Course title: Fundamentals of Computers and Programming			
Course code: NRG 106	**No. of credits:** 2	**L-T-P:** 12-4-28	**Learning hours:**30
Pre-requisite course code and title (if any): None			
Department: Department of Natural Resources			
Course coordinator: Dr. Ayushi Vijhani		**Course instructor:**	
Contact details: ayushi.vijhani@terisas.ac.in			
Course type: Core		**Course offered in:** Semester 1	

Course Description

The module will explore the fundamentals of programming in C. The course will also include basics of data base management system through Oracle/MySQL

Course objectives:

The objectives of the course are:

(1) Provide fundamentals of programming
(2) Provide fundamentals of C programming language
(3) Provide fundamental knowledge of database management system which is relevant to GIS

Course content

Module	Topic	L	T	P
1.	History of Programming, Making Flow Chart	2		
	Introduction to C, Structure of C Programme, Data type, Input and Output function, Conditional execution	5	2	
2.	DBMS and RDBMS (MS ACCESS; ORACLE; MySQL)	5	2	
	PRACTICALS			
1	Writing first C Programme			2
2	Using different types of data in C Programme			2
3	Writing a programme to use decision control statements, cases			2
4	Writing a programme using loop structure, nested loop			4
5	Use of Arrays			2
6	Programme using pointers			2
7	Design a Database and create required tables, apply the constraints like Primary Key, Foreign key, NOT NULL to the			4

	tables.			
8	Write a sql statement for implementing ALTER, UPDATE and DELETE, Write the queries to implement the joins			2
9	Write the query for implementing the following functions: • String Function • Numeric/Math Functions • Aggregate Functions • Date/Time Functions			2
10	Create Functions, procedures, packages, triggers, Different types of queries using Cases			4
11	Write the query to create the views, Inline view			2
	Total	**12**	**4**	**28**

Evaluation criteria

- Test1: Written Test: 15% (Module 1 of theory, Module 1-3 of Practical))
- Test2: Written Test: 15% (Module 2 of theory and related module of practical)
- Lab Assignments: 10% (All modules)
- Practical: [Lab exam and Viva] 30% (All modules)
- Test3: Written Test 30%

(Test 3 include entire syllabus)

Learning outcomes: Students will be able to

1. Describe how data are represented, manipulated, and stored in a computer [Test1, Lab Assignments]
2. Design programme using flowchart [Test1, Lab Assignments]
3. Able to write and execute C programme using different logical operators[Test2, Lab Assignments]
4. Able to create database table and perform logical queries with different conditions [Lab Assignments,Test3]

Pedagogical approach:

The course will be delivered through class lectures, lab exercise and tutorials.

Materials

Required text

1. Benjamin C.P. (2002) Types and Programming Languages, The MITPress.
2. Bruce J.M. (1999) Principles of Programming Languages: Design, Evaluation and Implementation, Oxford University Press.
3. Daniel P.F. and Wand M. (2001) Christopher Thomas Haynes: Essentials of Programming Languages, The MIT Press.

Suggested readings

1. Gelernter D. and Jagannathan S. (1990) Programming Linguistics, The MIT Press.

2. Goldschlager L. (1998) A Lister Computer Science - A Modern Introduction Prentice Hall.
3. John C.M. (2002) Concepts in Programming Languages, Cambridge University Press.
4. Michael L. S. (2005) Programming Language Pragmatics, Morgan Kaufmann Publishers.
5. Sethi R. (1996) Programming Languages: Concepts and Constructs, 2nd ed., Addison Wesley.
6. Wexelblat R.L. (1981) History of Programming Languages, Academic Press.

Case studies
Websites
Journals

Additional information (if any)

Magazines

1. Coordinates
2. GIM International
3. GIS World
4. GIS@development
5. Goespatial today
6. GPS World

Student responsibilities

Attendance, feedback, discipline, guest faculty etc

Course reviewer:

1. Sanjay Kumar, Team Lead, AWS Software Pvt Ltd.
2. Jagdish Mutharia, Head (IT),TERI