

**INFORMATICS INSTITUTE OF COMPUTER STUDIES /
INFORMATICS INSTITUTE OF TECHNOLOGY**

DEPARTMENT OF COMPUTING
BSc/ BSc(Hons)/ Info. Systems/ Computing

MODULE CODE:	LEVEL:	CREDIT RATING (CATS / ECTS):
63IS3004	4	20/10

MODULE TITLE: Data Engineering

PRE-REQUISITES:

63IS2004 – Database Systems

AIMS/LEARNING OUTCOMES:

- To extend and deepen student knowledge of database systems gained from the successful completion of the Level 2 Unit in Database Systems.
- To introduce students to areas of advanced research in database systems.
- To enable students to evaluate and use alternative advanced methods of data modelling and implementation and to assess their relative suitability for different application domains.
- To provide a derailed knowledge and mastery of the technology of database implementation.
- To enable students to use web based database publishing.
- To enable students to evaluate and use alternative methods of data warehousing, data mining and data analysis.

At the end of this unit students should be able to:

- Design and implement a simple object-oriented database
- Assimilate, compare and evaluate emerging trends in data modelling
- Appreciate the complexities introduced by a distributed database environment.
- Analyse in outline the performance problems of a database system and suggest broad strategies for their solution.
- Publish contents of a database on the intranet / internet.
- Analyse data using data mining techniques and suggest and implement data warehousing models to suit the requirements.

SYLLABUS:

- The Object-Oriented paradigm and its application to database technology.
- Integration of database and knowledge bases e.g. coupling architecture and deductive database.
- Newly developing techniques in data analysis.
- Alternative approaches to semantic data modelling e.g. object-oriented data modelling, semantic object modelling, and extensions to E/R modelling.

- Distributed database systems: concepts, architectures; design of distributed database systems.
- Technical Issues: concurrency, transaction processing, query optimisation.
- Database administration, preservation of data security and integrity in a multi-user and multi-process environment.
- Database publishing mechanisms and web servers e.g. ODBC, JDBC, Tomcat, IIS.
- Data warehousing techniques, data mining and OLAP analysis.

INDICATIVE TEACHING AND LEARNING ACTIVITIES (HOURS):

Lecture:	Practical / Fieldwork:	Seminar / Tutorial:	Student Centred Learning:
24	12	12	152
Total Student Effort: 200			

ASSESSMENT WEIGHTINGS:

Examination:	In-Course Assessment:
60%	40%

INDICATIVE READING:

Author	Title (Edition)	Publisher, Year
N. Greenberg, P. Nathan	Introduction to Oracle9i: SQL Student Guide	Oracle Press, 2001
N. Pataballa, P. Nathan	Introduction to Oracle9i: PLSQL Student Guide	Oracle Press, 2001
J.H. Bekkke	Semantic Data Modelling	Prentice- Hall, 1991
P.B. Davies	Expert Database Systems	McGraw Hill, 1993
C.J. Date	An introduction to Database Systems (5 th Edition)	Addison Wesley, 1994
R. Elmasiri, P. Navathe	Fundamentals of Database Systems (2 nd Edition)	Addison Wesley, 1994
G. Gardarin, P. Valduriez	Relational Databases and Knowledge Bases	Addison Wesley, 1989
I.T. Hawryzkiewicz	Database Analysis and Design	Macmillan, 1991
J.G. Huges	Object-Oriented Databases	Prentice-Hall 1991
D.M. Kroenke	Database Processing (2 nd Edition)	Macmillan, 1995
J.D. Ullman	Principals of Data & Knowledge Based Systems	Computer Science Press, 1988