NEW ZEALAND INSTITUTES OF TECHNOLOGY AND POLYTECHNIC QUALIFICATIONS IN INFORMATION & COMMUNICATIONS TECHNOLOGY

PRESCRIPTION: DB600 DATABASE MANAGEMENT SYSTEMS (DBMS)

AIM OF MODULE:	To give the student an understanding of the principles of database design within a commercial environment.
CREDITS:	7
STUDENT LEARNING HOURS:	70
CONTENT REVISED:	2002
PRESCRIPTION EXPIRY DATE:	Nov 2011

Level and Assessment Schedule

TOPICS	Highest Skill Level R	C	A	P	Suggested Assessment Percentage
1. DBMS Management Issues		*			25
2. Design Overview		*			10
3. Database Standards		*			5
4. Data Dictionaries		*			5
5. Logical Design			*		20
6. Physical Design			*		25
7. Review of DBMSs				*	10
					100

LEARNING OUTCOMES

The student will:

C	1	Discuss issues which influence the selection of a DBMS product and describe how security and recovery are handled in a typical database environment.
C	2	Explain reasons for a database design approach, including factors such as concurrent and multi-user capability, data integrity and consistency, standardisation and productivity.
C	3	Outline the generally accepted standards of good database design.
C	4	Describe the use of a data dictionary.
A	5	Describe the relationship between data modelling and database design and prepare a logical database design for a realistic business example.
A	6	Implement a well-designed database for a realistic business example.
P	7	Critically evaluate DBMS by the evaluation of existing implemented database systems in order to identify specific design issues, strengths, weaknesses and possible improvements.

CONTENT

Where possible two different DBMSs should be used and compared (eg Access & Interbase, Access & SQL Server).

1 DBMS MANAGEMENT ISSUES

- Issues which affect selection include: DBMS features and tools, underlying model, cost/benefit analysis.
- The essential characteristics and differences of a variety of DBMS products should be investigated.
- Detailed description of the handling of security in typical DBMS products (eg views, groups, users, rights).
- Recovery should cover procedures for both hard and soft crashes.

2 DESIGN OVERVIEW

Explain the reasons for a database design approach, including concurrent and multi-user capability, data integrity and consistency, standardisation and productivity.

3 DATABASE STANDARDS

- Standards such as naming conventions, normalised relations, ERD conventions.

4 DATA DICTIONARIES

- Schema, sub-schema, standardisation.

5 LOGICAL DESIGN

- Examples used should be of substantial size and/or complexity with an emphasis on good design.
- ER diagrams, schema depiction, normalisation to 3rd normal form should be used and understood.
- Performance issues, denormalisation, use of automatically generated primary keys should be discussed.

6 IMPLEMENTATION - PHYSICAL DESIGN

- It is expected that SQL will be used to create:
  - tables with integrity checks on the attributes
  - triggers which implement business rules
  - views for complex queries and for controlling access rights

7 REVIEW OF DBMSs

- Analysis of real commercial business examples is expected.