

Computer Science Specific Bloom’s Taxonomy

A	Computer Science Specific Bloom's Taxonomy
A.1	Knowledge
<i>A.1.1</i>	<i>Describe</i>
A.1.2	Emerging technologies and research areas relevant to communication and pervasive computing
A.1.3	Components of graphics architectures for given applications
A.1.4	Basic components of a graphics api such as 2d and 3d drawing methods, affine and viewing transformations, colour and lighting models, texture mapping, interactive methods
A.1.5	Common algorithms for clipping, line generation on a pixel-based display, convex full finding, hidden surface removal, rendering and ray tracing
A.1.6	Different artificial intelligence architectures
A.1.7	Issues involved
A.1.8	Basic techniques for representing uncertainty in knowledge
A.1.9	The basic concepts of supervised learning
A.1.10	The impact of relevant codes of ethics and professional conduct
<i>A.1.2</i>	<i>Identify</i>
A.1.2.1	Usability problems
A.1.2.2	Social, economic and ethical issues that arise from the use of communication networks and pervasive computing technology
A.1.2.3	Emerging technologies and research areas relevant to communication and pervasive computing
A.1.2.4	Most appropriate data structure and algorithm to solve a particular problem
<i>A.1.3</i>	<i>Know</i>
A.1.3.1	Advantages and disadvantages
<i>A.1.4</i>	<i>Recognise</i>
A.1.4.1	Importance of identifying and involving users in the design of interactive systems
<i>A.1.5</i>	<i>Record</i>
A.1.5.1	The results of software engineering development work
<i>A.1.6</i>	<i>Select</i>
A.1.6.1	Appropriate style, method and mode of communicating information to different audiences
A.1.6.2	Basic components in the java language
A.1.6.3	Suitable usability evaluation methodologies
<i>A.1.7</i>	<i>Show</i>
A.1.7.1	An understanding of how to plan and manage a project
A.1.7.2	Awarness of different aspects of mathematics in analysing and understanding important areas of computing
A.1.7.3	Fluency in selecting and using basic components in the java language
A.1.7.4	An understanding of the theoretical underpinnings of the java language
A.1.7.5	Basic understanding of dbname transaction management
A.1.7.6	Clear understanding of basic matlab programming environment and data structures
A.1.7.7	Awareness of legal, social, ethical and professional issues in software development
A.1.7.8	How to use them
A.1.7.9	Understanding of the metrics used in comparing different hardware architectures of parallel computers
A.1.7.10	Familiarity with the main causes of inefficiency in parallel programs
A.1.7.11	Understanding of how to design and implement simple parallel programs using shared memory and message passing constructs
A.1.7.12	Appreciation of best practice in solving problems related to the student's degree programme
A.1.7.13	Familiarity with data mining algorithms
A.1.7.14	A range of multimedia formats for text, graphics, animatio, audio, images and video by detailed study of common multimedia formats
A.1.7.15	Familiarity with a range of common data compression methods
A.1.7.16	Understanding of the derivation from mathematical principles of underlying data compression algorithms
A.1.7.17	Familiarity with techniques and concepts for wireless communication
<i>A.1.8</i>	<i>Study</i>
A.1.8.1	Potential problems processing multimedia data and of implications of multimedia formats and types
A.1.8.2	The mathematical bases of derivations of methods and the compression pipelines employed by common compression formats such as GIF, JPEG, MPEG
A.2	Comprehension
<i>A.2.1</i>	<i>Understand</i>
A.2.1.1	What to encounter and expect from degree
A.2.1.2	Differences between subjects and disciplines
A.2.1.3	Computing history and internal workings of a computer
A.2.1.4	Structure of internet and role of main network protocols
A.2.1.5	Legal and ethical constraints on web development
A.2.1.6	Threats to systems on the internet and approaches to security
A.2.1.7	Functionality and foundations of internet search engines
A.2.1.8	Basic set theory, counting techniques, graph theory, probability and statistics
A.2.1.9	Relevant legal requirements and ethical issues
A.2.1.10	Importance of basic software engineering concepts, principles and practices
A.2.1.11	How to plan and manage a project
A.2.1.12	Important areas of computing using mathematics
A.2.1.13	The representational and processing power of the relational database management system
A.2.1.14	Object-oriented abstractions for concurrency and user interaction
A.2.1.15	The practical application of some general mathematical techniques in data processing
A.2.1.16	The application of statistical methods to problems in computer science
A.2.1.17	Efficient programming techniques for managing hardware resources
A.2.1.18	Concurrent programming techniques for parallel hardware platforms
A.2.1.19	Common approaches towards software development from waterfall to iterative and agile methods
A.2.1.20	Relation between software lifecycle models, standards, development processes and ensuring the quality of the resulting software
A.2.1.21	Relation between business processes, software systems, people and organisations
A.2.1.22	Need for and fundamental principles of wired and wireless communication networks
A.2.1.23	Use and operation of the key standards and protocols at each layer of communcation networks
A.2.1.24	Design of various fundamental data structures
A.2.1.25	Resources requirements of various algorithms and data structures
A.2.1.26	How to map conceptual models to efficient representations in a database schema
A.2.1.27	Post-relational data management techniques - objected oriented, extended relational, xml
A.2.1.28	The context in which xml may be used in data intensive and web systems
A.2.1.29	How xml and semantic web technologies are used to model and manage information in a web context
A.2.1.30	The component parts of a typical computer vision system
A.2.1.31	When and how to use them
A.2.1.32	The operation of monotonic and non-monotonic reasoning techniques
A.2.1.33	The concepts underlying planning systems
A.2.1.34	Flynn's taxonomy of parallel computer architectures
A.2.1.35	Distinction between shared memory and distributed memory parallel computers
A.2.1.36	The elements of a successful project related to the student's degree programme
A.2.1.37	Characteristics of spatial and temporal information and the models used to represent it
A.2.1.38	Role of information systems in supporting strategy, business processes and decision making
A.2.1.39	The architectures the different applications of the middleware employed
A.2.1.40	Benefits and disadvantages of evaluating and choosing different middleware
A.2.1.41	The need for and purpose of meta-heuristic techniques
A.2.1.42	The network design problems arising in wireless communications
A.2.1.43	The role of logic in the modelling of real-world problems
A.2.1.44	How expert systems are implemented
A.2.1.45	The importance of induction and other techniques for reproducing forms of reasoning employed by humans

A.2.1.46	What organisational knowledge is
A.2.1.47	The knowledge management lifecycle and activities
A.2.1.48	The capacity of technology to manage and change the way organisations create, transfer and use knowledge
A.2.1.49	The imperatives behind organisational knowledge
A.2.1.50	The derivation, management and exploitation of organisation knowledge
A.2.1.51	The process, purpose and goals of academic research, and of literature review/survey
A.2.1.52	Of file structures both in linux environment and windows disk structures
A.3	Application
<i>A.3.1</i>	<i>Apply</i>
A.3.1.1	Mathemathical techniques and knowledge to a problem situation
A.3.1.2	Task analysis and dialogue design methods to facilitate effective interaction design
A.3.1.3	Suitable usability evaluation methodologies
A.3.1.4	Principles of good object-oriented software design to the creation of robust maintainable code
A.3.1.5	Appropriate requirement gathering approaches to determine functional and non-functional requirements in a constrained project scenario
<i>A.3.2</i>	<i>Choose</i>
A.3.2.1	Appropriate methodology relevant to the research issue or topic
A.3.2.2	Appropriate tools and techniques
A.3.2.3	Appropriate documents and citation to support the construction of own arguments
<i>A.3.3</i>	<i>Demonstrate</i>
A.3.3.1	Ability to plan, integrate and monitor personal, academic and career development
A.3.3.2	Self-awareness and reflection including constructive feedback
A.3.3.3	An awareness of relevant legal requirements and ethical issues
A.3.3.4	How the main requirements can be delivered
A.3.3.5	How some of the main requirements can be implemented
A.3.3.6	How the system can be validated
A.3.3.7	Awareness of the nature of professional bodies and relevant codes of ethics and professional conduct
A.3.3.8	Understanding of the fundamental elements of assembly language
A.3.3.9	Understanding of file and I/O systems in modern operating systems
A.3.3.10	Knowledge of the perceptual and cognitive demands of users
A.3.3.11	Awareness of interface design patterns for web and mobile applications
A.3.3.12	A knowledge of various techniques for use in building applications in Java
A.3.3.13	An understanding of discrete probability theory
A.3.3.14	Awareness of basic digital signal processing with matlab
A.3.3.15	Awareness of basic image processing concepts with matlab
A.3.3.16	Awareness of basic computer graphics and computational geometry concepts with matlab
A.3.3.17	Understanding of formal languages and automata theory
A.3.3.18	Understanding of the history and challenges of pervasive computing
A.3.3.19	How communciation networks form the substrate for pervasive environment
A.3.3.20	Understanding of context aware computing
A.3.3.21	Undertsanding of probalistic reasoning
A.3.3.22	In-depth understanding of the technologies and methodologies used in the project
A.3.3.23	Appreciation of emerging database and information system technologies
A.3.3.24	Awareness of the factors involved in multimedia systems
A.3.3.25	Awareness of a range of approaches to ethical reasoning
A.3.3.26	Awareness of the nature of professional bodies
A.3.3.27	A grasp of the rationale behind meta-heuristics considered
A.3.3.28	An understanding of the process of synthesising the knowledge acquired from the reviewed works
<i>A.3.4</i>	<i>Determine</i>
A.3.4.1	Implications of using outsourcing or virtual enterprises to address the pressure of globalisation
<i>A.3.5</i>	<i>Employ</i>
A.3.5.1	For simple algorithm design
<i>A.3.6</i>	<i>Establish</i>
A.3.6.1	Personal learning environment and PDP
<i>A.3.7</i>	<i>Exhibit</i>
A.3.7.1	Sound knowledge in the subject area related to the project
A.3.7.2	Understanding of data mining
<i>A.3.8</i>	<i>Illustrate</i>
A.3.8.1	Basic database concepts and systems architectures
A.3.8.2	These with examples
<i>A.3.9</i>	<i>Implement</i>
A.3.9.1	Simple algorithms expressed in pseudocode
A.3.9.2	Software system based on a design
A.3.9.3	Fundamental data structures and algorithms
A.3.9.4	Range of image processing and computer vision algorithms
<i>A.3.10</i>	<i>Use</i>
A.3.10.1	HTML, CSS, Javascript, PHP and databases
A.3.10.2	Python and common modules
A.3.10.3	O-notation
A.3.10.4	Recursion
A.3.10.5	Variety of tools for professional communicate
A.3.10.6	A variety of tools and techniques for planning and managing a project
A.3.10.7	Models to meet a given problem
A.3.10.8	UML models
A.3.10.9	Basic components in the java language
A.3.10.10	Standard c, standard c++, cocoa and gnustep libraries effectively
A.3.10.11	Common software development tools aimed at different developement approaches and stages
A.3.10.12	Standard graphics api
A.3.10.13	To discuss the trade-offs between different designs
A.3.10.14	Range of forensic tools and techniques
<i>A.3.11</i>	<i>Write</i>
A.3.11.1	Programs in c, c++, objective c and openc1/cuda
A.3.11.2	Graphics program for creating images of 2d and 3d scenes and user interaction
A.4	Analysis
<i>A.4.1</i>	<i>Analyse</i>
A.4.1.1	Software system and functionality
A.4.1.2	Efficiency of algorithms
A.4.1.3	Important areas of computing using mathematics
A.4.1.4	Existing definitions techniques for querying, transforming and assuring quality of information
A.4.1.5	Resources requirements of various algorithms and data structures
A.4.1.6	The professional requirements of a computer forensics practitioner
<i>A.4.2</i>	<i>Contrast</i>
A.4.2.1	Different searching algorithms
A.4.2.2	Alternative management schemes
A.4.2.3	Implementation of commonly used operating systems
A.4.2.4	Different approaches towards programming of c, c++, objective c and openc1/cuda
A.4.2.5	Operation of local area, wide area, personal area, adhoc and sensor networks
A.4.2.6	Most common models used for structured knowledge representation

A.4.2.7	Basic techniques for representing uncertainty in knowledge
A.4.3	<i>Distinguish</i>
A.4.3.1	Between the properties of the specialised indexing methods used to access spatial and temporal data
A.4.4	<i>Divide</i>
A.4.4.1	Programs into subtasks by the appropriate definition of functions and or modules
A.4.5	<i>Investigate</i>
A.4.5.1	Familiarity with a range of multimedia formats for text, graphics, animatio, audio, images and video by detailed study of common multimedia formats
A.4.5.2	How they are utilised in practical compression formats
A.4.6	<i>Relate</i>
A.4.6.1	Knowledge to individual application domains such as health informatics, bio informatics, geoinformatics and business informatics
A.4.7	<i>Solve</i>
A.4.7.1	Simple problems
A.4.7.2	Problems
A.4.7.3	Simple problems in curve, surface and solid modelling
A.4.8	<i>Specify</i>
A.4.8.1	Appropriate functional and non-functional requirments
A.4.9	<i>Utilise</i>
A.4.9.1	A range of design patterns
A.4.9.2	Hardware resources such as memory and processing cores efficiently
A.5	Synthesis
A.5.1	<i>Construct</i>
A.5.1.1	Software system and functionality
A.5.1.2	Website
A.5.2	<i>Create</i>
A.5.2.1	A prototype system
A.5.3	<i>Design</i>
A.5.3.1	Websites
A.5.3.2	A system
A.5.3.3	Relational database system conceptually, logically and physically
A.5.3.4	Software systems to meet given requirements
A.5.4	<i>Develop</i>
A.5.4.1	Informal algorithms
A.5.4.2	Ability to plan, integrate and monitor personal, academic and career development
A.5.4.3	A set of test cases
A.5.4.4	Visual java program that has input and output functionality that is event driven
A.5.4.5	Relational database queries using structual query language
A.5.4.6	Understanding of how information is captured, shared and exploited in organisations
A.5.5	<i>Discuss</i>
A.5.5.1	Legal requirements relevant to a given context of the development and use of information systems, with particular focus on data protection, intellectual property rights and the computer misuse act
A.5.5.2	The nature of digital evidence and the interpretations of that evidence obtained from computer forensics investigations
A.5.5.3	The challenges facing the computer forensics practitioner
A.5.6	<i>Explain</i>
A.5.6.1	The need for process and memory management in an operating system
A.5.6.2	The process of and the issues involved in database design and implementation
A.5.6.3	Basic object-oriented principles
A.5.6.4	A range of design patterns
A.5.6.5	Difference between various fundamental algorithmic techniques
A.5.6.6	How to apply them
A.5.6.7	How certain problems can be solved by searching
A.5.6.8	Distinction between them
A.5.6.9	How they differ from classical search techniques
A.5.6.10	Amdahl's law, parallel efficiency and scalability
A.5.6.11	Issues involved in designing and implementing a data warehouse
A.5.6.12	The properties of the specialised indexing methods used to access spatial and temporal data
A.5.7	<i>Form</i>
A.5.7.1	Support networks
A.5.8	<i>Manage</i>
A.5.8.1	Hardware resources such as memory and processing cores efficiently
A.5.9	<i>Perform</i>
A.5.9.1	Key technical tasks from each stage of the project
A.5.9.2	Meta-heuristics on specific problem instances
A.5.9.3	Effective and efficient academic literature search, including restricting searches, identifying, locating, retrieving and storing documents
A.6	Evaluation
A.6.1	<i>Assess</i>
A.6.1.1	Benefits, risks and quality factors appropriate to specifying, designing and implementing a software system
A.6.1.2	Relevance and impact of retrieved literature
A.6.2	<i>Compare</i>
A.6.2.1	Most common models used for structured knowledge representation
A.6.2.2	A variety of information system methodologies
A.6.3	<i>Document</i>
A.6.3.1	The results of software engineering development work
A.6.4	<i>Evaluate</i>
A.6.4.1	Techniques used in project management and the technical tasks involved in each stage of the development lifecycle
A.6.4.2	Existing definitions techniques for querying, transforming and assuring quality of information
A.6.4.3	How well a software system meets given requirements
A.6.4.4	Practical performance of various algorithms and data structures
A.6.4.5	Their appropriateness
A.6.4.6	Range of techniques for managing changes to business processes
A.6.4.7	The principles of computer forensics analysis
A.6.4.8	The legal and procedural issues
A.6.4.9	The professional requirements of a computer forensics practitioner
A.6.4.10	Interactive software systems
A.6.5	<i>Justify</i>
A.6.5.1	Basic object-oriented principles
A.6.5.2	The mathematics and data structures used for graphics transformations, projection and curve, surface and solid modelling
A.6.6	<i>Test</i>
A.6.6.1	Software system based on a design
A.6.6.2	Practical performance of various algorithms and data structures
A.6.7	<i>Value</i>
A.6.7.1	Differences between subjects and disciplines