The Challenge Line Problem is a pedagogical issue that underlies most engineering courses. The issue is about how to achieve the optimum balance between two extremes. The first extreme provides students with highly contrained problems in which there is a clearly defined solution. The other extreme provides students with open ended problems that have multiple potential solutions and includes the possibility that there is no viable solution. This paper describes one approach to the Challenge Line Problem that was taken in a laboratory based course in mechatronics engineering. Working in small teams, students add electronic components to a mobile robot base and write the programs required to make the robot perform a set of tasks. In the context of a mechatronics course, the one extreme is to provide students with a ready made robot in which the robot does exactly what is expected when it is turned on. The other extreme requires the students to obtain the electronic parts, assemble the sensor array, program, test, revise and determine if the robot will perform the assigned task within the given constraints. Although the application of mobile robots as an education tool is becoming common at many universities, this particular mechatronics course is oriented towards mechanical engineering students who have only a rudimentary background in microcontrollers and electronics. After several years of experience, it is believed that a course has been established that moves in stages from the highly constrained extreme to the open ended extreme of the Challenge Line Problem and yet provides both a broad and stimulating learning experience for the students. It does so through a combination of lectures, tutorials, workshops and a series of eight laboratories that culminates in a design project that requires the students to assemble and program a team of robots to perform a given cooperative task.