UNIVERSITY OF TECHNOLOGY, JAMAICA

School of Computing and Information Technology

Object-Oriented Programming (CIT2004) Project

Facilitator(s):	H. Scarlett | O. Charles | R. Clarke | N. Nembhard | S. Taylor | C. Panther		
Assessment:	Group Assignment (3 - 4 **registered** students per group)		
Given Week of:	September 26, 2022	**Due :**	November 18, 2022

The Home & Away Institute (H&AI) is an Educational Institution that specializes in offering Distance Learning courses. The institution has been in operation for over three (3) years, and has been using a paper based system for the administrative processes such as student admission, and programme administration.

The Chairman of the H&AI has requested that a program be created to automate the student admission and programme administration processes. As the Manager of the Information and Communication Technology (ICT) Department, you are in charge of presenting the prototype system at the next meeting of the Board that is schedule for November 18, 2023.

After completing an analysis of the paper based system, the Chairman provided a set of basic system requirements. The Chairman has also instructed your team to provide additional functionalities to enhance the program.

Basic requirements. The prototype should:

- provide an administrator account for the initial system configuration that allows the administrator to create user accounts for staff members.
- provide staff members with a login screen for accessing the system.
- provide staff with menu options to:
    - Register Student, and
    - Programme Administration.
        - Create Programme.
        - Modify Programme Details.
        - Generate Student List
- provide students with a login screen for accessing the system.
- provide students with menu options to:
    - Enroll for Semester

        - View Programme Details.
        - Add Course.
        - Generate Fee Breakdown for Semester
    - Generate Progress Report.

The analysis of the paper based system also uncovered details related to the various records held in a number of files (i.e. staff, student, course, and programme), some of the information stored, includes:

Staff Record:

- Id Number, Name (First and Last), Faculty, Department and Date employed (day, month, year)

Student Record:

- Id Number, Name (First and Last), Address, Date enrolled, Programme Code, Enrolment Status and Contact number.

Course Record:

- Course Code, Name, Description, Credits and Pre-requisite

Programme Record:

- Programme Code, Name, Maximum number of courses, Award and Accreditation

H&AI offers Certificate, Diploma and Associate Degree programmes. Each programme consists of a number of courses:

- Certificate Programmes offer students four specialized courses.
- Diploma Programmes offer student six specialized courses.
- Associate Degree Programmes offer students eight specialized courses

Functionality Requirements when the user selects:
Register Student – the system should accept student's details and generate a student record. The student id number should be generated using the current year, programme code and a sequence that starts at zero (0), and the enrollment status should be set to zero (0).

Programme Administration:

- *Create Programme* – the system should accept general programme details.
- *Modify Programme Details* – the system should allow for the addition, removal, and editing of courses for the programme.
- *Generate Student List* – the system should accept a programme code then displays the list of student currently enrolled in the programme.

Enroll for Semester:

- *View Programme Details* – the system should display all courses in the programme.
- *Add Course* – the system should allow the selection of courses from the enrolled programme.
- *Generate Fee Breakdown for Semester* – the system should display all courses enrolled in for the semester and the total cost (i.e. number of credits * cost per credit), it should also switch students enrolled status to one (1).

Generate Progress Report – the system should display all the courses the student has ever enrolled in for the programme.

Required:
Perform an object-oriented analysis on the proposed system described above, and then design the system using the Unified Modelling Language (UML). Utilize composition and inheritance in your design to increase reusability and reduce system complexity.

Project Schedule:

Task	Due Date
Object-Oriented Analysis & Design (OOA&D)	October 7, 2022
Project Work Breakdown Schedule (WBS)	October 7, 2022
First System Prototype	October 21, 2022
Updated OOA&D and WBS	October 21, 2022
Second System Prototype	November 11, 2022
Final OOA&D, WBS, and completed System	November 18, 2022

Grading Scheme (100 marks): General Mark Breakdown

- ***Documentation (15 marks)***
  - Group Report (outlining contribution(s) of each member) **[2 marks]**
  - Object-Oriented Analysis and Design of system **[10 marks]**
  - User Manual **[3 marks]**
  - Signed Declaration of Authorship Form for each group member – **CUMPULSORY, AS PROJECTS WILL NOT BE CONSIDERED FOR GRADING WITHOUT THEM**
- ***Source Code (35 marks)***
  - Comments **[3 marks]**
    - Each file should have details for the student(s) who wrote the file
    - Practice use of self-commenting files (i.e. proper variable and method naming).
    - Proper use of inline and method comments where necessary

- Naming Convention **[7 marks]**
  - Pascal Case should be used for naming classes.
  - Camel Case should be used for variable and method naming.
  - Ensure class files are named appropriately.
- Object-Oriented Programming Techniques **[15 marks]**
  - Inheritance, Subtype Polymorphism, Composition
  - Method overriding and overloading
- Use of Files Management Techniques **[10 marks]**
  - Proper implementation of appropriate file management

- ***Functionality (50 marks)***
  - Robustness
    - User Input validation **[5 marks]**
    - Error / Exception Handling **[5 marks]**
  - User Interface (Ease of user interaction)
    - Program Navigation (i.e. Menu System) **[3 marks]**
    - Consistent Screen User Friendly Layout/Design **[3 marks]**
    - Consistent Layout/Formatting of User Input & Output **[5 marks]**
    - Appropriate Notifications (i.e. error and information messages) **[4 marks]**
  - System Feature(s) Implemented
    - Register, Enroll and Generate Progress report **[10 marks]**
    - Programme Administration **[15 marks]**

Extra Marks (10 marks):

A project that satisfies the program's functional requirements **can** gain additional 10 marks:

- + 10 marks – Awarded for use of colours and graphics to enhance the look and feel of the program.

Submission:

Your lab tutor will inform you of their preferred means for submission of your group's project solution on or before the due date.

Unless directed otherwise by your lab tutor, your project solution should be zipped. The zip file should contain all Documentation (User Manual, OOA & OOD, WBS, and signed Declaration of Authorship Form for each member), Source Files and Executable. The name of the zip file should be in this format:

LASTNAME_OF_EACH_GROUP_MEMBER.zip e.g., BROWN_CLARKE_MILLS.zip

Each group will have to do a 20 minutes interview with their tutor to receive a grade. Any group member who misses the grading interview will automatically attract a zero (0).

Late Submission:

Any project submitted after the due date will be late and will have a penalty applied for each day late. Additionally, late projects will **not** be considered for extra marks. Please see table below for a breakdown of penalty for late submissions as per the university's policy:

Time of Submission after Deadline	Penalty (%)
One Day (or part thereof)	10
Two Days (or period > 1 day but <= 2 days)	20
Three Days (or period > 2 days but <= 3 days)	50
Beyond Three Days	100

Group Members:

No group should exceed four members, any group exceeding the limit will receive a 20% deduction in their overall grade. Similarly, any group with less than three members will receive a 20% deduction in their overall grade (unless the group size was expressly approved by the lab tutor).