

MEMORANDUM

To: Dr. Jennifer McCormick
Kelly Wittman
Dr. Ken Folks
Robin LeClaire
Dr. Andrew Melin

From: Dr. Jennifer Jensen, Assistant Director, Curriculum and Instruction

Date: March 15, 2019

Re: Core 40 Science Requirement Recommendations

Background

Pursuant to HEA 1426, the State Board shall adopt rules regarding science requirements for the Core 40 curriculum models. IDOE formed a Core 40 Science Committee of various stakeholders including secondary subject matter experts, postsecondary subject matter experts, industry leaders, the Commission for Higher Education, and the State Board. A complete list of participants can be found at the end of this memorandum.

The Core 40 Science Committee first met October 23, 2018, to consider two questions: (1) Should the language around science requirements for the Core 40 diploma change; (2) What courses should satisfy the science requirements for the Core 40 diploma? All courses that satisfy an approved CTE Pathway were given careful consideration, utilizing the published standards for each course and the experience of those on the committee. Additional conversation was held around whether or not computer science courses might fulfill a science requirement. After the initial meeting, a survey was sent to all members of the committee. Utilizing the results of the survey, a second meeting was scheduled on January 16. The committee was highly engaged in these critical conversations regarding science curriculum and requirements. This meeting was followed by a second survey, indicating consensus. A final virtual meeting was held on March 13 to finalize the Core 40 Science Committee recommendations.

Recommendations

1. The Core 40 Science Committee recommends that the language regarding science requirements should not change. Students are required to have two credits of Biology, two credits of Chemistry or Physics or Integrated Chemistry-Physics, and two additional Core 40 science credits.

2. The Core 40 Science Committee recommends expanding the list of courses that would satisfy the two additional credits of Core 40 science to include the following courses:
- 4570 AP Computer Science A
 - 4568 AP Computer Science Principles
 - 4854 IB Computer Science Higher Level
 - 4856 IB Computer Science Standard Level
 - 8118 Cambridge International AS Level Computer Science
 - 8116 Cambridge International A Level Computer Science
 - 4801 Computer Science I
 - 5236 Computer Science II
 - 5250 Computer Science III: Databases
 - 5251 Computer Science III: Informatics
 - 5249 Computer Science III: Software Development
 - 5253 Computer Science III: Cybersecurity
 - 5261 PLTW Cybersecurity
 - 4816/5518 Aerospace Engineering
 - 4818 Environmental Sustainability
 - 4814/5644 Principles of Engineering
 - 5008 Animal Science
 - 5180 Natural Resources
 - 5170 Plant and Soil Sciences
 - 5229 Sustainable Energy Alternatives
 - 5216 PLTW Human Body Systems
 - 5217 PLTW Medical Interventions
 - 5215 Health Science Education II: Physical Therapy

Rationale

The Core 40 Science Committee carefully considered the course descriptions and standards for all computer science courses. Because of the lack of focus on the natural world, the committee does not believe that computer science is a pure form of science. However, the committee recognizes that computer science courses require a level of inquiry and experimentation that models scientific inquiry, and therefore reached consensus on the inclusion of the courses listed. An effort was made to ensure that each course contained a level of rigor necessary for college and career preparation, as well as modeled scientific principles, even within the technological world. Additionally, higher education institutions were consulted with regards to their admissions policies, and how the inclusion of computer science might impact students. While requirements still vary by institution, the response was largely positive, indicating no negative impact on admissions.

The committee also considered all courses that satisfy an approved CTE Pathway. Courses chosen demonstrated through the published standards that they contained significant science content, modeled the scientific principles of inquiry and experimentation, and contained a level of rigor necessary for college and career preparation. Courses that did not make this list did not

have standards that demonstrated significant scientific content. While the committee recognizes that courses may be taught with more or less science, depending on the teacher, the consensus was that the standards had to dictate the decision of the committee. For example, Health Science Education II: Physical Therapy has a preponderance of standards that require science and inquiry. In contrast, Health Science Education II: Pharmacy standards had a greater focus on employability skills, interacting with patients and doctors, maintaining records, and dispensing medications.

The committee recommends that the list of approved courses be evaluated on a regular basis, as new courses are added or standards are changed.

Committee Members

Barkman, Kim	Agriculture	Beech Grove High School
Bennett, Rich	Biology	University of Southern Indiana
Bruck, Aaron	Chemistry	Vincennes University
Campbell, Nancy	CTE Director	Prosser Career Education Center
Ernest, Byron	SBOE	State Board Member
Finkler, Michael	Physiology	Indiana University - Kokomo
Flewelling, Jerome	Physics	Crown Point Community Schools
Fritz, Vanessa	Biology	Ivy Tech Community College
Hanson, James	PLTW Engineering	Walker Career Center
Harkness, John	Physics	West Washington High School
Harl, Anthony	IDOE	Career Education Specialist
Haubold, Kristen	PLTW Computer Science	South Bend Community Schools
Hoover, Gregg	Superintendent	Benton Community School Corporation
Jensen, Jennifer	IDOE	Assistant Director, Curriculum & Instruction
Kielmovitch, Alicia	SBOE	Director of Policy & Legislation
King, Robin	PLTW Health	Central Nine Career Center
Koressel, Jacob	IDOE	Computer Science Specialist
Lambert, Tari	CHE	TransferIN
Lane, Kathryn	Biology	Brown County High School
McCaw, Betsy	Industry	Central Indiana Corporate Sponsorship
McGregor, Reginald	Industry	Rolls Royce
Reck, Catherine	Chemistry	Indiana University - Bloomington
Sauer, Ken	CHE	Chief Academic Officer
Scherwinski, Ashlee	K-12 Science Coach	Indianapolis Public Schools
Seung, Elsun	Chemistry	Indiana State University
Smitha, Kandy	CTE - Health	J. Everett Light Career Center
Terry, Kim	Biology	South Vermillion High School
Vogelsang, Keith	Earth Science	Ivy Tech Community College
White, Lori	Chemistry	Cascade High School
Williams, Craig	Physics	Northwestern High School