settings and specialties.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the clinical application field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Advances in genomic medicine and genetic technology have been dramatic. Genetic counselling has an essential role to play in helping patients and other healthcare professionals understand the options, benefits and limitations of this rapidly changing landscape. This course is designed to equip the students with basics knowledge and mindset to understand the integral roles of genetic counsellors as an inter-disciplinary team that works across a broad range of health care settings and specialties.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Principles of effective genetic counseling	1	2
Genetic counseling session videos followed by a discussion	1	2
Psychological aspects of genetic counseling	1	2
Genetic Risk assessment	1	2
Risk calculation workshop I	1	2
Utility of Bayesian analysis in genetic counseling	1	2
Risk assessment in chromosomal disorders	1	2

Role of genetic counseling in Laboratories	1	2
Role of genetic counseling in population screening programs	1	2
Genetic counseling in clinics: pediatric and adult medical genetics	1	2
Genetic counseling in clinics: Prenatal genetic	1	2
Genetic counseling in clinics: Cancer genetics	1	2

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12	12				24
	Actual	12	12				24
Credit	Planed	1	1				2
	Actual	1	1				2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recall the basic foundational knowledge in genetic counselling encompassing medical genetics; psychological and ethical issues; and familial and social implications of genetic contributions to health and human disease	Lectures	Written assignment
1.2			
2.0	**Cognitive Skills**		
2.1			
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	incorporate, interpret and communicate results of genetic and genomic technology.	Lectures and small group discussion	Written assignment and role play presentation
3.2	Illustrate the clinical practice across the full scope of current and future practice settings.		
	Develop critical thinking and research skills to make original contributions to research in the field of genetic counseling		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Written Assignment	23	55%
2	Role-play Presentation	23-24	45%
3			
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. R.J.M Gardner, Grant R Sutherland, and Lisa G. Shaffer. Chromosome abnormalities and genetic counseling. 4th edition. 2. Bonnie S. LeRoy, Patricia M. Veach, Dianne M. Bartels. Genetic counseling practice: Advanced concepts and skills.1st edition. 3. Wendy R. Uhlmann, Jane L. Schuette, Beverly Yashar. A guide to genetic counseling. 2nd edition 4. Peter S. Harper. Practical Genetic counseling. 7th edition 5. Ian D. Yang. Introduction to Risk calculation in genetic counseling. 3rd edition 6. Peter J. Bridge. The calculation of genetic risk: worked example in DNA diagnostics. 7. McKinsey L. Goodenberger, Brittany C. Thomas, Teresa Kruisselbrink Practical genetic counselling for the Laboratory
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Iman Sabri Abumansour

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Genomics in the Laboratory

Course Code: Gen140003726-2

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Genomics in the Laboratory

2. Credit hours: 2

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Neda Bogari

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	20%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	80%

Comments: Most of this module session will be carried out as laboratory demonstration and hands on experiments

B Objectives

1. What is the main purpose for this course? This course aims to teach students basic laboratory safety steps along with basic calculation and how to perform several tests within the lab preparing them to start their research project.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course covers a wide variety of genetic lab topics including but not limited to lab safety and precautions, calculations and genetic diagnosis. It, also, includes some of the most commonly used molecular genetic and cytogenetic techniques such as PCR, karyotyping and gel electrophoresis.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Lab Safety and Precautions	1	2
Lab notebook and Chemical Calculations	2	4
Genetic testing and results' interpretation	1	2
Polymerase Chain Reaction (PCR)	2	4
Gel electrophoresis	1	2
DNA Sequencing technique	2	4
Karyotyping and chromosomal staining	1	2
DNA Microarray	1	2

Next generation sequencing	2	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12		14			26
	Actual	12		14			26
Credit	Planed	1		1			2
	Actual	1		1			2

3. Additional private study/learning hours expected for students per week. 20

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

1.1	Identify types of biological and chemical hazards	lectures	Assignment
1.2	Identify types of lab wastes and their management methods		
2.0	**Cognitive Skills**		
2.1			
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	Perform various lab calculations	Laboratory demonstration and hands on	Assessing Students during class activities and lab book evaluation
3.2	Identify appropriate genetic tests for the diagnosis of a given cases		
	Perform various lab experiments including: • Perform PCR technique • Perform gel electrophoresis technique • Perform DNA sequencing technique • perform DNA microarray technique • Perform next generation sequencing		
	Perform genetic statistics and results interpretation		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Written Assignment	24	20%
2	Laboratory assessment	25	50%
3	Lab book evaluation	25	30%
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks 1. Jim Huggett, and Justin O'Grady, 2014. Molecular diagnostics: current research and applications. United Kingdom: Caister Academic Press. 2. Emery, A. E. H., & Rimoin, D. L. (2013). Emery & Rimoin's principles and practice of medical genetics. SienceDirect.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course. In addition, Laboratory able to accommodate ~10 students are needed for this course. In addition to computer lab to perform data analysis.
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Several laboratory equipment will be required including PCR, Gel electrophoresis, qPCR, NGS etc...

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Neda Bogari

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Therapeutic approaches in Medical genetics

Course Code: Gen160003727-1

Course Specifications

Institution: Umm Al-Qura university	Date: 26/08/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Therapeutic approaches in Medical genetics

2. Credit hours: 1

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Iman Sabri Abumansour

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	80%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other	X	What percentage?	20%

Comments: This course will use small group discussion as a way of teaching

B Objectives

1. What is the main purpose for this course?

This course is designed to provide fundamental principles of treatment modalities in inherited human diseases NOW and potentially in FUTURE. Its aim is to empower students with basic Knowledge of current treatments in field of inborn error of metabolism as well as disorders due to genetic causes. Additionally, it provides a scope on potential novel treatments in field of medical genetics to stimulate graduates to contribute in generating new ideas for translational researches to bridge the gap between basic sciences and clinical practice.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

This course will be updated depending on the evaluation of the students and the advances the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

This course is designed to provide fundamental principles of treatment modalities in inherited human diseases NOW and potentially in FUTURE. Its aim is to empower students with basic Knowledge of current treatments in field of inborn error of metabolism as well as disorders due to genetic causes. Additionally, it provides a scope on potential novel treatments in field of medical genetics to stimulate graduates to contribute in generating new ideas for translational researches to bridge the gap between basic sciences and clinical practice.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Overview of general therapeutic methods in field of medical genetics	1	1
Spectrum of Treatable genetics and metabolic disorders	1	1
Conventional methods of therapies in IEM and genetic disorders	1	1
Process of Treatment Discovery and development	1	1
Basic concepts in Genetic engineering	1	1
Principles in gene therapy	1	1
Genome editing	1	1
Clinical applications of gene therapy and genome editing	1	1
RNA based therapeutics	1	1
Stem cell therapy	1	1
Genomics and Precision medicine	1	1

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12					12
	Actual	12					12
Credit	Planed	1					1
	Actual	1					1

3. Additional private study/learning hours expected for students per week.	10

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Demonstrate knowledge of conventional therapies and process of drug discovery	Lectures and small group discussion	Participation and small group discussion and project presentation
1.2	Demonstrate knowledge and basic understanding of new technologies that are used for discovery of new treatments		
	Identify obstacles and challenges in the process of developing new treatments		
	Describe the ethical issues related to therapeutics based on genetic manipulations		
2.0	**Cognitive Skills**		
2.1			
2.2			
3.0	**Interpersonal Skills & Responsibility**		

3.1	Critically analyze research papers in preparation to contribute in the development of new knowledge	Lectures and small group discussion	Participation and small group discussion and project presentation
3.2	Write up a research proposal to enhance the writing skills as well as the ability of advancing professional knowledge as a junior researcher		
4.0	**Communication, Information Technology, Numerical**		
4.1			
4.2			
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Participation and small group discussion	28	40%
2	Project presentation	29	60%
3			
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks • Charles R Scriver. Scriver's OMMBID the online metabolic & molecular bases of inherited disease. McGraw-Hill c2001 • Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. • Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science • Gelehrter, T.D., Collins, F.S., Ginsburg, D., 2017 Principles of Medical Genetic Book. SERBIULA (sistema Librum 2.0). • National Academy of Medicine, 2017. Human Genome Editing: Science, Ethics, and Governance.
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. NA
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random student, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Iman Sabri Abumansour

Signature: _____ Date Specification Completed: 26/08/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/0.8/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Genetic screening

Course Code: Gen170003728-1

Course Specifications

Institution: Umm Al-Qura university	Date: 23/11/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Genetic screening

2. Credit hours: 1

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

MSc in medical genetics

4. Name of faculty member responsible for the course

Dr. Zohor Azher

5. Level/year at which this course is offered: Level B/Year 1

6. Pre-requisites for this course (if any):

non

7. Co-requisites for this course (if any):

non

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? This course is designed to introduce students to the application of Molecular and biochemical methods in screening of genetic pathologies and the impact of the screening programs in reducing morbidity and mortality of many genetic diseases especially in Saudi Arabia.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) This course will be updated depending on the evaluation of the students and on the advances in the research field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This course is designed to introduce students to the application of Molecular and biochemical methods in screening of genetic pathologies and the impact of the screening programs in reducing morbidity and mortality of many genetic diseases especially in Saudi Arabia.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction: Principles of genetic screening programs	1	1
Screening approaches for high risk individuals (Autosomal dominant, recessive and X-linked diseases)	2	3
Population Screening (Antenatal, Newborn and adult screening)	2	3
The results of genetic screening and confidentiality	1	2
National screening programs in Saudi Arabia	2	3

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	12					12
	Actual	12					12
Credit	Planed	1					1
	Actual	1					1

3. Additional private study/learning hours expected for students per week. 10

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Explain the potential advantages of genetic screening programs	Lectures	MCQ exam

1.2	Describe the national screening programs in Saudi Arabia.		
2.0	**Cognitive Skills**		
2.1	Recognize the principles of genetic screening programs in high and low risk populations.	Lectures	MCQ exam
3.0	**Interpersonal Skills & Responsibility**		
3.1	Illustrate the advantages and disadvantages of presymptomatic or predictive testing from both a practical and ethical point of view	Lectures	MCQ exam
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Use library, electronic and online resources to collect and select information	Lectures	MCQ exam
5.0	**Psychomotor**		
5.1	Manage time effectively and priorities tasks appropriately whilst working independently or as part of a team	Lectures	MCQ exam
5.2	Demonstrate an enthusiastic and positive approach to learning	Lectures	MCQ exam

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	MCQ exam	28	60%
2	assignment	29	40%
3			
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E Learning Resources

1. List Required Textbooks • Turnpenny, P.D. and Ellard, S., 2016. Emery's Elements of Medical Genetics Book. Elsevier Health Sciences. • Strachan, T., Read, A., 2010. Human Molecular Genetics Book. Garland Science • Gelehrter, T.D., Collins, F.S., Ginsburg, D., 2017 Principles of Medical Genetic Book. SERBIULA (sistema Librum 2.0). • Pritchard and Korf, 2013. Medical Genetics at a Glance book. Wiley-BLACKWELL.
2. List Essential References Materials (Journals, Reports, etc.) • Journal of Human Genetics • European Journal of Human Genetics • American Journal of Medical Genetics • American Journal of Human Genetics
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. • https://www.omim.org/ • https://www.ncbi.nlm.nih.gov/books/NBK1116/ • https://genome.ucsc.edu/ • https://www.ensembl.org/index.html
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course. In addition, Laboratory able to accommodate ~10 students are needed for this course. In addition to computer lab to perform data analysis.
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Several laboratory equipment will be required including PCR, Gel electrophoresis, qPCR, NGS etc...

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random students, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from another institutions will be asked to review the course every other year. These along with students feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Dr. Zohor Azher

Signature:__Zohor Azher__ Date Specification Completed: 23/11/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 23/11/2018

4/1/4. Course Specification:

COURSE SPECIFICATIONS

Form

Course Title: Epigenetics

Course Code: Gen180003729-1

Course Specifications

Institution : Umm Al-Qura university	Date: 25/11/2018
College/Department: Faculty of Medicine/ Medical genetics department	

A. Course Identification and General Information

1. Course title and code:

Epigenetics

2. Credit hours: 1

3. Program(s) in which the course is offered.

(If general elective available in many programs indicate this rather than list programs)

M.Sc., in medical genetics

4. Name of faculty member responsible for the course

Prof. Faisal Allaf

5. Level/year at which this course is offered: level B/Year 1

6. Pre-requisites for this course (if any):

None

7. Co-requisites for this course (if any):

None

8. Location if not on main campus:

Main Campus

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B. Objectives

1. What is the main purpose for this course?

This course aims to provide up to date information on Epigenetics in cancer in general and specifically to understand the role of Epigenetics playing in cancer development and it's prevention by targeting Genome Epigenetics.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web-based reference material, changes in content as a result of new research in the field)

This course provides basic information; however, the students will be instructed to use the web-based materials such as PUBMED, UCSC Genome browser, NCBI-Gene. Based upon the new publications in the subsequent modules, this course will be updated in Epigenetics field.

MS-primers designing using Web-based tools, promoter sequence downloading etc., will be taught as a Lab-based learning method.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

The main focus of this 6-credit hour (28 contact hours) lecture series is to train the students of 1st year M.Sc., in Medical Genetics in basics of Epigenome structure, function, it's role in cancer progression, and the use of the epigenetics in cancer treatment. This course will improve students' knowledge about the epigenetics, and help them to design the future experiments when they do the practical work in their second year for their thesis requirement. This course comprises of wide variety of topics from chromatin structure, role of chromatin and histones in cancer development, to use of epigenetics in cancer treatment and drug development. Hands on experimental techniques with step-by-step instructions will be taught with students' assignments and presentations from the recent development in this area. It will provide basic and advanced methods for students Epigenetics and teach students cutting edge methodologies. Topics include: - Epigenome Structure I: Genome-wide mapping of Histone modifications, Chromatin and transcription factors, ncRNA and micro-RNA role in epigenetics (ChIP, ChIP-seq, ncRNA mapping, data analysis) - Epigenome Structure II: Nuclear architecture, long-range Chromatin interactions, chromatin remodelling complexes. Biochemistry of modifying enzymes (DNA

methyltransferase such as DNMT1, DNMT3A, and DNMT3B, methylation and acetylation role in X-inactivation). Binding proteins and micro-RNAs in Chromatin regulation and gene expression (CBP/P300, protein-protein, protein-nucleic acids interactions, complex purification, polycomb group proteins) - Fractionation of cells and nuclei for Chromatin preparation. DNA Methylation and Imprinting (analysis of DNA Methylation by different methods) imprinted genes in the various cancers and its role in cancer therapy. All students will have to complete reading assignments on basic and advanced topics in Epigenetics and the experimental approaches used in this field (to be provided by instructors ahead of the beginning of the course). Written reports summarizing and discussing the experiments in reflection of this theoretical background are part of the evaluation for all students.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Chromatin Biology, Epigenome Structure and Nuclear Organization	1	1
Introduction to Epigenetics	1	1
Practical's- Histones isolation and separation on gel.	1	2
Epigenetic Alterations in different Cancers	1	2
Epigenetics in Transcriptional Regulation	1	1
Practical's- Chip Assay. Overview of Protocols and	1	2
Epigenetic in gene silencing	1	1
microRNAs and non-coding RNAs in the aberrant epigenetic regulation of cancer.	1	1
Genome Imprinting in Tumor Progression	1	1
Epigenetic treatment of Pancreatic, Breast cancer, Prostate cancer,	1	1
Epigenetic drugs for cancer treatment and prevention: mechanisms of action	1	1

Practical's- Promoter methylation of MGMT or PTEN. (Based upon the availability of reagents students will do the Practical's- otherwise this will be taught as a Lab-visit, explaining to the students the protocols in it, and presentation by a group of students as a PPT.	1	1

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Practical	Studio	Other:	Total
Contact Hours	Planed	11		4			15
	Actual	11		4			15
Credit	Planed	0.75		0.25			1
	Actual	0.75		0.25			1

3. Additional private study/learning hours expected for students per week. 10

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe the relation between cancer and Epigenetic changes in Genome	Lectures	Assignment
1.2	Explain the use of Epigenetics in the understanding cancer development, cancer Diagnosis, and Therapy.		
2.0	**Cognitive Skills**		
2.1	Critical analysis of paper to identify most appropriate techniques for used in the Epigenetics research and diagnosis of cancer	Lectures	Assignment
2.2	Identify Epigenetic changes in cancer		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Define different scientific topics on Epigenetics and cancer as a group work, and participate in reading assignments (collecting recent literature) to plan like a research project work- that will be presented and written like these objectives, and experiments needed to achieve the goals.	Lectures	Poster presentation
4.0	**Communication, Information Technology, Numerical**		
4.1	Select recent literature on Epigenetics and cancer as individual, will perform reading assignments, will prepare and present seminars in front of the class to provide the background and scope of different protocols in context to their future thesis work and answer different scientific questions.	Lecture	Oral preparation
4.2	Use different software and programs to simulate the chromatin models. Learn primers designing for Epigenetics experiments, using the Web-based tools.	Practical	Lab-based Tutorials.
5.0	**Psychomotor**		
5.1	N/A		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Assignment (literature review writing and Poster presentation)	28	25%
2	Oral presentation	29	25%
3	Quiz (case based)	29	50%
4			
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Each student will be assigned to a tutor that is expected to meet the student once a month and to be available if and when necessary. The students will be able to contact their tutor when they are in need of help. Additionally, each staff member will also assign 2 hours per week as office hours to be available to answer students' questions and help if and when they need it.

E. Learning Resources

1. List Required Textbooks 1. Epigenetics, CSHL press, 2nd edition – https://www.cshlpress.com/default.tpl?cart 2. Epigenetics Protocols (Methods in Molecular Biology) 2nd edition – 3. Detailed handouts provided by instructors
2. List Essential References Materials (Journals, Reports, etc.) Cancer Epigenetics: From Mechanism to Therapy. by MA Dawson- https://www.cell.com/abstract/S0092-8674(12)00762-3 DOI: https://doi.org/10.1016/j.cell.2012.06.013. Annual Review of Pharmacology and Toxicology Targeting Epigenetics in Cancer, by Richard L. Bennett and Jonathan D. Licht- Annu. Rev. Pharmacol. Toxicol. 2018. 58:187–207 https://doi.org/10.1146/annurev-pharmtox010716-105106 Richard H. Goodman and Sarah Smolik. CBP/p300 in cell growth, transformation, and development. GENES & DEVELOPMENT 14:1553–1577. Cold Spring Harbor Laboratory Press ISSN 0890-9369/0000; www.genesdev.org

Genomic Imprinting in Mammals – Mechanisms Yoon, et al., Nat Genet 30, 92-6 (2002); Watanabe, et al., Science 332: 848-52 (2011); Bell and Felsenfeld Nature 405, 482-5 (2000)

Thomas, M. C., & Chiang, C.-M. (2006). The General Transcription Machinery and General Cofactors. Critical Reviews in Biochemistry and Molecular Biology, 41(3), 105–178. doi:10.1080/10409230600648736.

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

NA-Cancer Epigenetics: Modifications, Screening, and Therapy- https://www.annualreviews.org/doi/10.1146/annurev.med.59.061606.095816.

Wu X, Munroe DJ. EasyExonPrimer: automated primer design for exon sequences. Appl Bioinformatics. 2006;5(2):119-20. EasyExonPrimer is available from http://129.43.22.27/~primer/.

Exon Primers designing- https://ihg.helmholtz-muenchen.de/ihg/ExonPrimer.html

Gábor E. Tusnády, István Simon, András Váradi, and Tamás Arányi. BiSearch: primer-design and search tool for PCR on bisulfite-treated genomes. Nucleic Acids Res. 2005; 33(1): e9.

PUBMED.

ENSEMBLE.

UCSC Genome Browser.

NCBI-Gene.

EXON primers.

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Students will use the on-line available genetics program such as ENSEMBLE, UCSC genome browser, and NCBI-gene, and various primer designing software's for methylation studies. Also, they will use the freely available on-line software's for 3-D creation of chromatin complexes, transcription factors binding to it.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classrooms able to accommodate ~10 students are needed for this course. Students are required to have their own latest Notebook computer.
2. Technology resources (AV, data show, Smart Board, software, etc.) Projector/data show will be mostly used in this course. Student will be thought the NCBI-Gene bank program online- and downloading the specific gene sequences, and promoters' regions, to design the Methylation Specific (MS) primers for the MS-PCR of specific genes.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list). Based upon the budget available we will be demonstrating to students one of the following experiments in the Epigenetics area as a bench work. The tissue of cell culture material will be required to demonstrate the Chip-assay, and Histone proteins isolation and running to separate Histone H1, H2, H3 and H4. For Chip-Assay specific anti-body needs to be ordered, and Histone protein standards can be obtained from the Collaborators if possible. Also, need to be ordered is the MS-PCR primers, and a kit to perform MS-PCR.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching At the end of each course, students will be asked to fill anonymous online feedback on the course, materials and teaching staff.

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Department staff will attend random sessions to assess the teaching process and the teaching members. Feedback will be provided to the teaching member to further improve their abilities
3. Processes for Improvement of Teaching Feedback provided by students and other staff members should be carefully considered by each staff member. Additionally, Staff members will be provided with lectures/workshop to improve their skills before the start of the program.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Each assignment/exam will be assessed by 2 independent staff members. Additionally, each course a committee will evaluate the assessment of one random student, the committee will not include any of the assessing bodies
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The outcome of the course will be reviewed by the end of each year and the course will be updated accordingly. In addition, staff members from other institutions will be asked to review the course every other year. These along with students' feedback will provide a good assessment of the course which can be used to further improve the course.

Name of Course Instructor: Prof. Faisal Allaf

Signature: _____ Date Specification Completed: 26/11/2018

Program Coordinator: Dr. Ahmad Mufti

Signature: _____ Date Received: 26/11/2018