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IT2017 Report: Implementing A Competency-Based Information Technology Program

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ABSTRACT

ACM and IEEE have developed a computing curriculum report titled Information Technology Curricular 2017: Curriculum Guidelines for Undergraduate Degree Programs in Information Technology, also known as IT2017 [4]. The development of this report has received content contributions from industry and academia through surveys as well as many international conferences and workshops. Open online publication of the report became available in fall of 2017. In this special session, five members of the IT2017 executive committee will present a digest of the content of the report, describe the proposed IT curricular framework, and facilitate open and vigorous discussion of the report's guidelines for developing new information technology programs or enhancing existing ones. The novelty of the report is its focus on industry-informed competencies that IT graduates should have to meet the growing demands of a changing technological world in the next decade. The experience should provide a better understanding of IT in a modern age.

CCS CONCEPTS

• **Social and professional topics** → **Model curricula; Computing education programs; Information technology education; Student assessment; Computing profession;**

KEYWORDS

Information technology curricula IT2017, IT framework, IT curricular guidelines

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1 SUMMARY

ACM and IEEE have developed a computing curriculum report titled Information Technology Curricular 2017: Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology, also known as IT2017 [4]. The development of this report has received content contributions from industry and academia through surveys as well as many international conferences and workshops. Open online publication of the report became available in fall of 2017.

In this special session, five members of the IT2017 executive committee will present a digest of the content of the report, describe the proposed IT curricular framework, and facilitate vigorous discussion of the report's guidelines for developing new information technology programs or enhancing existing ones. The novelty of the report is its focus on industry-informed competencies that IT graduates should have to meet the growing demands of a changing technological world in the next decade. The experience should provide a better understanding of IT in a modern age.

2 OBJECTIVES

The computing education community benefits from computing curricula reports that ACM, in collaboration with other professional societies, updates regularly with guidelines that reflect educational and technological innovations and transformations. The development of IT2017 curricular guidelines for high quality and rigorous baccalaureate IT programs has adopted a comprehensive approach that engaged international perspectives [7, 9] and examined the needs and expectations from industry and IT professional societies [1, 2, 8] over the past three years. In essence, the IT2017 task group holds the view that IT programs should prepare students with knowledge and skills and encourage formation of dispositions in learning contexts that emphasize development of competencies: what students do and how they demonstrate performance with what they know.

A twelve-member diverse task group has worked diligently to produce a forward-looking report that is globally relevant and balances perspectives from educators, practitioners, and IT professionals. Key to the effectiveness of the curricular guidelines in the

report are implementation decisions that take into account institutional missions, local contexts, and specific program goals and resources. The session will elicit productive conversations around how to effectively implement the IT2017 curricular framework in educational institutions around the world.

3 OUTLINE

A competency-centered IT curricular framework is a relatively novel departure from the traditional body of knowledge sliced and diced into areas, units, and topics. A content-based approach is more likely to frame the guidelines with what needs to be taught rather than what kinds of learning students need to demonstrate and higher-level competencies that matter in the workplace.

Presenters will use the first half of the session to describe the novelties of the IT2017 report, including its focus on competencies; strongly integrative nature of IT competency domains; implementation flexibility through essential and supplemental IT domains; and wider applicability of the IT2017 guidelines to a variety of baccalaureate programs regardless of their prescribed duration. In the second half of the session presenters will facilitate discussions and productive interactions with the attendees.

3.1 Mihaela Sabin

Mihaela Sabin is the Chair of the IT2017 task group. She serves as Vice-Chair for Education on the SIGITE Executive Committee and SIGITE representative on the ACM Education Council. Sabin is an associate professor of computer science at the University of New Hampshire and has been involved in computing curriculum development in CS and IT.

3.2 John Impagliazzo

John Impagliazzo is Professor Emeritus in the School of Engineering and Applied Science at Hofstra University. He is a member of the IT2017 Executive Committee and chaired the CE2016 curriculum report task force.

3.3 Hala Alrumaih

Hala Alrumaih is a lecturer in information systems at Al Imam Mohammad Ibn Saud Islamic University and a PhD candidate in information systems at King Saud University. Her research interests include requirements engineering and the semantic web. Alrumaih is a member of the IT2017 Executive Committee.

3.4 Cara Tang

Cara Tang is department chair of computer information systems at Portland Community College. She represents two-year colleges on the task group through her position as chair of the Committee for Computing Education in Community Colleges (CCECC).

3.5 Ming Zhang

Ming Zhang is a professor of computer science at Peking University. She is a member of the ACM Education Council and Chair of the ACM SIGCSE China Chapter. Zhang is a member of the IT2017 Executive Committee. She also serves as vice director of CCF Educational Committee.

4 EXPECTATIONS

At the heart of the IT curricular framework is a set of competencies identified through knowledge, skills, and dispositions. Other ACM curriculum reports have adopted a competency-based approach [5, 10]. Recent curricular frameworks for computing education, K-12 Computer Science Framework [3] and Advance Placement CS Principles Framework [6], integrate disciplinary key concepts with aspects of work that engage students to apply core ideas and develop skills in the context of authentic experiences. In this session, we expect the audience to share and learn how to translate into practice a competency-based curriculum and how to design learning activities that bridge the gap between learning outcomes and professional readiness.

5 SUITABILITY FOR A SPECIAL SESSION

This presentation is highly suited as a special session. The special nature of competency-based IT curriculum warrants both information transfer and vigorous audience interaction and inquiry. After a brief overview of the IT2017 project, the presenters will engage the audience in active discussion on competencies within information technology and become an integral part of the overall presentation. Implementation practices, ideas, and challenges are of high interest to all computing programs motivated by developing computing competencies for their graduates.

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REFERENCES

- [1] Hart Research Associates. 2015. *Falling Short? College Learning and Career Success*. Technical Report. Washington DC.
- [2] PayScale Human Capital. 2017. *2016 Workforce Skills Preparedness Report*. Technical Report. <http://www.payscale.com/data-packages/job-skills>
- [3] K-12 Computer Science Framework. 2017. . <http://k12cs.org>
- [4] IT2017 Task Group. 2017. *Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology*. <http://it2017.acm.org>
- [5] Elizabeth K. Hawthorne, Robert D. Campbell, Cara Tang, Cindy S. Tucker, and Jim Nichols (Eds.). 2014. *Information Technology Competency Model of Core Learning Outcomes and Assessment for Associate-Degree Curriculum*. ACM, New York, NY, USA. ACM Order No.: 999140.
- [6] The College Board's Advanced Placement Program. 2017. *AP Computer Science Principles Course*. New York.
- [7] Mihaela Sabin, John Impagliazzo, Hala Alrumaih, Brenda Byers, Daina Gudoniene, Margaret Hamilton, Vsevolod Kotlyarov, Barry Lunt, James W. McGuffee, Svetlana Peltsverger, Cara Tang, Barbara Viola, and Ming Zhang. 2015. Multinational Perspectives on Information Technology from Academia and Industry. In *Proceedings of the 2015 ITiCSE on Working Group Reports (ITiCSE-WGR '15)*. ACM, New York, NY, USA, 149–171. <https://doi.org/10.1145/2858796.2858802>
- [8] Mihaela Sabin, Paul Snow, and Barbara Viola. 2016. Industry and Faculty Surveys Call for Increased Collaboration to Prepare Information Technology Graduates. *J. Comput. Sci. Coll.* 31, 6 (June 2016), 70–78. <http://dl.acm.org/citation.cfm?id=2904446.2904465>
- [9] Mihaela Sabin, Barbara Viola, John Impagliazzo, Renzo Angles, Mariela Curiel, Paul Leger, Jorge Murillo, Hernán Nina, José Antonio Pow-Sang, and Ignacio Trejos. 2016. Latin American Perspectives to Internationalize Undergraduate Information Technology Education. In *Proceedings of the 2016 ITiCSE Working Group Reports (ITiCSE '16)*. ACM, New York, NY, USA, 1–22. <https://doi.org/10.1145/3024906.3029847>
- [10] Heikki Topi, Helena Karsten, Sue A. Brown, João Alvaro Carvalho, Brian Donnellan, Jun Shen, Bernard C. Y. Tan, and Mark F. Thoun. 2017. *MSIS 2016: Global Competency Model for Graduate Degree Programs in Information Systems*. Technical Report. New York, NY, USA.