

7th Semester

CSE-4101: Artificial Intelligence [3.0 credits, 45 Hours Lecture]

Introduction to old and new AI techniques; Knowledge representation; Propositional and first order logic, inference in first order logic; Frame problem; Search techniques in AI; Game playing; Planning; Probabilistic reasoning; Learning in symbolic and non-symbolic representation; Natural language processing. Introduction to expert system.

CSE-4102: Artificial Intelligence Lab. [1.5 credits, 45 Hours Lecture]

Laboratory works based on CSE 4101.

CSE-4103: Compiler Design and Construction [3.0 credits, 45 Hours Lecture]

Introduction to compiling; Basic issues; Lexical analysis; Syntax analysis; Syntax-directed translation; Semantic analysis: type-checking; Run-time environments; Intermediate code generation; Code generation; Code optimization.

CSE-4104: Compiler Design and Construction Lab. [0.75 credits, 22.5 Hours Lecture]

Laboratory works based on CSE-4103 and project works using some lexical analyzer and parser designing tools.

CSE-4105: System Programming [2.0 credits, 30 Hours Lecture]

Systems programming concepts, general machine structures, machine and assembly language, concepts of translation oriented system programs; **Kernel:** General kernel responsibilities, kernel organization, kernel compiling and installing, kernel's role at system startup, process creation and termination, Process execution, ELF format, inter process communication, signal handling, Memory management: page frame management, memory area management, kernel memory management, VFS: VFS data structures, File system handling, Generic characteristics of Ext3 file system, **Interrupt:** Interrupt handlers, registering an interrupt handler, writing an interrupt handler. **System Calls:** system call handler, system call implementation, entering and exiting a system call. **Linux Module Programming:** linux device driver, Building, installing and loading modules, I/O architecture, the device driver model, device files, character device driver, block device driver, working with USB device driver. **Assembler, Linker & Loaders:** Basic Assembler Functions, Machine Dependent Assembler features, Machine Independent Assembler Features, Assembler Design Options - One pass assembler and multipass assembler, Basic Loader Functions, Machine Dependent Loader Features, Machine Independent Loader Features, Linkage Editors, Dynamic Linking, Bootstrap Loader, Basic Macro Processor Functions.

CSE-4106: System programming Lab [1.5 credits, 45 Hours]

Laboratory works based on CSE 4105.

Student will be asked to develop some system tools based on various system call. Linux module programming will be an important part of this lab. They will be asked to develop device driver for Linux as a Linux module.

CSE-4107: Simulation and Modeling [3.0 credits, 45 Hours Lecture]

Simulation modeling basics: systems, models and simulation; Classification of simulation models; Steps in a simulation study; Concepts in discrete-event simulation: event-scheduling vs. process-interaction approaches, time-advance mechanism, organization of a discrete-event simulation model; Continuous simulation models; Combined discrete-continuous models; Monte Carlo simulation; Simulation of queuing systems.

Building valid and credible simulation models: validation principles and techniques, statistical procedures for comparing real-world observations and simulated outputs, input modeling; Generating random numbers and random variates; Output analysis. Simulation languages; Analysis and modeling of some practical systems.

CSE-4109: Computer Graphics [3.0 credits, 45 Hours Lecture]

Graphics hardware: display devices, input devices etc; Basic raster graphics algorithms for drawing 2D primitives; Two-dimensional and three-dimensional viewing, clipping and transformations; Three-dimensional object representations: polygon surface, B-Spline curves and surfaces, BSP trees, Octrees, Fractal-Geometry methods; Visible surface detection methods: Z-buffer method, BSP tree method, Ray casting method; Illumination models; Surface rendering methods: polygon rendering, ray tracing, terrain visualization with height mapping, modeling surface details with texture mapping; Color models; Computer animation.

CSE-4110: Computer Graphics Lab. [0.75 credits, 22.5 Hours Lecture]

Laboratory works based on CSE-4207.



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