FOS Study Material (Updated May 2021)

Telecommunication, Signal and Image Processing (Dr. Sesay)


Power and Control Systems (Dr. Zareipour – Power Systems and Dr. Westwick – Control Systems)


Control Systems. Chapters 2, 3, 4, 5, 6, 8 and 13 from Modern Control Systems (12th Ed.), R.C. Dorf, and R.H. Bishop, Pearson.

Software Engineering (Dr. Moussavi)


- Database Architectures and Web
- Relational Model
- Relational Algebra
- SQL data manipulation
- SQL data definition
- Database Analysis and Design
- Entity Relationship Modelling
- Normalization

Data structures and algorithms. Chapters 3-5, 9, 10 from Data Structures and Algorithm Analysis in Java, M.A. Weiss. Pearson.

- Lists, stacks and queues
- Trees
- Hashing
- Graphs
- Algorithm design techniques

Object-oriented design and design patterns. Chapters: 2, 4-9 from Object oriented software engineering, practical development using UML and Java, T. Lethbridge, and R. Laganiere, McGraw-Hill.

Topics:
- Principles of object orientation
- Developing requirements
- Modelling with classes
- Using design patterns
- Focusing on users and their tasks
- Modelling interactions and behaviour
- Architecting and designing software

**Biomedical Engineering (Dr. Murari)**


**Circuits and Electronics (Dr. Murari)**


**Computer Engineering (Dr. Mike Smith) – Exam Not available for June 2021**

Review of computer architecture, microcontrollers and their instruction sets; Interfacing using common input/output devices – e.g. SPI, GPIO; Strategies for interrupt handling and exception handling; Interfacing combining code using functions implemented in high level and assembly languages; Real time operating systems; Software and hardware optimizations to achieve real time operations; Processor characteristics needed to match the requirements for typical DSP applications; Hardware and software optimization techniques including multiple busses; Super-scalar and other highly parallel instruction sets, critical timing paths; Optimizing compilers and multi-processor operation. Digital Design and Computer Architecture (2nd Ed.), by D. Harris, and S.L. Harris, Morgan Kaufmann Publishers.

Interrupt handling, DMA and interfacing. Source material TBD.

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**RF Circuits and Applied Electromagnetics (Dr. Vyas)**


Microwave amplifiers. Chapters 2-4 from Microwave Transistor Amplifiers: Analysis and Design (2nd Ed.), G. Gonzalez, Prentice Hall.

RF and Microwave Circuits. Chapters 1-7, 10, 12 from Microwave Engineering (4th Ed), David M.Pozar, Wiley.