Module Code	21349030	Course Term	
Course Subject Name	**Agri-Food Production System Engineering**	Autumn Semester	
Course Tutor	**Yasumaru Hirai**		
Credit	2	Taught Day	
Schools	School of Agriculture	**WED-3**	
Taught Year			
Campus	Ito campus		
Subject Area			
Course Subject Classification	Specialized Subject	Wednesday, 3rd period (13:00-14:30)	
Course Requirements			
Course Requirement (Pre-requisite)	Basic knowledge in Elementary Calculus, Ordinary High School Physics and Mathematics		

Course Outline

Agri-food production system engineering is essential to develop production, processing and distribution systems for safety, security and high quality agri-foods. In this course, students can learn current situation of agricultural production and acquire fundamental knowledge regarding "agricultural machinery", "agro-informatics", and "heat and mass transfer" used in the Agri-food production system engineering.

key words

Agricultural machinery, Agro-informatics, Heat and mass transfer, ICT (information and communication technology), Postharvest processing, Sensor, Social networking services, Sustainable agriculture

Study Objectives (General)

Study Objectives (Specific)

Students understand history and trend of agricultural mechanization in Japan.
Students understand power generated by prime movers such as engines and electric motors.
Students understand agricultural work (tillage, transplanting, harvesting) by agricultural machinery.
Students understand basic knowledge and technologies related to smart agriculture based on ICT
Students learn about how to use these knowledge and technologies in agriculture
Students understand the fundamentals of heat transfer

Course Plan

1. History of the mechanization of rice production in Japan (10/6) (Yasumaru HIRAI)
2. Prime movers(10/13) (Yasumaru HIRAI)
3. Rice harvesting machines (10/20) (Yasumaru HIRAI)
4. Trend of mechanization in Japan for improvement of agricultural production I (10/27) (Eiji INOUE)
5. Trend of mechanization in Japan for improvement of agricultural production II (11/10) (Eiji INOUE)
6. Fundamental of heat transfer for good understanding postharvest systems (11/17) (Fumihiko TANAKA)
7. Application of CFD to postharvest system design and optimization 1 (11/24) (Fumihiko TANAKA)
8. Application of CFD to postharvest system design and optimization 2 (12/1) (Fumihiko TANAKA)
9. Introduction to food value chain (12/8) (Fumina TANAKA)
10 Fundamental knowledge on ICT in agriculture (12/15) (Takashi OKAYASU)
11 Fabrication challenge using an open-source physical computing platform I (12/22) (Takashi OKAYASU)
12 Fabrication challenge using an open-source physical computing platform II (1/12) (Takashi OKAYASU)
13 Fabrication challenge using an open-source physical computing platform III (1/19) (Takashi OKAYASU)
14 Plant growth sensing and analysis using computer vision (1/26) (Takashi OKAYASU)
15 (2/2, 2/9) Extra day

Course Approaches	1. This course will involve lectures, student presentation, computer exercises, and fabrication of sensing device using a microcomputer "Arduino". 2. Students will have opportunities to take small tests, make presentations and submit report assignments. 3. Several lectures will use a computer (Microsoft Excel).
Textbooks	Learning materials will be provided by the instructors.
Reference Books	
Study consultation (office hour)	Yasumaru HIRAI Office: West Bldg. 5 #836a Office Hours: 16.30-17.30 (Wednesday) Email: hirai@bpes.kyushu-u.ac.jp Phone: Hirai 092-802-4634 Eiji INOUE Office: West Bldg. 5 #878 Office Hours: 16.30-17.30 (Monday) Email: inoeiji@bpes.kyushu-u.ac.jp Phone: 092-802-4633 Fumihiko TANAKA Office: West Bldg. 5 #873 Office Hours: 16.30-17.30 (Monday) Email: fumit@bpes.kyushu-u.ac.jp Phone: 092-802-4636 Takashi OKAYASU Office: West Bldg. 5 #877 Office Hours: 16.30-17.30 (Wednesday) Email: okayasu@bpes.kyushu-u.ac.jp Phone: 092-802-4632 Fumina TANAKA Office: West Bldg. 5 #874 Office Hours: 16.30-17.30 (Wednesday) Email: fuminat@bpes.kyushu-u.ac.jp Phone: 092-802-4637
Exams/Results Evaluation Method	Hirai(Lecture 1-3): Attendance : 60%, Report: 40% Inoue(Lecture 4-5): Attendance : 60%, Report: 40% Tanaka & Tanaka(Lecture 6-9): Attendance : 60%, Report: 40% Okayasu(Lecture 10-14): Attendance : 30%, Report: 40%, Fabrication: 30%
Others	Please enroll in this course in the moodle system from the following URL. https://moodle.s.kyushu-u.ac.jp/course/view.php?id=30976