BSE2105 Formal Methods (3CU)

Course Objectives;

* Demonstrate factual knowledge including the mathematical notation and terminology used in the course;
* Be able describe the fundamental principles including the laws and theorems arising from the concepts covered in this course;
* Be able to apply course material along with techniques and procedures covered in this course to solve practical problems; and
* Demonstrate programming skills by writing numerical programs, such as Mat lab programs, to solve the above problems.

Course Content; Predicate Logic Specification: 1. Foundations2.Basicconcepts3.Verification

4.Z5. Tools and systems: Z animation–Miranda and ZANS, Nitpick, the Z Notation. Algebraic Specification: 1. Foundations 2. Basic concepts 3. Verification4. Tools and systems; Miranda, The OBJ family of languages, LARCH. Optional Topics (as time permits): 1. State charts 2. Integrated creation of a program and its correctness proof3. Automatic program synthesis, Scripting Languages.

References

•Z:An Introduction to Formal Methods, by Antoni Diller, 2nd edition, Wiley, (June1994), ISBN-10:0471939730

•Logic in Computer Science: Modeling and Reasoning about Systems, by Michael Huth and

Mark Ryan, Cambridge UniversityPress;2ndEdition(August,2004),ISBN-10:052154310X

•Formal Methods and Models for System Design: A System Level Perspective, by Gupta, R., Le Guernic, P. Shukla, S.K. and Talpin, J.P.(Eds.), 2004,ISBN:978-1-4020-8051.

.