Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Technology

Faculty/Institute: Engineering

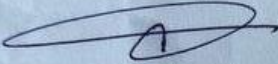**Scientific Department**: Communication Engineering

Academic or Professional Program Name: Wireless Communication Systems Engineering

Final Certificate Name: Bachelor of Wireless Communication Engineering

Academic System: Courses

Description Preparation Date: 07.04.2024
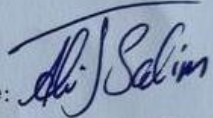
File Completion Date: 14.04.2024

Signature: _____

Head of Department Name:

Dr. mohamed Hussein miry

Date: 14 / 4 / 2024

Signature: Ali J Salim

Scientific Associate Name:

Asst. Prof. Dr. Ali J. Salim

Date: 14/4/2024

The file is checked by: Prof. Dr. Zainb Naser Jameel

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 14 / 4 / 2024

Signature: _____

Afaneen Anwer Abbood

Approval of the Dean

1. Program Vision

"To pioneer advancements in wireless communication technologies, empowering global connectivity through innovation, collaboration, and excellence."

As the cornerstone of our vision, we envision the Wireless Communication Engineering Department as a trailblazer in the realm of wireless technologies. Our aim is not just to keep pace with the rapid evolution of communication systems but to lead the way in shaping the future of connectivity. We envision a future where seamless, ubiquitous wireless communication empowers individuals, organizations, and societies worldwide.

Key Elements:

1. **Innovation Leadership**: We aspire to be at the forefront of innovation, continuously pushing the boundaries of what's possible in wireless communication. Through cutting-edge research and development, we strive to introduce novel solutions that address emerging challenges and unlock new opportunities.

2. **Global Connectivity**: Our vision encompasses a world where everyone, regardless of location or circumstance, has access to reliable, high-speed wireless connectivity. We're committed to developing technologies that bridge the digital divide, fostering inclusivity, and driving socio-economic development on a global scale.

3. **Collaborative Ecosystem**: Recognizing the interconnected nature of the wireless industry, we emphasize collaboration across disciplines, industries, and academia. By fostering partnerships and networks, we harness collective expertise to accelerate innovation and amplify impact.

4. **Excellence in Education**: We envision a learning environment that nurtures the next generation of wireless communication engineers and leaders. Through rigorous academic programs, hands-on research

opportunities, and mentorship, we empower students to excel and become catalysts for positive change in the field.

5. **Ethical and Sustainable Practices:** Central to our vision is a commitment to ethical conduct and sustainability. We advocate for responsible use of technology, prioritizing privacy, security, and environmental stewardship in all aspects of our work.

6. **Adaptability and Resilience:** In a dynamic landscape characterized by rapid technological evolution and unforeseen challenges, we emphasize adaptability and resilience. Our vision encompasses an agile and forward-thinking approach, enabling us to thrive in an ever-changing environment.

By embodying these principles and pursuing our vision with unwavering dedication, we aim to shape a future where wireless communication serves as a catalyst for progress, connectivity, and empowerment across the globe.

2. Program Mission

The mission of wireless communication engineering is to design, develop, and optimize systems and technologies that enable seamless and reliable transmission of data, voice, and multimedia content without the need for physical connections. This involves innovating in areas such as radio frequency (RF) design, signal processing, networking protocols, and antenna design to create efficient and robust wireless communication solutions. The ultimate goal is to enhance connectivity, accessibility, and mobility for individuals and organizations, facilitating the exchange of information across diverse environments and applications, ranging from personal mobile devices to industrial automation and IoT (Internet of Things) systems. Additionally, wireless communication engineering aims to address challenges such as spectrum efficiency, interference mitigation, security,

and energy efficiency to ensure sustainable and resilient wireless networks for present and future generations.

3. Program Objectives

The objectives of a wireless communication engineering department can vary depending on the specific goals of the organization or institution. However, here are some common objectives that such a department might pursue:

1. **Research and Development:** Conducting cutting-edge research to advance the field of wireless communication technologies, including but not limited to radio frequency (RF) systems, antennas, modulation techniques, signal processing, and network protocols.

2. **Innovation and Design:** Developing novel wireless communication systems and solutions to address emerging challenges and meet the evolving needs of industries and society, such as IoT (Internet of Things), 5G and beyond, smart cities, healthcare applications, and autonomous vehicles.

3. **Education and Training:** Providing high-quality education and training programs to produce skilled professionals in wireless communication engineering, including undergraduate and graduate degree programs, workshops, seminars, and industry certifications.

4. **Industry Collaboration:** Collaborating with industry partners to transfer research findings into practical applications, foster technology transfer, and facilitate the integration of new wireless technologies into commercial products and services.

5. **Standardization and Regulation:** Contributing to the development of standards and regulations for wireless communication systems, ensuring

interoperability, spectrum efficiency, security, and compliance with regulatory requirements at the national and international levels.

6. **Network Optimization and Management:** Developing algorithms, protocols, and tools for optimizing the performance, reliability, and scalability of wireless networks, including cellular networks, WLANs (Wireless Local Area Networks), ad hoc networks, and mesh networks.

7. **Security and Privacy:** Researching and implementing techniques to enhance the security and privacy of wireless communication systems, including encryption, authentication, intrusion detection, and privacy-preserving data transmission.

8. **Spectrum Management:** Studying efficient ways to manage and allocate radio frequency spectrum resources to accommodate the increasing demand for wireless services while minimizing interference and maximizing spectrum utilization.

9. **Environmental and Health Impacts:** Investigating the environmental and health impacts of wireless communication technologies, including electromagnetic radiation exposure and energy consumption, and developing strategies to mitigate potential risks.

10. **Global Connectivity:** Contributing to the advancement of global connectivity by extending wireless communication coverage to underserved and remote areas, bridging the digital divide, and promoting equitable access to communication infrastructure and services worldwide.

By pursuing these objectives, a wireless communication engineering department can play a crucial role in driving innovation, advancing knowledge, and shaping the future of wireless technologies for the benefit of society.

4. **Program Accreditation**

The department is preparing to obtain accreditation from an organization ABET

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	11	20	12.41%	
College Requirements	15	34	21.38%	
Department Requirements	48	105	66.21%	
Summer Training	1	0	0	
Other	None			

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours Theoretical / Practical	
First/First	CE 1101	Technical English I	1	-
First/First	CE 1102	Mathematics I	4	-
First/First	CE 1103	Computer Science I	1	1
First/First	CE 1104	Electronics I	3	-
First/First	CE 1105	Engineering Drawing	-	3
First/First	CE 1106	Digital Techniques	2	-
First/First	CE 1107	Solid State Physics and Semiconductors	2	-
First/First	CE 1108	Electrical Engineering Fundamentals I	3	-
First/First	CE 1109	Workshops I	-	4
First/First	CE 1110	Electrical and Electronic Lab. I	-	3
First/First	CEM1107	Human Rights		
First/Second	CE 1202	Mathematics II	4	-

First/Second	CE 1203	Computer Science II	1	1
First/Second	CE 1204	Measurements and Instrumentations	2	-
First/Second	CE 1205	Auto CAD	-	3
First/Second	CE 1206	Probability and Statistics	3	-
First/Second	CE 1207	Physics of Microwave Materials	2	-
First/Second	CE 1208	Electrical Engineering Fundamentals II	3	-
First/Second	CE 1209	Workshops II	-	4
First/Second	CE 1210	Electrical and Electronic Lab. II	-	3
Second/First	CE2101	Physics of Optical Elements	2	-
Second/First	CE2102	Mathematics III	4	-
Second/First	CEM2103	Communication Systems II	3	-
Second/First	CE2104	Computer Programming	2	-
Second/First	CE2105	Electromagnetic Fields I	3	-
Second/First	CE2106	Radio Wave Propagation	3	-
Second/First	CE2107	Baath Party Crimes	1	-
Second/First	CE2108	Electronic Communication	3	-
Second/First	CE2109	Analog Communications and Electronics Lab.II	-	6
Second/Second	CE 2201	Physics of Optical Elements	2	-
Second/Second	CE 2202	Mathematics IV	4	-
Second/Second	CE 2203	Communication Systems II	3	-
Second/Second	CE 2204	Microprocessor Engineering	2	-
Second/Second	CE 2205	Electromagnetic Fields II	3	-
Second/Second	CE 2206	Radio Wave Propagation	3	-
Second/Second	CE2207	Arabic Language	1	-
Second/Second	CE 2208	Electronic Communication	3	-
Second/Second	CE 2209	Analog Communications and Electronics Lab.II	-	6
Third/First	CE 3101	Numerical Analysis I	2	-
Third/First	CE 3102	Engineering Analysis I	4	-
Third/First	CE 3103	Control Engineering I	2	-
Third/First	CE 3104	Digital Communication I	2	-
Third/First	CEM 3105	Microwave Engineering	2	-
Third/First	CE 3106	Signals and systems I	2	-
Third/First	CEM 3107	Antenna Theory	2	-
Third/First	CE 3108	Antennas and Control Lab.	-	4
Third/First	CE 3109	Microprocessor and Digital Communication Lab.	-	4
Third/Second	CE 3201	Numerical Analysis II	2	-
Third/Second	CE 3202	Engineering Analysis II	4	-
Third/Second	CE 3203	Control Engineering II	3	-

Third/Second	CE 3204	Digital Communication II	3	-
Third/Second	CE 3205	Microwave Circuits Design	3	-
Third/Second	CE 3206	Signals and systems II	2	-
Third/Second	CEM 3207	Antennas and Arrays	3	-
Third/Second	CE 3208	Antennas and Control Lab.	-	4
Third/Second	CE 3209	Microprocessor and Digital Communication Lab.	-	4
Forth/First	CE4101	Final Year Project I	1	3
Forth/First	CE4102	Industrial Management2	2	-
Forth/First	CE4103	Mobile Communication Systems I	4	-
Forth/First	CE4104	Optical fiber communication	2	-
Forth/First	CE4105	Satellite communication	2	-
Forth/First	CE4106	Digital Signal Processing I	3	-
Forth/First	CEM4107	Data transmission	2	-
Forth/First	CEM4108	Elective Subject(A)	2	-
Forth/First	CE 4109	Digital signal processing and communication lab	-	6
Forth/Second	CE 4201	Final Year Project II	1	3
Forth/Second	CE 4202	Operational Research	2	-
Forth/Second	CEM 4203	Mobile Communication Systems II	3	-
Forth/Second	CEM 4204	Secure Communication System	2	-
Forth/Second	CEM 4205	Radar & Navigation Systems	2	-
Forth/Second	CE 4206	Digital Signal Processing II	2	-
Forth/Second	CEM 4207	Computer Networks	2	-
Forth/Second	CEM 4208	Elective Subject (B)	2	-
Forth/Second	CEM 4209	Digital Signal Processing and Communication Lab. II	-	6

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	1.Students can gain knowledge, understanding, principles, theories and fundamentals in Wireless communication engineering 2.Students can understand mathematics, equations and algorithms for studying Wireless communications engineering 3.To learn about the most important computer programs that are used in the field of engineering problem solving and design for its Wireless communications engineering departments and the foundations of its theoretical applications 4.To be able to understand the basis of the work of the laboratory equipment used in wireless communication engineering services

Skills	
Learning Outcomes 2	1.The ability to select and conduct the required tests and to collect, compare and analyze the results of the tests. 2.Ability to design, audit and supervise the implementation of various wireless communication engineering facilities. 3.The ability to derive and approach engineering issues in a scientific way and to determine the appropriate method of processing Emerging engineering problems. 4.Student can understand advanced applications in wireless communication.
Learning Outcomes 3	1.Able to analyze the problems and discuss and find effective solutions with the possibility of using specialized computer programs 2.Justifies and conveys concepts and demonstrates them in particular to the concepts of engineering in the field of wireless communications engineering
Ethics	
Learning Outcomes 4	Professionalism: Students should demonstrate professionalism in their interactions with faculty, peers, and industry professionals. This involves being punctual, respectful, and cooperative in group projects, lab sessions, and other academic activities.
Learning Outcomes 5	Integrity: Students should uphold academic integrity by avoiding plagiarism, cheating, or any other form of dishonesty in their coursework and research projects. Proper citation of sources and adherence to academic standards are essential.

9. Teaching and Learning Strategies

1- Theoretical lectures

2-Discussion lectures

3- Practical lectures in laboratories

4- Scientific seminars by students

5-Graduate projects for students of the finished stage and discussed

6- Methods of small educational clusters

10. Evaluation methods

1. Monthly or quarterly examinations

2. Quizzes

3. Writing scientific reports

4. Scientific Seminars

5. Homework

6. Committees for discussing graduation projects for students of the final stage

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr. Jawad Kadhim Ali	Electricity	Electronic and communications engineering			Staff	
Prof. Dr. Thamer Mohammed Jameel	Electrical and Electronic	Radar engineering and signal processing			Staff	
Prof. Dr. Amal Ahmed Redha	Electrical and Electronic	Power			Staff	
Asst. Prof. Dr. Afaneen Anwar Abboud	Electrical and Electronic	Power			Staff	
Asst. Prof. Dr. Jamal Mohammed Rasool	Electrical	Communications and radar engineering			Staff	
Asst. Prof. Dr. Ali Jabbar Salem	Electrical and Electronic	Communication			Staff	
Asst. Prof. Dr. Muna Taha Idris	Physical education for girls	Physical education			Staff	
Asst. Prof. Dr. Mohammed Hussein Maree	Electrical and Electronic	Communication			Staff	
Asst. Prof. Dr. Ali Ouda Abd Noor	Electrical and Eelectronic	Electronic and communications			Staff	

Asst. Prof. Dr. Jabbar Khalaf Mohammed	Electrical and Electronic	Communication			Staff	
Asst. Prof. Amna Ali Salman	Electrical and Electronic	Electronic and communications			Staff	
Asst. Prof. Wael Yass Nasser	Electrical and Electronic	Electronic and communications			Staff	
Asst. Prof. Hussein Abdul Karim Hamas	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Mohammed Fadhil Hassan	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Hossam Hussein Ali	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Dina Adnan Hassan	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Ali Shawkat Dhiab	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Ammar Abdul Aziz Yahya	Electrical and Electronic	Power			Staff	
Lec. Dr. Haider Abdul Allah Abdul Karim	Electrical and Electronic	Electronic and communications			Staff	
Lec. Dr. Mohammed Abdul Razzaq Aziz	Electrical and Electronic	Electronic and communications			Staff	

Lec. Anmar Natiq Ghazi	Electricity	Educational technology/electrical machines			Staff	
Lec. Lamia Abdul Ameer Hadi	Applied mathematics	Algebra			Staff	
Lec. Mohammed Rashid Hussein	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Nadia Ismail Khalil	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Hussein Ali Attallah	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Rusul Musdaq Abdul Sada	Electrical and computer	computer			Staff	
Asst. Lec. Suha Erfan Abdul Rahman	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Muheimen Qahtan Khalaf	Computers	Computers			Staff	
Asst. Lec. Aya Nabil Abdul Zahra	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Ali Abbas	Electrical and Electronic	Electronic and communications			Staff	
Asst. Lec. Sazan Kamran Hussein	Electrical and Electronic	Electronic and communications			Staff	

Professional Development

Mentoring new faculty members

Mentoring new faculty members is crucial for their successful integration into the academic environment and for their long-term career development. Here are some tips for effectively mentoring new faculty members:

1. **Establish clear expectations**: From the outset, provide clear guidelines and expectations regarding their roles, responsibilities, and performance criteria. This clarity helps new faculty members understand what is expected of them and what they need to do to succeed.
2. **Offer guidance on navigating institutional culture**: Every academic institution has its own unique culture, norms, and processes. Help new faculty members navigate this landscape by providing insights into the institution's structure, policies, and traditions.
3. **Provide support for teaching and research**: Offer guidance and resources to help new faculty members excel in both teaching and research. This could include sharing best practices for course design and delivery, providing feedback on teaching materials and methods, and offering advice on securing research funding and publishing.
4. **Facilitate networking opportunities**: Help new faculty members build connections within the institution and the broader academic community. Introduce them to colleagues in their field, encourage participation in departmental and interdisciplinary events, and facilitate collaborations with other researchers.

Professional development of faculty members

An academic and professional development plan for faculty typically encompasses a variety of elements aimed at enhancing teaching effectiveness, fostering scholarly growth, and ensuring ongoing professional development. Here's a brief overview of key components:

1. Teaching and Learning Strategies:
    o Encouraging innovative teaching methodologies such as flipped classrooms, active learning techniques, and experiential learning.
    o Promoting the use of technology in teaching to enhance engagement and facilitate learning.
    o Providing support and resources for curriculum development and course design.
2. Assessment of Learning Outcomes:
    o Establishing clear learning objectives for courses and programs.
    o Implementing various assessment methods to measure student learning, such as exams, projects, presentations, and portfolios.
    o Analyzing assessment data to identify areas for improvement and inform instructional decisions.
3. Professional Development:
    o Offering workshops, seminars, and conferences on pedagogical techniques, assessment strategies, and technology integration.

- o Providing opportunities for faculty to pursue advanced degrees, certifications, or specialized training related to their disciplines.
  - o Supporting scholarly activities, including research projects, publications, and conference presentations.
4. Mentoring and Peer Collaboration:
  - o Pairing junior faculty with experienced mentors to provide guidance and support.
  - o Facilitating collaborative teaching initiatives and interdisciplinary research partnerships.
  - o Creating communities of practice where faculty can share best practices, discuss challenges, and collaborate on teaching and research projects.
5. Recognition and Rewards:
  - o Acknowledging and celebrating faculty achievements through awards, honors, and promotions.
  - o Establishing criteria for tenure and promotion that recognize excellence in teaching, research, and service.
  - o Providing incentives such as grants, sabbaticals, or reduced teaching loads for outstanding performance and contributions to the institution.

Overall, the academic and professional development plan aims to create a supportive environment that empowers faculty members to excel in their roles as educators, scholars, and mentors, ultimately benefiting both the faculty and the students they serve. Regular evaluation and feedback mechanisms are essential to ensure the effectiveness of the plan and make necessary adjustments to meet evolving needs and priorities..

12. Acceptance Criterion

Setting regulations related to enrollment in colleges or institutes, whether for central admission or otherwise, involves several considerations aimed at ensuring fairness, transparency, and efficiency in the admission process. Here are some key aspects to consider when setting such regulations:

1. **Admission Criteria**: Clearly define the criteria for admission, which may include academic qualifications, standardized test scores, extracurricular activities, interviews, and other relevant factors.
2. **Equity and Diversity**: Ensure that the admission process promotes equity and diversity by considering factors such as socioeconomic background, race, ethnicity, gender, geographic location, and disabilities. Implement policies to prevent discrimination and promote inclusivity.
3. **Transparency**: Make the admission process transparent by providing clear information about the requirements, procedures, deadlines, and selection criteria to prospective applicants. Transparency builds trust and confidence in the fairness of the process.
4. **Centralized vs. Decentralized Admission**: Decide whether to implement a centralized admission system managed by a central authority or decentralized admission processes managed by individual colleges or departments. Each approach has its advantages and challenges, so the decision should align with the institution's goals and resources.

5. **Application Process**: Streamline the application process to make it user-friendly and accessible to all applicants. Utilize online platforms for application submission, fee payment, document upload, and communication to simplify the process and reduce administrative burden.

13. The most important sources of information about the program

Wireless communication engineering study draws from various sources of information, including:

1. Textbooks: Comprehensive textbooks covering principles, theories, and practical applications in wireless communication.
2. Academic Journals: Peer-reviewed journals publishing the latest research findings, methodologies, and advancements in the field.
3. Research Papers: Academic papers presenting specific studies, experiments, and innovations conducted by researchers and practitioners.
4. Online Courses: Platforms offering structured courses on wireless communication topics, often with video lectures, assignments, and quizzes.
5. Industry Publications: Magazines, blogs, and newsletters focusing on industry trends, case studies, and practical insights.
6. Conferences: Events where professionals, academics, and industry experts gather to present and discuss new developments, technologies, and research findings.
7. Online Forums and Communities: Platforms where professionals and enthusiasts exchange knowledge, share experiences, and seek advice on wireless communication topics.
8. Standardization Organizations: Bodies like IEEE (Institute of Electrical and Electronics Engineers) and 3GPP (3rd Generation Partnership Project) publishing standards, specifications, and technical documents related to wireless communication protocols and technologies.
9. Simulation and Modeling Tools: Software tools for simulating and modeling wireless communication systems, enabling analysis, design, and optimization.
10. Practical Experience: Hands-on projects, internships, and industry collaborations providing real-world exposure to wireless communication technologies and practices.

14. Program Development Plan

Developing a Wireless Communication Engineering department requires a comprehensive plan encompassing various aspects such as infrastructure, curriculum development, research focus, faculty recruitment, and industry collaboration. Here's a general outline for such a development plan:

1. **Needs Assessment and Market Analysis:**

- o Identify the current and future demands for wireless communication engineers in various sectors such as telecommunications, IoT, healthcare, automotive, etc.
- o Analyze competitor institutions offering similar programs.
- o Conduct surveys and interviews with industry experts to understand the desired skill sets and knowledge areas.

2. **Infrastructure Development:**
   - o Allocate resources for setting up state-of-the-art laboratories equipped with the latest hardware and software tools used in wireless communication engineering.
   - o Ensure availability of necessary infrastructure for research and development activities, including RF testing equipment, software-defined radios, simulation tools,
   - o Establish networking infrastructure to support practical experiments and projects.

3. **Curriculum Design and Development:**
   - o Develop a comprehensive curriculum covering fundamental concepts as well as advanced topics in wireless communication engineering.
   - o Incorporate hands-on laboratory sessions, projects, and internships to provide practical exposure to students.
   - o Offer elective courses focusing on specific areas such as wireless network protocols, antenna design, signal processing for communications, etc.
   - o Regularly update the curriculum to keep pace with technological advancements and industry requirements.

4. **Faculty Recruitment and Development:**
   - o Recruit experienced faculty members with expertise in diverse areas of wireless communication engineering.
   - o Provide opportunities for professional development and encourage faculty to engage in research and industry collaborations.
   - o Establish mentorship programs to support junior faculty members and promote interdisciplinary research collaborations.

5. **Research Focus Areas:**
   - o Identify key research focus areas aligned with industry needs and emerging trends in wireless communication engineering.
   - o Encourage faculty and students to pursue research projects in areas such as 5G and beyond, Internet of Things (IoT), cognitive radio, wireless sensor networks, etc.
   - o Establish research centers or laboratories dedicated to specific research themes to facilitate collaboration and innovation.

6. **Industry Collaboration:**
   - o Forge partnerships with industry players, research institutions, and government agencies to facilitate technology transfer, collaborative research projects, and internship opportunities for students.
   - o Establish advisory boards comprising industry experts to provide guidance on curriculum development, research priorities, and industry trends.
   - o Organize seminars, workshops, and conferences featuring industry speakers to expose students to real-world challenges and opportunities.

7. **Student Recruitment and Support:**
   - o Develop marketing strategies to attract talented students to the Wireless Communication Engineering program.

- o Offer scholarships, assistantships, and other financial incentives to attract top talent.
- o Provide academic and career counseling services to support student success and facilitate their transition into the workforce.
8. **Quality Assurance and Continuous Improvement:**
    - o Implement mechanisms for monitoring and evaluating the effectiveness of the Wireless Communication Engineering program.
    - o Solicit feedback from students, faculty, and industry partners to identify areas for improvement.
    - o Regularly review and update program objectives, learning outcomes, and assessment methods to ensure relevance and quality.

By following this development plan, a Wireless Communication Engineering department can establish itself as a leading institution in the field, producing highly skilled graduates and contributing to advancements in wireless communication technology.

				Required program Learning outcomes											
Program Skills Outline															
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
	CE 1101	Technical English I	Basic	*	*			*	*		*			*	*
	CE 1102	Mathematics I	Basic		*	*	*		*	*	*		*	*	*
	CE 1103	Computer Science I	Basic	*	*		*		*	*		*	*	*	
	CE 1104	Electronics I	Basic	*	*		*	*	*	*	*		*	*	*
	CE 1105	Engineering Drawing	Basic	*		*	*	*		*	*	*		*	*
	CE 1106	Digital Techniques	Basic	*	*	*		*	*		*	*	*	*	
First/First	CE 1107	Solid State Physics and Semiconductors	Basic	*	*	*	*			*	*	*	*	*	*
	CE 1108	Electrical Engineering Fundamentals I	Basic		*		*	*	*		*	*	*		*
	CE 1109	Workshops I	Basic	*	*	*	*	*	*	*	*	*	*	*	
	CE 1110	Electrical and Electronic Lab. I	Basic	*	*		*	*	*	*	*	*	*	*	*
	CE 1202	Mathematics II	Basic		*		*		*	*	*		*	*	

Semester	Code	Course	Type												
First /Second	CE 1203	Computer Science II	Basic			*		*	*	*		*	*		*
	CE 1204	Measurements and Instrumentations	Basic	*		*	*	*		*	*	*	*	*	*
	CE 1205	Auto CAD	Basic		*	*	*		*			*	*	*	*
	CE 1206	Probability and Statistics	Basic	*	*	*	*	*	*	*	*	*	*	*	
	CE 1207	Physics of Microwave Materials	Basic	*	*		*	*	*		*			*	*
	CE 1208	Electrical Engineering Fundamentals II	Basic	*		*	*		*	*		*	*	*	
	CE 1209	Workshops II	Basic		*	*		*		*	*	*	*	*	*
	CE 1210	Electrical and Electronic Lab. II	Basic	*		*	*	*	*	*	*	*	*	*	*
Second/First	CE2101	Physics of Optical Elements	Basic	*	*					*		*		*	*
	CE2102	Mathematics III	Basic		*	*		*	*	*	*		*	*	
	CEM2103	Communication Systems II	Basic	*	*		*	*	*		*	*	*	*	*
	CE2104	Computer Programming	Basic	*		*	*		*	*	*		*	*	

Year/Semester	Code	Course Name	Type												
	CE2105	Electromagnetic Fields I	Basic	*	*	*		*	*	*	*	*	*	*	*
	CE2106	Radio Wave Propagation	Basic		*	*	*	*			*		*	*	*
	CE2107	Baath Party Crimes	Basic	*		*		*		*	*	*	*	*	
	CE2108	Electronic Communication	Basic	*		*		*	*				*		*
	CE2109	Analog Communications and Electronics Lab.II	Basic	*	*		*	*	*	*	*	*	*	*	*
Second/Second	CE 2201	Physics of Optical Elements	Basic		*	*	*	*	*	*		*	*	*	*
	CE 2202	Mathematics IV	Basic	*	*	*	*		*		*		*	*	*
	CE 2203	Communication Systems II	Basic		*	*		*		*	*	*	*	*	
	CE 2204	Microprocessor Engineering	Basic	*	*		*	*	*	*	*	*	*		*
	CE 2205	Electromagnetic Fields II	Basic		*	*		*	*			*		*	
	CE 2206	Radio Wave Propagation	Basic	*	*	*		*		*	*		*	*	*

Term	Code	Course Name	Type												
	CE2207	Arabic Language	Basic	*			*		*	*	*	*	*		
	CE 2208	Electronic Communication	Basic		*		*		*	*			*		*
	CE 2209	Analog Communications and Electronics Lab.II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Third/First	CE 3101	Numerical Analysis I	Basic		*	*	*	*		*	*	*	*	*	*
	CE 3102	Engineering Analysis I	Basic	*	*	*	*		*	*	*	*	*	*	*
	CE 3103	Control Engineering I	Basic		*		*	*			*	*	*	*	*
	CE 3104	Digital Communication I	Basic	*	*		*	*	*	*	*		*	*	
	CEM 3105	Microwave Engineering	Basic	*	*	*		*		*		*	*	*	*
	CE 3106	Signals and systems I	Basic			*	*		*	*		*		*	
	CEM 3107	Antenna Theory	Basic	*		*		*		*	*	*	*		*
	CE 3108	**Antennas and Control Lab.**	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	CE 3109	**Microprocessor and Digital Communication Lab.**	Basic	*	*	*	*	*	*	*	*	*	*	*	*

	CE 3201	Numerical Analysis II	Basic			*		*		*		*	*		*
	CE 3202	Engineering Analysis II	Basic	*		*	*	*	*	*	*	*	*	*	*
	CE 3203	Control Engineering II	Basic	*	*		*	*	*	*	*	*	*	*	
	CE 3204	Digital Communication II	Basic	*		*	*	*	*	*	*	*	*	*	*
Third/Second	CE 3205	**Microwave Circuits Design**	Basic	*	*	*		*		*	*		*	*	
	CE 3206	Signals and systems II	Basic	*	*	*	*		*		*	*		*	*
	CEM 3207	**Antennas and Arrays**	Basic		*		*	*		*	*		*	*	
	CE 3208	**Antennas and Control Lab.**	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	CE 3209	**Microprocessor and Digital Communication Lab.**	Basic												
Forth/First	CE4101	Final Year Project I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	CE4102	Industrial Management2	Basic	*		*		*	*		*		*	*	

Year/Semester	Code	Course	Type												
	CE4103	Mobile Communication Systems I	Basic	*		*		*	*		*	*	*		*
	CE4104	Optical fiber communication	Basic	*	*		*		*	*	*		*	*	*
	CE4105	Satellite communication	Basic			*	*		*	*		*		*	*
	CE4106	**Digital Signal Processing I**	Basic	*	*	*	*	*		*	*	*	*	*	
	CEM4107	Data transmission	Basic		*		*		*			*	*		*
	CEM4108	Elective Subject(A)	Optional	*	*			*	*	*	*		*	*	*
	CE 4109	Digital signal processing and communication lab	Basic		*		*		*	*		*		*	
Forth/Second	CE 4201	**Final Year Project II**	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	CE 4202	**Operational Research**	Basic	*			*		*	*		*	*	
	CEM 4203	**Mobile Communication Systems II**	Basic	*	*	*	*	*		*		*	*	*	*
	CEM 4204	**Secure Communication System**	Basic	*			*	*	*	*	*		*	

Code	Course	Type	1	2	3	4	5	6	7	8	9	10	11	12
CEM 4205	**Radar & Navigation Systems**	Basic		*	*		*	*		*		*		*
CE 4206	**Digital Signal Processing II**	Basic	*	*	*	*	*	*	*	*	*	*	*	*
CEM 4207	**Computer Networks**	Basic	*		*		*		*	*	*		*	*
CEM 4208	**Elective Subject (B)**	**Optional**	*		*	*	*	*	*	*	*	*		
CEM 4209	**Digital Signal Processing and Communication Lab. II**	Basic	*	*	*	*	*	*	*	*	*	*	*	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**