Part I

Course Title: Data Analysis and Modelling Application Development

Course Code: CS4384

Course Duration: One Semester

Credit Units: 3

Level: B4

Medium of Instruction: English

Prerequisites:
CS2360 Java Programming or
CS2363 Computer Programming

Precursors:
MA2176 Basic Calculus and Linear Algebra or
MA2177 Engineering Mathematics and Statistics

Equivalent Courses: (Course Code and Title)
Nil

Part II

1. Course Aims

This course aims to provide students with the concepts and applied knowledge of data analysis and modelling for the development of decision support applications using spreadsheets, macros, VBA programs, and analytical add-in tools.
2. **Course Intended Learning Outcomes (CILOs)**

*Upon successful completion of this course, students should be able to:*

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>describe the needs of decision makers, formulate spreadsheet models for data capture, extraction, transformation, and analysis in order to support the decision making, and present the analytical results in form of spreadsheet reports and graphic charts;</td>
<td></td>
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<tr>
<td>2.</td>
<td>apply numerical and statistical techniques and tools of the spreadsheet software to specify, design and implement decision support applications for general business, scientists, and engineers;</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>apply business intelligence techniques and tools of the popular spreadsheet software to specify, design and implement decision support applications for general business, scientists, and engineers;</td>
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<tr>
<td>4.</td>
<td>design and implement advanced decision support applications using macros, VBA programs, and analytical add-in tools.</td>
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</table>

3. **Teaching and learning Activities (TLAs)**

*(designed to facilitate students’ achievement of the CILOs)*

**Teaching pattern:**

*Suggested lecture/tutorial/laboratory mix: 3 hrs. lecture/tutorial*

<table>
<thead>
<tr>
<th>ILO No</th>
<th>TLAs</th>
<th>Hours/week (if applicable)</th>
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<tbody>
<tr>
<td>CILO 1, 2, 3, 4</td>
<td><strong>TLA1.</strong> Lecture: Present the concepts, knowledge, and techniques of developing decision support applications with spreadsheet software in lectures.</td>
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</table>
| CILO 1, 2, 3, 4 | **TLA2.** Tutorial: During tutorial sessions, the following activities are used to reinforce the learning and practice of various techniques of data analysis, business intelligence, and spreadsheet modeling learnt in lectures:  
  - **Exercises:** Hands-on activities using spreadsheet software, macro, VBA programs, and analytical add-in tools to practice the development of decision support applications. |                             |
Discussion: Discussion of various concepts learnt in lectures, and exemplified with exercise to demonstrate the applicability of various techniques in data analysis, modeling, and decision support.

Presentations: Members of project team will make presentation of their project work, and the rest of the tutorial group and the instructor will comment and offer suggestions for improvements.

4. Assessment Tasks/Activities
(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

<table>
<thead>
<tr>
<th>CILO No.</th>
<th>Type of Assessment Tasks/Activities</th>
<th>Weighting (if applicable)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILO 1</td>
<td>Coursework assignment, mini-project, quiz, and examination.</td>
<td></td>
<td></td>
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<tr>
<td>CILO 2</td>
<td>Coursework assignment, mini-project, quiz, and examination.</td>
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<tr>
<td>CILO 3</td>
<td>Coursework assignment, mini-project, quiz, and examination.</td>
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<tr>
<td>CILO 4</td>
<td>Coursework assignment, mini-project, quiz, and examination.</td>
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</table>

5. Grading of Student Achievement: Refer to Grading of Courses in the Academic Regulations.

Examination duration: 2.5 hours (Computer-based Exam)

Percentage of coursework, examination, etc.: 50% CW; 50% Exam

Grading pattern: Standard (A+AA-…F)

For a student to pass the course, at least 40% of the maximum mark for the coursework and 30% of the maximum mark for the examination must be obtained.
Part III

Keyword Syllabus

Principles of decision making, decision support systems, data analysis, data modelling, spreadsheets, Excel, automation with Macros, VBA programming, data extraction and transformation, business intelligence, pivot table analysis, OLAP cubes, numerical methods, statistical analysis.

Recommended Reading
Text(s)


Online Resources

Course reading materials will be augmented by articles from journals and by whitepapers and other materials available on-line.