THE UNIVERSITY OF WESTERN AUSTRALIA

GENE4002 Integrated Topics in Genetics I

Introduction to Unit

Semester 2, 2024

A/Prof Heng Chooi
School of Molecular Sciences

Acknowledgement to Country

We acknowledge that the University of Western Australia (UWA) Crawley campus is situated on Noongar land, that the Noongar people remain the spiritual and cultural custodians of their land and continue to practice their values, languages, beliefs and knowledge.

THE UNIVERSITY OF WESTERN AUSTRALIA

UWA STUDYING ONLINE ETIQUETTE: Using Zoom and Teams

Log in using your Student ID and full name

Dress as you normally would for a uni class

Arrive on time and prepared

Sit in a well-lit space with a neutral background

Use a headset with external mic

Close other applications and eliminate distractions

Mute your mic when not speaking

Turn on/~~off~~ your camera as needed

On is encouraged

Use "raise hand" feature to indicate you want to talk

Use chat function to ask questions silently

Do not record/share sessions without permission

Be patient and respectful towards everyone

We expect respect

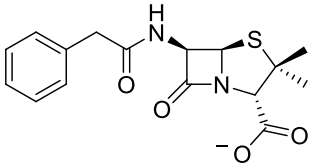
All UWA students must engage in online learning in a manner that reflects our Code of Conduct. Demonstrate personal responsibility and uphold the University's values in all communications.

THE UNIVERSITY OF WESTERN AUSTRALIA

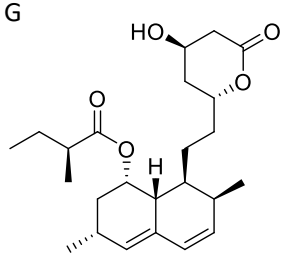
Unit Coordinator: A/Prof Heng Chooi

- Position: Associate Professor
- Office: Bayliss Building, Room 2.58
- Email: yitheng.chooi@uwa.edu.au
- Phone: 08 6488 3041
- Consultation: by appointment

Research Interests



Penicillin G

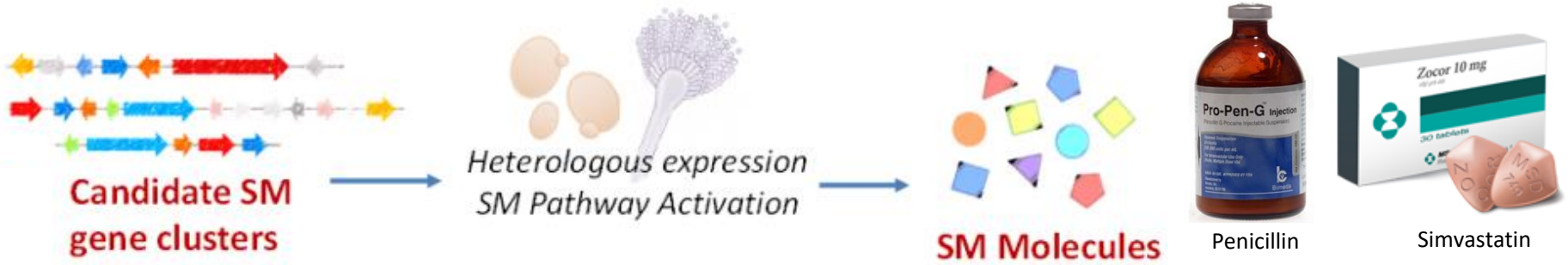


Lovastatin

- **Genetics and biochemical basis of fungal secondary metabolite (natural product) biosynthesis:**
- **Genetic engineering/synthetic biology of antibiotics/natural products**
- **Uncover the extended genotype - small molecules in host-microbe interactions**

Technologies:

Fungal genetics and genomics, recombinant DNA techniques; synthetic biology and metabolic engineering; recombinant protein expression and enzyme characterisation; analytical chemistry (compound isolation, HPLC-MS, etc.)



Penicillin

Simvastatin

For more information about research please visit www.chooilab.org

Lecturer: **Dr Mark Waters**

Location: Bayliss Building 2.59

email: mark.waters@uwa.edu.au

Covers topic Set 2 - 3

Office Hours: By appointment

Research Interests: Genetic and molecular basis of plant development, Hormone perception and signalling mechanisms in plants, Evolution of hormone signalling systems, Protein-ligand interactions

The subjects of his studies are using model plant *Arabidopsis thaliana* to dissect how plants perceive plant hormones and growth regulators, especially karrikins.

Technologies Used: plant genetics (forward and reverse genetics), molecular biology, protein-protein interactions, transcriptomics, synthetic biology

Unit Information

Content	This unit consists of lectures and related activities focusing on Mendelian genetics and introductory level molecular, population, cyto- and quantitative genetics. The lectures are prerecorded and organised into modules that cover mechanisms and techniques of molecular genetics, mutation and repair, linkage analysis, gene function and expression, and transgenesis in animals and plants. Face-to-face tutorials will focus on student understanding of the learning outcomes associated with each lecture module.

Unit Learning Outcomes

#	Outcome	How outcome will be assessed
1	become knowledgeable in and have an appreciation for molecular genetic mechanisms, mutation and repair, gene function, transgenesis in animals and plants, genes controlling developmental processes in eukaryotic organisms, and the influences of evolution and the environment animals and plants	Online quizzes,worksheets, participation
2	gain advanced knowledge of genomic and post-genomic technologies, how genomes are analysed and the resources available to do this	Online quizzes, worksheets, participation

Why do you do Genetics?

What Major are you in?

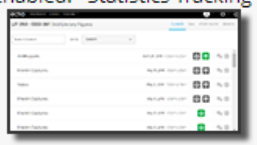
Learning Management System (LMS)

- Unit Outline/Unit Guide
- Lecture Materials
- Lecture Recording/Link to Lecture Capture System
- Pre-tutorial Quizzes
- Evaluation Quizzes
- Worksheets and Submission
- Tutorial Discussion Surveys

Let’s have a look together on LMS
URL: www.lms.edu.au

Lecture Recording System

Enabled: Statistics Tracking



Welcome to the new lecture capture system.

Click the title above to launch the Unit's Dashboard and view recorded lectures.

You can get a quick introduction to using the system from the help pages.

echovideo Library Courses Collections Analytics Create

RESET LMS LINK UNLINK LMS COURSE GENE4002 - GENE4002_SEM-1_2024 Integrated Topics in Genetics[GENE4002]

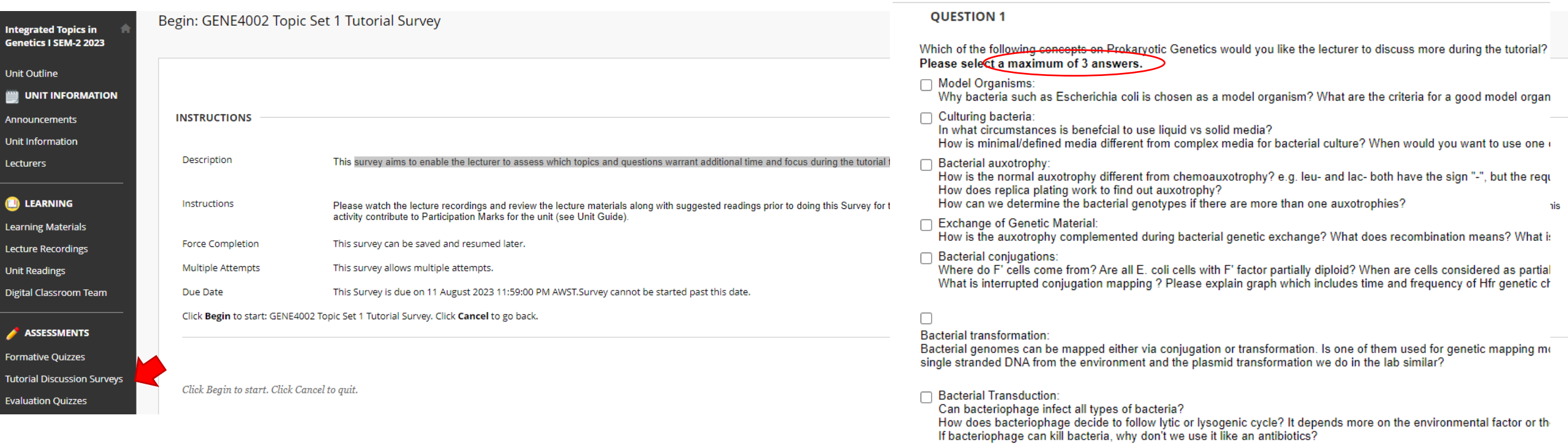
REORDER Search

- TOPIC SET 1
  - Prokaryotic Genetics I
  - Prokaryotic Genetics II
  - Mendelian Genetics I
  - Mendelian Genetics II
- TOPIC SET 2
- TOPIC SET 3
- TOPIC SET 4
- TOPIC SET 5

GUIDELINES FOR RESPONDING TO SURVEY FOR TUTORIALS

The survey aims to enable the lecturer to assess which topics and questions warrant additional time and focus during the tutorial to maximise the benefits for the students.

Please watch the lecture recordings and review the lecture materials along with suggested readings prior to doing this Survey for the upcoming Topic Set 1 Tutorial discussion. Please submit your survey before the due date (5 days before the tutorial) according to the Unit Schedule.



This activity contribute to Participation Marks for the unit (see Unit Guide).

Unit Contact

Tutorials

Wednesday: 4-6 pm [week 31 (31/7), 33 (14/8), 35 (38/8), 37 (11/9), 40(2/10), 42 (16/10)]
via MS Teams
(Teams recordings mainly for record keeping and revision)

Lectures

Lecture recordings* available through Lecture Capture System (LCS)
Lecture notes available through Lecture Management System (LMS)

*Ignore references to laboratory practicals, tutorials and lectures
not in the GENE4002 Topic Sets in the lecture recordings.
Some of the lecture recordings may have parts of other lectures in them – find the slides that correspond to the GENE4002 lecture notes.

Consultation sessions: by appointment in office or over Teams (we will try to answer your questions by email first)

More on Tutorials

- Tutorials are COMPULSORY. Attendance is expected and is graded. It is the main mode of contact for this unit and there're only 5 tutorials!
- IMPORTANT: please let your Unit Coordinator know beforehand if you are unable to attend in person due to time-table clashes or extraneous circumstances.
- Please seek Special Consideration if you are unable to attend the tutorials due to significant reasons as attendance carry participation marks.

- To make the most efficient use of tutorial time, students should vote for the topics/questions they need help most in the Tutorial Topic Survey for each Topic Set on GENE4002 LMS site.
- The survey should be added by the Friday preceding the Tutorial.
- Students are encouraged to post additional questions on LMS Discussion Board or better - raise hand and ask questions during tutorial.

Assessment Mechanisms

Item	Weight	Description and due date
Online Evaluation Quizzes:	40%	One Evaluation Quiz of each topic set. Opens on LMS after the tutorial of the corresponding topic and due in two weeks (8 marks each for 5 topic sets)
Worksheets	50%	One Worksheet for each topic set consist of mainly short answer questions. Open at the same time as Evaluation Quiz (10 marks each). Worksheet 1 due separately, Worksheet 2/3 and Worksheet 4/5 due together
Participation (incl. tutorial attendance, pre-tutorial quizzes, and tutorial survey)	10%	Pre-tutorial Quiz: One for each topic set. Opens two weeks prior to the tutorial topic and due the Monday before the corresponding tutorial (1 marks each). Tutorial Topic Survey on LMS: submit your choices on the Friday before the corresponding tutorial (optional: submit questions on LMS Discussion Board). Attendance at tutorials: Compulsory (half of the participation marks). Bonus for participating in discussion during tutorial and LMS Discussion Board.

WE ARE HERE TO HELP YOU LEARN AND NOT TO PENALISE YOU!

Assessments:

Pre-tutorial Quizzes (PQs): These online quizzes on LMS are formative in nature. You have UNLIMITED attempts. Its purpose is to prompt you to have questions during the upcoming tutorials about the topic. There is one PQ for each topic (1 mark each) and will contribute towards Participation Marks. It will be released 2 weeks before the topic's tutorial and due a day before the topic's tutorial.

Evaluative Quizzes (EQs): These are online quizzes on LMS. You have only ONE attempt and must be carried out in one sitting in the specified time frame (30 mins). Its purpose is to test your understanding about each topic and is one of the main assessment mechanisms. There are one EQ for each topic (8 marks each, 40 marks total). It will be released the day following the topic's tutorial and due ~2 weeks before the next topic's tutorial.

Worksheets (EQs): These are PDF worksheets that you can do at your own time during the period of the assessment. Its purpose is to test your deeper understanding of each topic and ability to work out the problems and explain them. Worksheets will be submitted through LMS Turnitin Submission Portal and will go through Plagiarism checking. There are one WS for each topic (10 marks each, 50 marks total). It will be released the day following the topic's tutorial. You will be given ~ 2weeks time for each worksheet, but Worksheet Topic 2/3 and 4/5 are combined and due together.

GENE4002 SEM2 2024 Overview for Workshops, Lectures and Assessments

Tutorial date	Topic Set	Lecture topics	Tutor	Pre-tutorial Quiz (PQ)	Eval. Quiz (EQ)	Worksheet (WS)
31/07/2024		Introduction to GENE4002	Heng Chooi			
14/08/2024	Topic Set 1	Prokaryotic Genetics Mendelian Genetics I & II (Review of Cytogenetics)	Heng Chooi	25/03 PQ2 due	15/08 release EQ1 28/08 EQ1 due	15/08 release WS1 28/08 WS1 due
28/08/2024	Topic Set 2	Linkage Analysis I & II Linkage & Mapping I & II (Review of Mitosis/Meiosis)	Mark Waters	23/08 PQ3 due	29/08 release EQ2 11/09 EQ2 due	29/08 release WS2
11/09/2024	Topic Set 3	Genotype and Allele Frequencies Hardy-Weinberg Equilibrium Natural Selection Mutation, Genetic Drift and Migration	Mark Waters	06/09 PQ4 due	12/09 release EQ3 02/10 EQ3 due	12/09 release WS3 02/10 WS2/3 due
2/10/2024	Topic Set 4	Molecular Genetics I & II Molecular Genetics II & IV	Heng Chooi	20/09 PQ4 due	03/10 release EQ4 16/10 EQ4 due	03/10 release WS4
16/10/2024	Topic Set 5	Gene Mutations I & II Transcgenics I-III	Heng Chooi	11/10 PQ4 due	17/10 release EQ5 30/10 EQ5 due	17/10 release WS5 30/10 WS4/5 due

Tutorial (MS Teams) Wednesday 4-6 pm

A PDF copy will be on LMS under Unit Information

GENE4002 SEM2 2024 Tutorial and Assessment Timetable

August		September		October	
31 Wed	**Introduction to unit (HC)**	31 Sat		1 Tue	
1 Thu	PQ 1 released	1 Sun		2 Wed	**Workshop Topic Set 4 (HC)**
2 Fri		2 Mon	*Watch recorded lectures in Topic Set 3*	3 Thu	PQ 5, EQ/WS 4 released
3 Sat		3 Tue		4 Fri	
4 Sun	*Watch recorded lectures in Topic Set 1*	4 Wed		5 Sat	
5 Mon		5 Thu		6 Sun	*Watch recorded lectures in Topic Set 5*
6 Tue		6 Fri	**Answer Topic 1 Survey**	7 Mon	
7 Wed		7 Sat		8 Tue	
8 Thu		8 Sun		9 Wed	
9 Fri	**Answer Topic 1 Survey**	9 Mon	PQ 3, EQ 2 DUE	10 Thu	
10 Sat		10 Tue		11 Fri	**Answer Topic 5 Survey**
11 Sun		11 Wed	**Tutorial Topic Set 3 (MW)**	12 Sat	
12 Mon	PQ 1 DUE	12 Thu	PQ 4, EQ/WS 3 released	13 Sun	
13 Tue		13 Fri		14 Mon	PQ5, EQ 4 DUE
14 Wed	**Tutorial Topic Set 1 (HC)**	14 Sat		15 Tue	
15 Thu	PQ 2, EQ/WS 1 released	15 Sun		16 Wed	**Tutorial Topic Set 5 (HC)**
16 Fri		16 Mon	*Watch recorded lectures in Topic Set 4*	17 Thu	EQ/WS 5 released
17 Sat		17 Tue		18 Fri	
18 Sun		18 Wed		19 Sat	
19 Mon	*Watch recorded lectures in Topic Set 2*	19 Thu		20 Sun	
20 Tue		20 Fri		21 Mon	
21 Wed		21 Sat		22 Tue	
22 Thu		22 Sun		23 Wed	
23 Fri	**Answer Topic 2 Survey**	23 Mon		24 Thu	
24 Sat		24 Tue		25 Fri	**Answer Topic 4 Survey**
25 Sun		25 Wed		26 Sat	
26 Mon	PQ 2, EQ1, **WS 1** DUE	26 Thu		27 Sun	
27 Tue		27 Fri	**Answer Topic 4 Survey**	28 Mon	
28 Wed	**Tutorial Topic Set 2 (MW)**	28 Sat		29 Tue	
29 Thu	PQ 3, EQ/WS 2 released	29 Sun		30 Wed	EQ 5, **WS 4/5** DUE
30 Fri		30 Mon	PQ 4, EQ 3, **WS 2/3** DUE	31 Thu	

A PDF copy will be on LMS under Unit Information

Penalty for late work: five percentage points (5%) per day (includes Saturday and Sunday)

Communication: Do not expect an answer to an email outside of business hours (Monday – Friday, 9.00 – 17.00) (Although I may). Please also provide at least 24 hr, as sometimes we couldn't get to all the emails within a day. And if you did not get an answer after 48 hr, please follow up with another email (unless is super urgent).

Please check the "Announcement" section in the unit's LMS page before sending an email. Your question may have already been addressed.

Plagiarism: any doubts about what constitutes plagiarism, see

http://www.teachingandlearning.uwa.edu.au/staff/policies/conduct

PLAGIARISM DETECTION SOFTWARE USED FOR WORKSHEET SUBMISSION – TURNITIN

A few words of advice from Dr Mark Waters (Academic Misconduct Officer)

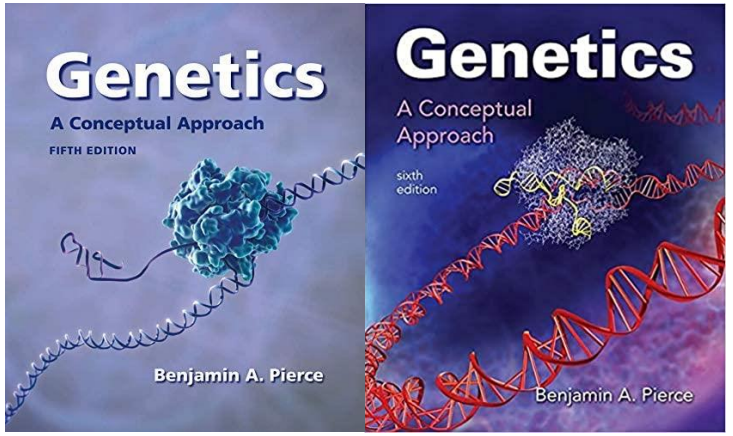
Can I use ChatGPT and other AI tools in my assessments?

UWA's Academic Integrity Policy allows for the limited use of AI in research, study and assessment. The policy permits you to use AI as educational and study tools. You can use them to assist in your research, your study, and for broad editorial assistance in your writing.

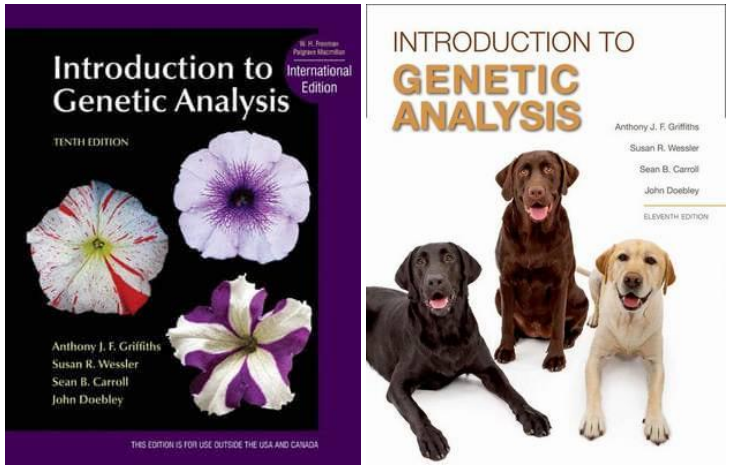
AI tools **may only be used** in an assessment where it is **explicitly permitted** by your Unit Coordinator. And in the case for the GENE4002 Worksheets – the answer is NO (Warning that we often find the answers are wrong).

Unit Readings:

Textbooks: Benjamin A. Pierce
Genetics A Conceptual Approach (c 2014, 5th edition)
– an e-copy of this book should be available via the library.



A.J.F. Griffiths, S.R. Wessler, S.B. Carroll & J. Doebley
Introduction to Genetic Analysis (c 2012, 10th edition)



See LMS for Online Copy

Copies of various editions of both textbooks are available in the BJ Marshall Library

GENE4002

- **Quizzes and worksheets will be available the day following the corresponding tutorials***

If you do not see the expected quizzes or worksheet automatically made available on LMS, please email the Unit Coordinator knows immediately (sometimes they were not released on time due are errors in settings on LMS).

Enjoy and Good Luck for this Unit!