Exam Prep

BCS1110

Dr. Ashish Sai & Dr. Thomas Bitterman

Exam Prep

bcs1110.ashish.nl

Week 1

1. Introduction
2. Hardware

Lecture 1: Introduction

- Definition of computer science? [Slides 9–18]
- Social Aspects of Computer Science [Slide 19 and Required Reading 1]
- Using logic and creativity in CS [Slides 20–28]
- Standardization and Non-Standardization [Slides 29–34]
- Computational Thinking (Part 4/5) [Slides 46–54]

Lecture 2

- Building blocks of a computer (Slides 8–22):
- Transistor, Basic Gates (AND, OR, NOT), Truth Table
- Combinational Circuits (designing circuits from boolean expressions)
- Abstraction in Hardware (Slides 23–27):
  - Binary and decimal number systems, Conversion
- Arithmetic Logic Unit (ALU) (Slides 35–39):
  - ALU, opcode, status
- More Abstraction CPU (Slides 40–49):
  - Structure of the CPU (Control Unit, ALU, Registers, RAM)
  - Instruction Sets, Moore’s Law

Week 2

Dr. Thomas Bitterman

Week 3

Theory of Computation 1 and 2

Theory of Computation 1

- Formal theory of computation [Slides 4–19]
- Strings, Languages, and relationships [Part 1/4, Slides 20–29]
- Finite Automata, design and recognition [Parts 2/4 and 3/3, Slides 30–51 and 53–66]
- Deterministic Finite Automata (DFA) [Part 4/4, Slides 67–77]

Theory of Computation 2

- Tabular DFA [Part 1/4, Slides 8–16]
- Regular Languages [Part 2/4, Slides 17–25]
- Non-deterministic Finite Automata (NFA) [Part 3/4 and Part 4/4, Slides 29–53]

Week 4

Computer Networks 1 & 2

Computer Networks Lecture 1 & 2 (Dr. Ashish Sai)

- Introduction to Networks (Part 1/4, Slides 6–32):
- Computer network basics, communication channels, bandwidth, network topologies
- Introduction to the Internet (Part 2/4, Slides 33–70):
- Internet history, client–server model, traceroute, URL, standardized protocols, TCP/IP layers
- Ignore Part 3/4 (Slides 71–83)
- Everything in Part 4/4 (Slides 85–90)

Lecture by Tom

Please check with Tom for specific topics.

Week 5

Information Security and Privacy 1 & 2

Information Security and Privacy (Dr. Ashish Sai)

- Importance of security
- Encryption (Part 1, Slides 6–18):
  - Difference between encryption and decryption, symmetric vs. asymmetric encryption, applications
- Misconception vs. Reality (Part 2, Slides 20–26):
  - End-to-end encryption, password manager benefits
- Passwords (Part 3, Slides 32–51):
- Hashing, Multi-factor Authentication, password attacks, prevention

Lecture by Tom

Please check with Tom for specific topics.

Demo Exam Paper

Program: BSc Computer Science

Course code: BCS1110

Examiners: dr. Ashish Sai & dr. Thomas Bitterman

Date/time: 24-Oct-2023, 17:00 to 19:00

Format: Closed book exam

Allowed aids: **Pens**, simple (non-programmable) calculator from the DACS list of allowed calculators

Instructions

- The exam consists of **25 questions** consisting of multiple choice and open ended.
- You have 2 hours to solve all the questions
  - NOT all questions are made even (the grades vary based on the question) so plan your time well.

Instructions

- Ensure that you properly motivate your answers
- Only use black or dark blue pens, and write in a readable way. Do not use pencils

  Answers that cannot be read easily cannot be graded and may therefore lower your grade

Good Luck with your exams