

1046-E1-1399      **Hugh W. McGuire\*** ([mcguire@cis.gvsu.edu](mailto:mcguire@cis.gvsu.edu)), 1 Campus Drive, Allendale, MI 49401-9403.

*ProofBuilder, a Tool for Showing Students How to Construct Basic Proofs.* Preliminary report.

**ProofBuilder** is a piece of software that helps students learn how to construct proofs. It is intended for basic Discrete Mathematics and bridge courses, covering topics such as basic number theory, sets, summations, combinatorics, and order of magnitude ( $O()$  etc.). It uses proper Mathematical symbols, e.g. “ $\forall$ ” and “ $\in$ ”; and it provides a full range of proof methods: substitution of equivalents, application of comparisons (“ $<$ ”, “ $\geq$ ”, etc.), direct proof, backward reasoning, proof by contraposition, splitting into cases, resolution, induction, proof by contradiction, etc. It is flexible, accommodating different styles of logic — different symbols, deductions, etc.; and it runs on different computer platforms: Windows, Mac, LINUX, etc. **ProofBuilder** avoids doing all reasoning automatically for student users, so they will still learn to do logical reasoning; but it does help students by helping to organize all the myriad elements of a proof and preventing clerical errors, e.g. when one wants to change some parts of a formula and copy the rest unchanged. The following Website provides documentation:

<http://www.cis.gvsu.edu/~mcguire/ProofBuilder/>

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