

Место формальных
методов в Программной
инженерии.

Место Программной
инженерии в Computer
Science

Computer Science Curricula 2013

Strawman Draft (February 2012)

The Joint Task Force on Computing
Curricula Association for Computing
Machinery IEEE-Computer Society

Computer Science Curricula 2013

The Body of Knowledge

- Algorithms and Complexity (AL)
- Architecture and Organization (AR)
- Computational Science (CN)
- Discrete Structures (DS)
- Graphics and Visualization (GV)
- Human-Computer Interaction (HC)
- Information Assurance and Security (IAS)
- Information Management (IM)
- Intelligent Systems (IS)
- Networking and Communication (NC)
- Operating Systems (OS)
- Platform-Based Development (PBD)
- Parallel and Distributed Computing (PD)
- Programming Languages (PL)
- Software Development Fundamentals (SDF)
- Software Engineering (SE)
- Systems Fundamentals (SF)
- Social and Professional Practice (SP)

Computer Science Curriculum 2008:

An Interim Revision of CS 2001
Report from the Interim Review
Task Force

includes update of the CS2001 body of
knowledge plus commentary

December 2008

Association for Computing
Machinery
IEEE Computer Society

Appendix A

Overview of the Body of Knowledge

DS. Discrete Structures (43 core hours)

DS/FunctionsRelationsAndSets (6)
DS/BasicLogic (10)
DS/ProofTechniques (12)
DS/BasicsOfCounting (5)
DS/GraphsAndTrees (4)
DS/DiscreteProbability (6)

PF. Programming Fundamentals (47 core hours)

PF/FundamentalConstructs (9)
PF/AlgorithmicProblemSolving (6)
PF/DataStructures (10)
PF/Recursion (4)
PF/EventDrivenProgramming (4)
PF/ObjectOriented (8)
PF/FoundationsInformationSecurity (4)
PF/SecureProgramming (2)

AL. Algorithms and Complexity (31 core hours)

AL/BasicAnalysis (4)
AL/AlgorithmicStrategies (6)
AL/FundamentalAlgorithms (12)
AL/DistributedAlgorithms (3)
AL/BasicComputability (6)
AL/PversusNP
AL/AutomataTheory
AL/AdvancedAnalysis
AL/CryptographicAlgorithms
AL/GeometricAlgorithms
AL/ParallelAlgorithms

AR. Architecture and Organization (36 core hours)

AR/DigitalLogicAndDataRepresentation (7)
AR/ComputerArchitectureAndOrganization (9)
AR/InterfacingAndI/OStrategies (3)
AR/MemoryArchitecture (5)
AR/FunctionalOrganization (6)
AR/Multiprocessing (6)
AR/PerformanceEnhancements
AR/DistributedArchitectures
AR/Devices
AR/DirectionsInComputing

OS. Operating Systems (18 core hours)

OS/OverviewOfOperatingSystems (2)
OS/OperatingSystemPrinciples (2)
OS/Concurrency (6)
OS/SchedulingandDispatch (3)
OS/MemoryManagement (3)
OS/DeviceManagement
OS/SecurityAndProtection (2)
OS/FileSystems
OS/RealTimeAndEmbeddedSystems
OS/FaultTolerance
OS/SystemPerformanceEvaluation
OS/Scripting
OS/DigitalForensics
OS/SecurityModels

NC. Net-Centric Computing (15 core hours)

NC/Introduction(2)
NC/NetworkCommunication (7)
NC/NetworkSecurity (6)
NC/WebOrganization
NC/NetworkedApplications
NC/NetworkManagement
NC/Compression
NC/MultimediaTechnologies
NC/MobileComputing

PL. Programming Languages (21 core hours)

PL/Overview(2)
PL/VirtualMachines(1)
PL/BasicLanguageTranslation(2)
PL/DeclarationsAndTypes(3)
PL/AbstractionMechanisms(3)
PL/ObjectOrientedProgramming(10)
PL/FunctionalProgramming
PL/LanguageTranslationSystems
PL/TypeSystems
PL/ProgrammingLanguageSemantics
PL/ProgrammingLanguageDesign

HC. Human-Computer Interaction (8 core hours)

HC/Foundations (6)
HC/BuildingGUIInterfaces (2)
HC/UserCenteredSoftwareEvaluation
HC/UserCenteredSoftwareDevelopment
HC/GUIDesign
HC/GUIProgramming
HC/MultimediaAndMultimodalSystems
HC/CollaborationAndCommunication
HC/InteractionDesignForNewEnvironments
HC/HumanFactorsAndSecurity

GV. Graphics and Visual Computing (3 core hours)

GV/FundamentalTechniques (2)
GV/GraphicSystems (1)
GV/GraphicCommunication
GV/GeometricModeling
GV/BasicRendering
GV/AdvancedRendering
GV/ComputerAnimation
GV/Visualization
GV/VirtualReality
GV/ComputerVision
GV/ComputationalGeometry
GV/GameEngineProgramming

IS. Intelligent Systems (10 core hours)

IS/FundamentalIssues (1)
IS/BasicSearchStrategies (5)
IS/KnowledgeBasedReasoning (4)
IS/AdvancedSearch
IS/AdvancedReasoning
IS/Agents
IS/NaturalLanguageProcessing
IS/MachineLearning
IS/PlanningSystems
IS/Robotics
IS/Perception

IM. Information Management (11 core hours)

IM/InformationModels (4)
IM/DatabaseSystems (3)
IM/DataModeling (4)
IM/Indexing
IM/RelationalDatabases
IM/QueryLanguages
IM/RelationalDatabaseDesign
IM/TransactionProcessing
IM/DistributedDatabases
IM/PhysicalDatabaseDesign
IM/DataMining
IM/InformationStorageAndRetrieval
IM/Hypermedia
IM/MultimediaSystems
IM/DigitalLibraries

SP. Social and Professional Issues (16 core hours)

SP/HistoryOfComputing (1)
SP/SocialContext (3)
SP/AnalyticalTools (2)
SP/ProfessionalEthics (3)
SP/Risks (2)
SP/SecurityOperations
SP/IntellectualProperty (3)
SP/PrivacyAndCivilLiberties (2)
SP/ComputerCrime
SP/EconomicsOfComputing
SP/PhilosophicalFrameworks

SE. Software Engineering (31 core hours)

SE/SoftwareDesign (8)
SE/UsingAPIs (5)
SE/ToolsAndEnvironments (3)
SE/SoftwareProcesses (2)
SE/RequirementsSpecifications (4)
SE/SoftwareVerificationValidation (3)
SE/SoftwareEvolution (3)
SE/SoftwareProjectManagement (3)
SE/ComponentBasedComputing
SE/FormalMethods
SE/SoftwareReliability
SE/SpecializedSystems
SE/RiskAssessment
SE/RobustAndSecurity-EnhancedProgramming

CN. Computational Science (no core hours)

CN/ModelingAndSimulation
CN/OperationsResearch
CN/ParallelComputation