University education is delivered via lectures and classes that are attended by students. When and where these classes are taught is determined by the timetable. A timetable has many stakeholders, and it is the task of planners to accommodate their needs as far as possible, as it has a significant influence on the daily life of both staff and students. Furthermore, it has a large impact on the use of the university’s resources. Rooms are a significant cost, and as many are allocated specifically to teaching it is important that the planners optimize their use. Creating a high-quality timetable is, therefore, essential to providing an excellent education, while at the same time using the university’s resources efficiently. This thesis presents an introduction to the university course timetabling problem and its different formulations. Although university timetabling has been widely studied in the literature, work has focused on the creation of a schedule once all of the available resources have been determined, called the course assignment problem. This thesis broadens the perspective by also investigating the decision problems that must be solved before and after the course assignment problem. One important problem is to determine the necessary resources. This thesis formulates the room planning problem that determines which rooms are available, and the teaching periods problem that determines timeslots for teaching. It then analyzes how the available resources affect the quality of the timetable. Once the timetable has been generated, there can be disruptions. This thesis investigates the quality recovering problem, which addresses this issue. In this case, an important constraint is that the new solution must be similar to the initial one, but not degrade the quality of the timetable. Solution methods are presented to these four problems. These are based on mixed-integer programming, and the same underlying model is used in different ways to solve decision problems that occur at different levels of the organization. All methods are tested on the curriculum-based course timetabling problem used for the Second International Timetabling Competition, which is the most-studied problem formulation in the literature. Finally, this thesis suggests potential directions for future research, which aims to ensure that there are tangible benefits for planners and universities.