

Subject Description Form

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| Subject Code | EIE226 (for 42077) |
| Subject Title | Introduction to Databases |
| Credit Value | 3 |
| Level | 2 |
| Pre-requisite / Co-requisite/ Exclusion | Nil |
| Objectives | <p>To introduce:</p> <ol style="list-style-type: none"> 1. concepts of data models and principles of data normalization 2. database development life cycle 3. practical skills of relational database design |
| Intended Subject Learning Outcomes | <p>Upon completion of the subject, students will be able to:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ol style="list-style-type: none"> 1. Develop data models for a database application using ER diagrams 2. Use the concepts of data normalization to develop well-designed database applications. |
| Contribution of the Subject to the Attainment of the Programme Outcomes | <p>Programme Outcomes:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ul style="list-style-type: none"> • Programme Outcome 4: This subject contributes to the programme outcome by providing students with laboratory exercises to write software programs to develop database applications. • Programme Outcome 8: This subject contributes to the programme outcome through the teaching of the theories and concepts of databases. <p><u>Category B: Attributes for all-roundedness</u></p> <ul style="list-style-type: none"> • Programme Outcome 11: This subject contributes to the programme outcome through providing the opportunity for students to learn independently. |
| Subject Synopsis/ Indicative Syllabus | <p>Syllabus:</p> <ol style="list-style-type: none"> 1. <u>Database context</u> Introduction to Database; File and database processing systems; Definition of database; DBMS examples. 2. <u>Database design</u> <ol style="list-style-type: none"> 2.1 Data Modelling: Entity relationship model; Elements of the E.R. model. 2.2 Relational Model: Keys Definition; Integrity Constraints, Transforming ER diagrams into relations; Normalization. 2.3 Mapping Logical Database Designs into Physical Storage Mechanisms: Indexing; File Organisations. 3. <u>Database Processing</u> Foundations of relational implementation; Defining relational data; Relational data manipulation; Relational algebra; Structured query language; Restricting and sorting data; Displaying data from multiple tables. 4. <u>Data Management</u> <ol style="list-style-type: none"> 4.1 Data administration: data dictionaries; data quality; database security; |

| | <p>authentication and authorisation; concurrent access 4.2 Distributed databases: client-server architecture, replication and partitioning; Internet and Intranet databases</p> <p>Laboratory Experiments</p> <p>Experiment/Mini Project:</p> <p>Possible mini-projects include - Design and develop a database system for various practical applications.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>Teaching/Learning Methodology</p> | <p>Lectures: Fundamental principles and key concepts of the subject are delivered to students.</p> <p>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.</p> <p>Laboratory Sessions: Students will do some programming exercises to enhance their understanding on database design and development.</p> <p>Mini-project: Students in groups of 2-3 will design and develop a database systems for some practical applications.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Alignment of Assessment and Intended Subject Learning Outcomes</p> | <table border="1" data-bbox="501 871 1415 1431"> <thead> <tr> <th rowspan="2">Specific Assessment Methods/Tasks</th> <th rowspan="2">% Weighting</th> <th colspan="2">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th> </tr> <tr> <th>1</th> <th>2</th> </tr> </thead> <tbody> <tr> <td>1. Continuous Assessment (Total: 60%)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Short quizzes</td> <td>5%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>• Tests</td> <td>20%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>• Laboratory</td> <td>5%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>• Mini-project</td> <td>30%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Examination</td> <td>40%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> <td></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Short quizzes: These can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.</p> <p>Tests & Examination: End-of-chapter-type problems 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 appropriate design.</p> <p>Laboratory: Each student is required to produce a report; the accuracy and presentation of the report will be assessed.</p> <p>Miniproject: Each group of students are required to produce a written report; oral examination will be conducted for each group member to evaluate their technical knowledge and communication skills.</p> | | | Specific Assessment Methods/Tasks | % Weighting | Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate) | | 1 | 2 | 1. Continuous Assessment (Total: 60%) | | | | • Short quizzes | 5% | ✓ | ✓ | • Tests | 20% | ✓ | ✓ | • Laboratory | 5% | ✓ | ✓ | • Mini-project | 30% | ✓ | ✓ | 2. Examination | 40% | ✓ | ✓ | Total | 100% | | |
| Specific Assessment Methods/Tasks | % Weighting | Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1. Continuous Assessment (Total: 60%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| • Short quizzes | 5% | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| • Tests | 20% | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| • Laboratory | 5% | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| • Mini-project | 30% | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Examination | 40% | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Student Study Effort</p> | <p>Class contact (time-tabled):</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Expected | <ul style="list-style-type: none"> Lecture | 24 Hours |
| | <ul style="list-style-type: none"> Tutorial/Laboratory/Practice Classes | 18 hours |
| | Other student study effort: | |
| | <ul style="list-style-type: none"> Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination | 36 Hours |
| | <ul style="list-style-type: none"> Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing | 27 Hours |
| | Total student study effort: | 105 Hours |
| Reading List and References | Textbooks: 1. Michael V. Mannino, <i>Database Design, Application Development and Administration</i> , 3 rd ed., McGraw-Hill, 2007. | |