Lesson Plan: Niranjan Maheshwari

Programming using Python **(**CSGE101**)**

**Generic Elective-GE (2021-22)**

**Sem-I**

Tentative weekly teaching plan is as follows:

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| Week | Topics |
| 1-2 | Computer Fundamentals and Problem Solving: Basic Computer Organization: CPU,  memory, I/O Units. Problem solving using computer, notion of an algorithm. |
| 3 | Introduction to Python Programming: Python interpreter/shell, indentation; identifiers and keywords; |
| 4 | literals, numbers, and strings; operators (arithmetic operator, relational operator, Boolean operator, |
| 5 | assignment, operator, ternary operator and bitwise operator) and expressions |
| 6 | assignment, operator, ternary operator and bitwise operator) and expressions |
| 7 | Creating Python Programs: Input and output statements, |
| 8 | defining functions, control statements |
| 9 | conditional statements, loop control statements, break, continue and pass, exit function |
| 10 | default arguments, errors and exceptions. |
| 11 | Strings and Lists: String class, built-in functions for string, string traversal, |
| 12-13 | string operators and operations; Lists creation, traversal, slicing and splitting operations, passing list to a function  Object Oriented Programming: Introduction to Classes, |
| 14-15 | Objects and Methods, Standard Libraries, File handling through libraries.  Built-in data structures: Tuples, sets, dictionary, stacks, and queues; searching and sorting |

**Database Management System (CSGE201)**

**Generic Elective-GE(2021-22)**

**Sem-III**

Tentative weekly teaching plan is as follows:

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| Week | Topics |
| 1-2 | Introduction to database, relational data model, DBMS architecture, |
| 3 | data independence and data abstraction, DBA, database users, end users, front end tools |
| 4 | Data Modelling: Entity types, entity set, attribute and key |
| 5 | relationships, relation types, ER diagrams |
| 6 | database design using ER diagrams. |
| 7 | Relational Data Model: Relational model concepts, relational constraints, |
| 8 | primary and foreign key, candidate key, alternate, composite, super-key. |
| 9 | Data Redundancy, FD |
| 10 | Normalization: 1NF, 2NF, 3NF. |
| 11 | Structured Query Language: Introduction to SQL, concepts of Data Definition Language (DDL) and Data Manipulation Language (DML), |
| 12-13 | DDL queries like create a data base, drop a database, create table, drop table, alter table, DML queries like inserting data in a table, update in a table, delete data from a table, filter data. Create relationships between database tables, auto increment, check, |
| 14-15 | Null values, aggregate functions - min, max, count, average, sum, nested sub-queries, group by, having, exists, case, order by. Join operations - inner, left join, right join, natural join and Cartesian product. Overview of forms and reports. |