

ITEM	DETAILS	
1. Title of subject	DATABASE ORGANISATION & DESIGN	
2. Subject code	STC203	
3. Status of subject	Core	
4. Stage	Year 3	
5. Credit Hour	4	
6. Pre-Requisite	STC103 Structured Programming	
7. Assessment	<p>Coursework 40% Test 1 10% Test 2 10% Assignment 1 10% Assignment 2 10%</p> <p>Final Exam 60%</p>	
8. Semester	Semester 1	
9. Objective of subject	<p>The objectives are:</p> <ul style="list-style-type: none"> • To expose the students to basic data processing and information and file organization. • To give basic knowledge of concept, theory, design and data structure management. • To train the students to use management system of Data Structure for them to write a program on data structure application. 	
10. Synopsis of subject	<p>To expose students with basic knowledge of data processing and information and file management. To teach a basic knowledge of the concept, theory, and design of databases and the advantages of databases over file processing systems. To train students in a particular Database Management System to enable them to write a database application program.</p>	
11. Details of subject	Contents	Hours

<p>Week 1 and 2</p>	<p>Topic:</p> <ol style="list-style-type: none"> Database Concepts: <ul style="list-style-type: none"> Basic concepts File processing vs. database Data characteristics Data dependencies Database Approach: <ul style="list-style-type: none"> Database Management System Components of Database Management System Roles in the Database Environment History & Advantages and Disadvantages of DBMS <p>Learning Outcomes: At the end of the lessons, students will be able to: Comprehend the Database Concepts, Characteristics and problems of File based system and typical functions, Components and Advantages and Disadvantages of DBMS.</p> <p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 1.</p>	<p>8</p>
<p>Week 3 and 4</p>	<ol style="list-style-type: none"> Data & File Processing <ul style="list-style-type: none"> Data management – file, record and data concept Data representation – ASCII, EBCDIC Logical & physical record – blocking factor File organisation sequential, random index sequential file systems Database Environment <ul style="list-style-type: none"> Database Architecture-ANSI-SPARC Data Models and Conceptual Modelling Database language (DDL & DML) <p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> Understand the File processing Understand the Database Environment <p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 2.</p>	<p>8</p>
<p>Week 5</p>	<ol style="list-style-type: none"> Database Planning & Design <ul style="list-style-type: none"> Design tools & design phases Database management system Database administration <p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> Understand main stages of database application life cycle Understand the benefits of CASE tools. 	<p>4</p>

	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 9.</p>	
Week 6 & 7	<p>6. Entity Relationship Model</p> <ul style="list-style-type: none"> • Entitiies • Attributes • Key & role • Attributes on Relationships <p>7. ER Model Using Unified Modelling Language</p> <ul style="list-style-type: none"> • Structural Constraints • Mulpticity • Aggregation & generalization • Cardinality and Participation Constraints 	8
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Understand the Entity Relationship model ▪ Understand ER diagrams with Multiplicity using UML <p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 11.</p>	
Week 8	<p>8. Relational Model</p> <ul style="list-style-type: none"> • Relation, view & data structure • Mapping from E-R diagram • Relational DBMS • Criteria & integrity rules 	4
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Understand Referential Integrity Rules. 	
	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 3.</p>	
Week 9 & 10	<p>9. Normalization:</p> <ul style="list-style-type: none"> • Data Redundancy and Update Anomalies • Functional Dependencies • Purpose of Normalisation <p>10. Process of Normalisation</p> <ul style="list-style-type: none"> • 1NF • 2NF • 3NF • BCNF 	8
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Understand the problems of redundant data ▪ Understand to normalise the redundancy up to first three Normal Forms. 	

	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 13.</p>	
Week 11 and Week 12	<p>11 Relational Data Manipulation Language & Relational Calculus</p> <ul style="list-style-type: none"> • Relational algebra • Unary Operations • Set Operations, Join & Division Operations • Tuple Relational Calculus • Domain Relational Calculus <p>12 Query Languages</p> <ul style="list-style-type: none"> • SQL • QBE 	8
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Understand the Relational Algebra and Relational Calculus ▪ Understand query languages associated with the relational models. 	
	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 4.</p>	
Week 13	<p>Other Data Model</p> <ul style="list-style-type: none"> • Network model. DBTG set • Hierarchical model. IMS architecture • Hierarchical vs. network vs. relational 	4
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Have an understanding of various other Network models. 	
	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapter 22.</p>	
Week 14	<p>Other Topics</p> <ul style="list-style-type: none"> • Distributed & object – oriented database • Client – server architecture 	4
	<p>Learning Outcomes: At the end of the lessons, students will be able to:</p> <ul style="list-style-type: none"> ▪ Have an understanding of the current Distributed and Object Oriented Database concepts. 	
	<p>Further reading for this lesson: Connolly, Begg & Strachan. (1996). Chapters 23 & 24.</p>	
	Total	56

<p>12. Text</p>	<p>Compulsory</p>	<ol style="list-style-type: none"> 1. Conolly, T., Begg, C., & Strachan, A. (1996). <i>Database Systems : A Practical Approach to Design. Implementation & Management</i>. Addison-Wesley Publishing. 2. Ricardo, C. M. (1990). <i>Database Systems: Principles, Design and Implementation</i>. Macmillan Publishing Co. 3. Date, C. J. (1994). <i>An Introduction to Database Systems</i> (6th ed.). Addison Wesley Publishing.
	<p>Reference</p>	<ol style="list-style-type: none"> 1. Kroenke, D. M. (1998). <i>Database Processing : Fundamentals , Design and Implementation</i> (6th ed.). Prentice Hall. 2. Hansen, G. W., & Hansen, J. W. (1996). <i>Database Management & Design</i> (2nd ed.). Prentice Hall. 3. Sharifah Mastura Syed Mohamad. (1994). <i>Pemprosesan Data</i>. Universiti Sains Malaysia.