

## CSCB36 – Course Information

**Course Description** Mathematical induction with emphasis on applications relevant to computer science. Aspects of mathematical logic, correctness proofs for iterative and recursive algorithms, solutions of linear and divide-and-conquer recurrences, introduction to automata and formal languages.



**Exclusion** (CSCB38H), CSC236H, (CSC238H), CSC240H

**Prerequisite** [CSCA48H & CSCA65H] plus [CGPA 2.5 or enrolment in a CSC subject POST]

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### Textbooks:

(optional) *CSC236/B36 Introduction to the Theory of Computation* by Vassos Hadzilacos available from Derrick (SW628A).

(optional) *Discrete Mathematics and Its Applications* by Kenneth Rosen ISBN 9780073229720. Available from the bookstore or Amazon.ca or Chapters.ca.

### Evaluation:

Exercises 6x2%	= 12%
Assignments 3x8%	= 24%
Term Tests 2x12%	= 24%
Final Exam	40%

**NOTE:** See the course website about *academic integrity* before handing in any assignments. No *late* assignments without *prior* permission.

### What you need to know from CSC165/A65

- **Basic Logic**

- Be able to translate from English to predicate/propositional logic and vice versa
- Understand when  $P \rightarrow Q$  is true and when it is false

- **Proof Methods and Structure**

- We'll review in tutorial.

- **Basic complexity theory**–Asymptotic Bounds

- “Big-Oh”–Worst case upper bound
- “Big-Omega”–Worst case lower bound
- “Big-Theta”– Worst case tight bound.

## Topics

- Induction  
(Chapters 1 and 3)
- Functions defined by induction, recurrences  
(Chapter 3)
- Program Correctness  
(Chapter 2)
- Formal Languages  
(Chapters 7 and 8)

## Schedule

September	Monday	Tuesday	Wednesday	Thursday	Friday
		1	2	3	4
	7	8	9	10	11
	14	15	16	17	18
Induction	Lecture 1		Lecture 2		Tutorial 1/ Exercise 1
	21	22	23	24	25
Induction			Lecture 3-4		Exercise 2
	28	29	30	1	2
Structural Induction			Lecture 5-6		Assignment 1
October	Monday	Tuesday	Wednesday	Thursday	Friday
	5	6	7	8	9
Recurrence Relations	Lecture 7		Test 1, Lecture 8		Tutorial 4
	12	13	14	15	16
Divide and Conquer	<i>Thanksgiving</i>		Lecture 9-10		Exercise 3
	19	20	21	22	23
Algorithm Correctness			Lecture 11-12		Exercise 4
	26	27	28	29	30
Algorithm Correctness			Lecture 13-14		Assignment 2
November	Monday	Tuesday	Wednesday	Thursday	Friday
	2	3	4	5	6
Regular Languages	Lecture 15		Test 2, Lecture 16		Tutorial 8
	9	10	11	12	13
Regular Languages			Lecture 17-18		Tutorial 9
	16	17	18	19	20
Context-free Grammars			Lecture 19-20, Exercise 5		Tutorial 10
	23	24	25	26	27
Context-free Grammars			Lecture 21-22, Exercise 6		Tutorial 11
December	Monday	Tuesday	Wednesday	Thursday	Friday
		1	2	3	4
			Lecture 23-24, Assignment 3		
	7	8	9	10	11
	Exams	Exams	Exams	Exams	Exams
	14	15	16	17	18
	Exams	Exams	Exams	Exams	Exams