

Given the variability in student learning, it is becoming increasingly important to tailor courses as well as course sequences to student needs. This paper presents a systematic methodology for offering personalized course sequence recommendations to students. First, a forward-search backward-induction algorithm is developed that can optimally select course sequences to decrease the time required for a student to graduate. The algorithm accounts for prerequisite requirements (typically present in higher level education) and course availability. Second, using the tools of multiarmed bandits, an algorithm is developed that can optimally recommend a course sequence that both reduces the time to graduate while also increasing the overall GPA of the student. The algorithm dynamically learns how students with different contextual backgrounds perform for given course sequences and, then, recommends an optimal course sequence for new students. Using real-world student data from the UCLA Mechanical and Aerospace Engineering Department, we illustrate how the proposed algorithms outperform other methods that do not include student contextual information when making course sequence recommendations.