

Course Title	Advanced Plant Breeding		
Instructor	Tsutomu KUBOYAMA		
Code	MA050700	Semester	1st (April-)
Credit(s)	1	Day/Period	Thu, 2
Description Code	A-PEA-612		
Outline	This lecture presents basic theory of plant breeding for the genetic improvement of plants. Topics include qualitative and quantitative traits, breeding techniques for major self-pollinating and cross-pollinating crops, development of hybrid varieties. In addition, this lecture also provides an introduction to Biotech crops, DNA markers and marker assisted breeding.		
Keywords	genetics, hybrid, cross pollination, self pollination, DNA markers, marker assisted selection, QTL, transgenic, genetic modified (GM) crops		
Goals	Upon completion of this course, student will 1. Apply the basic theory of plant breeding for genetic improvement of plants, 2. Understand how Biotech crops are made and how they are applied to modern agriculture, 3. Understand what DNA markers are, how to make them and how they are used in marker assisted selection. [Diploma policy] 1 Academic and research skills in the specialized field		
Course Plan	1. Introduction 2. Basic theory of Plant Breeding 3. Impact of Genomics on Plant Breeding 4. DNA markers 5. QTL analysis 6. Marker assisted selection 7. Genetic modified crops 8. Reproductive barriers in plants		
Advice for Preview and Review	Students should read text books before lectures. Question about textbooks should be asked in this lecture. After lectures, please check words and concepts which were difficult to understand in the library or www.		
Prerequisite	Students will be required to read textbooks before lectures. In addition, students will make a presentation about the topics of the day.		
Grading Criteria	Presentation (50%) and answers to questions from the lecturer (50%).		
Texts/References	Principles of Plant Genetics and Breeding, George Acquaah, Wiley-Blackwell; 2 ed (2012/10/1) ISBN-13: 978-0470664759 Essential Genetics: A Genomics Perspective, Hartl, Daniel L., Ph.D., Jones & Bartlett Pub; 6 ed, ISBN-13: 978-1449686888		