**CS3201: COMPUTER NETWORKS**

**Effective Term**
Semester A 2023/24

**Part I Course Overview**

**Course Title**
Computer Networks

**Subject Code**
CS - Computer Science

**Course Number**
3201

**Academic Unit**
Computer Science (CS)

**College/School**
College of Engineering (EG)

**Course Duration**
One Semester

**Credit Units**
3

**Level**
B1, B2, B3, B4 - Bachelor's Degree

**Medium of Instruction**
English

**Medium of Assessment**
English

**Prerequisites**
Nil

**Precursors**
CS2310 Computer Programming or
CS2311 Computer Programming or
CS2315 Computer Programming or
CS2334 Data Structures for Data Science or
CS2360 Java Programming

**Equivalent Courses**
Nil

**Exclusive Courses**
Nil
Part II Course Details

Abstract
This course aims to introduce fundamental concepts in data communication and computer networks. The framework of the course is the 5-layer architecture, with the lower layers up to and including the transport layer as the main focus. Examples will be drawn liberally from the Internet to illustrate abstract concepts so that students can understand how a computer network actually works.

Course Intended Learning Outcomes (CILOs)

<table>
<thead>
<tr>
<th>CILOs</th>
<th>Weighting (if app.)</th>
<th>DEC-A1</th>
<th>DEC-A2</th>
<th>DEC-A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identify and describe the key transmission level technologies used in modern communication networks.</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Apply the concepts of layered architecture in assessing the placement of network devices, protocols and services.</td>
<td>15</td>
<td></td>
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<tr>
<td>3 Explain the working of error control and medium access control protocols in the data link layer and apply them to both wired and wireless local area networks.</td>
<td>15</td>
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<tr>
<td>4 Explain the role of routing, congestion and flow control, naming and internetworking in the context of a global network such as the Internet, and the common protocols used to implement these functions.</td>
<td>25</td>
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</tr>
<tr>
<td>5 Compare the services provided by the UDP/TCP transport layer protocols and explain the mechanisms used to provide a reliable data transport service on an unreliable IP network.</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>6 Analyze the application of network technologies in designated scenarios and explore how these technologies can be deployed to support the Quality of Service requirements of current and future applications.</td>
<td>15</td>
<td>x</td>
<td>x</td>
<td></td>
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</table>

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing/constructing creative works/new artefacts, effective solutions to real-life problems or new processes.
Teaching and Learning Activities (TLAs)

<table>
<thead>
<tr>
<th>TLAs</th>
<th>Brief Description</th>
<th>CILO No.</th>
<th>Hours/week (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>3 hours/week</td>
</tr>
<tr>
<td>2</td>
<td>Tutorials</td>
<td>1, 2, 3, 4, 5</td>
<td>1 hour/week started from week 2</td>
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</tbody>
</table>

The tutorials provide an opportunity for the students to discuss and deepen their understanding of material learned during the lecture. In particular, questions will be formulated in the form of specific scenarios to help the students to apply concepts learned and to encourage them to propose creative solutions.

Assessment Tasks / Activities (ATs)

<table>
<thead>
<tr>
<th>ATs</th>
<th>CILO No.</th>
<th>Weighting (%)</th>
<th>Remarks (e.g. Parameter for GenAI use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assignments</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>Quiz</td>
<td>1, 2, 3</td>
<td>12</td>
</tr>
</tbody>
</table>

Continuous Assessment (%)
30

Examination (%)
70

Examination Duration (Hours)
2

Additional Information for ATs
For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Rubrics (AR)

Assessment Task
Assignments

Criterion
Ability to apply concepts learned in lectures to solve problems in data communications and computer networks.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate
Assessment Task
Quiz

Criterion
Ability to solve short questions in data communications and computer networks.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Examination

Criterion
Ability to apply concepts learned in lectures to solve problems in data communications and computer networks, including modelling, analysis of performance, specification evaluation of appropriate technology for specific network scenarios.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels
Part III Other Information

Keyword Syllabus


Reading List

Compulsory Readings

<table>
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<tr>
<th>Title</th>
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Additional Readings

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