## Subject Description Form

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>EIE565</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Title</td>
<td>Advanced Multimedia Technology</td>
</tr>
<tr>
<td>Credit Value</td>
<td>3</td>
</tr>
<tr>
<td>Level</td>
<td>5</td>
</tr>
<tr>
<td>Pre-requisite/Co-requisite/Exclusion</td>
<td>Nil</td>
</tr>
</tbody>
</table>

### Objectives

This course is designed to provide students with the theories and practices of current multimedia technologies. After the completion of the module, the student should be able to appreciate a wide range of techniques and standards adopted by the multimedia industry, as well as the current development of the technologies. These include the understanding of multimedia system architecture and requirements, multimedia information management, human and body animation, multimedia security and digital rights management, etc.

### Intended Learning Outcomes

Upon completion of the subject, students will be able to:

**Category A: Professional/academic knowledge and skills**

a. Understand the current state-of-the-art developments in multimedia technologies  
b. Understand the different multimedia standards and the technologies.  
c. Understand the techniques for multimedia signal processing.

**Category B: Attributes for all-roundedness**

d. Think critically and creatively.  
e. Assimilate new technological and development in related fields.

### Subject Synopsis/Indicative Syllabus

1. **Introduction to Multimedia Systems and Standards**  
   a. Multimedia System Requirements and Multimedia Computing  
   b. Needs for Multimedia Standards  
   c. Overview of Multimedia Standards

2. **Face Detection, Recognition, Animation, and Applications**  
   a. Face Detection, Tracking and Recognition  
   b. Face Modelling and Animation  
   c. Talking-head Animation: MPEG-4 Facial Animation

3. **Audio-Video Analysis and Retrieval**  
   a. Content-based Image Retrieval  
   b. Content-based Video Retrieval: Scene Break Detection, Key Frame Representation, Indexing, Retrieval

4. **Multimedia Information Security and Digital Rights Management (DRM)**  
   a. Overview of DRM Systems, DRM in Consumer Electronics, Authentication Techniques  
   b. Audiovisual Data Confidentiality, Integrity and Copyright Protection  
   c. Watermarking Techniques, Applications and Attacks
Teaching/Learning Methodology

Lectures: Fundamental principles, current multimedia standards, and key concepts and technologies of the subject are delivered to students.

Tutorials: Students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed.

Laboratory Sessions: Students will conduct laboratory exercises on some of the following topics: Face recognition, Image retrieval and relevance feedback, Multimedia protection.

<table>
<thead>
<tr>
<th>Teaching/Learning Methodology</th>
<th>Intended Subject Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Lectures</td>
<td>✓</td>
</tr>
<tr>
<td>Tutorials</td>
<td>✓</td>
</tr>
<tr>
<td>Laboratory sessions</td>
<td>✓</td>
</tr>
</tbody>
</table>

Assessment Methods in Alignment with Intended Learning Outcomes

<table>
<thead>
<tr>
<th>Specific assessment methods/tasks</th>
<th>% weighting</th>
<th>Intended subject learning outcomes to be assessed (Please tick as appropriate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tests</td>
<td>25%</td>
<td>a</td>
</tr>
<tr>
<td>2. Assignments</td>
<td>20%</td>
<td>✓</td>
</tr>
<tr>
<td>3. Examination</td>
<td>35%</td>
<td>✓</td>
</tr>
<tr>
<td>4. Laboratory</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>✓</td>
</tr>
</tbody>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignments, Tests, & Examination: These are used to evaluate the students’ ability in applying concepts and skills learnt in the classroom. Students need to think critically and to learn independently in order to come up with an alternative solution to an existing problem.

Laboratory: Students will be assessed about the performance on applying the multimedia technologies that they have learnt. Students are required to produce a written report, and the accuracy and presentation of the report will be assessed.

Student Study Effort Expected

Class contact:
- Lectures 26 Hrs.
- Tutorials 13 Hrs.

Other student study effort:
- Laboratory 6 Hrs.
- Self-study, assignments, reports 60 Hrs.

Total student study effort 105 Hrs.

Reading List and References

References:

June 2016