Business & Computing Examinations (BCE)
LONDON (UK)

Database Programme Analysis

The development of BCE programmes include extensive market research from the following sources:

- Data from BCE Centre Annual Reports.
- Enquiries received from different stakeholders.
- Email survey from statutory consultees and stakeholder bodies.
- Questionnaire survey from BCE learners.
- Input received during Approved Centres and Corporate companies training seminar.
- BCE discussions and feedback from potential employers.

BCE learners are 18+, classified as follows:

- Holders of General Certificate of Secondary Education (GCSE) intending to obtain a programme for employment or further education.
- Those already in employment furthering their knowledge for promotion or to venture into new fields.
- Corporate Companies approaching BCE directly or Approved Centres for in-house training.
- Those looking for career change.
- Mature adults with no formal programmes.

Guided Learning Hoursis the entire notional learning hours representing estimate of total amount of time reasonably required for learners to achieve necessary level of attainment for the award of a programme. This comprises of and **Guided Learning**.

Activities that contribute to guided learning hours include:

- Guided Learning
- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning

Activities that contribute to Guided Learning include:

- Classroom-based learning supervised by a Tutor
- Work-based learning supervised by a Tutor
- Live webinar or telephone tutorial with a Tutor in real time
- E-learning supervised by a Tutor in real time
- Forms of assessment

Level 5 Diploma in Database Administration (135 Credits)

Database programs offer learners a chance to pursue a career in the theoretical and practical aspects of database development process. The field of database has grown considerably with the advances in technology and the internet, and many database engineers are involved with implementation of new databases, and staying ahead of market trends.

Why does the programme exists – Database technology is one of the most important aspect of computing. Businesses in much of world depend on database technology. For example, bank customer details, utility and flight details are stored on databases.

How it fits into the larger programme – Everything revolves on database technology – from transport, finance, retail, education etc.

For whom it was designed – Learners who complete the Level 5 Diploma in Information Technology, Level 5 Diploma in System Design, Level 5 Diploma in eCommerce & Web Design, Level 5 Diploma in Programming or Diploma in Windows/Unix Networking

How it will benefit learners –The field of database administration is the largest sector and many firms employ programme holders starting at junior database administrators. The disaster recovery services and software installation divisions are growing, along with the World Wide Web and internet-related industries. The government, universities, and manufacturers of computer products are additional sectors of the economy that have created a demand for skilled database professionals.

Units:

- Oracle SQL
- Oracle PL/SQL
- Oracle Database Administration
- Windows SQL Server Administration
- Oracle Solaris Network Administration

SQL - Structured Query Language (SQL) is a specialised language for updating, deleting, and requesting information from databases. SQL is an ANSI and ISO standard, and is the de facto standard database query language. A variety of established database products support SQL, including products from Oracle and Microsoft SQL Server. It is widely used in both industry and academia, often for enormous, complex databases. In a distributed database system, a program often referred to as the database's "back end" runs constantly on a server, interpreting data files on the server as a standard relational database. Programs on client computers allow users to manipulate that data, using tables, columns, rows, and fields. To do this, client programs send SQL statements to the server. The server then processes these statements and returns replies to the client program.

PL/SQL - a Procedural Language extension to Structured Query Language (SQL). The purpose of PL/SQL is to combine database language and procedural programming language. The basic unit in PL/SQL is called a block, which is made up of three parts: a declarative part, an executable part and an exception-building part.

Database Administration - The essential feature of database technology is that it provides an INTERNAL representation (model) of the EXTERNAL world of interest. Examples are the representation of a particular date/time/flight/aircraft in airline reservation or of item code/item description/quantity on hand/reorder level/reorder quantity in a stock control system. *Why is it important?* Business in much of the world depends on database technology; from the behind the scenes designs to practical implementation using software programs like Oracle, Windows SQL Server, Ingress, SAP and Sybase. For example: *Finance:* the UK clearing banks have calculated that if their database systems were removed it would take every person in UK working 24 hours per day, 7 days per week to process all the financial transactions manually. The London Stock Exchange relies on computer systems for recording buying and selling of stock which happens very quickly and in large quantities. The amount of money involved in these transactions is enormous. *Transport:* All airlines use online seat reservation systems and have systems for scheduling aircraft, for building and maintaining timetables, for handling the in-flight catering and for mechanical servicing of the planes. Similar systems exist for rail, sea and road transport. They all use database technology extensively. *Utilities:* major utilities (water, electricity, gas) all have generation/distribution systems based on database technology. *Resources:* The mineral exploration/extraction companies, and governments who regulate them (especially for oil exploration/extraction) have extensive databases which have complex data structures (usually including GIS (Geographical Information System)) components. *Production engineering:* from scheduling workflow through the production lines of machines to stock control and order processing, database technology underpins all activity in this area. *Environment:* protection and control of the environment by government agencies depend heavily on database systems with GIS facilities, together with databases of toxic substances and clean-up recommendations. *Tourism:* hotel systems and local tourist attractions, information and booking facilities rely on database systems, and the major package tour operators have extensive databases for holiday planning and booking, together with financial systems for payment and invoicing. *Leisure:* the entertainment industry uses database systems extensively for theatre, concert and cinema ticket bookings. *Culture:* museums, art galleries, history exhibitions - all utilise database technology (and especially multimedia database technology) for cataloguing their collections and recording access to them. *Education:* programmes, materials, and assessment all rely heavily on database technology in all sectors of education. Increasingly the linking of database technology with hypermedia delivery systems allows courseware to be maintained up-to-date and delivered to the consumer. *Healthcare:* healthcare has long relied on database technology to schedule hospital beds or appointments at clinics or doctor's surgery. *Government administration* would be paralysed without database technology; the collection of taxes and the payment of social security benefits depend totally on database technology. *Retail:* the major retail stores utilise database technology in stock control and PoS (Point of Sale) systems. Modern retailers use

advanced data mining techniques to determine trends in sales and consumer preference to optimise stock control, retail performance, customer convenience and profit.

Windows SQL Server Database Administration – The competitor of Oracle Database is Microsoft SQL, hence learning these two programs at the same time make learners' identifier the differences between them and is an advantage when looking for work or changing jobs.

Oracle Solaris Network Administration – Solaris is one of the most popular Unix operating systems. At the same time, Oracle is most popular database program. The effect of the combination of these two programs can not be emphasised enough.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours(TQT)	Number of Credits
Oracle SQL	Basic knowledge of relational databases; for example, Access.	A pass or higher at Diploma level.	280	28
Oracle PL/SQL	Basic programming knowledge.	A pass or higher at Diploma level.	280	28
Oracle Database Administration	Basic knowledge of relational databases; for example, Access.	A pass or higher at Diploma level.	280	28
Windows SQL Server Database Administration	Knowledge of Windows operating system.	A pass or higher at Diploma level.	280	28
Oracle Solaris Network Administration	Detailed knowledge of Solaris commands and Solaris Network Administration	A pass or higher at Diploma level.	280	28
Coursework (Project) for all units			310	31

Rules of combination:	All units are mandatory
Age Group:	18+
Programme Type:	Vendor/Industry

Oracle SQL Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Basic components of entity-relationship model	2.0	8	6	2	2	2	20
02	Components of the Structured Query Language (SQL)	2.0	8	6	2	2	2	20
03	SQL WHERE clause	2.0	8	6	2	2	2	20
04	SQL Cartesian Join	2.0	8	6	2	2	2	20
05	SQL functions	2.0	8	6	2	2	2	20
06	Queries with single/multiple row functions	2.0	8	6	2	2	2	20
07	SQL subqueries	2.0	8	6	2	2	2	20
08	SQL CREATE TABLE statement	2.0	8	6	2	2	2	20
09	SQL integrity constraints	2.0	8	6	2	2	2	20
10	Updating tables	2.0	8	6	2	2	2	20
11	Data Manipulating Language (DML) operations	2.0	8	6	2	2	2	20
12	Creating a sequence	2.0	8	6	2	2	2	20
13	Authentication privileges	2.0	8	6	2	2	2	20
14	Creating reports	2.0	8	6	2	2	2	20
		28	**112**					**280**

PL/SQL Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	PL/SQL Environment Setup	2.0	8	6	2	2	2	20
02	Declarations	2.0	8	6	2	2	2	20
03	Sections of the PLS/SQL block	2.0	8	6	2	2	2	20
04	PL/SQL data types	2.0	8	6	2	2	2	20
05	User-Defined Subtypes	2.0	8	6	2	2	2	20
06	Using the IF statement	2.0	8	6	2	2	2	20
07	Looping using PL/SQL	2.0	8	6	2	2	2	20
08	Using cursors in PL/SQL	2.0	8	6	2	2	2	20
09	Exception handling	2.0	8	6	2	2	2	20
10	PL/SQL subprograms	2.0	8	6	2	2	2	20
11	PL/SQL packages	2.0	8	6	2	2	2	20
12	PL/SQL object types	2.0	8	6	2	2	2	20
13	SQL Support in PL/SQL	2.0	8	6	2	2	2	20
14	Managing Cursors	2.0	8	6	2	2	2	20
		28	**112**					**280**

Oracle Database Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Analysing Oracle database architecture	2.0	8	6	2	2	2	20
02	Oracle DBA database administration tools	2.0	8	6	2	2	2	20
03	Setting up database objects	2.0	8	6	2	2	2	20
04	Oracle data dictionary	2.0	8	6	2	2	2	20
05	Analysing log files	2.0	8	6	2	2	2	20
06	Database logical and physical structure	2.0	8	6	2	2	2	20
07	Table storage methods	2.0	8	6	2	2	2	20
08	Organisation of large objects	2.0	8	6	2	2	2	20
09	Oracle indexes	2.0	8	6	2	2	2	20
10	Data constraints	2.0	8	6	2	2	2	20
11	User profiles in Oracle	2.0	8	6	2	2	2	20
12	System and object privileges	2.0	8	6	2	2	2	20
13	Assigning roles and privileges	2.0	8	6	2	2	2	20
14	Globalisation parameters	2.0	8	6	2	2	2	20
		28	**112**					**280**

Windows SQL Server Database Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Functions of Microsoft SQL server	2.0	8	6	2	2	2	20
02	Microsoft SQL server installation	2.0	8	6	2	2	2	20
03	SQL server user and object administrative tools	2.0	8	6	2	2	2	20
04	Creating database	2.0	8	6	2	2	2	20
05	Importing/exporting data	2.0	8	6	2	2	2	20
06	Retrieving information using SQL Select statements	2.0	8	6	2	2	2	20
07	Inserting and updating SQL database	2.0	8	6	2	2	2	20
08	SQL command functions	2.0	8	6	2	2	2	20
09	Creating transactions in SQL server	2.0	8	6	2	2	2	20
10	Creating data indexing	2.0	8	6	2	2	2	20
11	Database backup and restoration	2.0	8	6	2	2	2	20
12	SQL server security features	2.0	8	6	2	2	2	20
13	SQL server reporting services	2.0	8	6	2	2	2	20
14	SQL Server Integration Services (SSIS)	2.0	8	6	2	2		20
		28.0	**112**					**280**

Oracle Solaris Network Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Networking basics	2.0	8	6	2	2	2	20
02	TCP/IP administrative tools	2.0	8	6	2	2	2	20
03	Addressing Scheme	2.0	8	6	2	2	2	20
04	Troubleshooting Network Problems	2.0	8	6	2	2	2	20
05	IP Tunnelling	2.0	8	6	2	2	2	20
06	Dynamic Host Configuration Protocol (DHCP)	2.0	8	6	2	2	2	20
07	DHCP Configuration	2.0	8	6	2	2	2	20
08	Configuring and Administering the DHCP Client	2.0	8	6	2	2	2	20
09	Introduction to cryptographic protection	2.0	8	6	2	2	2	20
10	Network IP Security (IPSec)	2.0	8	6	2	2	2	20
11	IP Filter in Oracle Solaris	2.0	8	6	2	2	2	20
12	Network performance monitoring	2.0	8	6	2	2	2	20
13	Virtual Router Redundancy Protocol (VRRP)	2.0	8	6	2	2	2	20
14	IP Quality of Service (IP QoS)	2.0	8	6	2	2		20
		28.0	**112**					**280**

Level 5 Diploma in Database Developer (191 Credits)

A database developer is someone that develops software which works closely with a database. Most custom software development interacts with a database and, as such, technically speaking a web developer or client/server programmer can also be called a database developer.

Why does the programme exists – The database developer programme enable learners to be proficient in developing forms and reports.

How it fits into the larger programme – Forms, Reports and Java development help learners with the industrial exposure needed.

For whom it was designed – Learners who complete the Level 5 Diploma in Database Administration.

How it will benefit learners – By being proficient in Forms, Report and Java development, learners gain the knowledge needed in the industrial world.

Units:

- Programming the Web using HTML & XML
- Oracle Forms Developer
- Oracle Reports Developer
- Oracle Designer
- Oracle JDeveloper

Programming the Web using HTML & XML. **HTML** - HyperText Markup Language (HTML) is a language to specify the structure of documents for retrieval across the Internet using browser programs of the World Wide Web. **XML** - XML was designed to transport and store data. HTML was designed to display data. XML carries and stores data.

Oracle Forms Developer - an application development tool for building client-server database applications. Three components are employed while building applications for Oracle: (i) Oracle Form Designer (ii) Oracle Forms Generator (iii) Oracle Forms Runform.

Oracle Reports Developer - Oracle Reports is a tool for developing reports against data stored in an Oracle database. It is a production reporting tool to dynamically retrieve, format and distribute database information.

Oracle Designer - Oracle Designer (previously called Designer/2000 and Oracle Case) is Oracle's CASE modelling tool, used for capturing and presenting business requirements. It incorporates support for system analysis, software design, automatic code generation and business process re-engineering. It is an integrated Computer-Aided Software Engineering (CASE) tool that encompasses the full development life cycle from business process re-engineering to implementation and maintenance of a system.

Oracle Designer can (i) Create and maintain a central repository of data collected during the development life cycle. (ii) Guide the development team through the required life cycle steps, ensuring the capture of customer data. (iii) Display requirements and processes in easy-to-understand diagrams, matrices, and logical and physical data models. (iv) Generate code from the data collected to create Oracle Developer and Web forms.

Oracle JDeveloper - JDeveloper is a freeware IDE supplied by Oracle Corporation. It offers features for development in Java, XML, SQL and PL/SQL, HTML, JavaScript, BPEL and PHP. JDeveloper covers the full development lifecycle from design through coding, debugging, optimization and profiling to deploying. Oracle JDeveloper is a free integrated development environment that simplifies the development of Java-based SOA and Java EE applications. JDeveloper offers complete end-to-end development to Oracle Fusion Middleware and Oracle Fusion Applications with support for the full development life cycle.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours(TQT)	Number of Credits
Programming the Web using HTML & XML	Basic knowledge of computers and file management.	A pass or higher in Diploma in Database Administration or equivalence	440	44
Oracle Forms Developer	Detailed knowledge of Oracle SQL	A pass or higher in Diploma in Database Administration or equivalence	280	28
Oracle Reports Developer	Detailed knowledge of Oracle SQL	A pass or higher in Diploma in Database Administration or equivalence	300	30
Oracle Designer	Detailed knowledge of Oracle SQL	A pass or higher in Diploma in Database Administration or equivalence	280	28
Oracle JDeveloper	Knowledge of HTML and XML Web Applications	A pass or higher in Diploma in Database Administration or equivalence	300	30
Coursework (Project) for all units			310	31

Rules of combination:	All units are mandatory
Age Group:	18+
Programme Type:	Vendor/Industry

Programming with Web using HTML & XML Learning Hours Information Sheet
[see Diploma in Web Design]

Oracle Forms Developer Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Forms Services window	2.0	8	6	2	2	2	20
02	Oracle Application Server Architecture	2.0	8	6	2	2	2	20
03	Oracle Forms Object Navigator	2.0	8	6	2	2	2	20
04	Rapid Application Development (RAD) environment	2.0	8	6	2	2	2	20
05	Steps for creating basic data entry and query	2.0	8	6	2	2	2	20
06	Creating a new form	2.0	8	6	2	2	2	20
07	Running a form	2.0	8	6	2	2	2	20
08	Basic Forms function	2.0	8	6	2	2	2	20
09	Master-detail Form	2.0	8	6	2	2	2	20
10	List of Values (LOV)	2.0	8	6	2	2	2	20
11	Oracle Forms components	2.0	8	6	2	2	2	20
12	Interoperability and compatibility issues	2.0	8	6	2	2	2	20
13	Forms default menu	2.0	8	6	2	2	2	20
14	Building the Database Tables	2.0	8	6	2	2		20
		28.0	**112**					**280**

Oracle Reports Developer Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Reports Builder features and functionality	2.0	8	6	2	2	2	20
02	Oracle Reports properties and preferences	2.0	8	6	2	2	2	20
03	Creating Report Builder applications	2.0	8	6	2	2	2	20
04	Using Ref cursors	2.0	8	6	2	2	2	20
05	Using XML pluggable data source	2.0	8	6	2	2	2	20
06	Building a report using Express Data	2.0	8	6	2	2	2	20
07	Creating a Report using the Text Pluggable Data Source	2.0	8	6	2	2	2	20
08	Building a Master-Master Report	2.0	8	6	2	2	2	20
09	Single/Two Query Group Report	2.0	8	6	2	2	2	20
10	Building Summary Report	2.0	8	6	2	2	2	20
11	Building Header and Footer Report	2.0	8	6	2	2	2	20
12	Building Report with Graphics	2.0	8	6	2	2	2	20
13	Creating a matrix report	2.0	8	6	2	2	2	20
14	Building a Cheque Printing Report	2.0	8	6	2	2	2	20
15	Building Invoice Report	2.0	8	6	2	2	2	20
		30	**120**					**300**

Oracle Designer Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Oracle Designer tools	2.0	8	6	2	2	2	20
02	Diagrams for modelling system	2.0	8	6	2	2	2	20
03	Logical and physical storage structures	2.0	8	6	2	2	2	20
04	Repository	2.0	8	6	2	2	2	20
05	Entity-Relationship Diagrams	2.0	8	6	2	2	2	20
06	ER-Constructs	2.0	8	6	2	2	2	20
07	Oracle hierarchy diagrammer	2.0	8	6	2	2	2	20
08	Entities and Relationships	2.0	8	6	2	2	2	20
09	Fixed Relationships	2.0	8	6	2	2	2	20
10	Association Entity Types	2.0	8	6	2	2	2	20
11	Form Builder	2.0	8	6	2	2	2	20
12	Oracle Designer form generator	2.0	8	6	2	2	2	20
13	Web application development	2.0	8	6	2	2	2	20
14	Exiting from Oracle Designer	2.0	8	6	2	2		20
		28.0	**112**					**280**

Oracle JDeveloper Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Executing Java application in Oracle database	2.0	8	6	2	2	2	20
02	Components of the OracleJVM	2.0	8	6	2	2	2	20
03	Deploying Java applications within Oracle database	2.0	8	6	2	2	2	20
04	Execution Control	2.0	8	6	2	2	2	20
05	Invoking Java within Oracle database	2.0	8	6	2	2	2	20
06	Debugging Server Applications	2.0	8	6	2	2	2	20
07	Configuring Oracle JVM	2.0	8	6	2	2	2	20
08	Enabling the Java Client	2.0	8	6	2	2	2	20
09	Stored procedures run-time	2.0	8	6	2	2	2	20
10	Advantages of Stored Procedures	2.0	8	6	2	2	2	20
11	Mapping functions to Java Class methods	2.0	8	6	2	2	2	20
12	Calling Java stored procedures	2.0	8	6	2	2	2	20
13	Building Java stored procedure applications	2.0	8	6	2	2	2	20
14	Network security	2.0	8	6	2	2	2	20
15	Java application performance methods	2.0	8	6	2	2	2	20
		30	**120**					**300**