Description: Agricultural Materials And Crop Storage

Subject Cat-Nbr Class Term Mode Units Campus
AGR 3303 21166 1, 2003 ONC 1.00 TWMBA

Academic Group: FOENS
Academic Org: FOES03
HECS Band: 2
ASCED Code: 039999

STAFFING
Examiner: Guangnan Chen
Moderator: Rod Smith

SYNOPSIS
The handling, grading, storage, packaging and processing of agricultural produce are all important parts of the agricultural production and distribution system and frequently involve costs in excess of those associated with simply growing the crop. A knowledge of, the physiological, physical, thermal, aerodynamic, rheological, electrical and optical properties of agricultural materials is highly relevant to these areas. Such knowledge may be used for the purposes of devising techniques for grading, sorting, separation, moisture determination, flow rate prediction, the design of packaging and the determination of stresses in large storage structures. Post harvest treatments against pests and diseases are considered as well as modified atmosphere storage and controlled atmosphere storage for extending shelf life. The fundamentals of waste management and some basic aspects of food processing technology are also considered.

OBJECTIVES
On completion of this course, students should be able to:

- list and define the relevant physical properties of agricultural materials;
- discuss, measure and calculate rheological parameters;
- describe aerodynamic and hydrodynamic characteristics;
- discuss the importance of physiological and environmental factors to quality of horticultural produce;
- appreciate the scope for and limitations of irradiation and other treatments in maintenance of quality;
- discuss the causes and consequences of mechanical damage;
- describe and measure material properties of granular materials, and understand their dynamic and static behaviour;
• compare various materials handling systems;
• discuss the requirements for proper post harvest management of crops and fruits;
• understand the principles of separation, sorting and grading;
• understand the physiological and environmental factors influencing quality of horticultural produce and specify appropriate post harvest technology;
• determine the requirements for good packaging;
• discuss the principles of waste management;
• describe available technologies for food processing and their commercial use.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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</thead>
<tbody>
<tr>
<td>1. Physical properties</td>
<td>6.00</td>
</tr>
<tr>
<td>2. Basic concepts of rheology</td>
<td>6.00</td>
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<tr>
<td>3. Aero and hydrodynamic characteristics</td>
<td>4.00</td>
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<tr>
<td>4. Separation processes</td>
<td>4.00</td>
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<tr>
<td>5. Physiological/environmental factors influencing produce quality</td>
<td>8.00</td>
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<tr>
<td>6. Mechanical damage</td>
<td>8.00</td>
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<tr>
<td>7. Controlled atmosphere, aeration, freezing and cooling</td>
<td>11.00</td>
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<tr>
<td>8. Post harvest treatments for disease and insect control</td>
<td>3.00</td>
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<tr>
<td>9. Irradiation of food and agricultural produce</td>
<td>2.00</td>
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<tr>
<td>10. Grading Packaging and transport</td>
<td>12.00</td>
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<tr>
<td>11. Behaviour of granular materials</td>
<td>8.00</td>
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<tr>
<td>12. Bulk storage of granular materials</td>
<td>10.00</td>
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<tr>
<td>13. Materials handling</td>
<td>8.00</td>
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<tr>
<td>14. Waste management</td>
<td>4.00</td>
</tr>
<tr>
<td>15. Aspects of food processing technology</td>
<td>6.00</td>
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</tbody>
</table>

**TEXT and MATERIALS required to be PURCHASED or ACCESSED:**

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

McGlasson, W., Lee, G. & Hall *Post Harvest*, 4th edition, NSW University Press,
REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


Mohsenin, N. N. *Thermal Properties of Plant and Animal Materials*, Gordon and Breach,


STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assessment</td>
<td>24</td>
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<tr>
<td>Directed Study</td>
<td>30</td>
</tr>
<tr>
<td>Examinations</td>
<td>3</td>
</tr>
<tr>
<td>Lectures</td>
<td>39</td>
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<tr>
<td>Private Study</td>
<td>46</td>
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<tr>
<td>Tutorials or Workshops</td>
<td>13</td>
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</table>

ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>200.00</td>
<td>20.00</td>
<td>Y</td>
<td>17 Apr 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>200.00</td>
<td>20.00</td>
<td>Y</td>
<td>23 May 2003</td>
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<tr>
<td>3 HOUR CLOSED/OPEN EXAMINATION</td>
<td>600.00</td>
<td>60.00</td>
<td>Y</td>
<td>END S1 (see note )</td>
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</table>

NOTES:

- Student Administration will advise students of the dates of their examinations during the semester.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2 Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for each assessment item.

3 Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval then a penalty of 20% of the total marks available for the assignment will apply for each working day late.

4 Requirements for student to be awarded a passing grade in the course:
   To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by satisfactorily completing all summative assessment items (the examination and assignments), as stated in 2 above.

5 Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.

6 Examination information:
   The examination in this course is a combined examination. Part A is a Closed examination of 1 hour duration and 200 marks have been allocated for this part. Part B is an Open examination of 2 hours duration and 400 marks have been allocated for this part. In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination. In an Open Examination, candidates may have access to any material during the examination except the following: electronic communication devices, bulky materials, devices requiring mains power and material likely to disturb other students.

7 Examination period when Deferred/Supplementary examinations will be held:
   Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.

8 University Regulations:
   Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL: http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the current USQ Handbook.

**ASSESSMENT NOTES**

1 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.
2 Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

3 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.

5 The Faculty will NOT accept submission of assignments by facsimile.

6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.

7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

8 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

9 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

10 The Faculty of Engineering and Surveying does not offer supplementary examinations.