Approved by the Regents
May 16, 2013

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Kathleen H. Sienko, assistant professor of mechanical engineering, Department of Mechanical Engineering, and assistant professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering, is recommended for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2007	Massachusetts Institute of Technology and Harvard University, Medical Engineering and Bioastronautics, Cambridge, MA
M.S.	2000	Massachusetts Institute of Technology, Aeronautics and Astronautics, Cambridge, MA
B.S.	1998	University of Kentucky, Materials Engineering, Lexington, KY

Professional Record:

2007 – present	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2007 – present	Assistant Professor, Department of Biomedical Engineering, University of Michigan

Summary of Evaluation:

Teaching: Professor Sienko has taught two core undergraduate classes (ME240 and ME450). She has also developed two new graduate courses, Quantitative Analysis of Physiological Systems and Design for Global Health, which have enriched our graduate curriculum in Bio- and Health Systems - an area Mechanical Engineering (ME) has strategically identified for future growth. She has graduated one Ph.D. student and currently is advising an additional three. She has graduated five M.S.E. students and has advised many undergraduate student projects. She has been publishing with her students in quality journals. Her Q1/Q2 scores are strong and the comments from her students were very positive and complimentary, showing that she is an effective teacher and advisor. In addition, Professor Sienko has spent tremendous effort in integrating her research in Global Health Design with the College's Multidisciplinary Engineering Design Education and International Experience initiatives. She has developed and piloted a Minor in Multidisciplinary Design, with a specialization in Global Health Design, within the college. The international experiences for undergraduates that she created have led to international attention from the World Health Organization (WHO) and brought recognition to the University. Her educational efforts are well recognized by her peers, as evidenced by her invitation to speak at the NAE Frontiers of Engineering Education Symposium (twice), and winning the Pi Tau Sigma Michigan Phi Rho Professor of the Term Award, the University of Michigan Provost's Teaching Innovation Prize, and the University of Michigan Undergraduate Teaching Award.

Research: Professor Sienko's research interests are on the human-centered design of medical devices, with a special emphasis on technologies for resource-limited settings. She has built upon her Ph.D. work and developed rehabilitation devices for individuals with balance deficits, and has also branched out to pursue the design of medical devices that address global health challenges. Professor Sienko has developed a strong research program here, winning the prestigious NSF CAREER grant and another NSF core grant, a major NIH grant, a Gates Grand Challenges Exploration Grant, and several other external and internal grants. She has authored 22 journal papers (published or accepted for publication; 18 since joining Michigan). In addition, she has filed four patent applications (one granted so far) and many invention disclosures. The external reviewers praise her for the impact and quality of her work. She has become an

energetic leader on the national stage, and a sought-after speaker who has brought considerable recognition to the University. Professor Sienko has developed an excellent research record.

Recent and Significant Publications:

Bechly, K., Carender, W., Myles, J. and Sienko, K. H., "Determining the preferred modality for real-time biofeedback during balance training," *Gait & Posture* (in press).

Sabet Sarvestani, A., Bufumbo, L., Geiger, J. D. and Sienko, K. H., "Traditional male circumcision in Uganda: A qualitative focus group discussion analysis," *Public Library of Science ONE*, (in press).

Lee, B. C., Martin, B. and Sienko, K. H, (2012), "Vibration induced postural responses as a function of torso location," *Experimental Brain Research*, Oct, 222(4):471-82.

Perosky, J. E., Rabban, R. N., Bradshaw, J. G. T., Gienapp, A. P., Ofosu, A. A. and Sienko, K. H, (2012), "Designing a portable gynecological examination table: Improving access to antenatal care in rural Ghana," *International Journal for Service Learning in Engineering*; 7(1):1-14.

Sienko, K. H., Balkwill, M. D. and Wall, C, (2012). "Biofeedback improves postural control recovery from multi-axis discrete perturbations," *Journal of NeuroEngineering and Rehabilitation*, Aug 3, 9:53.

Lee, B. C., Kim, J., Chen, S. and Sienko, K. H, (2012), "Cell phone based real- time vibrotactile feedback for balance rehabilitation training," *Journal of NeuroEngineering and Rehabilitation*, Feb 8;9:10.

Haggerty, S., Jiang, L. T., Galecki, A. and Sienko, K. H, (2012), "Effects of biofeedback on secondary-task response time and postural stability in older adults," *Gait & Posture*; Apr, 35(4):523-8.

Lee, B. C. and Sienko, K. H, (2011), "Real-time vibrotactile motion instruction and error-detection," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*; Aug, 19(4):374-81.

Lemmermen, K., Van Wingen, T., Scott, P., Spencer, C. and Sienko, K. H, (2010), "Adult male circumcision device for use in traditional ceremonies," *ASME Journal of Medical Devices*, 4(4):045003-7.

Sienko, K. H., Vichare, V. V., Balkwill, M. D. and Wall, C, (2010), "Assessment of vibrotactile feedback on postural stability during pseudorandom multidirectional platform motion," *IEEE Transactions on Biomedical Engineering*, Apr, 57(4): 944-52.

Service: Professor Sienko has provided leadership among the ME junior faculty as a coordinator of the junior faculty mentor luncheon. She has served as a member on the ME Graduate Program Committee and on the ME Faculty Search Committee. She is also active in serving at the college and university levels. Examples include membership on the Provost's Faculty Advisory Committee, faculty advisor for the Center for Global Health Student Associates, Internal Advisory Committee Member for the Center for Global Health, and member on the CRLT Faculty Panel. Her efforts in enhancing outreach and diversity are recognized by her peers as evidenced by the recent College Raymond J. and Monica E. Schultz Outreach and Diversity Award. Externally, Professor Sienko is active serving the technical community, as proposal/paper reviewer, technical committee member, and conference session organizer. She also serves as an associate editor for a special issue in *IEEE Transactions on Haptics*. In addition, Professor Sienko has served the WHO on multiple occasions.

External Reviewers:

Reviewer A: "I view her as a U.S. leader in the development of medical devices for global health."

Reviewer B: "The global health engineering innovation program she has built at Michigan is in the same class as top-rated programs at Rice, Johns Hopkins, Stanford and here at [my institution]."

Reviewer C: "At the present time, she is the leader in tactile cueing using vibration for enhancing balance. She has made a remarkable number of important contributions and observations. She has also

chosen to work on one of the most important problems that our aging society faces, namely how to reduce the postural instability that often accompanies aging and disease processes. She is a pioneer in this endeavor and deserves the highest praise…Dr. Sienko is certainly widely known nationally and internationally. Anyone who studies postural control or balance would be aware of her work."

Reviewer D: "Indeed, Dr. Sienko's work with students on medical devices for the developing world has been among the best in the nation."

Reviewer E: "She has published in the top medical device journals…which are sponsored by the lead professional societies in electrical and mechanical engineering..."

Summary of Recommendation: In summary, Professor Sienko is a great asset to Michigan. She has built a strong research record with excellent potential, and her performance in teaching and service has been exceptional. It is with the support of the College of Engineering Executive Committee that I recommend Kathleen H. Sienko for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2013