`BSE3102 Object-Oriented Software Engineering (4CU)

Course Objectives; Upon completion of the course, students will be able to: (i) Understand the entire software engineering project process, which consists of object-oriented analysis, design, programming and testing; (ii) Understand basic object-oriented programming concepts; (iii) Effectively use the main features of the object-oriented programming language Java; (iv) Gain experience in implementing object-oriented programs in Java; (v) Apply an iterative, use case-driven process to the development to faro bust design model; (vi) Use UML to represent the design model; (vii) Apply the OO concepts abstraction, encapsulation, inheritance, hierarchy, modularity, and polymorphism to the development of faro bust design model; and (viii) Design and implement a software system using object-oriented software engineering paradigm.

Course Content; In particular the course covers the following main themes and associated topics: (i) Systems Modelling and Design Software Engineering processes and principles of good software design. UML modelling and design with particular emphasis on software architecture, behavioral modelling, object interaction sand state-charts.(ii)Formal specifications of system requirements Principles of formal specifications and object orientation ,state and operations chemas; class chemas, object aggregation and inheritance; specification of dependency and information sharing; definition of class union; semantic issues; reasoning techniques for validating invariant properties, such as safety and liveness. (iii)Specification of object oriented programs Principles of object-oriented program specifications, concepts of mid-conditions, pre-conditions and post-conditions of methods, the role and definition of class invariants; loop invariants as a programming technique; techniques for reasoning about the correctness of programs. (iv) The development process Generation of specifications of object-oriented programs from formal specifications of system requirement; validation and verification processes of software system; acquisition of practical experience in modelling and specifying Java programs, using appropriate tools for developing and checking specifications of Java programs.

References

•Larman C2002, Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process, Second Edition, Prentice-Hall

•Schach, S.R., Object Oriented and Classical Software Engineering, 7thedition, McGraw-Hill,

2007

•Pressman R.S.and InceD., Software Engineering A Practitioners Approach, McGraw-Hill,

2007

•Summerville, I., Software Engineering, 8thedition, AddisonWesley,2006

•Thayer, R.H. and Christiansen, M.J., Software Engineering, Volume 1: The Development

Process,3rdedition,Wiley&Sons,2005

•Thayer, R.H. and Dorfman, M., Software Engineering, Volume2: TheSupportingProcesses,

3rdedition,Wiley&Sons,2005