

<b>Course Code</b> CSEG 3102	<b>Course name</b> OOAD Lab	L	T	P	C
<b>Version 1.0</b>		0	0	1	1
<b>Pre-requisites/Exposure</b>	a. Basic Knowledge of object oriented language b. Basic Knowledge of software development life cycle				
<b>Co-requisites</b>	--				

### Course Objectives:

- (a) The student should be able to design different UML diagrams like Use case diagram, class diagram and sequence diagrams.
- (b) This will help to learn how to apply object oriented concepts to all stages of software development.

### Course Outcomes

- CO1. State the importance of object oriented modeling with UML
- CO2. Identify the role of actors, classes and objects in a software design
- CO3. Demonstrate the models for activity relationship and interaction modeling
- CO4. Analyze events and design state diagram.
- CO5. Evaluate component and deployment diagrams.

### Catalog Description

#### Course Content

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#### Experiment No: 01 Introduction to OOAD

OOAD Overview, UML OVERVIEW, Goals of UML, A conceptual model of UML, Object oriented concepts, Role of UML in OO design.

#### Experiment No: 02 Introduction of UML tools

Give overview of different UML tools available. Introduce any UML tool with few sample diagrams. Also, take some examples to let students find entities, relationships.

#### Experiment No: 03 Use Case Diagram

Draw Use Case Diagram for following:

a) An organization wants to develop the system based on following Requirements:

1. Students have to register first through fill up the registration form.
2. Faculty can prepare the grade sheet of concern subjects.
3. Student and faculty can see the result of each student.
4. Faculty can generate the report about registered students.
5. System can verify the students Registration Details First.
6. Student may have to fill up the hostel details during registration process.

b) Consider a bookstore in a shopping mall. The customer selects the books from racks to purchase. The customer brings selected books to cashier. The cashier scans each item with checkout system to prepare an order. The cashier requests to customer for payment. The customer gives credit card to cashier. The verifier and checkout system scans the card. The verifier accepts the card and payment is accepted. Customer signs the credit card slip. The purchased books are handed over to customer.

**Practice Question:** Design Use case diagram for Online Movie-Ticket Booking System.

### Experiment No: 04 Class Diagram and Object Diagram

A) Draw the class diagram for the following:

A school has a principal, many students, and many teachers. Each of these persons has a name, birthdate, and may borrow and return books. Teachers and the principal are both paid a salary; the principal evaluates the teachers. A school board supervises multiple schools and can hire and fire the principal for each school. A school has many playgrounds and rooms. A playground has many swings. Each room has many chairs and doors. Rooms include restrooms, classrooms, and the cafeteria. Each classroom has many computers and desks. Each desk has many rulers.

B) Draw class Diagram for a Hockey League:

Draw a UML class diagram representing the following elements from the problem domain for a Hockey League. A Hockey League is made up of at least 4 hockey teams. Each hockey team is composed of 6-12 players and 1 player is the captain of the team. A team has a name and registration number. Player has a name, a number and a position. Hockey teams play games against each other. Each game has a score card and a location. Each team also has a coach. A coach has a number of certificates and experience letter. A coach can provide coaching to multiple teams. Coaches and players are people having name and address. A league also has registration number and teams dynamically participate in the league. Draw a class diagram for this information with appropriate relationships and multiplicities.

c) Design a class diagram and any two **object diagrams** for each statement:

1. A faculty takes many subjects in a school.

2. Athlete may represent country in various sports events.

**Practice Question:** Give overview of class diagram and draw a class diagram for online ticket reservation system. The System developed should contain following features:

1. The System should provide information about arrival and departure trains along with information about stations through which it passes.
2. Search about train passing through stations can be obtained either by means of train no, train name or specifying the source and destination stations.
3. While displaying information about train it has provide following information's
  - a) Stations through which train passes along with arrival and departure time.
  - b) Availability of seats in different classes along with waiting list.
4. While reserving ticket online the system obtain following information's from the user
  - a) Passenger name, Gender, Age, Address
  - b) Credit Card No, Bank Name
  - c) Class through passenger is going to travel i.e First class or Second class or AC
  - d) Train no and Train name, Date of Journey and number of tickets to be booked.
5. Based on the availability of tickets the ticket has to be issued. The ticket issued should contain the following information's PNR NO, Train No, Date, K.M., no of adults and children, Ticket No, Class, Ticket No, Coach, Seat/Berth, Sex, Age, Reservation fee, Total Cash, Train Name, Departure time.
6. Cancellation of booked tickets should be available.

### **Experiment No: 05 Activity and Swimlane Diagram**

a) Design detailed Activity diagram of Hospital Management System for the following:

1. System helps in registering information about patients and handles patient's query.
2. A unique ID is generated for each patient after registration for maintains medical history of patient.
3. System also monitors the doctor appointments, when the ID is generated the patient receives the appointment time and number from the receptionist and accordingly visits the doctor.
4. This system also deals with testing appointments as and when ID is generated the patient receives the appointment time and number and accordingly undergoes the test.
5. It also deals with bed allotments to various patients by checking their ID. It also undergoes various operations by diagnosing the patients.
6. The system identifies whether the person is a doctor or staff and handles various activities such as draw salary and gives salary, also it adds doctor/staff information into database.
7. This system is responsible for handling various other activities like deleting, editing doctor/staff information into the database.
8. As per doctor diagnoses the patient, gives treatment and gives suggestions to patients and prescribe laboratory tests and medicines.
9. This system also takes care of medical equipment, doctor visit, vitals recording, patient

case sheet, diet ordering, blood requisition, transfer information and discharge information, maintenance of wards, inter and intra wards transfers also it generates patient's discharge summary which includes patients health at the time of discharge, medical history, various diagnosis and drug prescriptions, history of patients illness and course in hospital.

10. Patient can pay bill through credit card, cash or cheque whose information is maintained by this system.

b) Design Swimlane diagram for booking an “online movie ticket”.

### **Experiment No: 06 Sequence Diagram**

a) Develop a system in terms of accessing ATM. To develop an ATM System for ABC Bank The System developed should contain the following features

1. The Customer login into the system using Credit Card No or Debit Card no and Pin Number. The system checks for validation.
2. The System queries the customer for the type of account either Saving Account or Credit. After getting the type of account the system shows the amount left.
3. The System then queries the customer for required amount. The user enters the amount and gets the money.

b) Design a sequence diagram for booking an “online movie ticket”.

### **Experiment No: 07 Collaboration Diagram**

a) Develop a system in terms of accessing ATM. To develop an ATM System for ABC Bank The System developed should contain the following features

1. The Customer login into the system using Credit Card No or Debit Card no and Pin Number. The system checks for validation.
2. The System queries the customer for the type of account either Saving Account or Credit. After getting the type of account the system shows the amount left.
3. The System then queries the customer for required amount. The user enters the amount and gets the money.

b) Design a collaboration diagram for booking an “online movie ticket”.

### **Experiment No: 08 State Diagram**

Assume suitable states, events, etc. to design State diagram for:

- a) “Printer”
- b) “ATM Machine”
- c) “Telephone”

## Experiment No: 09 Component Diagram

Assume suitable notations to design Component diagram for:

- Library Management System.
- ATM

## Experiment No: 10 Deployment Diagram

Assume suitable notations to design Deployment diagram for:

- Library Management System
- ATM

## Text Books

- Object-Oriented Modeling and Design with UML, Michael R Blaha & James R Rumbaugh, Pearson Education
- Object Oriented Analysis and Design, Atul Kahate, TMH

## Reference Books

- Applying UML and Patterns, Craig Larmen, Pearson Education
- The Unified Modeling Language User Guide, Grady Booch&James Rumbaugh&Ivar Jacobson, Addison Wesley

**Continuous Evaluation-** There will be continuous evaluation for all practical subjects of CoES during the semester w.e.f. January 2016. The performance of a student in a Practical subject will be evaluated as per process given below:

1. Components of evaluation
  - a. Viva voce / Quiz (50%) + Performance & Records (50%).
  - b. Lab performance and record evaluation shall be a continuous process throughout the semester.
  - c. Minimum three Viva voce/ Quiz based on practical sessions shall be conducted during the semester.

### Relationship between the Program Outcomes (POs), Program Specific Outcomes and Course Outcomes (COs)

[illegible]

Average	1	1	1	1	1	1.6	1	1.6	1	1	1	1	1	1	1
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1. Weak Mapped

2. Moderate Mapped

3. Strong Mapped