CURRICULUM REVISION PROJECT

2013

TEACHER GUIDE FOR
RELATIONAL DATABASE MANAGEMENT SYSTEM
(17332)

THIRD SEMESTER
(CO/CM/IF/CD/CW)

JUNE 2013

MAHARASHTRA STATE

BOARD OF TECHNICAL EDUCATION, Mumbai

CURRICULUM DEVELOPMENT CELL, MSBTE, MUMBAI.

TEACHER'S GUIDE AND SAMPLE QUESTION PAPER

Designation	Team of Design
Education Technology Consultant	**Prof. D. M. Makone** **Prof. S. D. Khare** **Dr. R. S. Mahashabde**
Project Period	May2013 – June 2013
Project Co-ordinator	**Dr. D.V. Chavak** Vice principal, Institute of technology, Ulhasnagar.
Subject Experts	**1. Mrs. Jyoti V. Bansode** Lecturer in Computer Department Shah & Anchor Kutchhi Polytechnic, Chembur. Mumbai – 400 088 **2. Mr. Santosh A. Korde** Lecturer in Computer Department Y.B. Patil Polytechnic, Akurdi Pune **3. Mr. Abhijeet A. Pasi** Lecturer in Computer Department Shah & Anchor Kutchhi Polytechnic, Chembur. Mumbai – 400 088

2013, Maharashtra State Board of Technical Education,
49, Kherwadi, Aliyawar Jung Road, Bandra (East), Mumbai-400051.
Maharashtra State, India.

1. APPROACH TO CURRICULUM DESIGN

1.1 Overview of Revised Curriculum:

Background: MSBTE is introducing the revised curriculum under 'G' scheme from the academic year 2012-13.

There are many institutions in the state running different diploma courses. In order to ensure uniform and effective implementation of the curriculum it is necessary that every teacher is aware of approach for curriculum design, educational principles to be adopted, learning resources to be used and evaluation methods. The teacher guide prepared for each subject will provide the inputs related to above mentioned aspects to achieve uniform and effective implementation of curriculum of various subjects.

1.2 Curriculum philosophy:

MSBTE has adopted systems approach while designing the scientific based curriculum since 1995. The same approach has been adopted while revising the curriculum in semester pattern.

Fig. No. 1 shows the systems diagram. This diagram provides the holistic view for curriculum designing, development, implementation and evaluation.

The input to polytechnic education system is the students having 10+ qualifications. The teaching learning process occurs in the institution for six/eight semesters. The output of the system i. e. Diploma pass out is normally the input to industries. (Some students do go for higher education). While designing the curriculum the expectations of the industries play a major role. Due to globalization and competition the industries expect that pass outs have generic and technological skills along with right attitude.

To fulfill the needs derived from systems approach following conceptual framework is considered:

1.3 Curriculum:

“Curriculum is an educational program designed and implemented to achieve specified educational objectives”

This definition takes into account the fact that

- Education is purposeful
- There is an organized plan of action contemplated
- Such a plan is translated into action through appropriate strategies of implementation.

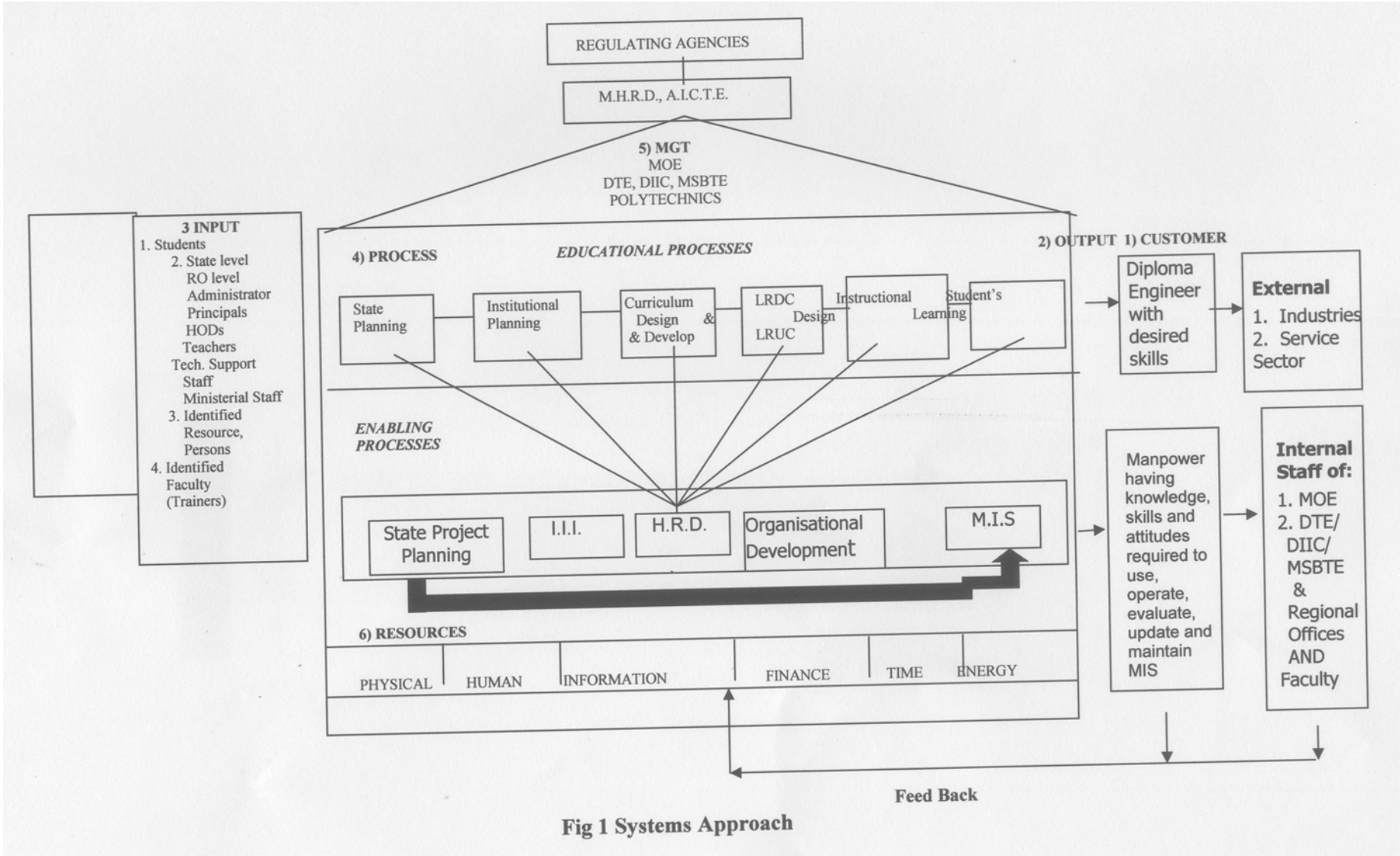


Fig 1 Systems Approach

1.4 Curriculum goals

1. To develop confidence in students by providing more exposure to industry experience and world of work at global level.

2. To provide conceptual knowledge and develop analytical ability

3. To develop communication skill with good English by providing sufficient practice

4. To enhance latest technical knowledge industry interaction and media

5. To develop learning to learn skills and life skills to cope up with industrial culture

6. To impart managerial skills by providing appropriate theoretical inputs

7. To develop problem solving ability through technical projects.

1.5 DESIRED SKILLS

Industries expect from the diploma engineer the abilities and skills of general nature and specific to the job performance. The curriculum aims at developing life skills and technological skills so that the diploma pass outs would be suitable for industry. The skills are listed below:

Life Skills:

Search information from various sources
Develop Communication ability
Develop presentation skills
Work as a member of a team/group and as leader
Collect field data
Develop learning to learn
Write repot for given task/work/project
Develop computer proficiency

Develop observation skills

Technological Skills:

Diploma engineers should possess following intellectual and motor skills in order to satisfactorily perform duties assigned to them:

Intellectual Skills:

- Use of data sheets, charts, handbooks, standards
- Interpret drawing, circuit diagrams, plant layouts, charts, performance analysis
- Select materials and components
- Locate faults and repairs of faults
- Analyse the data
- Prepare Estimate
- Design of simple components
- Use of computer software

Motor Skills:

- Measure accurately different parameters
- Operate machines
- Calibrate instruments
- Repair Faults
- Install machines
- Draw plant layout and Prepare detailed drawing
- Conduct various tests and Draw characteristics

1.6 Salient Changes in the curriculum:

- For First semester Basic science is divided into two parts-Basic Physics and Basic Chemistry. Theory examination of both parts as well as practical examination of both parts will be conducted on separate days. Sum of theory marks of both parts shall be considered for passing theory examination of Basic Science. Similarly it is applicable to practical examination. It is mandatory to appear for theory & practical examination of both parts. Candidates remaining absent in any examination of any section will not be declared successful for that exam head.

- For second semester applied science is divided into two sections-Applied Physics & Applied Chemistry where the theory examination of 50 marks each and practical examination of 25 marks each will be conducted separately & the minimum passing marks for applied science will be the combination of both the sections. It is mandatory to appear for theory & practical examinations of both parts. Candidates remaining absent in any examination of any section will not be declared successful for that exam head.

- The component of Development of life skills were taught in two semesters. In Development of life skills-I the topics related to personal development, such as Learning to Learn Skills, personality development, presentation skills etc. were included. In Development of Life Skills-II the topics related to Team Building, Leadership, Group behavior etc. were covered. In the revised curriculum the scope of development of life skills has be broaden to include behavioral science component. Therefore the subject Development of Life Skills-II has been renamed and it is now included at Vth semester in the revised curriculum under the title Behavioral Science.

- The subject of Professional Practices was introduced to integrate the skills acquired in the Development of Life Skills, through technical subjects from second to sixth semester. The experience in implementing the content of the subject shows that there are limited activities possible in second semester as the technical knowledge given to the students is very limited. Also at sixth semester the students are doing projects in which they are performing many activities included in the Professional Practices & therefore it is proposed that the subject of Professional Practices be prescribed only for three semesters vis. Third, fourth and fifth semesters.

- Introduction of Environment Studies at fourth semester for all courses.

- From the experience of implementation of Elective Subjects at V and VI semesters in last five years, it is proposed to have only one elective at the sixth semester for all courses. However the specialized courses like Medical Electronics, Electronics and Video Engineering will not have provision for electives. For elective, student will have to choose one from the given two/three subjects.

- While revising the curriculum redundant/obsolete topics/sub topics are being replaced by new/advance technology topic/sub topics.

- In Computer Engineering Group new subjects like Advanced Linux Programming, Scripting Technology, Network Programming, Fiber Optic communication have been added as elective subjects.

2. OBJECTIVES

2.1 Introduction

Objectives are the statements which describe the expected learning outcome. Such statements enable teachers to plan instructional process with appropriate resources. These objectives also provide a direction to frame proper questions to assess the learning outcome.

During last decade there has been research on cognitive approach in psychology. This approach is based on biological structure of brain and meta-cognitive knowledge dimension. Important elements of this approach which form basics of learning are explained below.

2.2 Domains of Learning:

Learning is a process by which students develop relatively permanent change in mental associations through experience. This is how learning is defined by cognitive psychologists. Behavioral; psychologists define learning as a relatively permanent change in behavior.

There are following domains of learning:

A: Cognitive Domain relates to intellectual skills or abilities

B: Affective Domain relates to emotions, feelings, likes, dislikes etc.

C: Psychomotor Domain relates to manipulative skills of hands, legs. Eye-hand coordination in Engineering & Technology courses, endeavor is made to design curriculum with a focus on development of cognitive skills through classroom teaching. Where as manipulative (psychomotor) skills are developed in workshops, laboratories & seminars where students work individually or in a group. Development of affective skills attitudes and value is supposed to be acquired through projects and co curricular activities. These are also developed from the work culture or institutions.

How far a student has developed these abilities/skills especially from cognitive and psychomotor domains is assessed on the basis of suitable examinations. When classroom and laboratory teaching is viewed in this light, evaluation becomes an integral part of teaching – learning process.

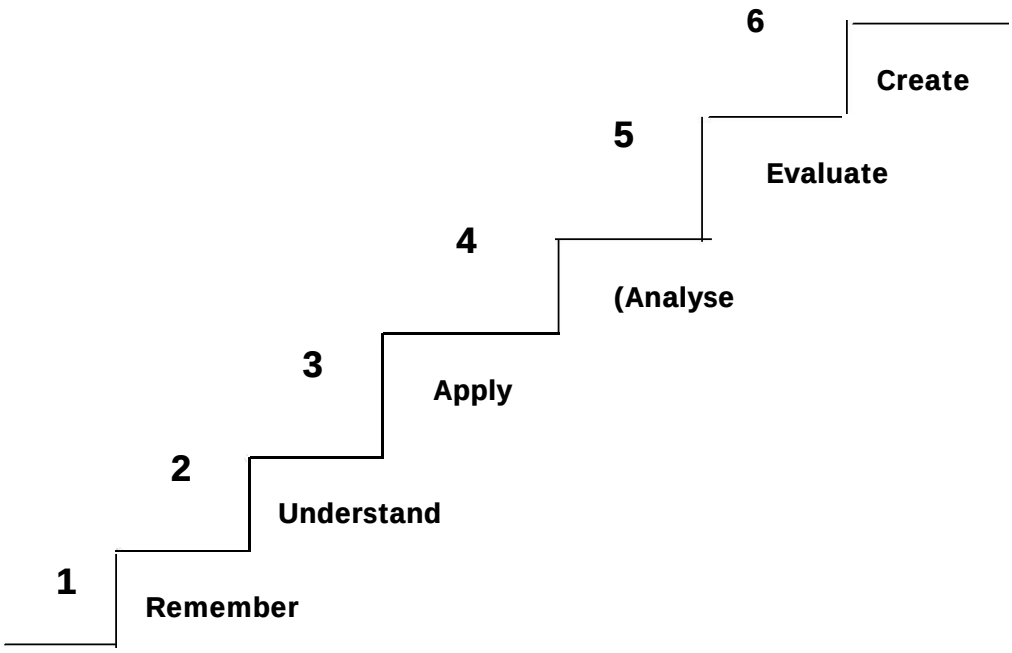
2.4 LEVELS OF LEARNING:

Question paper is a tool/ instrument designed to test the extent of learning of the student. Various questions set in a question paper should assess the abilities of students to respond to level of learning. Dr. Bloom a German educationist classified levels of learning in cognitive domain for the purpose of writing objectives and assessment. Dr. Bloom's revised taxonomy is based on cognitive psychology and is two dimensional. First dimension is cognitive process dimension ad other is knowledge dimension. Details of these two dimensions are given below.

2.4.1 Cognitive Domain:

Dr. Benjamin Bloom (1956) analysed questions asked in various examinations in American situation and proposed a hierarchical arrangement of instructional objectives (Intellectual abilities) tested by these questions.

The lowest level of cognitive learning achieved by a student is demonstrated by the recall of information that the student retrieves from his long term memory. So, the storage and retrieval of specific facts, concepts, principles, laws, definitions, properties, procedures etc. directly from memory was classified as a knowledge level objective. Thus questions testing memory of students were treated as at the lowest level of the hierarchy of intellectual abilities. The other levels of hierarchy proposed by Dr. Bloom in 1956 relate to the degree of information processing required in the brain needed to provide answer to a question. The various levels in the cognitive hierarchy proposed by Dr. Bloom in 1956 and further revised in 2001 are given below in the diagrammatic form.



Following are the details of each level which indicate the general and specific objectives. Further appropriate verbs are given which are useful in setting good questions. In this table only four levels are considered for diploma students.

Description of the Major Levels in the cognitive Domain (Bloom's Taxonomy)	Illustrative General Instructional Objectives	Illustrative verbs for stating specific learning outcomes
Remember – Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required to mind of the appropriate information. This represents the lowest level of learning outcomes in the cognitive domain	Knows common terms, specific facts, basic concepts, principles, methods & procedures	Define, describe, identify label, list, match, name, outline, reproduce, select, state

Understand – This is defined as the ability to grasp the meaning of material. This may be	Understands fact, principles Interprets	Convert, distinguish estimate, explain, extend,

shown by translating material from one form to another (words or numbers) by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). Draw sketches these learning outcomes go one step beyond the simple remembering of material and represent the lowest level of understanding.	verbal material, Interprets charts, tables, graphs. Translates verbal material to mathematical formula. Estimates consequences implied in data. Justifies methods & procedures.	generalize, give examples; infer, paraphrase, predict, rewrite, summarize, draw labeled sketches.
Apply – Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as concepts, principles, rules, methods, laws and theories. Learning outcomes in this area require a higher level of understanding than those under the level described earlier.	Applies principles to new situations. Applies theories to practical situations. Solves mathematical problem. Construct charts, graphs Demonstrates correct usage of a procedure	Change, compile, demonstrate, discover manipulate, modify operate, predict, prepare, produce, show, solve, use.
Analyze – Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationship between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than “understand” and apply because they require an understanding of both the content and the structural form of the material.	Recognizes unstated assumptions and logical fallacies in reasoning. Distinguishes between facts and inferences. Evaluates relevance/ adequacy of data.	Breakdown, diagram, differentiate, discriminate, distinguish, identify illustrate, infer, outline, point out, relate, select, separate, subdivide.

2.4.2 Categories of Knowledge Dimension

After considering the various designations of knowledge types, especially developments in cognitive psychology that have taken place since the original framework of Bloom's taxonomy, knowledge is categorised in 4 types – Factual , Conceptual, Procedural and Meta-cognitive.

Factual Knowledge (A) is knowledge of discrete, isolated content elements. It includes knowledge of terminology and knowledge of specific details and elements. In contrast,

Conceptual Knowledge (B) is knowledge of "more complex, organised knowledge form". It includes knowledge of classifications and categories, principles and generalizations and theories, models and structures.

Procedural Knowledge (C) is "knowledge of how to do something". It includes knowledge of skills and algorithms, techniques and methods, as well as knowledge of criteria used to determine and/or justify "when to do what" within specific fields and disciplines.

Meta-cognitive knowledge (D) is "knowledge about cognition in general as well as awareness of and knowledge about one's own cognition. It encompasses strategic knowledge, knowledge about cognitive tasks, including contextual and conditional knowledge; and self-knowledge".

Assessment is required to be done on the basis of categories of knowledge and levels of learning. Table below indicates the two dimensional grid based on Blooms Taxonomy for setting questions.

Knowledge Dimension	COGNITIVE PROCESS DIMENSION			
	1 Remember	2 Understand	3 Apply	4 Analyze
A. Factual Knowledge				
B. Conceptual Knowledge				
C. Procedural Knowledge				
D. Meta-Cognitive Knowledge				

2.5 Components of Curriculum:

2.5.1 Rationale: It indicates the logical basis for the inclusion of the subject in the curriculum It also indicates the importance of the subject related to entire curriculum. Importance of the subject is on two counts:

One the knowledge gained while studying the subject helps understand and develop further knowledge of the subject or understand and effectively learn the higher level subjects.

The other indicates how the knowledge gained can be used in the world of work to perform given tasks.

Rationale tells the students the connection of subjects related to study of higher level subjects and also the us in their job/profession.

2.5.2 Objectives: Objectives indicate what the student will be to do/perform after he completes the study of the subject. It also in other words indicate the scope of the subject. Objectives indicate what is achievable and hence gives direction to the student about how to study the subject, what important things are to be observed and performed during practicals. Just as rationale indicates the use of the knowledge gained while studing the subject, objectives indicate how efficiently and effectively one can work if the objectives are fulfilled while studying the subject.

2.5.3 Learning Structure: It graphically/pictorially indicates the content of the curriculum of the subject and what is to be learnt in the subject. As you know that in Cognitive Domain knowledge is divided in four components Factual, Conceptual, Procedural and Metacognitive. Of this Factual, Conceptual and Procedural knowledge components are identified in the curriculum of the subject along with the applications. Learning structure gives broad idea of these components for a subject. It indicates the scope of the subject. Normally we first decide what we want to achieve by studying the subject, which forms the application component. Based on this we decide what procedures are required for these applications.

Facts, Concepts, Principles are used in developing procedures and applications. So these are given sequentially below procedure as Principles, Concepts and Facts in their order. Learning structure also provide an idea about how to develop the subject logically to achieve the objectives.

2.5.4 Contents: List of topics and subtopics to be included in the curriculum of the subject

is given in the contents. This helps in achieving the rationale and objectives identified. Contents indicate the importance of the topics, sub topics in development of the subject and accordingly weightages in terms of Hours required to teach the subject components, so that the desired learning takes place. Marks to be allotted while testing the knowledge gained by the student are also indicated.

One has to be careful in allotting the hours required to teach the topics looking at the importance of the topic for development of the subject. There fore it is necessary to provide sufficient time to teach concepts and principles so that they are well understood by the students as they form the basis for development of the subject.

2.5.5 Practicals: While designing the curriculum the objectives are identified. To achieve these objectives students have to develop certain intellectual and motor skills. These skills are developed through well designed Practicals. So in the curriculum the list of the skills to be developed through Practicals is given. The list of Practicals is so developed that after performing the Practicals identified skills will be developed. Here it is necessary that the teacher gives enough opportunity to all the students to perform the practical properly to develop the skills in each one of them.

The skills will be developed if the students actually perform certain activities or tasks. Therefore it is necessary that any practical included in the curriculum necessarily involve some activities to be done by the students. So there should not be any study type experiment as it is nothing but repetition of what is taught in the theory class. So one has to think and innovate to modify the study experiments so that students will be asked to perform some activity. It could be in terms of identifying components, listing of materials used for manufacturing the components, stating importance of use of certain materials etc.

So any curriculum of a subject is so designed that it achieves the objectives of that subject as well as fulfill the objectives of the entire curriculum

CONTENT ANALYSIS

3.1 Components of Content Analysis:

As we have discussed earlier, any curriculum or syllabus of a SUBJECT given to the teacher is organised in terms of UNITS which include TOPICS or SUB-TOPICS as the case may be indicating the TIME in which it is expected to be taught to the students. Components of a topic or part thereof are analysed here at a micro level.

Before we begin actual leaching of any topic (lesson), we must carefully and critically analyse it so that we can plan for teaching - select appropriate media, methods and techniques of teaching and arrange the suitable resources to be required. This analysis of the content of a Topic results in identification of the following components of the content:

1. Facts
2. Concepts
3. Principles (rules, laws, theories)
4. Procedures
5. Applications
6. Skills (Psychomotor Skills), and
7. Attitudes (underlying affective behaviors as quite often these are not specifically mentioned in the syllabus, still they are to be developed lesson after lesson gradually).

When we undertake the exercise of content analysis, we ourselves understand the subject fully well and at the same time we become clear as to what we are going to teach It also gives us an idea as to which methods of teaching and media of instruction we It also gives us an idea as to which methods of teaching and media of instruction we should prepare and use and also what resources including time we will require. This analysis will also enable us to design assignments as well as how we are going to assess students learning.

Since the nature of the components of content (1 to 7) differs from one another. These are learned by the students differently as different mental processes are involved in learning these components. The immediate implication of this varying nature of components is that these need to be taught differently and assessed differently. For example, if you look at components I to 5 all of which belong to Cognitive Domain of Learning; Component 6 belongs to Psychomotor Domain and Component 7 belongs to Affective Domain (cannot be taught as these attitudes are caught), you will find that these differ from one another. The classification of human behaviors (activities) into the above three domains of learning entails the use of entirely different methods and media of instruction. Different locations of learning (classroom, laboratories, workshops, field visits) need to be selected.

Now we will discuss these components in some detail and see how each one of these should be taught and assessed differently.

3.1.1 FACTS:

These are universally accepted and commonly understood items about which there cannot be much argument and discussion. These are required only to be informed. For example: The sun rises in east and sets in the west; names of scientists and the year in which their theories were propounded; the rules and regulations of admission and examination prescribed by the University are some of the examples of facts. Sometimes, they need not be emphasised in the class as the students already know them. But information can be passed on by word of mouth, if deemed necessary.

3.1.2 CONCEPTS:

A concept is an abstraction or an idea that permits the learner to classify a variety of related phenomena into a convenient and meaningful category. Concept of something is like a picture formation of that thing which helps in conceptualizing it. Gagne says that concept learning produces a certain fundamental change in human performance that is independent of subject or content. Concepts can be divided into the following two categories:

1. Concrete Concepts: those which can be seen, touched and manipulated e.g. house, book, table, chair, cat, dog, any machine or apparatus, overhead projector, chalkboard and duster.

2. Abstract Concepts: those which cannot be seen and touched and handled but can only be imagined e.g. force, work, fractions, decimal, bending moment, moment of inertia, friction, heat, and induction. Teaching of concrete concepts is not that difficult because the teacher can show the object physically or its picture. On the contrary, teaching of an abstract concept offers difficulty to the teacher as well as for students to understand. These concepts can be learned by heart without understanding as children mug up Nursery Rhymes without understanding even a single word. But at the stage of higher tearing, this type of rote learning is not desirable. Adolescents (teenagers) and adults do not accept things without understanding.

3.1.3 Concept Attributes:

We identify a concept and understand it, once we are told about its qualities characteristics, and features. They are technically called concept attributes. While teaching a

concept to our students we must spell out as many attributes as possible for better understanding of the concept.

Example: The Concept **of Friction**

Attributes:

1. Friction is a resistive force.
2. Frictional force acts in the direction opposite to the direction of the applied force.
3. Frictional force is more when the surfaces in contact are rough.
4. Smooth surfaces (perfect) have zero friction.
5. Frictional force is self-adjusting to a limit.

Towards the end of this Theme Paper a number of examples of concept attributes are given for your guidance.

The following questions pertaining to a concept (object or process) will be helpful in writing concept attributes:

1. What it is.
2. What are its constituent parts.
3. How it works.
4. How it is similar to and different from other known concepts.
5. What are its uses?

3.1.4 PRINCIPLES:

A principle is a statement of relationship between two or more concepts. Principles are sometimes called rules, laws or generalizations. In others words, relationship between two or more concepts which is scientific and universally true is called a Principle.

For Example: (related concepts are underlined)

1. Actions and reactions are equal and opposite.

2. Ohm's law I = V/R is a principle, where I (Current), V (Voltage), and R (Resistance) are the concepts. While teaching a principle we must recall the concepts which it involves. These concepts might have been taught in the previous lesson. As you already know, concept learning is a prerequisite to Principle learning. Thus we recall the concepts of current, voltage and resistance by asking questions to the students. Only after that we must tell the relationship among these i.e. Ohm's Law.

3.1.5 APPLICATIONS:

Whatever principles, laws and theories have been learned are only academic exercises unless these are applied to solve a practical problem. In other words, we call this application transfer of learning to a new situation. If you recall, the process of learning dealt with in Theme Paper 2, you will appreciate that the litmus test of learning having occurred is its application in a new situation or solving a new problem.

For example:

1. Ohm's law can be applied to find out the unknown quantity (voltage, current, and resistance).

2. Design of a structure can be made based on related principles and theories.

3. Principles of learning and events of instruction can be applied in ‘Designing a lesson Plan' and 'Presenting the lesson in the classroom".

4, The above principles can also be applied while preparing textbooks, workbooks, learning packages and laboratory manuals to be used by the students.

3.1.6 PROCEDURES:

While analysing the content of a topic you might come across certain standard procedures which are prescribed to perform an operation or a given task. These procedures should be clearly identified and taught accordingly not to be left to chance. We should not pre-suppose that the students understand them. We cannot afford to take these things for granted.

For Example:

1. Procedure of setting up of an apparatus.
2. Procedure to start an engine.
3. Procedure to operate a machine (a lathe).

3.1.7 SKILLS (PSYCHOMOTOR):

A skill is an ability to perform a task expertly and well. The skilled performance; must meet a pre-specified standard of acceptable performance. A skill has the following three characteristics:

1. It represents a chain of motor responses;
2. It involves the co-ordination of hand and eye movements, and

3. It requires the organization of chains into complex response patterns.

Skills could be intellectual (thinking, understanding); interactive (communication skills) and social (socialising, mixing up with others) also. But normally when we use the word skills, it refers to psychomotor skills.

For Example:

1. Welding a butt joint,
2. Setting a theodolite at a station,
3. Making proper circuit connections, and
4. Turning a job on a lathe machine.

Laboratories and workshops of Polytechnics are the locations where these skills are developed among the students under the guidance of expert instructors *of* operators. Drill and practice are the main methods of teaching and learning these skills through model demonstrations and careful observations thereof. Alongside developing these skills, desirable attitudes like cooperation, team work, leadership, safety, cost consciousness are also developed.

3.2 TEACHING OF CONCEPTS:

In order to teach concepts effectively the following steps have been suggested by De Cecco & Crawford (1974).

Steps Suggested:

1. Describe the performance expected of the student after he has learned the concept.
2. Reduce the number of attributes to be learned in complex concepts and make important attributes dominant.
3. Provide the student with verbal indicators (explanation).
4. Provide positive and negative examples (non-examples) of the concept.
5. Present the examples in close succession or simultaneously.
6. Provide occasions for student responses and the reinforcement of these responses, and
7. Assess the learning of the concept.

3.3 TEACHING OF PRINCIPLES:

De Cecco & Crawford (1974) has suggested the following steps for teaching principles effectively.

Steps:

1. Describe the performance expected of the student after he has learned the principle.

2. Decide and indicate which concepts or principles the students must recall in learning the new principle.
3. Assist the student in the recall of component concepts.
4. Help the student in the recall of component concepts.
5. Help the student to combine the concepts and put them in a proper order.
6. Provide for practice of the principle and for reinforcement of student responses.
7. Assess the learning of the principle.

3.4 CONCLUSION:

To sum up, it can be said that. it is essential for the teachers to develop the skills of 'Content Analysis' of their subjects. It brings content clarity among teachers themselves. More importantly, Content Analysis will be a pre-requisite for writing Instructional Objectives of the topic to be taught. You will study Instructional Objectives in a separate Theme Paper in detail. Teaching and learning process is bound to be effective once these crucial academic activities are undertaken.

4. Curriculum:

w.e.f Academic Year 2012-13 'G' Scheme

Course Name: Computer Engineering Group

Course Code: CO/CD/CM/CW/IF

Semester: Third

Subject Title: Relation Database Management System

Subject Code: 17332

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	---	04	03	100	---	25#	50@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

Each and every Organization like shopping mall, hospital, banking, institutes, Industry etc. needs to share huge amount of data in effective manner. This subject enables to create, store, modify and extract information from a database.

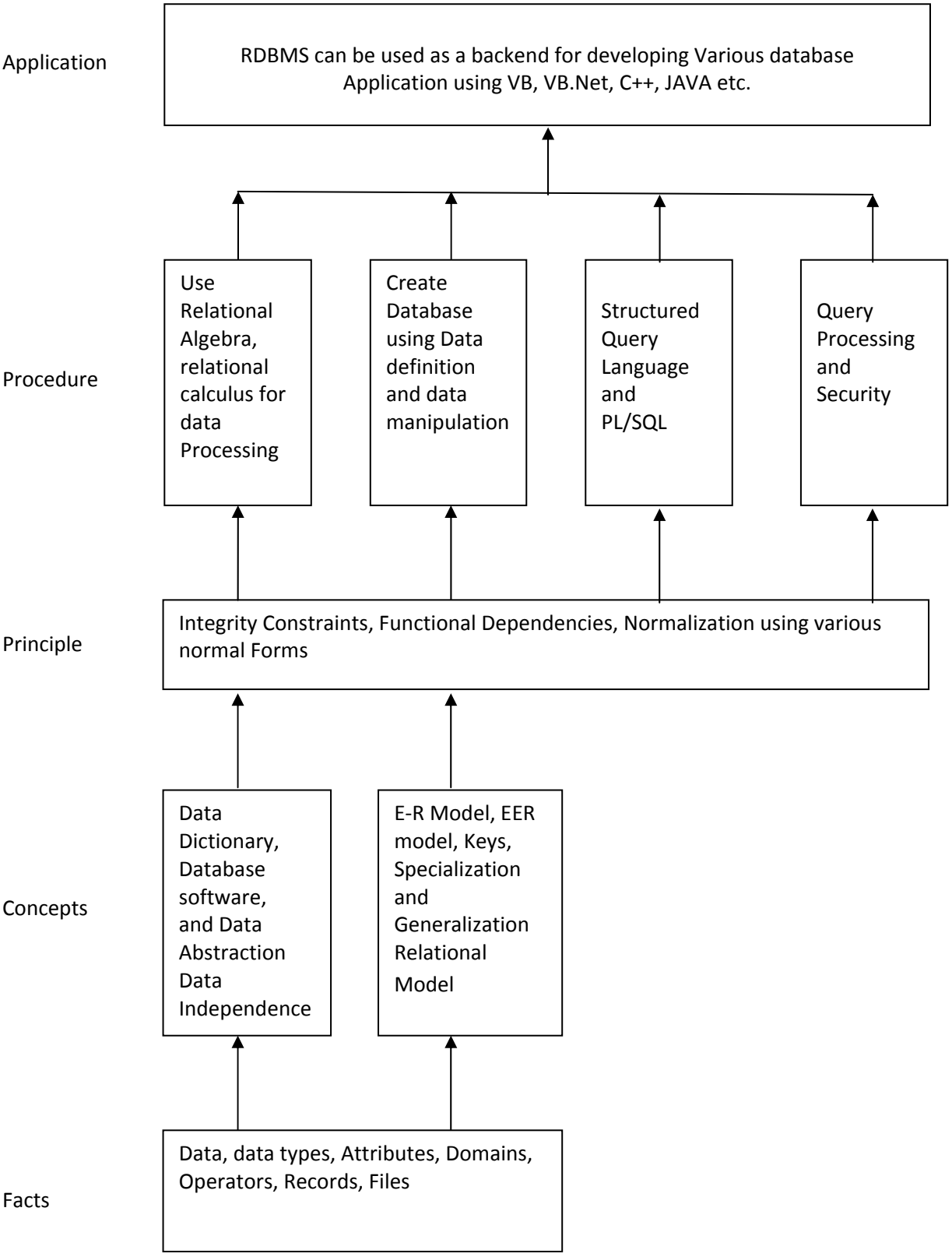
Relational database management system has been developed to manage the information stored in the database. After learning this subject student will be able to use RDBM package as a backend for developing database applications.

General Objectives:

The Students will be able to:

1. Design the database structure with appropriate data tables.
2. Aware of proper specifications of data.
3. Create normalized database file.
4. Understand Query Processing.

Learning Structure:



Topic No.	Content	Hours	Marks
01	**Database System Concept** Specific Objectives: ➢ State the importance of DBMS effectiveness and database tools. ➢ State the advantages of using database system to store operational data. ➢ Explain the concept of RDBMS ➢ Describe the overall structure of DBMS & Architecture of Client/Server system. ➢ Explain the concept of data mining and data warehousing 1.1 An Introduction to database. Data, database, DBMS, Disadvantages of file processing system, advantages of DBMS over file processing system, Application of database. 1.2 What is RDBMS, Difference between DBMS and RDBMS 1.3 Names of various DBMS and RDBMS softwares 1.4 Data abstraction, Database languages, Instance and schema, Data independence - Logical and Physical Independence. 1. 5 Components of DBMS and overall Structure of DBMS. Database Users, functions of Database Administrator. 1. 6 Introduction to client server architecture. Two/Three tier Architecture. 1.7 The 12 Rules (Codd's laws) for fully functional RDBMS. 1.8 Introduction to Distributed database, Introduction to data mining & data warehousing	08	16
02	**Relational Data Model and Security and Integrity Specification** Specific Objectives: ➢ Explain the commercial data processing applications by using ➢ Various data models. ➢ Implement the Concept of E-R Model. ➢ Describe the process of Normalization & Design database structure ➢ Using various Normal forms to reduce redundancy. ➢ Explain the various data constraints. ➢ Explain the need of data security. 2.1 ----------(10 Marks) ➢ Data Model • Network Model • Hierarchical Model • Relational Model ➢ Relational Model: - Basic Concepts Attributes and Domains. Key Concepts:- Candidate key, Primary key, Foreign key and Super key. ➢ E-R model, Components of ER Model, Types of attributes, role Indicator, weak & strong entity set.	14	22

	➢ Enhanced ER Model: Introduction, Specialization & Generalization 2.2 ----------(12 Marks) ➢ Relational Algebra and Relational Calculus. ➢ Database Design: Relational database Design, Functional dependencies, Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF, BCNF. Normalization based on multivalued dependencies, Normalization based on Join dependencies. ➢ Integrity Constraints**:** Domain Integrity Constraints, Entity integrity Constraints, Referential Integrity Constraints & on delete cascade ➢ Database Security: introduction, Data security requirements		
03	**Interactive SQL** Specific Objectives: ➢ Design SQL queries to Create Relational database and apply data constraints. ➢ Design the queries for data manipulation. ➢ Implement the queries using various operators & functions ➢ Design the queries for controlling in Database. ➢ Explain the concept of transaction processing. 3.1----------(10 Marks) ➢ Introduction to SQL ➢ Data Types in SQL ➢ DDL Commands: CREATE, ALTER, DROP, TRUNCATE, ➢ DESC, RENAME, Creating a User, Use of data constraints ➢ DML Commands: INSERT, UPDATE,DELETE,CALL 3.2----------(16 Marks) ➢ SQL Operators: Arithmetic Operators, Comparison Operators, Logical Operators, Set Operators, Range Searching operators- Between, Pattern matching operators-Like. ➢ Oracle Functions: String, Arithmetic, Date and time, Aggregate Functions and Miscellaneous Functions. Conversion Functions, Special Date formats using To_char() function ➢ Queries using Group by, having, and Order by clause, Joins, Types of Joins, Sub queries. ➢ DCL Commands: COMMIT, SAVEPOINT, ROLLBACK, GRANT, REVOKE. ➢ DQL Commands: SELECT. ➢ Transaction Processing: The concept of Transaction, ACID properties, States of Transaction, Concurrent execution of Multiple transaction, Serializability.	18	26
	Advance SQL: SQL Performance Tuning		

04	Specific Objectives: ➢ Design SQL queries for implementation of VIEWS, SEQUENES, INDEXES, SNAPSHOT and SYNONYM. 4.1 **Views:** What are Views? The Create View Command, Updating Views, Views and Joins, Views and Sub queries, What Views cannot do? , Dropping Views. 4.2 **Sequences**: Creating Sequences, Altering Sequences, Dropping Sequences. 4.3 **Indexe**s: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes. 4.4 **Snapshots:** Creating a Snapshot, Altering Snapshot, Dropping a Snapshot. 4.5 **Synonyms:** Creating Synonyms, Dropping Synonyms.	08	12
05	**PL/SQL , Database Objects & Security** Specific Objectives: State the features and components of the PL/SQL. Write simple PL/SQL Code using control structure and handle various exceptions. Create stored procedures and implement functions & create database trigger using PL/SQL. Provide security to database using Locks in PL./SQL 5.1 ----------(08 Marks) ➢ Introduction of PL/SQL, Advantages of PL/SQL ,The PL/SQL Block Structure, PL/SQL execution environment, PL/SQL data Types, Variables, Constants ➢ **Control Structure:** Conditional Control, Iterative Control, Sequential Control. 5.2 ----------(16 Marks) ➢ **Exception handling:** Predefined Exception, User defined Exception. ➢ **Cursors:** Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors. ➢ **Procedures:** Advantages, Creating, Executing and Deleting a Stored Procedure. ➢ **Functions:** Advantages, Creating, Executing and Deleting a Function. ➢ **Database Triggers:** Use of Database Triggers, How to apply database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger. ➢ **PL/SQL security**-Locks, Types of Locks-shared & exclusive. Locking strategy-Implicit &Explicit	16	24
	Total	**64**	**100**

Practicals:

Intellectual skills:

1. Write the fields of data base
2. Decide proper specifications
3. Execute Query Processing and transaction processing.
4. Prepare appropriate data tables
5. Writing of Sequential steps

Note:

- All the experiments shall be performed using Oracle 8i or Higher Versions.
- Students shall maintain a lab manual, giving details of the work-carried out during every practical session.
- Assessment shall be done based on the lab manual. This lab manual shall be submitted as term-work.

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Designing E-R diagrams. Designing a Normalized Database.	04
2	Creating & Executing DDL commands in SQL. & Apply various Integrity constraints on table.	04
3	Creating & Executing DML commands in SQL.	04
4	Writing Queries using various operators & Arithmetic, String Functions.	06
5	Executing Data Conversion functions such as To_char(), To_Number() and To_date(). Execute various Date functions and also display special date formats using To_char() function.	04
6	Executing Queries using the Select Command with Where, Having ,Group by and order by clauses also execute the queries using aggregate functions.	06
7	Execute the queries for implementation of Inner, Outer and Cross Join.	04
8	Executing DCL commands in SQL.	02
9	Implementation of Views.	04
10	Execute Indexes, Sequences,, Snpashots and synonyms in SQL.	04
11	Write the basic PL/SQL Programs and also Write a PL/SQL programs using if then else, for, while and nested loop.	04
12	Write a PL/SQL code to implement implicit and explicit cursors.	02
13	Write PL/SQL Programs based on Exceptions handling.(Predefined and user-defined exceptions)	02
14	Write PL/SQL code for creating Procedures, functions and database triggers.	06
15	Write a PL/SQL code to lock the table in shared mode and exclusive mode.	04
	Total	**64**

Learning Resources:

1. **Books:**

Sr. No.	Author	Title	Publisher
1	Korth	Database System Concepts(4th Edition)	Tata McGraw Hill
2	ISRD Group	Introduction to Database Management Systems	Tata McGraw Hill
3	Ivan Bayross(4th edition)	SQL ,PL/SQL the Programming language of Oracle	BPB
4	Chakrabarti Dasgupta	Advanced Database Management System	Dreamtech

2. Websites

1. wielyIndia.com or DreamtechPress.com
2. http://phindia.com/gupta/chapter/chapter1.pdf
3. www.williamstannings.com

5. IMPLEMENTATION STRATEGY

Common guidelines for effective teaching:

- Describe learning structure of the subject to the students at the start of semester in brief.
- Prepare own subject notes.
- Refer concept structure of every topic.
- Encourage students to write the commands and PL/SQL programs in lab manual / lab notebook.
- Ensure that syntaxes are properly practiced.
- Do not dictate programs/commands
- Give the relevance of each topic with real life applications such as Bus Reservation system, Library Management, University Management, College Management•

5.1 Planning of Lectures for a Semester with Content Detailing:

[The methods used to explain the contents are just guideline. Any relevant methods can be used for better understanding of students and effective teaching learning process]

Topic I	**Name: Database System Concept**
	Facts: ➢ Drawback of Conventional File system ➢ Need of DBMS **Concepts:** ➢ Concept of RDBMS ➢ Concept of Client-Server Architecture ➢ Concept of Data Mining and Data Warehousing **Principles:** ➢ Codd's Rule ➢ Structure of DBMS and RDBMS ➢ Applications of DBMS **Reference Material:** Books: - Title 1) Database System Concepts 4th Edition By Henry Korth 2) Introduction to Database Management Systems By ISRD Group **Teaching Aids:** Black board, Chalk, Transparencies, Power point presentation slides(PPTs), Reference books, notes, LCD projector/OHP Projector, **PPT with Sample: -** ➢ faculty.uaeu.ac.ae/myagoub/gis/Database[1]week3.**ppt** (Keyword in Google search:- "**basic concepts of dbms ppt"** Select "2nd Link") ➢ www.atkinson.yorku.ca/~marina/**PPT**/BD_1_06.**ppt** (Keyword in Google search:- "**basic concepts of dbms ppt"** Select "3rd Link") **Websites:** ➢ http://www.studytonight.com/dbms/overview-of-dbms.php ➢ http://techforum4u.com/content.php/506-Database-Management-System-Basic-Definitions-And-Concepts
Lecture No.	**Topic/ Subtopic to be covered**

1	• Introduction to data, database. • Disadvantages of file processing system, advantages of DBMS over file processing system • Application of database.
2	• Concept of RDBMS • Difference between DBMS and RDBMS • Names of various DBMS and RDBMS software
3	• Data abstraction (Three levels of data abstraction) • Database languages(DDL,DML(Procedural and Non-Procedural),DCL) • Instance and schema
4	• Data independence - Logical and Physical Independence. • Database Users • Functions of Database Administrator.
5	• Components of DBMS and overall Structure of DBMS.(Explain with diagram)
6	• Introduction to client server architecture. • Two/Three tier Architecture. • The 12 Rules (Codd's laws) for fully functional RDBMS.(Continue in next lecture)
7	• The 12 Rules (Codd's laws) for fully functional RDBMS • Introduction to Distributed database
8	• Introduction to data mining • Introduction to data warehousing • Revision of first chapter
Topic 2	**Name: Relational Data Model and Security and Integrity Specification**
	Facts: ➢ Importance of Normalization ➢ Functional dependencies **Concepts:** ➢ Concept of Normalization ➢ Concept of E-R Model ➢ Key Concepts **Principles:** ➢ Normalization ➢ Constraints **Reference Material:** Books: - Title 1) Database System Concepts 4th Edition By Henry Korth 2) Introduction to Database Management Systems By ISRD Group **Teaching Aids:** Black board, Chalk, Transparencies, Power point presentation slides(PPTs), Reference books, notes, LCD projector/OHP Projector, **PPT with Sample: -** http://www.uncg.edu/ism/ism318/normalization.pdf **Websites:** http://www.studytonight.com/dbms/overview-of-dbms.php
1	• What is Data Model • Different types of Data Model

	• Network Data Model • Hierarchical Data Model
2	• Relational Model: - Basic Concepts like Attributes, Tuples, Domains, Cardinality, Degree • Key Concepts:- Candidate key, Primary key, Foreign key and Super key.
3	• Concept of E-R model • Components of ER Model(Entity, Attribute, Relationship)(Explain different symbols) • Types of attributes, entities, role indicator • Draw any E-R diagram like Library Management, College Management) • Ask students to draw E-R diagram for any Management.
4	• Introduction to Enhanced ER Model(EER) • Specialization and Generalization • Give example of Specialization and Generalization
5	• What is Relational Algebra • Different operators (Select,Project,Union,Set-difference,Cartesian Product, Rename) • Explain with example for each operator
6	• Relational Algebra operators(Set Intersection,Natural Join,Division,Assignment) • Explain with example for each operator
7	• Tuple Relational Calculus: {t|P(t)} • Explain with example giving meaning of comparison operators(<,>,= etc.),set of connectivity operators like and(^),or($\vee$),not($\neg$) • There exists($\exists$ t$\in$r(Q(t))), for all(t$\in$r(Q(t)))
8	• Domain Relational Calculus • {<x1,x2,…….xn>|P(x1,x2,……xn)} Explain with example
9	• Introduction to Database Design • Definition and Explanation of 1NF(Drawbacks of 1NF) • Functional Dependency • Definition and Explanation of 2 NF(Drawbacks of 2NF)
10	• Transitive dependency • Definition and Explanation of 3NF • Definition and Explanation of BCNF
11	• Normalization based on multi-valued dependencies(4 NF) • Normalization based on Join dependencies(5NF)
12	• What are Integrity Constraints • Entity Integrity Constraints(Primary and Unique key) –Explain with example • Domain Integrity Constraints(Not Null, Check constraints) –Explain with example
13	• Referential Integrity Constraints(Foreign key) with On Delete Cascade-Explain with example
14	• Security (Different Security Measures at Various Levels) • Revision of second chapter
Topic 3	**Name: Interactive SQL**
	Facts:

	➢ DDL, DML, DCL ➢ Data Types ➢ Operators ➢ Functions **Concepts:** ➢ ACID Properties ➢ Transaction Processing: ➢ Join concept **Principles:** ➢ SQL Commands ➢ Join **Reference Material:** Books: - Title 1) Database System Concepts 4th Edition By Henry Korth 2) Introduction to Database Management Systems By ISRD Group **Teaching Aids:** Black board, Chalk, Transparencies, Power point presentation slides(PPTs), Reference books, notes, LCD projector/OHP Projector, **PPT with Sample: Preferably prepare PPTs containing-** inst.eecs.berkeley.edu/~cs186/sp06/lecs/lecture11**SQL**I.**ppt** (Keyword in Google search:- "**sql commands ppt"** Select "7th Link") **Websites:** http://www.studytonight.com/dbms/overview-of-dbms.php http://www.w3schools.com/sql/default.asp
Lecture No.	**Topic/ Subtopic to be covered**
1	• Introduction to SQL • Different SQL softwares available(like Oracle, My SQL) • Data Types in SQL • DDL Commands-Create with syntax and example
2	• DDL Commands –Alter command with different options (add, modify, drop column) • Drop and Truncate commands with syntax and example
3	• Desc ,Rename command • Creating different constraints like entity (Primary and Unique key)
4	• Creating Domain Integrity Constraints(Check and Not Null) • Creating Referential Integrity Constraints (foreign key, on delete cascade clause)
5	• DML Commands: INSERT-different ways to insert the records • Select command with where clause
6	• UPDATE,DELETE,CALL command with syntax and example
7	• SQL Operators: Arithmetic Operators(+,-,*,/) • Comparison Operators(<,>,=,< >,<=,>=) • Logical Operators(AND,OR,NOT) Explain all operators with syntax and example
8	• Set Operators(Union, Union All, Intersection ,Minus) with syntax and example

	• Between operator • Like operator with example having use of _ and %
9	• String functions (initcap, lower, upperltrim, rtrim etc.) • Arithmetic (Numeric Functions-Abs, cos, sin, tan, exp etc.), • Date and time (month_between, add_months, next_day, last_day etc.)
10	• Aggregate Functions(avg, sum, min, max, count) • Conversion Functions(To_Char,To_Date,to_number) explain with example
11	• Queries using Group by, having clause • Order By clause (Ascending and Descending)
12	• Join concept • Different Types of Join like natural, left outer, right outer, full outer,
13	• Join concept • self join, equi join, non equi join
14	• Explain Sub queries with different examples. DCL Commands: COMMIT, SAVEPOINT, ROLLBACK
15	• Granting authorization using Grant command(syntax and example) Revoke command with syntax and example
16	• Transaction Processing: The concept of Transaction, • ACID Properties
17	• Explain States of Transaction with diagram
18	• Serial schedule • Concurrent execution of multiple transaction • Serializability. • Conflict Serializability
Topic 4	**Name: Advance SQL: SQL Performance Tuning**
	Facts: ➢ Importance of Views ➢ Use of Snapshot, Indexes, Sequences, Synonyms. **Concepts:** ➢ Creation and Working with Views, Indexes, Snapshot, Sequences, Synonyms **Reference Material:** **Teaching Aids:** Black board, Chalk, Transparencies, Power point presentation slides(PPTs), Reference books, notes, LCD projector/OHP Projector, **PPT with Sample: -** ➢ For Views:- www.cs.sjsu.edu/faculty/lee/cs157/SQL - Weishan Wang.**ppt** ➢ **For Indexes and Sequences:-** www.dcs.warwick.ac.uk/~acristea/courses/CS252/CS252-course4.**ppt** **Websites:** ➢ http://www.studytonight.com/dbms/overview-of-dbms.php ➢ **For Snapshots**:- http://msdn.microsoft.com/en-us/library/ms175158.aspx
Lecture No.	**Topic/ Subtopic to be covered**
1	• What are views • How to create views(syntax and example) • Updating views
2	• Views and Joins

	• Views and Sub queries • How to drop views
3	• Use of sequences • Creating sequences • Altering sequences • Dropping sequences
4	• Use of Index • Types of Index • How to create index(syntax with example)
5	• Simple Index with syntax and example • Composite Index with syntax and example • How to drop Index
6	• Use of Snapshot • Creating snapshot • Altering snapshot • Dropping snapshot
7	• Use of Synonyms • Creating Synonyms • Dropping Synonyms
8	• Revision/Test
Topic 5	**Name: PL/SQL , Database Objects & Security**
	Facts: ➢ PL/SQL ➢ Triggers **Concepts:** ➢ Block Structure of PL/SQL ➢ Control Structure ➢ PL/SQL Security **Principles:** ➢ Cursor ➢ Functions ➢ Procedure **Reference Material:** Books: - Title 1) SQL PL/SQL The Programming Language of Oracle 4th Edition By Ivan Bayross 2) Introduction to Database Management Systems By ISRD Group **Teaching Aids:** Black board, Chalk, Transparencies, Power point presentation slides(PPTs), Reference books, notes, LCD projector/OHP Projector, **PPT with Sample: -** ➢ www.just.edu.jo/~qabuein/courses/cis421/chapter04.**ppt (preferable)** ➢ www.radford.edu/~cshing/340/lectures/**plsql**.**ppt** **Websites:** ➢ http://www.studytonight.com/dbms/overview-of-dbms.php ➢ http://plsql-tutorial.com/index.htm
1	Introduction of PL/SQL, Advantages of PL/SQL ,The PL/SQL Block Structure,

2	PL/SQL execution environment, PL/SQL data Types, Variables, Constants
3	**Control Structure** Conditional Control • IF-THEN ELSE • SIMPLE LOOP Sequential Control
4	**Control Structure** Iterative Control ➢ WHILE LOOP ➢ FOR LOOP
5	**Exception handling** ➢ Predefined Exception ➢ User defined Exception
6	**Cursors** ➢ Cursors Types ✓ Implicit Cursors ✓ Explicit Cursors, ➢ Declaring a Cursor ➢ Opening a Cursor ➢ Closing a Cursor
7	**Cursors** ➢ Fetching a Record from Cursor ➢ Cursor for loops ➢ Parameterized Cursors
8	**Procedures: (From ISRD Group)** ➢ Advantages ➢ Creating a Procedure ➢ Executing a Procedure ➢ Deleting a Procedure.
9	**Stored Procedure** ➢ Advantages ➢ Creating a Procedure ➢ Executing a Procedure ➢ Deleting a Procedure. **For Above Topic Refer Following Link:** http://msdn.microsoft.com/en-us/library/aa174792(v=sql.80).aspx
10	**Functions:** ➢ Advantages ➢ Creating a Function ➢ Executing a Function ➢ Deleting a Function
11	**Database Triggers:** ➢ Basics of Triggers ➢ Use of Database Triggers, ➢ How to apply database Triggers
12	**Database Triggers:** ➢ Types of Triggers

	➢ Syntax for Creating Trigger ➢ Deleting Trigger.
13	**PL/SQL security-** ➢ Locks ➢ Types of Locks:- • Shared • Exclusive
14	**PL/SQL security-** ➢ Locking strategy • Implicit • Explicit
15	Revision for Current Chapter/ Review on Complete Curriculum
16	Review on Complete Curriculum

5.2 Planning and conduct of Test:

- There will be two tests each of 25 marks.
- The test will be conducted as per the MSBTE schedule.
- The schedule of the test and portion shall be declared at least one week in advance.
- The model answers with the marking scheme shall be displayed on the notice board.
- Teacher shall give the feedback to the students about their performance.

5.3 Details about conduct of Assignments.

N/A

5.4 Strategies for Conduct of Practical.

5.4.1 Approach For Design of Manual

N/A

5.4.2 Suggestion For Effective Conduct of practical and assessment

Practical No.	Title Of Experiments and Activity.	Duration
1	Designing ER Diagram, Designing a Normalized Database	4 Hrs
1 (a)	Designing ER Diagram	2 Hrs
	Introduction About E-R Diagram ➢ What is E-R Diagram? (10 Mins) ➢ Need of Designing E-R Diagram (10 Mins)	(20 Mins)
	Symbols of E-R Diagram (Description) ➢ Each Symbol (5 Mins Max)	(40 Mins)
	Sample Examples (Min. Two Examples) (Teacher shall discuss one example with students) (Teacher shall form group of 5 and allot one example to them during lab hours)	(30 Mins Each)
1 (b)	Designing a Normalized Database	2 Hrs
	Introduction to Normalization ➢ What is Normalization and Need of Normalization (10 Mins)	(10 Mins)
	Types of Normalization ➢ 1 NF (10 Mins) ➢ 2 NF (10 Mins) ➢ 3 NF (10 Mins) ➢ BCNF (10 Mins) ➢ 4 NF / 5 NF (10 Mins Only Introduction)	(50 Mins)
	Sample Example Teacher shall explain any one example. (For better understanding teacher shall consider only one table for all forms	(30 Mins)
	Assessment for Above Activity/ Experiment	(30 Mins)

Practical No.	Title Of Experiments and Activity.	Duration
2	Creating and Executing DDL Commands in SQL and Apply Various Integrity Constraints on Table	4 Hrs
2 (a)	Creating and Executing DDL Commands	(2 Hrss)
	• Introduction & Significance of DDL Command (10 Mins) • Significance of DDL Commands (10 Mins)	(20 Mins)
	DDL Command Description/ Explanation • Syntax and use of Each Command (10 Mins Each)	(50 Mins)
	Execution of All Command (Under Teacher Guidance)	(20 Mins)
	Practice Session (Teacher shall form suitable group of students and allot them sample relation)	(30 Mins)
2 (b)	Applying Various Integrity Constraints on Table	(2 Hrs)
	• Introduction to Various Integrity Constraints	(20 Mins)
	Types • Domain Integrity Constraints (15 Mins) • Entity Integrity Constraints (15 Mins) • Referential Integrity Constraints (10 Mins) • On Delete Cascade (10 Mins)	(1 Hr)
	Execution of all integrity constraints	(20 Mins)
	Assessment of Above Activity/Experiment	(30 Mins)
	Note: -For Better understanding teacher shall execute commands/ integrity constraints during its explanation	
3	Creating and Executing DML Commands in SQL	(4 Hrs)
	Introduction to DML Commands (10 Mins)	(10 Mins)
	Insert Command (With Syntax) • By Specifying all Attribute (15 Mins) • For Selected Attribute (15 Mins) • In the order Attribute declared in the table (15 Mins) • To insert more than one row (15 Mins)	(1 Hr)
	Select Command with where clause (With Syntax)	(25 Mins)
	Delete Command with where clause (With Syntax)	(25 Mins)
	Update Command with where clause (With Syntax)	(45 Mins)
	Practice Session/ Execution of above Experiment & Assessment of Activity/ Experiment	(1 hr 15 Mins)
	Note: -For Better understanding teacher shall execute commands/ integrity constraints during its explanation	

4	Writing Queries using various Operators and Arithmetic, String Functions	6 Hrs
4 (a)	Operators • Arithmetic Operator (30 Mins) • Logical Operator (30 Mins) • Comparison (1 Hr) ➢ Symbolic ➢ Word Comparison	2 Hrs
4 (b)	String Functions	2 Hrs
4 (c)	Arithmetic Functions	1 Hr
	Practice Session & Assessment of Above Activity / Experiment	1 Hr
	Note: -For Better understanding teacher shall execute commands during its explanation	

Note :- Other practicals shall be conducted in similar way.

5.4.3 Preparation For Conduct of Practical:-

- Check whether all computers are working.
- Install Oracle 8i or higher version preferably 9i.
- Prepare some Dummy Tables for further references

6. Mode Of Assessment

6.1 Class Test: -It is proposed that there will be two tests each of 25 marks. The tests will be conducted as per MSBTE schedule

6.1.1 Guideline for setting class test question paper:

The following instruction should be followed strictly by the paper setter (subject teacher):

1. The question paper should be set according to the given **Sample Test Paper format**.
2. Question paper for class tests first & second should be strictly based on the given syllabus.
3. Question 1 will be of 9 marks. The student will have to attempt any three out of four. This question will have each bit of 3 marks.

   Question 2 and 3 will be of 8 marks each. The student has to attempt any 2 out of 3. These questions will have each bit of 4 marks.
4. The teacher should ensure that the curriculum is covered by that time.
5. Duration of class test is one hour.
6. Instructions should be given at the top of the paper. k

Class Test-I

Syllabus for class test I:

1. Database System Concept
2. Relational Data Model and Security and Integrity Specification

Class Test-II

A) Syllabus for class test II:

3. Interactive SQL
4. Advance SQL: SQL Performance Tuning
5. PL/SQL, Database Objects and Security

Note: While setting the question paper

40% questions should be based on Remember level.

40% questions should be based on Understanding level.

20% questions should be based on Application level.

Scheme – G

Sample Question Paper Unit Test 1

Course Name: - Computer Engineering Group
Course Code: - CO/CM/CD/IF/CW
Semester: - THIRD
Subject Title: - RELATIONAL DATABASE MANAGEMENT SYSTEM **17732**
Marks: - 25 Marks

Q1. Attempt Any Three. (3*3)

a) List any six applications of DBMS.

b) Define Tuple, Attribute and Domain.

c) State the use of Projection operator of Relational Algebra with example.

d) Define Data Independence and list its types.

Q2. Attempt any Two. (4*2)

a) Describe any four Codd's rules/laws of RDBMS.
b) Explain Three Tier architecture with suitable diagram.
c) What is Relational Model? Give Suitable example.

Q3. Attempt any Two. (4*2)

a) State the meaning of the following
   i. Data Mining
   ii. Data Warehousing
b) Explain BCNF with suitable example.
c) Explain Referential Integrity constraint and On Delete Cascade with suitable example

Scheme – G

Sample Question Paper Unit Test 2

Course Name: - Computer Engineering Group

Course Code: - CO/CM/CD/IF/CW

Semester: - THIRD

Subject Title: - RELATIONAL DATABASE MANAGEMENT SYSTEM **17732**

Marks: - 25 Marks

Q1. Attempt any Three. (3*3)

a) Explain any two DML commands with example.
b) What is snapshot? What are the various operations performed on snapshot?
c) What are the different uses of Database Triggers?
d) Explain ACID properties of Transaction.

Q2. Attempt any Two. (4*2)

a) Consider the schema student(rno,name,course,dob,percentage,class) And solve the following queries.
   i. Display the name of the students having name starting with letter ‘A’.
   ii. Display the list of students having percentage more than 80 and having course as ‘CM’.
   iii. Change the course as ‘IF’ of student ‘Amit’.
   iv. Display the list of students having ‘First Class from ‘CO’ course.
b) What are the views? Give syntax and example of creating view.
c) What are the locks? Give its importance. Explain its types.

Q3. Attempt any Two. (4*2)

a) Explain following with syntax.
   i) Function
   ii) Procedure
b) Explain Drop and Truncate commands with syntax. State the difference between them.
c) How to create sequences and synonyms?

Scheme – G

Sample Question Paper

Course Name: - Computer Engineering Group

Course Code: - CO/CM/CD/IF/CW

Semester: - THIRD

Subject Title: - RELATIONAL DATABASE MANAGEMENT SYSTEM **17732**

Marks: - 100 Marks

Instructions

1. All questions are compulsory
2. Illustrate your answer with neat sketches wherever necessary
3. Figures to the right indicates full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q 1(a) Attempt any **SIX** of the following (12)

i. List any four DBMS software.
ii. Describe super key with example.
iii. What is Functional Dependency? Give suitable example.
iv. List any four DDL commands.
v. Explain group by, having clause of SQL with example.
vi. What is index? List its types.
vii. Explain Shared locks and Explicit locks.
viii. What is project operator in Relational Algebra? Give one example.

Q 1 (b) Attempt any **TWO** of the following (08)

i. Explain any four Codd's Rules/Laws of RDBMS.
ii. Explain ACID properties of Transaction.
iii. What are Predefined Exceptions and User Defined Exceptions?

Q 2 Attempt any **FOUR** of the following (16)

a) Describe Hierarchical Data Model with suitable example.
b) Explain Entity Integrity constraint with example.
c) Give syntax of UPDATE command. Demonstrate with suitable example.
d) Consider following schema
ACCOUNT_HOLDER (Account_No , Name, Account_Type, PAN_Number, Balance).
Create a view on ACCOUNT_HOLDER having attributes (Account_No, Name, PAN_Number) where Balance is greater than 50,000.
e) What is CURSOR? Explain its types.
f) List and explain four types of Database users.

Q 3 Attempt any **FOUR** of the following (16)

a) Consider Following Schema
Employee (ENO, ENAME, Department, Designation, DOJ, Salary, Dept_Location)
Solve the following query
i) List the employees having Designation as “Manager” and .Dept_Location as “Mumbai”
ii) Set the salary as Rs.50,000/- having Designation as “Project Leader”
iii) List ENO,ENAME,Salary of employees having Salary between Rs. 20,000/- to Rs.30,000/-
iv) List Ename of employees having 2nd alphabet in the name as “A”.

b) Give block-structure of PL/SQL and explain main components.
c) Explain 3NF with suitable example.
d) What are snapshots? Give its uses? How to create a snaoshot?
e) What are triggers? How to create triggers?
f) Draw and explain Client-Server architecture.

Q 4 Attempt any **FOUR** of the following (16)

a) Draw an E-R Diagram for College Management System.
b) Write PL/SQL program to display the Factorial of any number.
c) Explain ALTER command. Demonstrate with any two options.
d) Draw and explain State diagram of Transaction.
e) What are sequences? Why it is used? Create sequence for **“STUDENT”** table.
f) What is data warehousing and data mining?

Q 5 Attempt any **FOUR** of the following (16)

a) List and explain any four functions of Database Administrator.
b) What are snapshots? Create Snapshot for **"Vehicle"** table.
c) Explain Functions in PL/SQL with suitable example.
d) Explain two Locking Strategies.
e) Consider following Relational Algebra schema
   STUDENT (RNO, Name, DOB, Percentage, DNO)
   DEPARTMENT (DNO, DNAME, HEAD)
   Write Relational Algebra expressions.
   i. Find Student's name and course from Computer Department
   ii. Get the Student's name who has percentage greater than 70.
f) Explain four different types of SET operators

Q 6 Attempt any **FOUR** of the following (16)

a) List and explain any four advantages of DBMS over File processing system
b) Explain multivalued dependencies with example
c) Explain any four aggregate functions with example.
d) Describe following keys.
   i. Candidate Key
   ii. Primary Key
e) Describe Grant and Revoke commands.