

Molecular Evolution							
Course Code	DIC 8007						
Credits	Three (3 hr per week)						
Organizers	Ryuji Machida, Jen-Pan Huang, Shu-Miaw Chaw, Chung-Ping Lin						
Lecturers	Ryuji Machida, Jen-Pan Huang						
Time	Wednesday 9:10-12:20						
Place	Biodiversity Research Center, AS (Text book week @ B204 Interdisciplinary building; Hand-on week @ B15 Green house building)						
Prerequisites	Population Genetics and Evolution						
Remark	No more than 7 students						
Description	<p>Target students of the class is molecular beginner those who had never (or very small experience) used molecular biology technique on their project.</p> <p>The class has two components, lecture and hands-on training (every other week).</p> <p>The lecture will cover basic molecular evolution.</p> <p>Hands-on training start from sampling practices, pipetting to NGS library preparation and basic sequence analyses.</p>						
Purpose	<ol style="list-style-type: none"> 1. Students will learn the basic molecular evolution, both concept and experiment practice. 2. Once the course is completed, the student should be able to perform molecular experiment of the samples those collected from fields. 						
Reference	<p>Textbook</p> <p><u>An Introduction to Molecular Evolution and Phylogenetics</u>, Second Edition by Lindell Bromham (Oxford University Press, 2016)</p>						
Grade	<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Midterm exam:</td> <td style="text-align: right;">25%</td> </tr> <tr> <td>Final exam:</td> <td style="text-align: right;">25%</td> </tr> <tr> <td>Attendance & Discussion</td> <td style="text-align: right;">50%</td> </tr> </table>	Midterm exam:	25%	Final exam:	25%	Attendance & Discussion	50%
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	Date	Topic
Week 1	3/4	Textbook Week 01: Introduction (Chaw& Machida & Huang)
Week 2	3/11	Textbook Week 02: DNA (Huang)
Week 3	3/18	Hands-on Week 01 (Machida) Introduction and pipetting
Week 4	3/25	Textbook Week 03: Mutation (Huang)
Week 5	4/1	Hands-on Week 02 (Machida) DNA extraction and RNA handling. How to select kit. Read manual.
Week 6	4/8	Textbook Week 04: Replication (Huang)
Week 7	4/15	Hands-on Week 03 (Machida) What you need at sampling. Gel electrophoresis.
Week 8	4/22	Mid-term exam: (Machida & Huang)
Week 9	4/29	Textbook Week 05: Genome (Huang)
Week 10	5/6	Hands-on Week 04 (Machida) PCR. Primer design.
Week 11	5/13	Textbook Week 06: Gene (Huang)
Week 12	5/20	Hands-on Week 05 (Machida) Sanger Sequence and Next Generation Sequencing
Week 13	5/27	Textbook Week 07: Alignment (Huang)
Week 14	6/3	Hands-on Week 06 (Machida) Handling of NCBI data. BLAST search.
Week 15	6/10	Textbook Week 08: Phylogeny (Huang)
Week 16	6/17	Final exam: (Machida & Huang)