**Subject Description Form**

<table>
<thead>
<tr>
<th><strong>Subject Code</strong></th>
<th>COMP 5422</th>
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</thead>
<tbody>
<tr>
<td><strong>Subject Title</strong></td>
<td>Multimedia Computing, Systems and Applications</td>
</tr>
<tr>
<td><strong>Credit Value</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>Pre-requisite/Exclusion</strong></td>
<td>Nil</td>
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</tbody>
</table>

**Objectives**
The objectives of this subject are to:

1. To provide students with knowledge in fundamentals of multimedia, e.g. compression standards, data formats, media characteristics, storage and transmission requirements;
2. To provide students with knowledge of a wide spectrum of multimedia information processing techniques;
3. To train students with the ability to apply the knowledge in multimedia system and application development;
4. To equip students with the ability to appreciate new and innovative solutions of multimedia systems and applications.

**Intended Learning Outcomes**
Upon completion of the subject, students will be able to:

a) understand the various characteristics of different media;
b) understand the requirements and techniques of processing multimedia;
c) generalize the knowledge and skills in problem solving involving multimedia databases; and
d) conduct case study in multimedia applications.

**Subject Synopsis/Indicative Syllabus**

- **Multimedia System Primer**: Introduction to different multimedia platforms, systems, tools and applications; characteristics of different media and current trend
- **Data Representation, Coding and Compression**: Data representation, processing and analysis for Sound/Audio, Image and Graphics, Video and Animation; Coding requirements, Entropy and Hybrid Coding, Compression techniques and standards: JPEG, MPEG, DVI, ASF, etc.
- **Multimedia Content Analysis and Information Retrieval**: Multimedia contents: Color, shape, texture, motion, etc. Content analysis techniques: Color histogram, shape analysis, motion analysis, etc. Retrieval techniques: video segmentation, key frame selection, etc.
- **Multimedia Indexing**: Multidimensional data structures, K-d trees, R-trees, R+ and R* trees, Comparison of different data structures.
- **Multimedia Information Networking**: Video streaming, transmission characteristics, protocol support for multimedia networking, multicast techniques.
- **Selected Topics in Multimedia Computing, Systems and Applications**: Further topics related to multimedia computing, systems, and applications.
**Applications:** e.g., New MPEG standards, Multimedia Information Hiding and Watermarking, VoiceXML.

### Teaching/Learning Methodology

39 hours of class activities including - lecture, tutorial, lab, workshop seminar where applicable

### 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</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments, Tests &amp; Projects</td>
<td>55</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Final Examination</td>
<td>45</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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</table>

### Student study effort expected

**Class Contact:**

Class activities (lecture, tutorial, lab) 39 hours

**Other student study effort:**

Assignments, Quizzes, Projects, Exams 65 hours

**Total student study effort** 104 hours

### Reading list and references

**Books**


**Journals**

1. IEEE Multimedia
2. IEEE Trans. on Multimedia
3. ACM SIG Multimedia
4. Multimedia Systems
5. Multimedia Tools & Applications