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ACM/IEEE-CS Information Technology Curriculum 2017: A Status Update

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SUMMARY

The IT2008 Curriculum Guidelines for Undergraduate Degree Programs in Information Technology is showing its age, and in 2014, the ACM Education Board agreed to oversee the creation of a revision, now being referred to as IT2017. Members of the IT 2017 Task Group have been identified, and phone conference calls have been taking place. All proposed panel members are members of the IT2017 Task Group.

Categories and Subject Descriptors

K.3.2 [Computer and Information Science Education]: Curriculum; Computer science education

General Terms

Documentation, Design, Standardization

Keywords

Information Technology Education; Computing Curricula; IT2017; IT2008

1. INTRODUCTION

In 2012, ACM created an ad hoc committee and charged it with reviewing the *Curriculum Guidelines for Undergraduate Degree Programs in Information Technology* report (IT2008) [3] and determining the extent to which the document required revision [5]. The committee reported its findings to the ACM Education Board in April of 2014. While the committee found that the majority of current content already appears in the IT2008 document, it identified significant deviations that would guide the revision process toward a document that is appropriately forward looking given the significant advances in information technology that have occurred since 2008. In August 2014, the ACM

Education Board formed the IT2017 Task Group, which plans to deliver a final report in 2017.

The IT2017 Task Group consists of twelve members, five of whom form the Steering Committee. The remainder of the committee consists of three members (25%) from industry and government. The Task Group represents four countries: Canada, China, Saudi Arabia, and the United States.

2. PANEL GOALS AND ACTIVITIES

The primary goal of this panel is to provide an update on the current state of IT2017 and to engage the audience in discussions that will inform the work of the task group. The IT2017 effort has already reached out to various communities: Birds of a Feathers discussion at SIGCSE'15 [6], curriculum design workshop at EDUCON 2015 [2], online survey to over 12,000 ACM members affiliated with computing departments worldwide, and working group at ITiCSE'15 [7]. IT2017 work has primarily focused on:

- Updating the IT Body of Knowledge and identifying which IT knowledge areas will be relevant in 2025.
- Aligning desirable skills expected from IT graduates in mid-2020s with industry needs.
- Articulating IT practices in IT undergraduate programs that engage students with the IT disciplinary content and develop student proficiencies expected upon successful graduation.

Involving the SIGITE'15 audience in this panel session is particularly relevant to the IT education community. The major topics to guide the panel discussion will include an overview of IT2008, rationale for updating IT2008, proposed changes, and industry and academic input.

The IT 2008 report [3] was the result of an effort begun in 2003. It established a core IT curriculum founded on the five pillars of databases, networking, programming, human-computer interaction, and web systems, with the thread of security woven throughout the entire IT curriculum. This model has held well for the past decade and more, but it is time to revisit it. Additional core IT topics in the IT 2008 report included specific mathematics requirements, professionalism, IT fundamentals, system administration, and IT electives. These IT content areas also need

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to be revisited, and special consideration needs to be given to the inclusion of newly-emerged areas such as social media, big data, the internet of things.

Among the changes of the IT 2017 curriculum guidelines is an increase of 106 core hours from the current 315 core hours (including mathematics) to a total of 420 hours, plus relevant mathematics. Another change, supported by the ACM Education Board, is the distinction between essential and supplemental knowledge areas (KAs). Having supplemental KAs will give IT programs more choices and flexibility. The allocation of the 420 hours across the revised body of knowledge has 290 hours of essential knowledge units (KUs) and 130 hours of supplemental KUs. The essential component is required of all IT students. The supplemental component can be configured from a total of 260 hours mapped to supplemental KUs to accomplish the 420 core hours. Finally, the IT2017 mathematics requirements will expand on the IT2008 mathematics KAs.

The guiding principles of IT2017 include an emphasis on learning outcomes and professional practices rather than defining topics for the knowledge units that frame each knowledge area in the IT body of knowledge. Inspired by the recently published curriculum guidelines for associate-degree programs in IT [1], the emphasis on learning outcomes expresses the importance of competencies (what students can do) over knowledge (what students know). Hundreds of results from varied surveys have informed the Task Group of the perspectives from academia and industry and ways to formulate the learning outcomes.

3. PANEL PRESENTERS

3.1 Mihaela Sabin

Mihaela Sabin is the Chair of the ACM/IEEE-CS IT2017 Task Group. She has been a long-standing member of the ACM SIGITE, and has served as Eastern Regional representative and Vice-Chair of the SIGITE Executive Committee. Mihaela is an associate professor of computer science at the University of New Hampshire, and has been involved in curriculum development and revision of undergraduate and graduate programs in CS and IT at UNH.

3.2 Hala Alrumaih

Hala Alrumaih is a lecturer in the Information Systems Department at Al Imam Mohammad Ibn Saud Islamic University and a PhD student at King Saud University. She participated in developing a program plan for a Bachelor of Science Degree in Information Technology at her university and the Saudi Electronic University. Hala is a member of the IT2017 Executive Committee.

3.3 John Impagliazzo

John Impagliazzo is professor emeritus from Hofstra University. He is deeply involved in curricular and accreditation activities and he has evaluated over seventy computing and engineering programs worldwide. John is currently the chair of the ACM/IEEE-CS Computer Engineering committee that is producing the CE2016 report. John is a member of the ACM Education Board, a member of the IEEE Foundation board, and a member of the Association of Information Technology Professionals (AITP) board.

3.4 Barry M. Lunt

Barry Lunt brings over 14 years of involvement in the IT curriculum effort, attended and chaired all the IT 2008 Model

Curriculum meetings, edited the entire document, and championed the effort to have it accepted by the ACM Education Board [3]. He is also on the five-member Executive Committee for the IT 2017 revision, and is very committed to seeing that the changes made are those most appropriate for the future of IT.

3.5 Cara Tang

Cara Tang is Vice-Chair of the ACM Committee for Computing Education in Community Colleges (CCECC), and represents the 2-year perspective on the IT 2017 task group. She was heavily involved in the recent publication of the ACM Competency Model of Core Learning Outcomes and Assessment for Associate-Degree Curriculum in Information Technology [1].

3.6 Ming Zhang

Ming Zhang is a full professor of Computer Science at Peking University. She is a member of the ACM Education Council and Chair of the ACM China Education Committee. She worked on the Advisory Committee of Computer Science Education of MOE China from 2001-2013 and participated in the developing of the Chinese Computing Curriculum (CCC 2006). She is also a member of the IT 2017 Executive Committee.

4. ACKNOWLEDGMENTS

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