<table>
<thead>
<tr>
<th>Module Code</th>
<th>CS7002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Name</td>
<td>Data Communications</td>
</tr>
<tr>
<td>Module Short Title</td>
<td>N/a</td>
</tr>
<tr>
<td>ECTS weighting</td>
<td>5</td>
</tr>
<tr>
<td>Semester/term taught</td>
<td>Semester 1</td>
</tr>
</tbody>
</table>
| Contact Hours | Lecture hours: 2 p/w – 22 total  
Lab hours:  
Tutorial hours: 1 p/w – 11 total  
Total hours: 3 p/w – 33 total |
| Module Personnel | Dr. Stefan Weber, Dr. Marco Ruffini |
| Learning Outcomes | When students have successfully completed this module they should be able to:  
- explain the key concepts of networking technologies.  
- analyse communication problems between devices connected by various media. |
| Module Learning Aims | The module aims to equip the student with theoretical and practical knowledge of basic communication protocols such as IPv4, TCP and the underlying routing protocols and the application of these protocols in networking technology that is currently under development. |
| Module Content | The module is split into two parts: The first focussing on basic telecommunication and the second on more advanced topics.  
The telecommunications part gives an overall background on telecommunications systems, including both wired and wireless systems, following the Open Systems Interconnect (OSI) model. Specific topic covered in the lectures in this component are:  
1. Introduction to telecommunications systems  
   - Protocols, OSI and TCP/IP stacks  
   - Telecommunications network view: access |
2. Transport Layer
   - Network Layer
     - Application multiplexing
     - User Datagram Protocol (UDP)
     - Reliable data transfer
     - Transmission Control Protocol (TCP)
     - Flow Control & Congestion Control

3. Network Layer
   - TCP/IP Reference Model
   - Internet Protocol and Addressing
   - Network Address Translation
   - Link State and Distance Vector Routing Protocols
   - Intra and Inter-domain routing

4. Data link layers and wired links
   - Error correction and detection
   - Link-layer addressing
   - Ethernet
   - Link layer switching
   - Point to point protocol (PPP)

5. Medium Access Control and wireless links
   - Wireless links and propagation
   - Medium Access Control (MAC) protocols
   - 802.11 and other technologies
   - Cellular systems

The advanced topics covered in the second part of the module include but are not limited to mobile communications, mobile ad hoc networks, delay tolerant networking, wireless sensor networks, information-centric networks and cognitive networks.

Recommended Reading List
Research papers distributed throughout the 2nd part of the module

Module Pre Requisite

Module Co Requisite

Assessment Details
% Exam: 100
% Coursework: 0
For a description of assessment & assessment regulations see the course handbook.

N/a
<table>
<thead>
<tr>
<th>Module approval date</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved By</td>
<td>N/a</td>
</tr>
<tr>
<td>Academic Start Year</td>
<td>N/a</td>
</tr>
<tr>
<td>Academic Year of Data</td>
<td>N/a</td>
</tr>
</tbody>
</table>