

Academic Year: 2021 - 2022

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▼ Important Message

The information provided here is for reference and may be subject to change by the course coordinator(s) or the offering department(s) concerned.

▼ Section A: Course Information

BBMS4003 - Developmental Genetics

Faculty LKS Medical Faculty

Department

Description

School of Biomedical Sciences

Course Coordinator

Name	Faculty/ Department	Email Address
Dr. Bo Gao	School of Biomedical Sciences	gaobo@hku.hk

Credit Value 6.00

Course Grade A+ to F

Semester Offered First Semester

Prerequisite(s)/ Corequisite(s)/Impermissible Combination(s)

Pass in any one of these courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, BBMS3002 Molecular Biology of the Cell or equivalent courses

Approved Syllabus

This course covers the genetic bases as well as cellular and molecular processes of embryo development. Topics include: genetic control of body plans and pattern formation, morphogenesis, cell fate determination, formation of organ systems such as lung, kidney, vascular, skeletal and nervous systems, germ cells and sex determination, stem cells, regeneration, common congenital malformations, and key signaling molecules involved. Methods and technologies for studying developmental genetics, studies of model organisms, and examples relevant to human diseases and modern medicine are discussed.

Prerequisite: Pass in any one of these courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, BBMS3002 Molecular Biology of the Cell or equivalent courses

Assessment: 40% continuous assessment; 60% examination.

Course Objectives

This course aims to cover the genetic, cellular and molecular bases of development. Developmental principles such as patterning and axes formation, gradients and thresholds, signaling pathways and mechanisms, branching morphogenesis will be illustrated using model organisms, gene functions and mutation analyses, and contemporary genetics, genomics and cell biology technology platforms. Relevance to human diseases, stem cell biology and regenerative medicine will be highlighted.

▼ Section B: Teaching/ Learning

Course Type Lecture course

Course Learning Outcomes

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Academic Plan Minor in Genetics and Genomics (4)

On completing the course, students will be able to	Alignment with Programme Learning Outcomes
<p>[SN: 001]</p> <p>1 Illustrate the hierarchy of genetic regulation and molecular signaling mechanisms in multicellular developmental processes;</p>	<p>[SN: 00001] Students should be able to demonstrate solid knowledge of biomedical sciences.</p> <p>[SN: 00002] Students should be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.</p> <p>[SN: 00003] Students should be able to apply the core knowledge and skills for the pursuit of biomedical sciences research.</p> <p>[SN: 00004] Students should be able to evaluate research literature.</p> <p>[SN: 00006] Students should be able to identify potential approaches or research that will lead to the advancement in biomedical sciences.</p>
<p>[SN: 002]</p> <p>2 Describe the use of different model organisms for the understanding of developmental processes;</p>	<p>[SN: 00001] Students should be able to demonstrate solid knowledge of biomedical sciences.</p> <p>[SN: 00002] Students should be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.</p> <p>[SN: 00003] Students should be able to apply the core knowledge and skills for the pursuit of biomedical sciences research.</p> <p>[SN: 00004] Students should be able to evaluate research literature.</p> <p>[SN: 00006] Students should be able to identify potential approaches or research that will lead to the advancement in biomedical sciences.</p>
<p>[SN: 003]</p> <p>3 Apply genetics, genomics and transcriptomics technologies to study developmental systems;</p>	<p>[SN: 00003] Students should be able to apply the core knowledge and skills for the pursuit of biomedical sciences research.</p> <p>[SN: 00005] Students should be able to make rational hypotheses about ill-defined biomedical sciences problems based on the best available data and evidence.</p> <p>[SN: 00006] Students should be able to identify potential approaches or research that will lead to the advancement in biomedical sciences.</p> <p>[SN: 00009] Students should be able to communicate and collaborate effectively with scientific peers and healthcare professionals orally and in writing.</p> <p>[SN: 00012] Students should be able to participate in the generation, interpretation, application and dissemination of biomedical sciences knowledge which will improve the quality of healthcare.</p>
<p>[SN: 004]</p> <p>4 Integrate knowledge on development and developmental genetics and apply the knowledge on</p>	<p>[SN: 00005] Students should be able to make rational hypotheses about ill-defined biomedical sciences problems based on the best available data and evidence.</p>

the understanding of human diseases, stem cell biology and regenerative medicine.

[SN: 00006]

Students should be able to identify potential approaches or research that will lead to the advancement in biomedical sciences.

[SN: 00007]

Students should be able to engage in relevant and realistic self-appraisal as biomedical scientists and realize one's own capabilities and limitations.

[SN: 00008]

Students should be able to understand broader concepts of molecular and health sciences and be able to relate these to scientific issues of cultural, regional and global significance.

[SN: 00009]

Students should be able to communicate and collaborate effectively with scientific peers and healthcare professionals orally and in writing.

[SN: 00010]

Students should be able to understand the importance of ethics and integrity of scientific research, and respect the roles and contributions of other members of the team and display capacity for team work.

[SN: 00011]

Students should be able to appreciate the role of biomedical sciences in the improvement of human conditions.

[SN: 00012]

Students should be able to participate in the generation, interpretation, application and dissemination of biomedical sciences knowledge which will improve the quality of healthcare.

Course Teaching and Learning Activities

Description	Approx. number of hours (for normative student)	% of total study load
Lectures- contact hours	28.00	49.12
Tutorials- contact hours	5.00	8.77
Reading / Self study	24.00	42.11
Total	57.00	100.00

Assessment Methods and Weighting

Assessment methods	Weighting in final course grade (%)
Assignments	16.00
Examination	60.00
Presentation	8.00
Tests	16.00
Total	100.00
Coursework/Examination Ratio	40.00% / 60.00%

Assessment Methods and Assignment

Assessment Methods and Assignment	Alignment with Course Learning Outcomes
1 Assignments : Written assignments and oral presentation	[SN: 001] Illustrate the hierarchy of genetic regulation and molecular signaling mechanisms in multicellular developmental processes;
2 Examination : Exam	[SN: 001] Illustrate the hierarchy of genetic regulation and molecular signaling mechanisms in multicellular developmental processes;
3 Presentation	[SN: 001] Illustrate the hierarchy of genetic regulation and molecular

	signaling mechanisms in multicellular developmental processes;
4 Tests	[SN: 001] Illustrate the hierarchy of genetic regulation and molecular signaling mechanisms in multicellular developmental processes;

Course Grade Descriptors [Browse course grade descriptors](#)

Course URL Nil

Related Major/ Minor/ Professional Core

Description	Associated Credit Unit Statement
Minor in Genetics and Genomics (4)	Nil

Section C: Course Schedule

Course Schedule for this year 2021-22

Semester	Session	Start Date	End Date	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start Time	End Time	Venue	Teaching Staff
2021-22 Sem 1	1A-LEC (2732)	02/09/2021	07/10/2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10:30 AM	12:20 PM	Rm 102, KKL Building	Bo Gao Chi Hang Cheung Zhongjun Zhou
2021-22 Sem 1	1A-LEC (2732)	06/09/2021	04/10/2021	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11:30 AM	12:20 PM	JLG03	Bo Gao Chi Hang Cheung Zhongjun Zhou
2021-22 Sem 1	1A-LEC (2732)	18/10/2021	29/11/2021	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11:30 AM	12:20 PM	JLG03	Bo Gao Chi Hang Cheung Zhongjun Zhou
2021-22 Sem 1	1A-LEC (2732)	21/10/2021	25/11/2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10:30 AM	12:20 PM	Rm 102, KKL Building	Bo Gao Chi Hang Cheung Zhongjun Zhou

Note: Teaching staff information will be printed once they are finalised.

Section D: Additional Course Information

Note: Information about course content and reading materials listed below is extracted from Moodle at scheduled intervals. Please refer to Moodle for up-to-date information.

Course Content and Topics

This course will include the following topics:

1. Model organisms;
2. Gene regulation and morphogenesis;
3. Patterning and axes formation;
4. Molecular signaling in multiple developmental processes;
5. Neural and neural crest development;
6. Limb and skeletal development and regeneration;
7. Branching morphogenesis in development and in diseases;
8. Embryonic stem cells and fetal stem cells, neural and neural crest stem cells;
9. Genetics, genome manipulation, transgenesis, transcriptomics and stem cell based technology platforms.

Required/ Recommended Readings and Online Materials

TBC

Course Effectiveness Profile

	Academic Year	Academic Career	Enrollment #	Response #	Response Rate (%)	Mean Course Effectiveness	Course Coordinator's Comments
1	2019	UG	12	1	8	100.0	
2	2018	UG	23	12	52	70.0	
3	2018	TPG	1	1	100	100.0	
4	2017	UG	13	3	23	75.0	

Note: If the number of response is less than 6, "Mean Course Effectiveness" will be masked. For further details, please refer to [Operational Guide for Student Feedback on Teaching & Learning](#).

Section E: University Information**Academic Misconduct and Plagiarism****Academic honesty**

The University highly values honesty in the academic work submitted by students, and adopts a policy of zero tolerance on cheating in examinations and plagiarism in any work submitted for assessment. Any student who commits such an academic offence is liable to be considered by the University's Disciplinary Committee for possible disciplinary action which can result in serious consequences - including expulsion from the University.

Plagiarism is copying the work of another person without proper acknowledgement. There are two parts in the definition: copying and the absence of proper acknowledgement. As a result, it gives an impression to an ordinary reader that the work is the original work of the author when in fact it was copied from some others' work. Copying does not necessarily only mean copying word for word. Closely paraphrasing or substantial copying with minor modifications (such as changing grammar, adding a few words or reversing active/passive voices) is still copying for this purpose. It does not matter what the nature of the source is: it may be a book, an article, lecture notes or simply an assignment of another student, or in electronic form such as a website, an audio-visual production or other non-textual material, to name but a few. It does not matter whether the source has been published or not. Plagiarism covers any form of work submitted for assessment, including theses, dissertations, take-home examinations, assignments, projects and other forms of coursework.

Students are strongly advised to read the booklets "What is Plagiarism?" (<http://www.hku.hk/plagiarism/>) and "Plagiarism and How to Avoid it" (<http://www4.caes.hku.hk/plagiarism/>) and to consult your teachers if you have any questions on the definition of plagiarism and how to avoid it. Students are also advised to familiarise themselves with issues in relation to copyright as publicized in the section on "Copyright and Plagiarism" in the Student Handbook (<http://www.handbook.hku.hk/ug/>). These guidelines cover lecture notes, course materials, photocopies, internet materials as well as dissertations.

Students should read these guidelines carefully and revisit them from time to time.

University Assessment Policy

Please refer to the [University Assessment Policy](#) available online.

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