Six ways to compare modules

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How many copies of one object exist in another? How many copies of one object are required to build another? If we can build an object using a particular method, to what extent is that method unique? These questions pervade mathematics, and they must be interpreted differently in different contexts. We will approach these questions as they pertain to modules. To answer the first question, we will study how modules embed and factor. For the second question, we will consider the various ways through which a module can be generated and cogenerated. We will investigate the question of uniqueness as it applies to the splitting of modules and to the problem of cancellation. By the end of the talk, we will have covered two ways to interpret each of our three questions, yielding six ways to compare modules.

This talk will be accessible to graduate students.