

Heuristics for Course Planning in Degree Programs

Kingsley Gnanendran
OIM Department
The University of Scranton
Scranton, PA 18510, USA
skingsley.gnanendran@scranton.edu

Manohar Madan
ITSCM Department
University of Wisconsin-Whitewater
Whitewater, WI 53190, USA
madanm@uww.edu

Abstract

Higher education institutions today operate in an environment characterized, among other factors, by limited financial resources, stringent academic accreditation requirements, and heightened student expectations in terms of the expected time-to-degree, convenience/flexibility, and variety of choice in course offerings. In this talk, we investigate heuristic approaches for planning an appropriate mix of future courses to be offered in non-lockstep programs. Subject to a maximum time limit, such programs permit students to take alternative pathways and timelines to the degree based on their personal interests, time and cost pressures, and workplace or family commitments. Assuming that a long-range plan for course cycling is already in place at the institution, this paper solely focuses on techniques to modify such plans for the near-term based on an analysis of the progress of currently active cohorts with regard to time (delay) and cost (overrun). Using novel definitions of the well-known project performance measures (earned value, planned value, and actual cost) applicable to the educational context, we derive estimates of expected time-to-degree and expected cost for each cohort. Based on these computations, we are able to recommend guidelines for heuristically adjusting the long-range course cycling plan.

Keywords

Project Management, Multi-Project Scheduling, Educational Program Management, Heuristics, Course Planning

Biographies

Kingsley Gnanendran is a professor of operations management and director of the online MBA program at the University of Scranton, Pennsylvania, USA. He earned a B.S. in mechanical engineering from the University of Sri Lanka, an M. Eng. in industrial engineering and management from the Asian Institute of Technology, Bangkok, and a PhD in management science from the University of Tennessee-Knoxville. His research interests involve the application of optimization modeling to supply chains, and his publications have appeared in: *Decision Support Systems*, *International Journal of Production Research*, *European Journal of Operational Research*, and *International Journal of Production Economics*, among others. Dr. Gnanendran has been a Visiting Professor at the University of Waterloo (Ontario, Canada), Capital University of Economics and Business (Beijing), and Dayeh University (Taiwan). He is a member of INFORMS and APICS.

Manohar Madan is a Professor in the Information Technology and Supply Chain Management Department in the College of Business and Economics at the University of Wisconsin-Whitewater. His teaching and research interests are in the area of Operations and Supply Chain Management. He has a Ph.D. in Operations Management from the University of Tennessee. Manohar's research has been published in many professional journals such as *the Journal of Operations Management*, *IIE Transactions*, *OMEGA*, *International Journal of Operations and Production Management*, *International Journal of Production Research* and the *Journal of Operational Research Society*. He is a member of APICS, and also is certified as CPIM by APICS.