# Appendix C: Determining Alignment of Computer Science Courses with the 2016 DLCS Curriculum Framework

The four strands of the 2016 DLCS Curriculum Framework contain 12 groups of standards.

| **Computing & Society** | **Digital Tools & Collaboration & Computing Systems** | **Computational Thinking** |
| --- | --- | --- |
| **1.** | **2.** | **3.** | **4.** | **5.** | **6.** | **7.** | **8.** | **9.** | **10.** | **11.** | **12.** |
| Understand safety & security concepts, security & recovery strategies, & how to deal with cyberbullying & peer pressure in a social computing setting. (Standards: 6-8.CAS.a & 9-12.CAS.a) | Understand, analyze impact & intent of, & apply technology laws, license agreements & permissions. (Standards: 6-8.CAS.b & 9-12.CAS.b) | Recognize, analyze, & evaluate the impact of technology, assistive technology, technology proficiencies, & cybercrime in people's lives, commerce, & society. (Standards: 6-8.CAS.c & 9-12.CAS.c) | Selection & use of digital tools or resources & computing devices to create an artifact, solve a problem, communicate, publish online or accomplish a real-world task. (Standards: 6-8.DTC.a, 9-12.DTC.a, 6-8.DTC.b, 9-12.DTC.b, 6-8.CS.a & 9-12.CS.a) | Use of advance research skills including advanced searches, digital source evaluation, synthesis of information & appropriate digital citation. (Standards: 6-8.DTC.c & 9-12.DTC.c) | Understand how computing device components work. Use of troubleshooting strategies to solve routine hardware & software problems. (Standards: 6-8.CS.a, 9-12.CS.a, 6-8.CS.b, & 9-12.CS.b) | Understand how networks communicate, their vulnerabilities & issues that may impact their functionality. Evaluate the benefits of using a service with respect to function & quality. (Standards: 6-8.CS.c, 9-12.CS.c, 6-8.CS.d, & 9-12.CS.d) | Creation of new representations, through generalization & decomposition. Write & debug algorithms in a structured language. (Standards: 6-8.CT.a, 9-12.CT.a, 6-8.CT.b, & 9-12.CT.b) | Understand how different data representation affects storage & quality. Create, modify, & manipulate data structures, data sets, & data visualizations. (Standards: 6-8.CT.c & 9-12.CT.c) | Decompose tasks/problems into sub-problems to plan solutions. (Standards: 6-8.CT.d & 9-12.CT.d) | Creation of programs using an iterative design process to create an artifact or solve a problem. (Standards: 6-8.CT.d & 9-12.CT.d) | Creation of models & simulations to formulate, test, analyze, & refine a hypothesis. (Standards: 6-8.CT.e & 9-12.CT.e) |

In determining whether a computer science course aligns to the framework, DESE reviews curricular materials or, in the absence of materials, a description of the course. A coding schema of *Yes*, *Should*, or *May* represents the likelihood that the course addressed the knowledge and skills articulated in each of the 12 standard groupings. DESE staff then assign a percentage to the code. For example, DESE coded standards explicitly addressed in courses *Yes* and valued them at 8.33 percent. A course with all 12 standard groupings coded *Yes* covered 100 percent of the standards (8.33 x 12 = 100).

| **Code** | **Criteria** | **Value Per Standard Grouping** | **Total Possible Value** |
| --- | --- | --- | --- |
| Yes | Standard grouping explicitly addressed in curricular materials or course description. | 8.33 percent | x12 | 100 percent  |
| Should | Standard grouping inferred (but not explicitly addressed) in curricular materials or course description. | 4.165 percent | x12 | 50 percent |
| May | Standard grouping not explicitly addressed or inferred in curricular materials or course description. | .833 percent | x12 | 10 percent |

Of the 1,819 courses reviewed by DESE, 126 covered a percentage of the framework.[[1]](#footnote-1) Of those, *AP® Computer Science Principles* (10 courses), *Computer Science Principles* (1 course), and *Exploring Computer Science* (1 course) covered a substantial portion (88 percent) of the standards.

1. Massachusetts Educator Personnel Information Management System (EPIMS) Appendices G1 (Prior to Secondary Subject Area-Course Codes) and G2 (Secondary Subject Area-Course Codes): <http://www.doe.mass.edu/infoservices/data/epims/DHAppendices.xlsx> [↑](#footnote-ref-1)