CSCI-1411 Fundamentals Of Computing Lab

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Lab 11: Structures and Abstract Data Types

☐ Abstract Data Type (ADT): a user defined data type

☐ Structure: a group of items of different data types

```
struct course
{
    string discipline;
    int courseNumber;
    string courseTitle;
    short credits;
};
```

tag

members

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3

- How to use a structure?
  - Define a variable/an array
  - Access to its members

```
void main
{
    …
    course pChem;
    pChem.discipline = "Chemistry";
    pChem.courseNumber = 99;
    …

    course aSubjects[100];
}
```

instance

dot operator

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☐ How to use a structure?

    ◪ Initialize structures at the time of their definition (*in the order of structure members*)

```
void main
{
    …
    course pHistory = {"HIST", 302, "Colonial history", 3};
    …
}
```

Note: *If one structure member is left uninitialized, then all structure members that follow it must be uninitialized.*

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☐ Hierarchical (Nested) structures

```
struct center_point
{
    float x;
    float y;
}
struct circle
{
    float radius;
    float area;
    float circumference;
    center_point coordinate;
}
```

```
void main
{
    …
    circle circ1;
    circ1.coordinate.x = 10;
    circ1.coordinate.y = 5;
}
```

Lab 11: Structures and Abstract Data Types

□ Overview:

- Lab 11 Components
  - Lab Sections (11.1, 11.2, 11.3, 11.4, 11.5)

Lab 11: Structures and Abstract Data Types

- 11.1 Working with Basic Structures
  - (rect_struct.cpp)
  - Match the provided output
- 11.2 Initializing Structures
  - (init_struct.cpp)
- 11.3 Arrays of Structures
  - (array_struct.cpp)
  - Answer questions asked in exercise 2
- 11.4 Nested Structures
  - (nestedRect_struct.cpp)
- 11.5 Code Assignment
  - Pick option one or two
  - Name the source file (main.cpp)

Lab 11: Structures and Abstract Data Types

- Submission File Checklist
  - Submit all files on Canvas (One at a time or all of them in a single zip file). Be sure to include all source files and documents.

  - 11.1 rect_struct.cpp
  - 11.2 init_struct.cpp
  - 11.3 array_struct.cpp
  - 11.4 nestedRect_struct.cpp
  - 11.5 main.cpp