Examination of Course Alignment Using Simulated Students

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AM University — Introductory physics provides a foundation of both conceptual
knowledge and problem-solving skills which are used in subsequent coursework. It
is therefore vital that introductory coursework be well aligned within the under-
graduate curriculum to prepare students for new material encountered beyond the
first year. Recent results using q-matrices have shown an indication of appreciably
strong alignment of course content between Introductory Physics Mechanics and
a sophomore engineering Statics & Dynamics course. In this work, a further test
of alignment is presented using a probabilistic model of simulated student knowl-
edge. This model, which incorporates elements of Item Response Theory, uses the
previously developed q-matrices for these courses to predict course grades in the
sophomore level course. The predicted grades are then compared to actual grades,
from academic records, to determine success of the model. Potential improvements
to this model will also be discussed.

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