AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH
(AIUB)
Faculty of Science and Technology (FST)
Department of Computer Science (CS)
Undergraduate Program

COURSE PLAN

Spring 2019-2020 SEMESTER

I. Course Title

CSC 1205: Object Oriented Programming 1

II. Credit

3 Credits (2 hrs theory and 3 hrs Lab per week)

III. Nature

Core Course for CSE and CoE.

IV. Prerequisite

CSC 1102: Introduction to Programming,
CSC 1103: Introduction to Programming Lab.

V. Vision:

Our vision is to be the preeminent Department of Computer Science through creating recognized professionals who will provide innovative solutions by leveraging contemporary research methods and development techniques of computing that is in line with the national and global context.

VI. Mission:

The mission of the Department of Computer Science of AIUB is to educate students in a student-centric dynamic learning environment; to provide advanced facilities for conducting innovative research and development to meet the challenges of the modern era of computing, and to motivate them towards a life-long learning process.

VII - Course Description:

- Develop classes and describe how to declare a class
- Create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation, inheritance, polymorphism and abstraction
- Execute Java applications from the command line
- Use Java technology data types and expressions
- Use Java technology flow control constructs
- Use arrays and other data collections
- Use the concept of package
- Implement error-handling techniques using exception handling
- Create an event-driven graphical user interface (GUI) using Swing components: panels, buttons, labels, text fields, and text areas
- Implement input/output (I/O) functionality to read from and write to data and text files and understand advanced I/O streams

VIII – Course outcomes (CO) Matrix:

By the end of this course, students should be able to:

	CO	Level of Domain*				PO Assessed	Assessment Method
		C	P	A	S		
CO1	**Identify** the principles used and trace the output of a java program.	C				PO 4.1	Mid Term Exam
CO2	**Design** system components to solve a real life problem.		P			PO 3.2	Mid Term Lab Exam
CO3	**Develop** a solution for a complex engineering problem.		P			PO 3.1	Project
CO4	**Judge** the appropriateness of the developed solution.	C				PO 4.2	Project Investigation Report

C: Cognitive; P: Psychomotor; A: Affective; S: Soft-skills (CT: Critical Thinking, TS: Teamwork)
**The numbers under the 'Level of Domain' columns represent the level of Bloom's Taxonomy each CO corresponds to.*
*** The numbers under the 'PO Assessed' column represents the PO that each CO corresponds to. Following is the list of the PO the will be assessed:*

PO Assessed				
PO3	Design/ development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and of cultural, social and environmental concerns.	PO 3.1	Design solutions for complex engineering problems with appropriate consideration
			PO 3.2	Design system components or processes that meet the specified needs for public health and safety and of cultural, social and environmental concerns.
PO4	Investigation	Conduct investigations of complex problems, considering experimental design, data analysis and interpretation and information synthesis to provide valid conclusions.	PO 4.1	Conduct investigations to interpret complex problems.
			PO 4.2	Provide valid conclusions considering experimental design, data analysis and interpretation and information synthesis.

IX – Topics to be covered in class*:

TOPICS	Specific Objective(s)	Time Frame	Suggested Activities	Teaching Strategy(s)	CO mapped
Introduction to Java Language, Java technology, Java development Environment	Knowing Mission & Vision of AIUB. Understand Java Language, java development platforms and demonstrate the system setup for Java. Develop First Java application.	Week 1	Theory: Lecture LAB: Java Environment Setup, Compilation & Execution, and develop simple class using java	Lecture notes, question-answer session.	

Data Types, Type Casting, Array, String	Knowing different types of variables, their size, value ranges, default value, wrapper classes and casting from one type to another. Declaring an Array and accessing it Familiarizing with different String Operation	Week 2	Theory: Lecture LAB: Develop simple class to demonstrate data types, type casting, variable types and Array. Take Input from Command Line	Lecture notes, question-answer session.	CO1
Class, Object, Constructors, Methods, Variable Types, Static keyword	Understand the concept of Class and Object. Learn about constructors Learn to write methods Learning about different types of variable and differentiate between them. Static variables and methods.	Week 3	Theory: Lecture LAB: Develop simple classes with constructors and methods	Lecture notes, question & answer session. Declare Quiz	CO1
OOP Principle: Encapsulation, Using User Defined Package	Get familiarized with the concept of encapsulation, setter-getters, access modifiers and their visibility. Understand user defined packages along with its importance.	Week 4	Theory: Lecture LAB: Develop simple classes to show the visibility of different access modifiers	Lecture notes, question & answer session. Take Quiz	CO1 CO2 CO3 CO4
OOP Principle: Inheritance	Understand the concept of Inheritance Constructor Chaining The keyword this and super.	Week 5	Theory: Lecture LAB: Develop simple classes to demonstrate inheritance	Lecture notes, question-answer session. Declare Quiz	CO1 CO2 CO3 CO4
OOP Principle: Inheritance Contd.	Single, Multilevel, hierarchical, IS-A relationship, HAS-A relationship.	Week 6	Theory: Lecture LAB: Lab Exam	Lecture notes, question-answer session. Take Quiz	CO1 CO2 CO3 CO4
Midterm Week Week 7					

OOP Principle: Polymorphism	Understand the concept of Polymorphism Constructor Overloading, Method Overloading, Method Overriding, Polymorphic behavior of Objects The final keyword	Week 8	Theory: Lecture LAB: Develop classes to illustrate method overloading, method overriding and polymorphic behavior of objects.	Lecture notes, question-answer session	CO3 CO4
OOP Principle: Abstraction, Interface	Understand the concept of Interface Learn the importance of Interface	Week 9	Theory: Lecture Lab: write a program using the concepts of interface and abstractions.	Lecture notes, question-answer session	CO3 CO4
Exception Handling	Differentiate between error and exception. Know about different types of exceptions. Understand the concept of exception handling.	Week 10	Theory: Lecture LAB: Develop classes to show different exception handling approaches	Lecture notes, question-answer session. Take Quiz	CO3 CO4
File I/O	Input/output (I/O) functionality to read from and write data to text files	Week 11	Theory: Lecture LAB: Develop classes to read from a text file and write in another one	Lecture notes, question-answer session. Declare Quiz	CO3 CO4
Introducing Java GUI and different GUI components Java Event handling	Identify and use Java swing libraries, basic classes for developing GUI application. Get familiarized with event handling interfaces in Java.	Week 12-13 (Optional)	Theory: Lecture LAB: Develop simple Java swing applications	Lecture notes, question-answer session. Declare Quiz	CO3 CO4
Final term Week Week 14					

* The faculty reserves the right to change, amend, add or delete any of the contents.

X- Course Requirements*

At least **80% class attendance** and attending at least one quiz in each term is necessary to sit for the midterm exam or final term project defense. Make up for quiz might be arranged if proper medical documents are submitted and approved from the head of the department.

If any assignment is given, the students have to submit it before the deadline. Late submission of assignments might be accepted in emergency cases with some deduction of marks.

* The faculty reserves the right to change, amend, add or delete any of the requirements.

XI – Evaluation & Grading System

The following table shows the evaluation criteria for this course:

Marking System for Mid Term		Marking System for Final Term	
Attendance & Performance	10	Attendance & Performance	10
Quiz (Best 1 out of 2)	20	Quiz (Best 1 out of 2)	30
Lab Tasks	20	Lab Tasks	20
Mid Term Lab Exam	10	Mini Project/Assignment and Report	30
Mid Term Exam	40	Viva	10
Total	**100**	**Total**	**100**
Grand Total: 50% of Mid Term + 50% of Final Term			

The following table is a reference to AIUB Grading Policy:

Letter	Grade Point	Numerical %
A+	4.00	90 - 100
A	3.75	85 - < 90
B+	3.50	80 - < 85
B	3.25	75 - < 80
C+	3.00	70 - < 75
C	2.75	65 - < 70
D+	2.50	60 - < 65
D	2.25	50 - < 60
F	0.00	< 50 (Fail)

XII – Teaching Methods

Majority of the topics will be covered from the textbook. For the rest of the topics, reference books will be followed. Lectures notes will be uploaded in the VUES course page. White board will be used with multimedia projector for the convenience of the students.

XIII – Textbook/ References

1. Java Complete Reference, 7th Edition, By Herbert Schildt.
2. A Programmer's Guide to Java SE 8 Oracle Certified Associate, Khalid A. Mughal Rolf W. Rasmussen
3. Java How to Program Java, 9th Edition, By Deitel and Deitel.
4. The Java Language Specification, By J. Gosling, B. Joy, G. Steele, G.Bracha and A. Buckley
5. Introduction to Programming Using Java, 6th Edition, By David j. Eck
6. Head First Java, By Kathy Sierra and Bert Bates
7. The Java Tutorials. http://docs.oracle.com/javase/tutorial/

XIV - List of Faculties Teaching the Course

1. Ms. Sifat Rahman Ahona (Convenor)
2. Mr. Hafizur Rahman
3. Ms. Kawser Irom Rushee
4. Mr. Mohaimen-Bin-Noor
5. Dr. Ashraf Uddin
6. Fahmida Alam
7. Farzana Alam
8. Sazzad Hossain

9. Md. Siyamul Islam
10. Supta Richard Philip
11. Md. Masum Billah
12. Mir Md. Kawsur
13. Nazia Hossain

XV – Verification:

Prepared by : ---------- Sifat Rahman Ahona Course Convener Date:.....	Checked and certified by: ..... (Head of Department) Date:.....	Approved by: ..... (Dean of Faculty of Science and Technology) Date:.....
	Moderated by : …… Date : ……..	Moderated by : …… Date : ……..

APPENDIX

Program Outcomes (POs):

PO3	**Design/ Development of solutions**
3.1	Design solutions for complex engineering problems with appropriate consideration.
3.2	Design system components or processes that meet the specified needs for public health and safety and of cultural, social and environmental concerns.
PO4	**Investigation**
4.1	Conduct investigations to interpret complex problems.
4.2	Provide valid conclusions considering experimental design, data analysis and interpretation and information synthesis.

Mapping of CO Assessment Method and Rubric

The mapping between Course Outcome(s) (COs) and The Selected Assessment method(s) and the mapping between Assessment method(s) and Evaluation Rubric(s) is shown below:

CO	Description	Learning Domain	Assessment Method	Assessment Rubric
CO1	**Identify** the principles used and trace the output of a java program.	Cognitive	A part of Midterm Exam	Rubric for a part of Midterm Exam
CO2	**Design** system components to solve a real life problem.	Psychomotor	Midterm Lab Exam	Rubric for Midterm Lab Exam
CO3	**Develop** a solution for a complex engineering problem.	Psychomotor	Project	Rubric for project
CO4	**Judge** the appropriateness of the developed solution.	Cognitive	Project Concluding Report	Rubric for Project Concluding Report

Rubric for a part of Mid Term Exam Assessment (CO1)

	CO1 Assessment Rubrics					
	Category	**Evaluation Definition**	**Not Attended (0)**	**Moderate (1-2)**	**Good (3-4)**	**Excellent (5)**
1	**Identification**	**Can the students identify OOP principles and characteristics?**	• Student did not attend	• Student identified the principles but not correctly	• Student identified the principles and some of them are correct	• Student identified the principles correctly
2	**Number of Statements**	**Have the students written all the output statements?**	• Student did not attend	• Number of statements are below 33% of the total	• Number of statements are below 66% of the total	• Student has written all the statements
3	**Program Logic Understanding**	**Have the students understand program logics properly?**	• Student did not attend	• Student understood some of the logics properly	• Student understood most of the logics properly	• Student understood all the logics properly
4	**Correctness**	**Is the identification and output correct?**	• Student did not attend	• Identifications are correct	• Output is correct	• All the identification and output are correct

Rubric for Mid Term Lab Exam Assessment (CO2)

	CO2 Assessment Rubrics				
	Category	**Evaluation Definition**	**Not Attended (0)**	**Moderate (1)**	**Excellent (2)**
1	**OOP Concepts**	**Did the student applied OOP principles in the program?**	• Student did not attend	• Student Applied some of the OOP principles	• Student Applied OOP principles Properly
2	**Logical Operations**	**Did the student implemented the logical operations properly?**	• Student did not attend	• Student Applied some of the logics	• Student Applied Logics properly
3	**Correctness**	**Does the system works properly?**	• Student did not attend	• The System does not work properly	• The System Works Properly
4	**Completeness**	**Is the System complete?**	• Student did not attend	• The System is not complete	• The System is Complete
5	**Coding Standard**	**Did the student followed any coding standard?**	• Student did not attend	• The Student did not follow any coding standard	• The Student followed proper coding standard

Rubric for Project Assessment (CO3)

	CO3 Assessment Rubrics						
	Category	**Evaluation Definition**	**Not Attended (0)**	**Inadequate (1)**	**Moderate (2)**	**Good (3)**	**Excellent (4)**
1	**OOP Principles**	**Does the project OOP Principles?**	• Student did not attend	• The project only contains Encapsulation	• The Project Contains Encapsulation and Inheritance.	• The Project Contains Encapsulation, Inheritance and Polymorphism	• The Project Contains Encapsulation, Inheritance, Polymorphism and Abstraction
2	**Logical Operations**	**Did the student implemented the logical operations properly?**	• Student did not attend	• Student tried to implement but failed	• Student implemented only one logical operation	• Student implemented all the logical operations but some of them works properly	• All the logical operations work properly
3	**Exception Handling**	**Did the student implemented proper exception handling mechanism?**	• Student did not attend	• Student tried to implement but failed	• Student handled only one exception	• Student handled some of the exceptions	• Student handled all the exceptions
4	**File Operations**	**Did the student implemented File Operations properly?**	• Student did not attend	• Student created files but no I/O operations were there	• Student could only implement one of the Read or Write operation	• Student implemented both read write operations but only one works	• Both read write operations work properly
5	**Completeness**	**Is the Project complete?**	• Student did not attend	• The project is not complete	• The project is not complete and some of the major requirements are not done	• The project is complete without some minor requirements	• The project is complete with all requirements

Rubric for Project Concluding Report Assessment (CO4)

	CO4 Assessment Rubrics				
	Category	**Evaluation Definition**	**Not Attended (0)**	**Moderate (1)**	**Excellent (2)**
1	**Problem Analysis**	**What is the problem definition?**	• Student did not attend	• Student did not define the problem properly	• Student defined the problem properly
2	**UI Design Analysis**	**How well the UI has been designed?**	• Student did not attend	• Student did not judge the design properly	• Student judged the design properly
3	**Logical Analysis**	**Is the logical operations working?**	• Student did not attend	• Student did not explain the logical operations properly	• Student explained the logical operations properly
4	**OOP Concept Analysis**	**What are the OOP concepts used?**	• Student did not attend	• Student did not mention the concepts used properly	• Student mentioned the concepts used properly
5	**Discussion**	**What are the limitations of the projects?**	• Student did not attend	• Student did not discuss the project properly	• Student discussed the project properly