

## 31011 Discrete Mathematics (3)

### **Knowledge**

The students should be able to recognize several classical forms of syllogisms, and apply these as theorem proving techniques throughout the course. They should also be able identify useful arithmetic identities that may arise in diverse situations such as counting arguments, set theory, or problems involving probability.

### **Comprehension**

The students should be able to comprehend valid arguments, recognize invalid ones, and to provide counter-examples to the latter.

### **Application**

The students should be able to formulate and apply their theorem proving skills to such mathematical situations as those that arise in number theory, counting, probability, set theory and other similar situations.

### **Analysis**

The students should be expected to handle simple arithmetic identities and solve recurrence relations. They should also experiment with testing different solutions, relying on mathematical induction as a tool to identify correct answers.

### **Synthesis**

The students should be able to translate real world problems into precise mathematical terms. For example, they should be able to formulate formal mathematical propositions involving quantifiers out of problems stated in everyday terms, and they should be able to isolate hypotheses from the conclusion.

### **Evaluation**

The students should be tested regularly by quizzes and in-class tests, in order to assess their progress throughout the course.

### **Class Activities**

The students are expected to participate in class by actively constructing examples and engaging with the instructor during any process of inquiry.

### **Out of class Activities**

The students should be challenged with homework assignments, at least two per week, to test their problem solving skills.