

Research of Mobile Communication Curriculum Teaching

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Abstract

Mobile communication technology is one of the most rapidly developing technologies at present. Especially with the advent of 4G and 5G, mobile communication technology is playing an increasingly important role in people's life. Mobile communication curriculum is a professional course that students majoring in communication engineering must master. This curriculum involves a wide range of knowledge points, strong theoretical content, fast knowledge update and great difficulty in conducting experiments. In view of the characteristics of the curriculum and the problems encountered in teaching, discussion and exploration are made, and some teaching reform measures are put forward in this paper.

Keywords

Mobile Communication; Teaching Reform; Curriculum Discussion.

1. Features and Difficulties of the Curriculum

1.1. The Content is Extensive and Theoretical

Mobile communication courses are usually offered in the fifth or sixth semester, and students are required to master professional courses such as microwave technology and antenna, communication principle, digital signal processing, information and system in advance. Mobile communication curriculum involve the use of basic formulas to build various mathematical models of wireless communication, so students need to master the above basic knowledge, analyze and derive the formulas. For example, for studying the wireless communication system, the first step is to establish a channel model to analyze the characteristics of radio wave propagation in the wireless channel. In the channel model, including the encoder and modulator, transmitting converter, channel, receiving transducer, demodulator and decoder. Between each pair of modules, signals need to be processed according to their respective signal transformation principles, and each link of which requires students to have a solid theoretical basis of knowledge as a support.

1.2. The Content is Updated Quickly

Mobile communication industry is one of the most rapidly developing industries, and also one of the important guarantees of continuous progress in this era. Mobile communication technology will be updated in about 5-10 years. At present, the latest 5th generation mobile communication adopts a flexible new system design based on OFDM (orthogonal frequency division multiplexing) and MIMO (multiple input multiple output) basic technologies. At present, relevant textbooks are faced with the problem of not being able to follow up technology update in real time. When learning the curriculum of mobile communication, it is not enough to just explain it according to the textbook. Teachers should follow up the current mobile communication technology in time and master the future development direction of mobile communication. If teachers' knowledge update speed is slow, they will not be able to master the latest mobile communication technology, and they will not be able to apply the latest mobile communication technology to teaching experiments. Teachers require to invest more energy

and time in lesson preparation, learn and master new knowledge and technology, redesign teaching plans and lesson notes. At the same time, in the experimental teaching, it is necessary to keep familiar with the use of new equipment and new instruments to guide students to understand the latest communication technology more smoothly. Undoubtedly, teaching difficulties are increased for teachers.

2. Teaching Status

2.1. Lack of Teaching Hardware and Software

The teaching of mobile communication courses involves 2G, 3G, 4G and even 5G network content. In order to cover the whole teaching knowledge point, we need to build a laboratory containing four networks at the same time, and invest a lot of costs in both hardware and software. But the current commercial network is updated quickly, it is a risk that the established laboratory is not updated in time and the current commercial network development is disjointed. Even if the laboratory is set up, it is difficult to ensure that every student can be equipped with corresponding testing equipment and software in a teaching class if the teaching work is better carried out. It will affect the teaching efficiency and the final effect to a certain extent. Therefore, the lack of teaching hardware and software challenges the teaching work to a certain extent.

2.2. Theoretical Knowledge is Out of Step with Practical Application

When universities make curriculum plans, they usually start from the teachers and the actual situation of the school, without in-depth investigation of the actual employment and industry, and often pay more attention to the study of theoretical knowledge when teaching. However, mobile communication technology itself is a rapidly developing technology, which will be updated every few years, which has very high requirements for theoretical teaching. If knowledge cannot be updated in time, it may be divorced from reality, resulting in the fault of students' knowledge structure.

At present, the study of mobile communication mainly is focused on key technologies and 2G system. Only a small number of class hours are used for the introductions of 3G and 4G. In terms of the current development stage of mobile communication technology, 2G and 3G are almost obsolete communication technologies. If our curriculum continues to be based on this, there will be a serious disconnect between the theoretical knowledge students learn and the practical application. The main content we learn in the campus is the mobile communication technology that is on the verge of elimination, while when we step into the society, we will apply the latest technology that we have never come into contact with. This situation runs counter to the goal of cultivating application-oriented talents.

3. Exploration of Teaching Reform

3.1. Curriculum Content Adjustment

In the context of the current development of mobile communication technology, the course content of mobile communication technology should be inclined to the new technology, rather than remain in 2G and 3G teaching content. In order to adapt to the training program of application-oriented talents, it is particularly important to increase the proportion of learning 4G and 5G core technologies. According to the current situation, there are two main solutions. One is to choose new teaching materials, re-establish teaching content and allocation of class hours, and keep pace with The Times. Another scheme is to adjust the allocation of class hours on the original teaching scheme, compress 2G and 3G teaching hours, and add 4G and 5G teaching content. The new technology section can be taught by special lectures. On the basis of

ensuring the original teaching content, the learning of new technologies are increased, which can better integrate with the enterprise.

3.2. Using Simulation Software for Classroom Demonstration

Laboratory teaching should not be fixed in the laboratory, but can be complemented by demonstrations in the classroom. For example, when learning the modulation and demodulation principle of OFDM, the process can be shown intuitively and vividly through classroom simulation demonstration. At the same time, the basic knowledge required for the explanation of new knowledge can also be shown to students in the form of simulation to deepen their impression. For teachers, classroom demonstration will undoubtedly increase the time of lesson preparation, but it will make the class more organized and lively, which is very helpful to the improvement of teaching quality. For students, the link of classroom demonstration is undoubtedly very profitable, which can not only help them digest and understand the theoretical knowledge, but also connect the scattered experimental courses.

3.3. Trying to Carry Out Practice Teaching Jointly with School and Enterprise

In recent years, the school has cooperated with enterprises to jointly train students. However, at present, students of non-cooperative majors seldom have the opportunity to participate in the practical teaching of enterprises. The practical teaching in school is usually software simulation experiment and experiment box, which can not provide a complete project, and there is a certain gap between the actual project research and development and the needs of employers.

Universities can carry out practical teaching of relevant courses with cooperative enterprises for all students, not only for students majoring in cooperation. So that our students can verify the theoretical knowledge learned in class through practice, cultivate the engineering quality of students, and can mobilize the enthusiasm of students, improve the participation of students in the course.

In addition to building labs with companies, teachers from companies should also be invited to train students. Compared with college teachers, enterprise engineers have more project experience and can guide students to carry out project training. College teachers cannot completely rely on enterprise teachers to train students. They should also participate in following up these training projects to assist enterprise teachers in supervising and supervising students.

4. Conclusion

At present, the undergraduate teaching of mobile communication course still faces some difficulties, such as the knowledge updating too fast and the knowledge covering too wide. We try to carry out the curriculum reform by adjusting the curriculum content, using simulation software for classroom demonstration, and trying to jointly carry out practical teaching by school and enterprise. It is a long-term project to improve the teaching quality of mobile communication courses. In different times and different periods of mobile communication technology, the teaching content, teaching methods, teaching means and assessment methods of mobile communication should be different, and they should be changed according to the talent needs of students and enterprises at different levels.

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