# DATABASE PROGRAMMING

Curriculum Content Frameworks

**Please note: All assessment questions will be taken from the knowledge portion of these frameworks.**


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# Curriculum Content Frameworks

# DATABASE PROGRAMMING

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| Grade Levels: 11, 12<br>Course Code: 492570 | Prerequisite: Database Fundamentals |
| Course Description: This course enables users to build data warehouses and data marts; perform an array of integrated reporting; conduct ad-hoc querying and sophisticated analysis, including database optimization and maintenance, forecasting and trending, and market analysis; provide extended database support for online analytical processing, data-mining, and extraction; and perform transformation and loading operations. | |

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# Unit 1: Number, Date, and Conversion Functions
# Hours: 7.5

Terminology: Add_months, CASE, COALESCE, CONCAT, Decode, Dual table, Expression, If-Then-Else, NULLIF, NVL, NVL2, INITCAP, INSTR, Last_day, LENGTH, LPAD, LOWER, MOD function, Months_between, Next_day, Personal inventory, ROUND, REPLACE, RPAD, RR, SUBSTR, Sysdate, TRIM, TRUNC, UPPER

| **CAREER and TECHNICAL SKILLS**<br>What the Student Should be Able to Do | | | | **ACADEMIC and WORKPLACE SKILLS**<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 1.1 | Define terminology | 1.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Analyzes and applies what has been read to specific task [1.3.2]<br><br>Uses words appropriately [1.6.21] |
| 1.2 | Discuss the difference between single row and multiple row subqueries | 1.2.1 | Demonstrate the difference between single row and multiple row subqueries | Foundation | Listening | Comprehends ideas and concepts related to careers and technical skills [1.2.1] |
| 1.3 | Identify single row functions that perform case conversions | 1.3.1 | Apply single row functions that perform case conversions | Foundation | Listening | Comprehends ideas and concepts related to careers and technical skills [1.2.1] |
| 1.4 | Select and apply character case-manipulation functions LOWER, UPPER, and INITCAP in an SQL query | 1.4.1 | Prepare the code to run in HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.5 | Select and apply character case-manipulation functions CONCAT, SUBSTR, LENGTH, INSTR, LPAD, RPAD, TRIM, and REPLACE in an SQL query | 1.5.1 | Prepare the code to run in HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.6 | Select and apply the single-row number functions ROUND, TRUNC, and MOD in an SQL query | 1.6.1 | Prepare the code to run in HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.7 | Distinguish between the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value | 1.7.1 | Discuss the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value | Thinking | Reasoning | Comprehends ideas and concepts related to TRUNC and ROUND [4.5.2] |
| 1.8 | State the implications for business when applying TRUNC and ROUND to numeric values | 1.8.1 | Discuss the difference between TRUNC and ROUND | Thinking | Reasoning | Comprehends ideas and concepts related to TRUNC and ROUND [4.5.2] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 1.9 | Analyze and understand IT career options and education requirements based on interests, abilities, aptitudes, and accomplishments | 1.9.1 | Research IT career options and education | Thinking | Knowing How to Learn | Processes new information as related to workplace [4.3.5] |
| 1.10 | Demonstrate skills for locating, evaluating, and interpreting IT career information | 1.10.1 | Prepare a chart showing the IT career information | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |
| 1.11 | Apply concepts learned as a result of student's own work and academic experiences, and evaluate the application of skills to career options and the world of work | 1.11.1 | Explain the student concepts and evaluate the applications | Thinking | Reasoning | Comprehends ideas and concepts related to student's work and academic experience [4.5.2] |
| 1.12 | Give an example of an explicit data-type conversion and an implicit data-type conversion | 1.12.1 | Discuss an example of an explicit data-type conversion and an implicit data-type conversion | Thinking | Reasoning | Sees relationship between two or more ideas, objects, or situations [4.5.5] |
| 1.13 | Explain why it is important, from a business perspective, for a language to have built-in data-conversion capabilities | 1.13.1 | Prepare an example of why it is important, from a business perspective, for a language to have built-in data-conversion capabilities | Thinking | Reasoning | Uses logic to draw conclusions from available information [4.5.6] |
| 1.14 | Construct a SQL-query that correctly applies TO_CHAR, TO_NUMBER, and TO_DATE single row functions to produce a desired result | 1.14.1 | Prepare the code to run in HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.15 | Apply the appropriate date and/or character format model to produce a desired output | 1.15.1 | Prepare the code to run in HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.16 | Explain and apply the use YYYY and RRRR to return the correct year as stored in the database | 1.16.1 | Write the code to use a DUAL | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.17 | Explain the evaluation of a nested function | 1.17.1 | Demonstrate the evaluation of a nested function | Foundation | Listening | Comprehends ideas and concepts related to the nested function [1.2.1] |
| 1.18 | List at least four general functions that work with any data type and relate to handling null values | 1.18.1 | Create a chart showing the four functions | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |

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|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 1.19 | Explain the use of COALESCE and the NVL functions | 1.19.1 | Demonstrate the use of COALESCE and the NVL functions | Foundation | Listening | Comprehends ideas and concepts related to the use of COALESCE and NVL [1.2.1] |
| 1.20 | Construct and execute a SQL query that correctly applies NVL, NVL2, NULLIF, and COALESCE single-row functions | 1.20.1 | Write the code to use a HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.21 | Compare and contrast the DECODE and CASE functions | 1.21.1 | Demonstrate the use of DECODE and CASE functions | Foundation | Listening | Comprehends ideas and concepts related to the use of DECODE and CASE functions [1.2.1] |
| 1.22 | Construct and execute a SQL query that correctly uses the DECODE and CASE functions | 1.22.1 | Write the code to use a HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 1.23 | Construct and execute two methods for implementing IF-THEN-ELSE conditional logic | 1.23.1 | Write the code to use a HTML DB | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |

# Unit 2: Joins
# Hours: 7

Terminology: Business rule, Cardinality, Cartesian product, Conventions, Database, Degree, ERDish, Exhaustive, Information, Matrix diagram, Mutual exclusive, Nonequijoin, Optionality, Relationship, Reserved words, Revenue, Source document, Subentity, Subtype, Supertype

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|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 2.1 | Define terminology | 2.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to joins [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 2.2 | Identify the purpose of joins conditions | 2.2.1 | Demonstrate the purpose of joins conditions | Foundation | Listening | Comprehends ideas and concepts related to the purpose of joins conditions [1.2.1] |
| 2.3 | Discuss how to construct and execute a SELECT statement that results in a cartesian product | 2.3.1 | Create a SELECT statement that results in a cartesian product | Thinking | Problem Solving | Demonstrates logical reasoning in reaching a conclusion [4.4.2] |
| 2.4 | Discuss how to construct and execute a SELECT statement to access data from more than one table using an equijoin | 2.4.1 | Create a SELECT statement to access data from more than one table using an equijoin | Thinking | Reasoning | Comprehends ideas and concepts related to accessing data from more than one table [4.5.2] |
| 2.5 | Discuss how to construct and execute a SELECT statement that add search conditions using the AND operator | 2.5.1 | Create a SELECT statements that add search conditions using the AND operator | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.6 | Discuss how to apply the rule for using column aliases in a join statement | 2.6.1 | Create a column alias in a join statement | Thinking | Reasoning | Sees relationship between two or more ideas, objects, or situations [4.5.5] |
| 2.7 | Discuss why it is it important, from a business perspective, for a language to be able to combine information from multiple data sources | 2.7.1 | Demonstrate why is it important, from a business perspective, for a language to be able to combine information from multiple data sources | Thinking | Reasoning | Uses logic to draw conclusions from available information [4.5.6] |
| 2.8 | Discuss how to construct and execute a SELECT statement to access data from more than one table using a nonequijoin | 2.8.1 | Create a SELECT statement to access data from more than one table using a nonequijoin | Thinking | Decision Making | Evaluates information/data to make best decision [4.2.5] |

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|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 2.9 | Discuss how to SELECT and execute a statement to access data from more than one table using an outer join | 2.9.1 | Create a SELECT statement to access data from more than one table using an outer join | Thinking | Decision Making | Evaluates information/data to make best decision [4.2.5] |
| 2.10 | Illustrate positive associations between learning and work | 2.10.1 | Discuss examples of positive associations between learning and work | Foundation | Listening | Comprehends ideas and concepts related to learning and work [1.2.1] |
| 2.11 | Discuss how to construct and execute a SELECT statement to join a table to itself using a self-join | 2.11.1 | Create a SELECT statement to join a table to itself using a self-join | Thinking | Decision Making | Evaluates information/data to make best decision [4.2.5] |
| 2.12 | Identify factors that contribute to the changing nature of work | 2.12.1 | Discuss examples of factors that contribute to the changing nature of work | Foundation | Listening | Comprehends ideas and concepts related to the changing nature of work [1.2.1] |
| 2.13 | Illustrate how to incorporate into a career plan skills to stay up-to-date in anticipation of the changing nature of work | 2.13.1 | Demonstrate how to incorporate into a career plan skills to stay up-to-date in anticipation of the changing nature of work | Foundation | Listening | Comprehends ideas and concepts related to career plan skills [1.2.1] |
| 2.14 | Discuss how to compose and execute a natural join using SQL join syntax | 2.14.1 | Create a query using SQL join syntax that will execute a natural join | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.15 | Discuss how to create a Cartesian product using SQL join syntax | 2.15.1 | Create a query using SQL joint syntax that will result in a Cartesian product | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.16 | Discuss the relationship between a cross-join and a Cartesian product | 2.16.1 | Demonstrate the relationship between a cross-join and a Cartesian product | Foundation | Listening | Comprehends ideas and concepts related to cross-joins and cartesian products [1.2.1] |
| 2.17 | Discuss the relationship between a natural join and an equijoin | 2.17.1 | Demonstrate the relationship between a natural join and an equijoin | Foundation | Listening | Comprehends ideas and concepts related to natural joins and equijoins [1.2.1] |
| 2.18 | Discuss why it is important to have a standard for SQL as defined by ANSI | 2.18.1 | Demonstrate why it is important to have a standard for SQL as defined by ANSI | Foundation | Listening | Comprehends ideas and concepts related to the ANSI standard for SQL [1.2.1] |
| 2.19 | Discuss how to compose and execute a join with the USING and ON clauses | 2.19.1 | Create a join with the USING and ON clauses | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.20 | Discuss how to compose and execute an ANSI/SO SQL: 1999 query that joins three tables | 2.20.1 | Create an ANSI/SO SQL: 1999 query that joins three tables | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |

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| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 2.21 | Name the Oracle proprietary joins and their ANSI/SO SQL: 1999 counterparts | 2.21.1 | Demonstrate the Oracle proprietary joins and their ANSI/SO SQL: 1999 counterparts | Foundation | Listening | Comprehends ideas and concepts related to Oracle Joins vs. ANSI/SO SQL: 1999 joins [1.2.1] |
| 2.22 | Compare and contrast an inner and outer join | 2.22.1 | Demonstrate inner and outer joins | Foundation | Listening | Comprehends ideas and concepts related to inner and outer joins [1.2.1] |
| 2.23 | Discuss how to construct and execute a query to use a left outer join | 2.23.1 | Create a query that uses a left outer join | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.24 | Discuss how to construct and execute a query to use a right outer join | 2.24.1 | Create a query that uses a right outer join | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.25 | Discuss how to construct and execute a query to use a full outer join | 2.25.1 | Create a query that uses a full outer join | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 2.26 | Construct and execute a query to use an inner join | 2.26.1 | Write an HTML query that uses an inner join | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |

# Unit 3: Group Functions and Subqueries
# Hours: 7

Terminology: ALL, ANY, Barred relationship, Child record, Data manipulation. DELETE, Explicit, First normal form, GROUP BY, HAVING, IMPLICIT, Inner query, INSERT, Integration, Integrity constraint, Intersection entity, Many-to-many, Nontransferability, Normalization, One-to-many, One-to-one, Outer query, Parent record, Redundancy, Redundant, Subquery, Transferable, Update, User

| **CAREER and TECHNICAL SKILLS**<br>What the Student Should be Able to Do | | | | **ACADEMIC and WORKPLACE SKILLS**<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 3.1 | Define terminology | 3.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to group functions/subqueries [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 3.2 | Explain the seven group functions: AVG, COUNT, MAX, MIN, STUDDEV, SUM, VARIANCE | 3.2.2 | Research and give an example of the seven group functions | Foundation | Reading<br><br>Writing | Identifies relevant details, facts, and specifications [1.3.16]<br><br>Analyzes data, summarizes results, and makes conclusions [1.6.2] |
| 3.3 | Discuss how to construct and execute a SQL query using SELECT, FROM, WHERE, GROUP BY, ORDER BY syntax using group functions | 3.3.1 | Diagram a SQL query using SELECT, FROM, WHERE, GROUP BY, ORDER BY syntax using group functions | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |
| 3.4 | Discuss how to construct and execute group functions that operate only with numeric data types | 3.4.1 | Construct and execute group functions that operate only with numeric data types | Thinking | Reasoning | Comprehends ideas and concepts related to constructing and executing group functions [4.5.2] |
| 3.5 | Discuss how to construct and execute group functions that operate to produce a single value | 3.5.1 | Illustrate how to construct and execute a group function that will operate to produce a single value | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 3.6 | Compare and contrast the results set obtained from single-row functions versus group functions | 3.6.1 | Discuss the results set obtained from single-row functions versus group functions | Thinking | Problem Solving | Draws conclusions from what is read and gives possible solutions [4.4.4] |
| 3.7 | Discuss why is it important, from a business perspective, to be able to easily aggregate data (group) | 3.7.1 | What business problems does this solve? | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |

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| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 3.8 | Discuss how to construct and execute a SQL query applying COUNT, DISTINCT, NVL group functions | 3.8.1 | Give examples of how to construct a SQL query applying COUNT, DISTINCT, NVL group functions | Thinking | Reasoning | Comprehends ideas and concepts related to a SQL query applying COUNT, DISTINCT, and NVL group functions [4.5.2] |
| 3.9 | Differentiate between different kinds of interviews and the purposes of each | 3.9.1 | Demonstrate the different kinds of interviews and the purpose of each | Thinking | Decision Making | Comprehends ideas and concepts related to the different kinds of interviews [4.2.2] |
| 3.10 | List specific steps needed to better prepare for a job interview | 3.10.1 | Create specific steps needed to better prepare for a job interview | Foundation | Writing | Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6] |
| 3.11 | Identify the types of questions that cannot be asked during an interview | 3.11.1 | Research the types of questions that cannot be asked in an interview | Thinking | Reasoning | Comprehends ideas and concepts related to questions that cannot be asked in an interview [4.5.2] |
| 3.12 | Explain the importance of a first impression in the interview process | 3.12.1 | Discuss the importance of the first impression in the interview process | Thinking | Seeing Things in the Mind's Eye | Uses senses to perceive the first impression in the interview process [4.6.5] |

# Unit 4: Data Management Language
# Hours: 7

Terminology: Alter table, Bfile, Blob, CASCADE, Char, CHECK constraint, Clob, Column level, Commenton, Create table, Data dictionary, Data warehouse, Date data type, Default, Drop column, Drop table, FOREIGN KEY, INTERVAL DAY TO SECOND, INTERVAL YEAR TO DATE, INTERVAL YEAR TO MONTH, Long, Long raw, Not null, Null, On delete, On delete set, PRIMARY KEY, Psuedo column, References, Rename, Set unused, Table, Table level, TIMESTAMP, TRUNCATE TABLE, UNIQUE

| **CAREER and TECHNICAL SKILLS**<br>What the Student Should be Able to Do | | **ACADEMIC and WORKPLACE SKILLS**<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|
| **Knowledge** | **Application** | **Skill Group** | **Skill** | **Description** |
| 4.1 Define terminology | 4.1.1 Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to data management language [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 4.2 Construct a MERGE statement | 4.2.1 Execute a MERGE statement | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |
| 4.3 List each of the number, character, and date data types | 4.3.1 Create a table with examples of the number, character, and date data types | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.4 Create a table applying the appropriate data type for each column | 4.4.1 Diagram the appropriate uses of each data type | Thinking | Reasoning | Sees relationship between two or more ideas, objects, or situations [4.5.5] |
| 4.5 Discuss tables incorporating TIMESTAMP, INTERVAL YEAR TO MONTH, AND INTERVAL DAY TO SECOND data types to columns | 4.5.1 Create a table incorporating TIMESTAMP, INTERVAL YEAR TO MONTH, AND INTERVAL DAY TO SECOND data types | Thinking | Reasoning | Extract rules or principles from written information [4.5.4] |
| 4.6 Discuss how an organization use time stamps for time zones in business situations | 4.6.1 Research a list of examples of how businesses use time stamps for time zones | Foundation | Writing | Analyzes data, summarizes results, and makes conclusions [1.6.2] |
| 4.7 Articulate the changing nature of work and its associated educational requirements | 4.7.1 Research the changes in work and educational requirements | Thinking | Reasoning | Uses logic to draw conclusions from available information [4.5.6] |
| 4.8 Discuss each of the DDL statements: ALTER, DROP, RENAME, and TRUNCATE and discuss the effect each has on tables and columns | 4.8.1 Give examples of each DDL statement: ALTER, DROP, RENAME, and TRUNCATE and show the effect each has on tables and columns | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.9 Discuss why it is important to be able to modify a table | 4.9.1 Demonstrate the importance of being able to modify tables | Foundation | Writing | Analyzes data, summarizes results, and makes conclusions [1.6.2] |

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| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 4.10 | Discuss how to construct a query using the ALTER TABLE commands ADD, MODIFY, and DROP | 4.10.1 | Execute a query using the ALTER TABLE commands ADD, MODIFY, and DROP | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.11 | Discuss the rationale for using TRUNCATE vs. DELETE for tables | 4.11.1 | Provide a list of differences between TRUNCATE vs. DELETE | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 4.12 | Discuss adding a comment to a table using the COMMENT ON TABLE command | 4.12.1 | Create a table and add a comment using COMMENT ON TABLE command | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.13 | Identify the changes that can and cannot be made to modify a column | 4.13.1 | Create a list of examples of changes that can and cannot be made to modify a column | Foundation | Writing | Analyzes data, summarizes results, and makes conclusions [1.6.2] |
| 4.14 | Discuss the guidelines for dropping a column when constraints are present | 4.14.1 | Create a list of examples of dropping columns when constraints are present | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.15 | Discuss when and why the SET UNUSED statement is advantageous | 4.15.1 | Diagram when and why the SET UNUSED statement is advantageous | Thinking | Decision Making | Evaluates information/data to make best decision [4.2.5] |
| 4.16 | List the guidelines related to using a DROP TABLE statement | 4.16.1 | Create a chart explaining each guideline | Foundation | Speaking | Applies/Uses technical terms as appropriate to audience [1.5.2] |
| 4.17 | Discuss the term "constraint" as it relates to data integrity | 4.17.1 | Create a list of ways to use constraints | Foundation | Reading | Analyzes and applies what has been read to specific task [1.3.2] |
| 4.18 | Discuss NOT NULL and a UNIQUE constraint | 4.18.1 | Demonstrate NOT NULL and a UNIQUE constraint in a new table | Foundation | Writing | Presents answers/conclusions in a clear and understandable form [1.6.13] |
| 4.19 | Identify two reasons why constraints are incorporated into table definitions | 4.19.1 | Create one example for each reason constraints are incorporated into table definitions | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.20 | Discuss why it is important, from a business perspective, for a language to have built-in constraint-checking capability | 4.20.1<br><br><br>4.20.2 | Research and provide evidence to support the assigned topic<br><br>Research ways a business can use all of them together | Foundation | Reading<br><br>Speaking | Draws conclusions from what is read [1.3.12]<br><br>Participates in conversation, discussion, and presentations [1.5.8] |
| 4.21 | Evaluate a business problem that would involve a new table with NOT NULL and UNIQUE constraints | 4.21.1 | Write and display a code for both NOT NULL and UNIQUE constraints | Foundation | Writing | Composes and creates documents - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |

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| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 4.22 | Discuss PRIMARY KEY, FOREIGN KEY, and CHECK constraints | 4.22.1 | Create a table using an example of PRIMARY KEY, FOREIGN KEY, and CHECK constraints | Foundation | Science | Constructs graph of data [1.4.9] |
| 4.23 | Discuss the purpose of defining PRIMARY KEY, FOREIGN KEY, and CHECK constraints | 4.23.1 | Explain each term as it is used in a table | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.24 | Discuss how to use the CREATE TABLE | 4.24.1 | Demonstrate the creation of constraints at the column level and table level in a CREATE TABLE statement | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.25 | Evaluate a business problem requiring the addition of a PRIMARY KEY and FOREIGN KEY constraint | 4.25.1 | Write the code to execute the addition of a PRIMARY KEY and FOREIGN KEY; demonstrate them by creating a table | Thinking | Seeing Things in the Mind's Eye | Organizes and processes images - symbols, pictures, graphs, objects, etc. [4.6.2] |
| 4.26 | Differentiate between checking vs. constraint management | 4.26.1 | Demonstrate the different ways of using constraints | Foundation | Speaking | Participates in conversation, discussion, and presentations [1.5.8] |
| 4.27 | List three different functions that the ALTER statement can perform on constraints | 4.27.1 | Demonstrate how each ALTER statement works | Thinking | Reasoning | Comprehends ideas and concepts related to Database Programming [4.5.2] |
| 4.28 | Name a business function that would require a DBA to drop, enable, and/or disable a constraint or use the CASCADE | 4.28.1 | Identify the function that requires DBA rights | Thinking | Reasoning | Uses logic to draw conclusions from available information [4.5.6] |
| 4.29 | Evaluate a business problem to modify an existing table with new constraints | 4.29.1 | Write the code to resolve the problem | Thinking | Problem Solving | Revises plan of action indicated by findings [4.4.9] |
| 4.30 | Discuss the different activities that a database administrator might perfom with regard to constraints | 4.30.1 | Research evidence to support the assigned topic | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.55] |

# Unit 5: Transforming from the Conceptual to the Physical
# Hours: 6

Terminology: ALTER SEQUENCE, Caches, Complex view, CREATE VIEW, CYCLE/NOCYCLE, Disk I/O, DROP INDEX, DROP SEQUENCE, DROP SYNONYM, DROP VIEW, Expression, FORCE, Function-based, INCREMENT BY, INLINE VIEW, MAXVALUE/NOMAXVALUE, MINVALUE/NOMINVALUE, NEXTVAL, NO FORCE, REPLACE, Sequences, Sharable, Simple view, System crash, Synonym, TOP-N analysis, WITH CHECK OPTION, WITH READ ONLY, View

| **CAREER and TECHNICAL SKILLS**<br>What the Student Should be Able to Do | | | | **ACADEMIC and WORKPLACE SKILLS**<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 5.1 | Define terminology | 5.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to conceptual/physical [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 5.2 | Identify entity relationship models and database models | 5.2.1 | Distinguish entity relationship models from database models | Foundation | Writing | Analyzes data, summarizes results, and makes conclusions [1.6.2] |
| 5.3 | Compare and contrast the conceptual and physical data models | 5.3.1 | Describe the terminology mapping between a conceptual model and a relational database model | Foundation | Speaking | Applies/Uses technical terms as appropriate to audience [1.5.2] |
| 5.4 | Discuss the rule of basic mapping to transform an entity into a table | 5.4.1 | Apply the rule of basic mapping to transform an entity into a table | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.5 | Recall the rule of Oracle naming conventions for tables and columns used in relational models | 5.5.1 | Apply the rule of Oracle naming conventions for tables and columns used in relational models | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.6 | Recall the rule of relationship mapping to correctly transform one to many and barred relationships | 5.6.1 | Apply the rule of relationship mapping to correctly transform one to many and barred relationships | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.7 | Recall the rule of relationship mapping to correctly transform many-to-many relationships | 5.7.1 | Apply the rule of relationship mapping to correctly transform many-to-many relationships | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.8 | Recall the rule of relationship mapping to correctly transform one-to-one relationships | 5.8.1 | Apply the rule of relationship mapping to correctly transform one-to-one relationships | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.9 | Recall the rule of relationship mapping to correctly transform relationships in an arc | 5.9.1 | Apply the rule of relationship mapping to correctly transform relationships in an arc | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 5.10 | Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype implementations | 5.10.1 | State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype implementations | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.11 | Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping subtype implementations | 5.11.1 | State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping subtype implementations | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.12 | Recall the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype and subtype arc implementations | 5.12.1 | State and apply the table, column, identifiers, relationship, and integrity restraint rules for mapping supertype and subtype arc implementations | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 5.13 | Discuss how to create a table in HTML DB using a provided SQL script | 5.13.1 | Create a table in HTML DB using a provided SQL script | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 5.14 | Discuss entering data into an existing table using a provided SQL script | 5.14.1 | Enter sample data into an existing table using a provided SQL script | Thinking | Problem Solving | Recognizes/Defines problem [4.4.8] |
| | | | | | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| | | 5.14.2 | Query a table to view data using a provided SQL script | | | |

# Unit 6: Knowledge
# Hours: 6

Terminology: Object privileges, PUBLIC privileges, REVOKE privileges, System privileges, WITH GRANT OPTION

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 6.1 | Define terminology | 6.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to knowledge [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 6.2 | Explain Integrity Rule as it relates to database tables | 6.2.1 | Create a table following the Integrity Rule | Foundation | Writing | Uses words appropriately [1.6.21] |
| 6.3 | Identify table, row, column, primary key, unique key, and foreign key given in a diagram containing them | 6.3.1 | Printout a table and identify the rows, columns, UID, FK | Foundation | Writing | Composes and creates document - letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] |
| 6.4 | Identify violations of data-integrity rules | 6.4.1 | Correct violations of data-integrity rules | Thinking | Reasoning | Comprehends ideas and concepts related to data-integrity rules [4.5.2] |
| 6.5 | Recall the rules of SQL to display all columns of a table | 6.5.1 | Apply the rules of SQL to display all columns of a table | Foundation<br><br>Thinking | Speaking<br><br>Reasoning | Applies/Uses technical terms as appropriate to audience [1.5.2]<br><br>Applies rules and principles to a new situation [4.5.1] |
| 6.6 | Recall the rules of SQL to display a subset of the coulmns of a table specified by criteria | 6.6.1 | Apply the rules of SQL to display a subset of the coulmns of a table specified by criteria | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.7 | Explain how to add new data to a table containing 4 columns | 6.7.1 | Apply the rules of SQL to add new data to a table containing 4 columns | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.8 | Explain how to add a new column to an existing table | 6.8.1 | Apply the rules of SQL to add a new column to an existing table | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.9 | Discuss applications of DELETE | 6.9.1 | Use the DELETE and ALTER TABLE | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.10 | Illustrate a data-modeling project | 6.10.1 | Use a data-modeling project to salve a business information need | Thinking | Decision Making | Evaluates information/data to make best decision [4.2.5] |
| 6.11 | Discuss solutions to business problems using database technology | 6.11.1 | Work as a group to solve business problems using database technology | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 6.12 | Illustrate a database solution to a business problem | 6.12.1 | Create and present a database solution to a business problem | Foundation | Speaking | Adapts presentation to audience [1.5.1]<br><br>Organizes ideas and communicates oral messages to listeners [1.5.7] |
| 6.13 | Explain the different stages of the system development lifecycle | 6.13.1 | List and describe the different stages of the system development lifecycle | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.5.5] |
| 6.14 | Explain the role of data modeling in the system development lifecycle | 6.14.1 | Explain the purpose of data modeling | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.5.5] |
| 6.15 | Discuss the relationship between project tasks to the different stages of the system development lifecycle | 6.15.1 | Correctly apply relationships to List of Values (LOV) in an organizational hierarchy | Thinking | Reasoning | Sees relationship between two or more ideas, objects, or situations [4.5.5] |
| 6.16 | Recall how to implement tables from an ERD | 6.16.1 | Use HTML DB to inplement tables from an ERD | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.17 | Recall how to issue SQL queries in HTML DB | 6.17.1 | Produce query output using HTML DB | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.18 | Explain the features and benefits that Oracle Database Environment provides for businesses | 6.18.1 | Idenitfy & discribe the efficiency, accuracy, flexibility, workflow, & reporting qualities of Oracle | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.5.5] |
| 6.19 | Compare and contrast application software and system software | 6.19.1 | Identify key differences between application software and system software | Thinking | Decision Making | Comprehends ideas and concepts related to application and system software [4.2.2] |
| 6.20 | Identify the appropriate SQL functions to perform projection, selection, and join | 6.20.1 | Use the correct syntax to perform projection, selection, & join | Thinking | Decision Making | Comprehends ideas and concepts related to projection, selection, and join [4.2.2] |
| 6.21 | Discuss the correct syntax to perfom arithmetic expressions on the columns of a query | 6.21.1 | Use the correct syntax to perform arithmetic expressions on the columns of a query | Foundation | Arithmetic/ Mathematics | Uses basic numerical concepts in practical situations [1.1.32] |
| 6.22 | Recall correct operator precedence to display desired results | 6.22.1 | Formulate queries using correct operator precedence to display desired results | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.23 | Compare and contrast the concepts of null, zero and an empty string | 6.23.1 | Categorize the concepts of null, zero, and an empty string | Thinking | Reasoning | Sees relationship between two or more ideas, objects, or situations [4.5.5] |
| 6.24 | Recall the effect null values have in arithmetic expressions | 6.24.1 | Demonstrate the effect null values have in arithmetic expressions | Foundation | Arithmetic/ Mathematics | Uses basic numerical concepts in practical situations [1.1.32] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 6.25 | Discuss how to use a column alias | 6.25.1 | Construct a query using a column alias | Thinking | Decision Making | Comprehends ideas and concepts related to column aliases [4.2.2] |
| 6.26 | Recall how to use the concatenation operator | 6.26.1 | Apply the concatenation operator to link column values and expressions to create a character expression | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.27 | Discuss use of literal values of type character, number, and date | 6.27.1 | Use literal values of type character, number, and date in a SQL SELECT statement | Foundation | Speaking | Participates in conversation, discussion, and group presentations [1.5.8] |
| 6.28 | Define and use DISTINCT to eliminate duplicates in query results | 6.28.1 | Apply DISTINCT to eliminate duplicates in query results | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |
| 6.29 | Discuss the structure of a table using DESCRIBE | 6.29.1 | Display the structure of a table using DESCRIBE | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.30 | Illustrate the use of HTML DB to run, edit, and save SQL statements | 6.30.1 | Edit, execute, and asve SQL statements in HTML DB | Thinking | Decision Making | Comprehends ideas and concepts related to SQL statements [4.2.2] |
| 6.31 | Discuss how to access self test software to review for certification exam | 6.31.1 | Demonstrate the ability to log into the self test software | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.32 | Discuss how to use WHERE clause to restrict rows returned in a SQL query | 6.32.1 | Apply the WHERE clause to restrict rows returned in a SQL query | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.33 | Explain why it is important to be able to easily limit data retrieved from a table | 6.33.1 | Construct a query that limits or restricts a column or row | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.5.5] |
| 6.34 | Explain the use of logical comparisons to restrict the rows returned based on two or more conditions | 6.34.1 | Evaluate logical comparisons to restrict the rows returned based on two or more conditions | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.35 | Explain the rules of precedence by which expressions are evaluated and calculated | 6.35.1 | Apply the rules of precedence to determine the order in which expressions are evaluated and calculated | Thinking | Decision Making | Comprehends ideas and concepts related to the rules of precedence [4.2.2] |
| 6.36 | Identify a query to sort a result set in ascending or descending order | 6.36.1 | Construct a query to sort a result set in ascending or descending order | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.37 | Identify a query to order a result set using a column alias | 6.37.1 | Construct a query to order a result set using a column alias | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 6.38 | Identify a query to order a result set for single or multiple columns | 6.38.1 | Construct a query to order a result set for single or multiple columns | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 6.39 | Identify appropriate applications of single-row functions in query statements | 6.39.1 | Use single-row functions in a query | Thinking | Reasoning | Comprehends ideas and concepts related to single-row functions [4.5.2] |
| 6.40 | Identify a function as a single row or multiple row function | 6.40.1 | Classify a function as a single row or multiple row function | Thinking | Decision Making | Comprehends ideas and concepts related to the multiple row functions [4.2.2] |
| 6.41 | Compare and contrast the results returned by single row and multiple row functions | 6.41.1 | Categorize the results returned by a function as single row or multiple row | Thinking | Decision Making | Comprehends ideas and concepts related to single and multiple row functions [4.2.2] |

# Unit 7: HTML DB
# Hours: 6

Terminology: Application, Application builder, Oracle HTML DB

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 7.1 | Define terminology | 7.1.1 | Prepare a list of terms with definitions | Foundation | Reading | Applies/Understands technical words that pertain to HTML DB [1.3.6] |
| | | | | | Writing | Uses words appropriately [1.6.21] |
| 7.2 | Discuss using SQL concepts to create a functional database appropriate for a small business | 7.2.1 | Using SQL you will form a database for a small business | Foundation | Science | Applies knowledge to complete a practical task [1.4.3] |
| | | 7.2.2 | Using SQL form a database for a small business with a new list of values | Thinking | Problem Solving | Comprehends ideas and concepts related to input of data [4.4.1] |
| | | 7.2.3 | Using HTML DB SQL input data for the businesses customers, subjects, publishers, and item types | | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| | | 7.2.4 | Create and produce reports for customers orders using ORDER in the input form and report page | | | Comprehends ideas and concepts related to a database for a small business [4.5.2] |
| 7.3 | Discuss how to use Oracle HTML DB SQL Workshop to create table components and layouts using a wizard | 7.3.1 | Use Oracle's HTML DB SQL to make a table using layouts from a wizard | Thinking | Reasoning | Comprehends ideas and concepts related to a database for a small business [4.5.2] |
| 7.4 | Use Oracle HTML DB SQL Workshop to create the application's pages, page style, and popup list of values (LOVs) using a wizard | 7.4.1 | Using Oracle's HTML DB SQL create application pages, different page styles, and a list of values | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 7.5 | Use Oracle HTML DB SQL Workshop to create input forms using a wizard | 7.5.1 | Using Oracle's HTML DB SQL create input forms | Foundation | Writing | Completes form accurately [1.6.7] |
| 7.6 | Describe how to input data into the CUSTOMERS, SUBJECTS, PUBLISHERS, and ITEM_TYPES tables using a wizard | 7.6.1 | Create input forms to report areas for applications such as orders and items | Foundation | Writing | Completes form accurately [1.6.7] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 7.7 | Discuss how to create input forms and report areas for the application's ORDERS and ITEMS pages to enable use of the LOVs for inputting data using a wizard | 7.7.1 | Format the report pages | Thinking | Creative Thinking | Uses imagination to create something new [4.1.1] |
| 7.8 | Discuss how to create and produce reports about customer orders using the ORDER input form and report page | 7.8.1 | Create charts to display summary data | Thinking | Creative Thinking | Combines ideas or information in a new way [4.1.2] |
| 7.9 | Explain how to format report pages | 7.9.1 | Present to class functional database created along with data, reports, and forms | Foundation | Speaking | Adapts presentation to audience [1.5.1] |

# Unit 8: Database Operations
# Hours: 6

Terminology: COMMIT, ROLLBACK, SAVEPOINT

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 8.1 | Define terminology | 8.1.1 | Prepare a list of terms with definitions | Foundation | Reading<br><br>Writing | Applies/Understands technical words that pertain to database operations [1.3.6]<br><br>Uses words appropriately [1.6.21] |
| 8.2 | List three advantages of the COMMIT, ROLLBACK, and SAVEPOINT statements | 8.2.1 | List three advantages using these statements | Foundation | Writing | Analyzes data, summarizes results, and makes conclusions [1.6.2] |
| 8.3 | Explain why it is important, from a business perspective, to be able to control the flow of transaction processing | 8.3.1 | Explain the importance of controlling the flow of transaction processing | Foundation | Speaking | Applies/Uses technical terms as appropriate to audience [1.5.2] |
| 8.4 | Explain the difference between system security and data security as it relates to a database | 8.4.1 | Explain differences between system security and data security | Foundation | Speaking | Communicates a thought, idea, or fact in spoken form [1.5.5] |
| 8.5 | Discuss why it is important, from a business perspective, to be able to set up user accounts with different types of access permissions | 8.5.1 | Research and provide evidence to support the assigned topic | Thinking | Reasoning | Uses logic to draw conclusions from available information [4.5.6] |
| 8.6 | List 5 system privileges and explain their functions | 8.6.1 | List five system privileges with function explanation | Thinking | Reasoning | Extracts rules or principles from written information [4.5.4] |
| 8.7 | Write a statement to create a user | 8.7.1 | Write a statement to create a user | Foundation | Writing | Organizes information into an appropriate format [1.6.10] |
| 8.8 | Write a statement to GRANT privileges such as CREATE SESSION, CREATE TABLE, CREATE SEQUENCE, CREATE VIEW, and CREATE PROCEDURE | 8.8.1 | Write a statement to grant these privileges | Thinking | Reasoning | Applies rules and principles to a new situation [4.5.1] |
| 8.9 | Define and explain the advantages of a role | 8.9.1 | Define with explanation of the advantages of a role | Foundation | Writing | Evaluates written information for appropriatness/content/clarity [1.6.9] |

| CAREER and TECHNICAL SKILLS<br>What the Student Should be Able to Do | | | | ACADEMIC and WORKPLACE SKILLS<br>What the Instruction Should Reinforce | | |
|---|---|---|---|---|---|---|
| **Knowledge** | | **Application** | | **Skill Group** | **Skill** | **Description** |
| 8.10 | Define a database link and explain the object privileges that apply with a remote database | 8.10.1 | Define database links with explanation of object privileges | Foundation | Writing | Applies/Uses technical words and concepts [1.6.4] |

# Glossary
# Unit 1: Number, Date, and Conversion Functions

1. Add_months – function that adds calendar months to a date
2. CASE – implements conditional processing (If-Then-Else logic) within a SQL statement; it meets the ANSI standard
3. COALESCE – returns the first non-null expression in the list
4. CONCAT – merges the first character value to the second character value; equivalent to concatenation operator (||)
5. Decode – implements conditional processing (If-Then-Else logic) within a SQL statement; it is specific to the Oracle syntax
6. Dual Table – dummy table used to view results from functions and calculations
7. Expression – a symbol or combination of symbols that represents a quantity or a relationship between quantities
8. If-Then-Else – a programming IF statement that checks condition(s), if the condition(s) is true the THEN statement(s) get accomplished; if the condition is false the ELSE statement(s) gets accomplished.
9. NULLIF – compares two expressions; if they are equal, the function returns null; if they are not equal, the function returns the first expression
10. NVL – converts nulls to an actual value, or to force group functions to include null values
11. NVL2 – examines the first expression; if the first expression is not null, it returns the second expression; if the first expression is null, it returns the third expression
12. INITCAP – converts alpha character values to uppercase for the first letter of each word, all other letters in lowercase
13. INSTR – returns the numeric position of a named string
14. Last_day – function that calculates the last day of the month specified
15. LENGTH – returns the number of characters in the expression
16. LPAD – pads the character value right-justified to a total width of a specified character positions
17. LOWER – converts alpha character values to lowercase
18. MOD function – returns the remainder of a division
19. Months_between – function that calculates the number of months between two dates
20. Next_day – function that calculates the next date of the day specified

21. Personal Inventory – a detailed, itemized record of accomplishments
22. ROUND – rounds the column, expression, or value to a set number of decimal places
23. REPLACE – searches a text expression for a character string and, if found, replaces it with a specified replacement string
24. RPAD - pads the character value left-justified to a total width of a specified character positions
25. RR – century value depends on the specified year and the last two digits of the current year
26. SUBSTR – returns specified characters from character value starting at a specified character position and going specified character positions long
27. Sysdate – a function that returns the current database server date and time
28. TRIM - enables you to remove heading or trailing characters (or both) from a character string
29. TRUNC – truncates the column, expression, or value to a set number of decimal places
30. UPPER – converts alpha character values to uppercase

# Unit 2: Joins

1. Business rule – a formalized statement of the usual, customary, or generalized course of action or behavior for a business; a generalized statement that describes what is true in most or all cases

2. Cardinality – a property of an end of a relationship between X and Y, that describes how many of X is related to Y; both ends of a relationship must have a defined cardinality; same as degree

3. Cartesian product – results from an invalid or omitted join condition; all combinations of rows are displayed

4. Conventions – a practice or procedure widely observed in a group, especially to facilitate communication or social interaction; a custom

5. Database – a collection of data arranged for ease and speed of search and retrieval; one or more large structured sets of persistent data, usually associated with software to update and query the data

6. Degree – a property of an end of a relationship between X and Y, that describes how many of X is related to Y; both ends of a relationship must have a defined degree; same as cardinality

7. ERDish – the language or statements used to describe relationships between entities in an entity-relationship diagram

8. Exhaustive – not including the specified limits, but only the area between them: 20-25, exclusive; that is, 21, 22, 23 and 24

9. Information – knowledge, intelligence, a particular piece of data with a special meaning or function; information is often the result of combining, comparing, and performing calculations on data

10. Matrix diagram – a grid-like drawing that can be used to discover and record relationships between entities in an entity-relationship model

11. Mutual exclusive – a relationship that presents choices which are unable to be true at the same time; a choice between mutually exclusive possibilities means selecting "either this or that"

12. Nonequijoin – a join condition containing something other than an equality operator; values in a column in one table must be conditional to but not equal to a value(s) in another table

13. Optionality – a property of an end of a relationship between X and Y, that describes whether X must be or may be related to Y; both ends of a relationship must have a defined optionality

14. Relationship – a connection or association between objects

15. Reserved words – words that have a special meaning and function within a computer system or language

16. Revenue - that which returns or comes back from an investment; income

17. Source document – written or printed material that is used and/or produced by the business and which analysts can use to determine information requirements

18. Subentity – synonymous with subtype; an entity split into two or more parts, each of which has common attributes and/or relationships

19. Subtype – synonymous with subentity; an entity may be split into two or more parts, each of which has common attributes and/or relationships

20. Supertype – a means of classifying an entity that has subtypes

# Unit 3: Group Functions and Subqueries

1. ALL - compares value to every value returned by the subquery
2. ANY - compares value to each value returned by the subquery
3. Barred relationship - a relationship that participates in an entity's unique identifier
4. Child record - the record that holds the column data that references to another table
5. Data manipulation - enters new rows, changes existing rows, and removes unwanted rows from tables in the database
6. DELETE - removes existing rows from a table
7. Explicit - fully and clearly expressed; leaving nothing implied
8. First normal form – the output of the first step of database normalization; eliminates repeating groups by putting each into a separate table and connecting them with a one-to-many relationship
9. GROUP BY – divides the rows in a table into groups
10. HAVING – is used to specify which groups are to be displayed; restricts groups that do not meet group criteria
11. IMPLICIT – implied or understood though not directly expressed
12. Inner query – returns a value that is used by the outer query
13. INSERT – adds a new row to a table
14. Integration – combining software or hardware components or both into an overall system
15. Integrity constraint – ensure that the data adheres to a predefined set of rules
16. Intersection entity – the product of the resolution of a many-to-many relationship
17. Many-to-many – (A) a type of relationship that has "one or more" cardinality at both ends; (B) a relationship in which many records in one table match many records in another table
18. Nontransferability – property of a relationship where an instance of A is related to an instance of B, and the association cannot be moved to another instance of B; normally determined by the business rules
19. Normalization – a series of steps followed to obtain a database design that allows for efficient access and storage of data in a relational database reducing data redundancy and the chances of data becoming inconsistent

20. One-to-many – a relationship where a single record in Table A can be related to one or more records in Table B, but a single record in Table B can only be related to one record in Table A

21. One-to-one – (A) a type of relationship that has "one and only one" cardinality at both ends; (B) a relationship where each record in Table A can be related to one, and only one, record in Table B, and vice versa

22. Outer query – also called the main query, accepts a value from the inner query to solve its original query

23. Parent record – the record that holds the column data that references other tables

24. Redundancy – something that is unnecessarily repetitive, the state of being unnecessarily repetitive

25. Redundant – unnecessarily repetitive

26. Subquery – a SELECT statement that is embedded in a clause of another SELECT statement

27. Transferable – property of a relationship between A and B, where an instance of A is related to an instance of B, and the association can be moved to another instance of B; normally determined by the business rules

28. Update – modifies existing rows in a table

29. User – someone doing "real work" with the computer, using it as a means rather than an end

# Unit 4: Data Management Language

1. Alter table – to add, modify, or drop columns from a table; use to add a constraint to existing tables with the ADD clause
2. Bfile – binary data stored in an external file; up to 4 gigabytes
3. Blob – binary large object data up to 4 gigabytes
4. CASCADE – constraints referring to dropped columns will also be dropped
5. Char – the CHAR data type stores fixed-length character strings
6. CHECK constraint – specifies a condition that must be true for each row of data
7. Clob – large object data up to 4 gigabytes
8. Column level – references a single column and is defined within a specification for the owning column
9. Commenton – to engage and pay for the services of a professional (e.g., carpenter, writer, gardener)
10. Create table – command to create tables to store data
11. Data dictionary – created and maintained by the Oracle Server and contains information
12. Data warehouse – a generic term for a system for storing, retrieving and managing large amounts of any type of data
13. Date data type – date and time value between January 1, 4712 B.C. and A.D. December 31, 9999
14. Default – a particular setting or value for a variable that is assigned automatically by an operating system and remains in effect unless canceled or overridden by the operator, or specifies a preset value if a value is omitted in the INSERT statement
15. Drop column – to delete a column from a table
16. Drop table – removes the definition of the table
17. FOREIGN KEY – a column or set of columns that defines how tables relate to each other
18. INTERVAL DAY TO SECOND – allows time to be stored as an interval of days to hours, minutes, and seconds
19. INTERVAL YEAR TO DATE – allows time to be stored as an interval of year to date
20. INTERVAL YEAR TO MONTH – allows time to be stored as an interval of years and months
21. Long – variable-length character data up to 2 gigabytes

22. Long raw – raw binary data

23. Not null – constraint ensures that the column contains no null values

24. Null – a value that is unavailable, unassigned, unknown, or inapplicable; it is not a zero or space

25. On delete – deletes the dependent rows in the child table when a row in the parent table is deleted

26. On delete set – converts dependent foreign key values to null

27. PRIMARY KEY – (A) a constraint which ensures that the column contains no null values and uniquely identifies each row of the table, or unique identifier of each row of data in a table; it must contain a value and it must be unique; (B) the set of mandatory columns within a table that is used to enforce uniqueness of rows, and that is normally the most frequent means by which rows are accessed

28. Psuedo column – behaves like a table column but is not actually stored in the table, or dummy column, are not actual columns in a table but they behave like columns

29. References – identifies that table and column in the parent table

30. Rename – used to change the name of a table

31. Set unused – marks one or more columns as unused so that they can be dropped when the demand on system resources is lower

32. Table – an orderly arrangement of data, especially one in which the data are arranged in columns and rows in an essentially rectangular form, or stores data, basic unit of storage, composed of rows and columns; often an implementation of an entity

33. Table level – references one or more columns and is defined separately from the definitions of the columns in the table

34. TIMESTAMP – allows the time to be stored as a date with fractional seconds

35. TRUNCATE TABLE – used to remove all rows from a table and to release the storage spaced used by the table

36. UNIQUE – (A) an integrity constraint that requires every value in a column or set of columns be unique; (B) a set of columns within a table that is used to enforce uniqueness of rows, and that is an alternate means by which rows are accessed

# Unit 5: Transforming from the Conceptual to the Physical

1. ALTER SEQUENCE – modifies a sequence
2. Caches – a fast storage buffer in the central processing unit of a computer; also called cache memory
3. Complex view – derives data from more than one table, contains functions or groups of data, and does not always allow DML operations through the view
4. CREATE VIEW – creates a view by embedding a subquery within it
5. CYCLE/NOCYCLE – specifies whether the sequence continues to generate values after reaching its maximum or minimum values
6. Disk I/O – writing and reading of data onto and from a storage disk
7. DROP INDEX – removes an index
8. DROP SEQUENCE – removes a sequence
9. DROP SYNONYM – removes a synonym
10. DROP VIEW – removes a view
11. Expression – a symbol or combination of symbols that represents a quantity or a relationship between quantities
12. FORCE – creates a view regardless of whether or not the base tables exist
13. Function-based – index based on expressions
14. INCREMENT BY – specifies the interval between sequence numbers
15. INLINE VIEW – subqueries with an alias that can be used within a SQL statement
16. MAXVALUE/NOMAXVALUE – specifies a maximum or default value the sequence can generate
17. MINVALUE/NOMINVALUE – specifies the minimum sequence or default value
18. NEXTVAL – returns the next available sequence value
19. NO FORCE – creates a view only if the base tables exist
20. REPLACE – searches a text expression for a character string and, if found, replaces it with a specified replacement string
21. Sequences – generates a numeric value

22. Sharable – an object that can be shared by multiple users

23. Simple view – derives data from a table, no functions or groups, performs DML operations through the view

24. System crash – a sudden failure of a program or operating system, usually without serious consequences

25. Synonym – an expression that serves as a figurative or symbolic substitute for another, or gives alternative names to objects

26. TOP-N analysis – asks for the N largest or smallest values in a column

27. WITH CHECK OPTION – prohibits changing rows that are not in the subquery, or specifies that INSERTS and UPDATES performed through the view can't create rows which the view cannot select

28. WITH READ ONLY – ensures that no DML operations can occur

29. View – a table of logical subsets or combinations of data based on a table or another view

# Unit 6: Knowledge

1. Object Privileges – the right to manipulate the content of the objects in the database
2. PUBLIC Privileges – the right of an owner of a table to grant access to all users
3. REVOKE Privileges – the right to take away privileges granted to other users
4. System privileges – the right to access the database and its objects
5. WITH GRANT OPTION – allows the grantee to grant the object privileges to other users and roles

# Unit 7: HTML DB

1. Application – a collection of database-driven Web pages linked together using tabs, buttons, or hypertext links

2. Application builder – Oracle's HTML DB Web-based application developer tool used to design and assemble the Web-based user interfaces on top of database objects such as table, views, and procedures

3. Oracle HTML DB – a component in the Oracle Database 10g; a development tool for the Oracle database

# Unit 8:  Database Operations

1. COMMIT – ends the current transaction by making all pending data changes permanent

2. ROLLBACK – ends the current transaction by discarding all pending data changes

3. SAVEPOINT – marks a savepoint within the current transaction