FIRST YEAR
RDS 111

DENTAL ANATOMY, MORPHOLOGY AND
INTRODUCTION TO OPERATIVE DENTISTRY

Course Director (DUC)

PROF. ALI M. EL-SAHN

Course Contributors:

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Dr. H. Al Fawaz, Dr. R. Turkson and Dr. A. Loto
COURSE DESCRIPTION

Dental Anatomy is provided by the RDS Department in the first semester during the first year of the BDS program. It is a (1+1+0) course, equivalent to 2 credit hours.

FIRST SEMESTER

DENTAL ANATOMY

This component is designed to provide the student with the basic elements of tooth morphology as an essential pre-requisite for other dental courses. The course comprises lectures and practical sessions. Using wax, students restore the missing coronal surfaces of complete tooth models by a wax carving technique. This is designed to reinforce the theoretical knowledge gained in the lectures, as well as contribute towards the development of manual dexterity, a skill which is essential in the practice of dentistry. Identification of natural tooth specimens forms a significant part of the practical component of the course.

COURSE OBJECTIVES: At the end of the 1st semester the students should be able to:

1. Apply the terms and expressions used in dental anatomy and morphology with proficiency.
2. Record teeth, using different notations, but with particular emphasis on the method recommended by the International Dental Federation (FDI).
3. Understand the relationship of teeth to one another as well as the relation between the adjacent and opposing teeth
4. Understand the teeth alignments, articulation and the self-protective feature of the dentition.
5. Distinguish the morphological characteristics of different kinds of teeth. Thus, there are traits which separate the teeth of the upper from the lower arches, the molars from the incisors and the first molar from the second molar.
6. Develop his/her manual skills by carving in wax the different missing surfaces of all teeth.
7. Restore in casting wax, the missing surfaces in Dentoform by carving to normal anatomical and morphological features.
8. Drawing to scale two dimensions of all teeth following the lectures outline, using the table of measurements provided.

Important Note: Each student should collect natural teeth, clean and keep them in 10% formaline. Fail to do this will affect his/her progress and grades.
RECOMMENDED TEXTBOOKS

Either

1. Wheeler’s Dental Anatomy, Physiology and Occlusion
   8th edition 2003
   ASH and NELSON,
   W.B. Saunders Company

2. Dental Anatomy: Its relevance to Dentistry
   Julian B. Woelfel
   7th ed. 2007 Lea & Fabiger
**111 RDS**  
**LECTURE SCHEDULE**  
**(DUC)**  
**FIRST SEMESTER**  

**COURSE DIRECTOR: PROF. ALI EL SAHN**

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<th>WEEK</th>
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<tr>
<td>1</td>
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<td>Introduction to Dental Morphology</td>
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<td>2</td>
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<td>Tooth Anatomy and Notation</td>
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<td>3</td>
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<td>Dental Terminology of Permanent Dentition</td>
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<td>4</td>
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<td>Descriptive anatomy of Maxillary Permanent incisors</td>
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<td><strong>RAMADAN VACATION</strong></td>
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<td>Descriptive anatomy of Mandibular Permanent incisors</td>
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<td>Descriptive anatomy of Maxillary and Mandibular Permanent canines</td>
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<td><strong>MID-SEMESTER EXAMINATION</strong></td>
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<td>8</td>
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<td>Articulation of teeth</td>
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<td>Descriptive anatomy of Maxillary Permanent Premolars</td>
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<td>Descriptive anatomy of Maxillary 1st Permanent Molars</td>
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<td>Descriptive anatomy of Maxillary 2nd &amp; 3rd Permanent Molars</td>
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<td><strong>HAJ VACATION</strong></td>
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<td>13</td>
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<td>Descriptive anatomy of Mandibular 1st Permanent Molar</td>
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<td>Descriptive anatomy of Mandibular 2nd &amp; 3rd Permanent Molars</td>
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<td>15</td>
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<td>The Deciduous Dentition</td>
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<td>16</td>
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<td><strong>MID-YEAR WRITTEN EXAMINATION</strong></td>
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*All Lectures will be given by the Course Director.*
1. **Introduction to Dental Morphology I**
   - Outline of the course. Grading system and attendance.
   - Structures that form the foundation of teeth “Jaws”
   - Teeth – “Primary, Mixed and Permanent Dentition – Development Data (Lobes) “terms of reference in both identification”
     - Dental formula of Permanent Dentition
     - Function of teeth

2. **Tooth Anatomy and Notation**
   a) The macro anatomy of teeth
      - Crown A/C
      - Neck
      - Root
      - Pulp
      - Enamel Dentin
      - Amelocemental junction
      - Cementum Dentin
      - Chamber and RC
   b) Tooth numbering systems

3. **Dental Terminology of Permanent Dentition**
   a) Tooth surfaces and divisions of the crown
   b) Landmarks of teeth.
      These will include:
      A) Elevations
         - Cusps
         - Tubercle
      B) Depressions
         - Fossae (Central, Marginal) → Pits
         - Grooves → Fissures
      C) Cingulum
      - Ridges
   c) Trait categories

4. **Descriptive anatomy of Maxillary Permanent incisors from different aspects.**

5. **Descriptive anatomy of Mandibular Permanent incisors from different aspects.**
6. Descriptive anatomy of Maxillary and Mandibular Permanent canines from different aspects.

7. Mid-semester examination.

8. Articulation and alignment of teeth.

9. Descriptive anatomy of Maxillary Permanent Premolars from different aspects.

10. Descriptive anatomy of Mandibular Permanent Premolars from different aspects.

11. Descriptive anatomy of Maxillary 1st Permanent Molar from different aspects.

12. Descriptive anatomy of Maxillary 2nd & 3rd Permanent Molars from different aspects.

13. Descriptive anatomy of Mandibular 1st Permanent Molar from different aspects.

14. Descriptive anatomy of 2nd and 3rd mandibular permanent molars from different aspects.

15. The deciduous dentition.
   - Dental formula of deciduous teeth.
   - Morphological differences between deciduous and permanent dentition.

16. Mid-year examination.
# PRACTICAL SESSIONS

**FIRST SEMESTER 2007/2008**

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<th>WEEK</th>
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| 1    |      | A) Laboratory Orientation: seating arrangement, storage boxes, air gas control.  
      |      | B) Identification of permanent Dentition: Incisors, canines, premolars and molars. “Plaster models” |
| 2    |      | A) The macro anatomy of teeth: Section on a tooth models.  
      |      | B) Numbering systems : Dentoform or plaster models.  
      |      | C) Methods of calibration of anterior and posterior teeth, and introduction to drawing. |
| 3    |      | A) Identification of tooth surfaces and crown divisions  
      |      | B) Landmarks of teeth : Dentoform or plaster models.  
      |      | C) Identification of waxing instruments and uses.  
      |      | D) Demonstration for waxing and carving of the labial aspect of maxillary central incisor “plaster models” |
| 4    |      | Waxing and carving the labial aspect of maxillary central incisor “plaster models” |
|      |      | **RAMADAN VACATION** |
| 5    |      | A) Waxing and carving the lingual aspect of maxillary left central incisor “plaster models” |
|      |      | B) Identification of permanent central and lateral incisors “natural teeth” |
| 6    |      | A) Waxing and carving the mesial aspect of maxillary left canine “plaster models” |
|      |      | B) Identification of permanent maxillary and mandibular canines “natural teeth” |
|      |      | **MID-SEMESTER LABORATORY ASSESSMENT** |
| 8    |      | A) Implementation of the importance of occlusion, contacts, interproximal spaces, Embrasures and contours.  
      |      | B) Full crown waxing and carving of maxillary canine “Dentoform”.  
      |      | Dentoform and/or plaster models |
| 9    |      | A) Waxing and carving of maxillary left 2nd premolar “Dentoform” |
| 10   |      | A) Waxing and carving of mandibular 1st premolar “Dentoform”  
      |      | B) Identification of permanent maxillary and mandibular premolars. “Natural teeth” |
| 11   |      | A) Waxing and carving of maxillary 1st left molar “Dentoform”. |
| 12   |      | A) Catch-up session.  
      |      | B) Identification of maxillary molars. “natural teeth” |
|      |      | **HAJ VACATION** |
| 13   |      | A) Waxing and carving of mandibular 1st molar. “Dentoform” |
| 14   |      | A) Waxing and carving of mandibular 2nd molar. “Dentoform”  
      |      | B) Identification of mandibular molars “natural teeth”. |
| 15   |      | A) Identification and comparison between permanent and deciduous teeth “Natural teeth or models”  
      |      | B) Revision |
| 16   |      | **MID-YEAR LABORATORY ASSESSMENT** |

**NOTE:**  
1. The drawing projects are home assignment, should be checked and graded every week before you start your waxing projects.  
2. Waxing project should be finished and submitted for evaluation and grading by the end of your weekly session.
The continuous practical evaluation will be on the following exercises. (5 Marks each)

1. Waxing of labial aspect of maxillary central incisor
2. Waxing of lingual aspect of maxillary central incisor
3. Waxing of mesial aspect of maxillary canine
4. Waxing of full maxillary canine
5. Waxing of maxillary 2nd premolar
6. Waxing of mandibular 1st premolar
7. Waxing of maxillary 1st molar
8. Waxing of mandibular 1st molar
9. Waxing of mandibular 2nd molar

Final Laboratory consists of:

1. Waxing of one maxillary tooth on dentoform. Time allowed:
   
   1:15 mins. 10 pts.

2. Ten stations of natural teeth identification. Time allowed:
   - 11/2 min per station

**EVALUATION:** To pass this course successfully, students must pass both theoretical and practical component separately.

A. **THEORY**

1. Quizzes (each lecture)
2. Mid-sem. Written Examination

3. Final Written Examination

B. Practical

1. weekly practical projects
2. 1st In-Course Practical Examination
3. Drawing projects
4. Final teeth identification

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<td>DRAWING PROJECTS</td>
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TOTAL 100%  100
CHECKLIST: PRACTICAL SESSION #1

PART A - LABORATORY ORIENTATION

1. SEATING ARRANGEMENTS

   Divide students into Groups A, B and C as appropriate
   Note: Students are requested to sit at the same place for every practical session. Seating chart will be prepared by the third week.

2. STUDENTS' STORAGE BOXES

   Students to label their boxes. NAME and GROUP to be written legibly in English and Arabic.

3. STUDENTS TO PROVIDE THE FOLLOWING ITEMS BY THE NEXT PRACTICAL SESSION:
i] Old nylon socks
ii] Tissue paper
iii] Lighters

4. **AIR\GAS CONTROLS**
   Demonstration including bunsen burners and working lamps.

5. **SAFETY PRECAUTIONS**
   Bunsen burners and working lamps

**PART B - TUTORIAL (Small Group Teaching)**

This is based on the content of Lecture 1 (Dental Terminology)

1. Demonstration of the human skull, mandible and dental arches.
2. Identification of the 2 dentitions and classes of teeth: Incisors, Canines, Premolars and Molars.
3. Identification of the parts of natural teeth including the hard dental tissues and pulp cavity.

**CHECKLIST : PRACTICAL SESSION #2**

**A. ARMAMENTARIUM**

1. Drawing pencil, 3H or 4H, sharpened to a fine point.
2. Eraser.
4. Boley gauge.
B. DEMONSTRATION OF DRAWING OF TEETH

3. Directions for drawing.
4. Use the following six measurements:
   - Crown length
   - Mesiodistal crown
   - FacioLingual crown
   - Rooth length
   - Mesiodistal cervix
   - FacioLingual cervix

CHECKLIST: PRACTICAL SESSION #3

A. ARMAMENTARIUM

1. Instruments issue.
2. Give students handouts on waxing instruments; Instrument identification - names and uses.
3. Briefly introduce wax to students - its nature and uses.

B. WAXING TECHNIQUE
1. Sitting position, instrument hold and waxing technique.


3. Students practice waxing technique as above (no grading).

Note: Grading of weekly projects commences on the 3rd week of semester.

Note: Students are requested to sit at the same place for every practical session. Seating char. will be prepared by the third week.

TOOTH IDENTIFICATION

One of the main objectives of this course is that the student should be able to identify natural teeth according to their:

1. SET : Permanent or Deciduous?
2. CLASS : Incisor, Canine, Premolar or Molar?
3. ARCH : Maxillary or Mandibular?
4. TYPE : Incisor (Central or Lateral?) Premolar (first or second?) Molars (first, second or third?)
5. QUADRANT : Right or Left?

A systematic approach is recommended although in naming a tooth anatomically, the order will be different from the sequential steps used in the identification process. For example, it is usual to name a tooth thus:

"Right mandibular first permanent molar" rather than:

"Permanent molar maxillary first right".

It is helpful for the student to ask himself the following questions:

1. DOES THE TOOTH BELONG TO THE DECIDUOUS OR PERMANENT SET OF DENTITION?

Know the differences between permanent and deciduous teeth especially with respect to colour, shape, size, etc.

2. TO WHAT CLASS DOES IT BELONG?

To be able to do this, you must know the class traits of the various teeth. For example what features do all incisors have in common that distinguish them from other classes of teeth i.e., canines, premolars, or molars?

SECOND SEMESTER

Introduction to Operative Dentistry
OBJECTIVES

At the end of the second semester, students should be able to:

1. Diagnose lesions of hard tooth tissues and in particular dental caries, excavate carious lesions and cleave unsupported enamel of mounted extracted teeth, using suitable hand instruments.

2. Classify carious lesions and recognize approximal caries on a bitewing radiograph.

3. Identify the various hand and rotary instruments used in Operative Dentistry.

4. Know methods of isolation of the operative field and apply the RD.

5. Name the parts of a prepared simple and compound cavities.

6. Prepare shapes resemble class I and V for amalgam and manipulate rotary and hand instruments.

FORMAT

The course will comprise practical exercises and seminars. There will be in-course and end-of-course assessments, mostly in the form of objective structured practical examinations (OSPE). The weekly practical exercises will also be assessed.

RECOMMENDED TEXTBOOK

1. Schwartz
   Fundamentals of Operative Dentistry: A Contemporary Approach
### 111 RDS

**LECTURE SCHEDULE (DUC)**

**SECOND SEMESTER**

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<tr>
<td>1</td>
<td></td>
<td>An Introduction to Operative Dentistry</td>
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<td>2</td>
<td></td>
<td>Instruments and Instrumentation used in Operative Dentistry (1)</td>
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<td>Instruments and Instrumentation used in Operative Dentistry (2)</td>
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<td>Instruments and Instrumentation used in Operative Dentistry (3)</td>
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<td>5</td>
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<td>Instruments and Instrumentation used in Operative Dentistry (4)</td>
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<td>6</td>
<td></td>
<td>Dental Cariology I</td>
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<td>7</td>
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<td>Dental Cariology II</td>
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<td><strong>MID-SEMESTER EXAM</strong></td>
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<td>9</td>
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<td>Instruments used for isolation of operative field (1)</td>
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<td>10</td>
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<td>Instruments used for isolation of the operative field (2)</td>
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<td>11</td>
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<td>The general fundamental principles of cavity preparation</td>
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<td>12</td>
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<td>Steps of cavity preparation</td>
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<td>13</td>
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<td>The amalgam restoration</td>
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<td>14</td>
<td></td>
<td>Class I cavity preparation for amalgam restoration</td>
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<tr>
<td>15</td>
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<td>Class V cavity preparation for amalgam restoration</td>
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*All Lectures will be given by the Course Director*
LECTURE DESCRIPTION

SECOND SEMESTER

1. An Introduction to Operative Dentistry:
   Definition, Scope, and Objective

2. Dental Cariology I
   Etiology, epidemiology, classification, spread pattern,

3. Dental Cariology II
   Diagnostic methods, preventive measures

4. Instruments used in Operative Dentistry (1):
   General classification
   Hand instruments (A): design, nomenclature, instrument formula, contra-angling principles, examination instruments, hand cutting instruments direct and lateral cutting instruments, types and uses, instrument grasp.

5. Instrument used in Operative Dentistry (2)
   Hand instruments (B): 1. Hand instruments for manipulation of restorative material.
   2. Care of hand instruments

6. Instruments used in operative dentistry (3)
   Rotary instruments: 1) Historical development, types of hand pieces.
   2) General classification
   3) Burs
7. **Instruments used in Operative Dentistry (4):**

   Rotary instruments (2)  
   Abrasives  
   Points, stones, discs  
   Sterilization of the instruments

8. **Mid-Semester Exam.**

9. **Instruments used for isolation of the operative field (1):**

   Rubber dam equipments (Punch, forceps, holder clamps), saliva ejectors, evacuating tips and equipments.

10. **Instruments used for isolation of the operative field (2):**

    Rubber dam application

11. **The general fundamental principles of cavity preparations**

    Cavity classification and nomenclature.  
    Fundamental principles.

12. **Steps of cavity preparation:**

    Definitions and importance.

13. **Class I cavity preparation for amalgam restoration:**

    Definition, types, characteristics, application of the principles, procedural steps.

14. **Class V cavity preparation for amalgam restoration:**

    Definition, types, modification, characteristics, application of the principles, procedural steps.
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<tr>
<td>1</td>
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<td>Introduction to Phantom Lab. Demonstration on seating positions. Demonstration for mounting natural teeth</td>
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<tr>
<td>3</td>
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<td>Identification of: A) Instrument used for manipulation B) Care of the hand instruments C) Oral evaluation of the Hand Instrument I</td>
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<td>A) Identification and description of hand pieces and burs. B) Drawing the student name using hand piece and burs on side of Ivorine teeth.</td>
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<td>A) Identification and classification of abrasives. B) Oral evaluation of all instruments</td>
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<td>Showing the different shapes of caries lesions using radiograph films</td>
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<td>MID-SEMESTER LABORATORY ASSESSMENT</td>
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<td>9</td>
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<td>Demonstration of rubber dam equipments</td>
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<td>Demonstration and application of RD on maxillary first molar #16.</td>
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<td>12</td>
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<td>A) Introduction to instrumentation of Ivorine teeth. “H-shape” B) RD application on mandibular first molar #36.</td>
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<td>13</td>
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<td>A) Introduction to amalgam restoration B) introduction to instrumentation of ivorine teeth. “Trapizoid”</td>
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<td>REVISION/FINAL LABORATORY ASSESSMENT</td>
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EVALUATION: To pass this course successfully, students must pass both theoretical and practical component separately.

A. THEORY
1. Quizzes (each lecture)
2. Mid-semester. Written Examination
3. Final Written Examination

B. Practical
1. Weekly practical projects
2. 1st In-Course Practical Examination
3. Final Practical Examination

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(UPDATED course outline: September 9, 2007)