

Kingdom of Saudi Arabia  
Jouf University  
College of Computer and  
Information Sciences



# Guide for the Computer Engineering and Networks Program

DEPARTMENT OF COMPUTER ENGINEERING AND  
NETWORKS

COLLEGE OF COMPUTER AND INFORMATION  
SCIENCES

KINGDOM OF SAUDI ARABIA – AL-JOUF - SAKAKA

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Available in CEN program website:

<https://www.ju.edu.sa/en/colleges/science-college/college-of-computer-and-information-sciences/departments/computer-engineering-and-networks/>



**Guide for the Computer Engineering and Networks Program  
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## 1. Program creation

The Computer Engineering and Networks Program at the College of Computer and Information Sciences at Jouf University, with the support of the Deanship of the College and the University Administration, seeks to prepare and qualify its students and students to be able to integrate directly after graduation into the labor market through continuous development in the teaching method and the contents of the courses in line with the requirements of Labor market.

The Computer Engineering and Networks Program was opened, with the grace of God, in the year 1432 AH, and it receives quarterly a good number of students of the common first year and from departments of the college and other colleges of the university in a vigorous endeavor to be the tributary of the entity and the labor market and in order to provide a group of competent computer and network engineers capable of Providing the best services to society and to the companies and institutions in which they are employed. In pursuit of product quality (male / female graduate students), and in addition to the academic study plan, which is subject to constant updating, the most important and latest topics in the field of computer and network engineering are selected and taught as separate courses to be taught in approved courses of the plan, such as a course on selected subjects. In addition to all of the aforementioned, the program is concerned with and emphasizes that the subjects of the department's

students' graduation projects are at the core of the specialization and in the latest fields of computer engineering and networks. The department is supervised by a highly qualified academic cadre with extensive experience in the field of teaching and scientific research from different nationalities.

### **2. The vision and mission of the program**

#### **a) The vision**

Leadership in education and scientific research, along with being nationally ranked among the best Department for Computer Engineering and Networks.

#### **b) The mission**

Preparation of qualified scientific cadres in the various fields of computer engineering and networks through innovative education and scientific research, which develop their creative and analytical abilities to serve the society.

### **3. Program Goals**

Goals of Computer Engineering and Networks program are:

G.1 To prepare graduates who possess essential professional computer engineering and networks skills that make them confident to develop high quality engineering solutions.

G.2 To support faculty members to continuously develop their skills in computer engineering and networks.

G.3 To participate in the community development by providing consultancies and services in the field of Computer Engineering and Networks.

G.4 To contribute effectively to the scientific research related to the field of Computer Engineering and Networks.

## 4. Program learning outcomes

Knowledge and understanding	
K1	Demonstrate sound knowledge of contemporary issues.
K2	Demonstrate sound knowledge of computer engineering and networks issues and problems.
K3	Demonstrate sound knowledge of mathematics, science, and engineering sciences and design
Skills	
S1	Design and conduct appropriate experimentation including data collection, analysis, and interpretation, and drawing conclusions.
S2	Apply engineering design to meet specified needs within realistic constraints such as public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
S3	Use principles of engineering, science, and mathematics to solve complex engineering problems and to address related research questions.
S4	Communicate effectively with a range of audiences.
S5	Use the techniques, skills, and modern engineering tools necessary for computer engineering and networks practices.
Values	
V1	Participate effectively on a team as a member providing leadership, creating collaborative and inclusive environment, establishing goals, planning tasks to meet objectives.
V2	Recognize ethical and professional responsibilities in engineering situations including informed judgments with consideration of global, economic, environmental, and societal contexts.
V3	Assess own learning and performance autonomously and engage in independent life-long learning.

## 5. Graduate attributes

P1. Apply the knowledge of computer engineering and networks in the design of computer-based systems that conform to given specifications and cost constraints, for solving related engineering problems,

P2. Work creatively, cooperatively and responsibly as a member of a professional team,

P3. Independently acquire and apply required information on contemporary computer engineering and networks issues, and become lifelong learners and contributors to the society,

P4. Communicate ideas effectively in written or verbal form, and also adhere to ethical requirement guiding professional engineering practice in a workplace,

P5. Adapt to transition from an academic environment to a career within corporation, organization and entrepreneurial, or research environment.

P6. Adhere to high scientific and societal values and norms and demonstrate commitment to Islamic values.

P7. Engage effectively in serving the community.

## 6. Fields of work for program graduates

- ✓ Engineer, Computer
- ✓ Computer operator
- ✓ Computer engineering trainer



- ✓ Computer engineering teacher
- ✓ Network Administrator
- ✓ Network Engineer
- ✓ Computer networking technician
- ✓ Computer network security Supervisor

## 7. Admission program requirements

The University Council determines the number of students to be admitted in the upcoming academic year according to the recommendations of Colleges' Councils and respective bodies. Admission of prospective students requires the following:

1. The applicant must hold the General Secondary Certificate or its equivalent from inside or outside Saudi Arabia.
2. The General Secondary Certificate or its equivalent must have been obtained within the last five years (Exceptions can only be decided by the University Council in light of persuasive reasons)
3. The applicant must enjoy a good conduct.
4. The applicant must pass any interviews or tests decided by the University Council.
5. The applicant must be medically fit.
6. The applicant must obtain an approval to the study from his employer if he works in any government or private institution.

7. The applicant must meet any other conditions determined and announced by the University Council at the time of application. The applicant must have not been dismissed from another university for disciplinary reasons.
8. Holders of a bachelor's degree or its equivalent may not be admitted to study another bachelor's degree (exceptions can be decided only by the University Rector).
9. Applicants who are currently registered for another university degree or less, in this university or another one, may not be admitted. Selection of admitted students from applicants who meet all admission requirements is taken on the basis of their grades in the general secondary certificate, personal interviews and admission tests (if any).

### **8. Program study system**

Like all other programs at Jouf University, the program follows a semester system. Each academic year consists mainly of two academic semesters. Additionally, there is one summer semester with duration of eight weeks. In summer semester, the duration of each course is twice its duration of a regular academic semester. The graduation requirements are divided into different levels according to the study plan.

A List of Rules and Regulations of Undergraduate Study and Examinations can be viewed through the website of the Deanship of Admission and Registration, the URL is:

[http://dar.ju.edu.sa/forms/list\\_laws\\_E.pdf](http://dar.ju.edu.sa/forms/list_laws_E.pdf)

## 9. Duration of study

10 semesters - 5 years - 162 hours

## 10. Speciality selection

An Academic student guide is available in Arabic language on the website of the Deanship of Admission and Registration, the URL is :

[http://dar.ju.edu.sa/forms/Acadmic\\_Student.pdf](http://dar.ju.edu.sa/forms/Acadmic_Student.pdf)

This orientation program gives new students an opportunity to get more information about the program and the goals for their studies, and encourages them to discuss their interests with program coordinator and graduate students .

## 11. Study plan

### Study plan

Starting from 1439/1440 AH - 2018/2019 AD

Level	Course Code	Course Title	Required/ Elective	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 1	CIS 101	Computer Skills	Required	---	3	University
	ENGL 001	English Language (1)	Required	---	6	University
	MTH 101	Introductory Mathematics	Required	---	3	College
	EDU 101	University Life Skills	Required	---	2	University

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Level	Course Code	Course Title	Required/ Elective	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 2	CIS 102	Problem Solving and Programming	Required	CIS 101	3	College
	ENGL 002	English Language (2)	Required	ENGL 001	6	University
	MTH 102	Differential Calculus	Required	MTH 101	3	College
	CHM 103	Principles of Chemistry	Required	---	3	College
Level 3	ISL 101	Fundamental of Islamic Culture	Required	---	2	University
	ARB 100	Arabic Language Skills	Required	---	2	University
	CIS 203	Computer programming (1)	Required	CIS 102	4	College
	CIS 211	Discrete Maths	Required	MTH 102	3	College
	PHS 101	General Physics (1)	Required	---	4	Department
	MTH 203	Integral Calculus	Required	MTH 102	3	College
Level 4	CNE 101	Digital & Logic Design	Required	CIS 211	3	Department
	CIS 204	Computer programming (2)	Required	CIS 203	4	College
	PHS 202	General Physics (2)	Required	PHS 101	4	Department
	MTH 204	Advanced Calculus	Required	MTH 203	3	College
	MTH 285	Principles of Linear Algebra	Required	MTH 203	3	College

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Level	Course Code	Course Title	Required/ Elective	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 5	CNE 202	Advanced Digital & Logic Design	Required	CNE 101	3	Department
	CNE 203	Digital & Logic Design Lab	Required	Co-Req CNE 202	1	Department
	MTH 305	Differential Equations	Required	MTH 204	3	Department
	CIS 205	Data structures	Required	CIS 203	4	College
	MTH 281	Statistics and Probabilities	Required	MTH 203	3	Department
	ELE 262	Electrical & Electronic Circuits	Required	PHS 202	4	Department
Level 6	ISL 107	Professional Ethics	Required	---	2	University
	CIS 321	Software Engineering	Required	CIS 204	3	Department
	CIS 322	Concepts of Database Systems	Required	CIS 205	4	College
	MTH 382	Numerical Methods	Required	MTH 305	3	Department
	CNE 204	Computer Architecture & Organization	Required	CNE 202	3	Department
	CNE 211	Signals and Systems	Required	MTH 204	3	Department
Level 7	CIS 342	Operating Systems	Required	CIS 205	3	Department
	CNE 305	Microprocessor Systems	Required	CNE 204	4	Department
	CNE 312	Data & Computer Communications	Required	CNE 211	4	Department
	CNE 313	Computer Networks (1)	Required	Co-Req CNE 312	3	Department
	CNE 321	Automatic Control Systems	Required	CNE 211	3	Department
Level 8	ARB 102	Writing Skills	Required	---	2	University
	ISL 10x	ISL 109 or ISL 100 or ISL 108	Elective	---	2	University
	CIS 323	Software Project Management	Required	CIS 322	3	College

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Level	Course Code	Course Title	Required/ Elective	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
	CNE 307	Embedded Systems	Required	CNE 305	3	Department
	CNE 308	Embedded Systems Lab	Required	Co-Req CNE 307	1	Department
	CNE 314	Computer Networks (2)	Required	CNE 313	3	Department
	CNE 315	Computer Networks Lab	Required	Co-Req CNE 314	2	Department
	CNE 322	Automatic Control Systems Lab	Required	CNE 321	1	Department
Summer 4 <sup>th</sup> Year - Training	CNE 391	Field Training	Required	Finish 110 Credit Hours	1	College
Level 9	CNE 416	Principles of wireless Communication Networks	Required	CNE 313	3	Department
	CNE 417	Networks & Information Security	Required	CNE 315	3	Department
	CNE 406	Introduction to VLSI Design	Required	ELE 262	3	Department
	XXX xxx	Elective (1)	Elective	---	3	Department
	CNE 492	Graduation Project (1)	Required	Finish 110 CH	2	Department
Level 10	ISL 10x	ISL 109 or ISL 100 or ISL 108	Elective	---	2	University
	XXX 10x	EDU102 or BUS101	Elective	---	2	University
	XXX xxx	Elective (2)	Elective	---	3	Department
	XXX xxx	Elective (3)	Elective	---	3	Department
	CNE 493	Graduation Project (2)	Required	CNE 492	3	Department

## Computer Engineering and Networks Electives

Code			Name	CH	Prerequisite
1	CNE	494	Selected topics in Computer Engineering	3	Finish 110 Credit Hours, any departmental prerequisites
2	CNE	495	Selected topics in Networks	3	Finish 110 Credit Hours, any departmental prerequisites
3	CNE	481	Heterogeneous Networks	3	CNE 313

4	CNE	482	Optical Networks	3	CNE 313
5	CNE	483	Wireless Sensor Networks	3	CNE 313
6	CNE	484	Digital Image Processing	3	CIS 205
7	CNE	485	Parallel Architecture Computing	3	CNE 305
8	CNE	472	Network Security Practice	3	Co-Req. CNE 417
9	CNE	473	Testing of Digital Circuits	3	CNE 203
10	CNE	474	Pattern Recognition	3	Finish 90 Credit Hours
11	CNE	475	Digital and Fuzzy Control	3	CNE 322
12	CNE	476	Modern Sensors	3	Finish 90 Credit Hours
13	CNE	477	Digital Design using VHDL	3	CNE 203
14	CNE	478	Intelligent Systems and Robotics	3	Finish 90 Credit Hours
15	CIS	313	Artificial Intelligence	3	CIS 205
16	CIS	414	Design and Analysis of Algorithms	3	CIS 205
17	CIS	426	Advanced Software Engineering	3	CIS 321
18	CIS	434	Cloud computing	3	Finish 90 Credit Hours
19	CIS	442	Applied Cryptography	3	Finish 90 Credit Hours
20	CIS	462	Natural Language Processing	3	Finish 90 Credit Hours
21	CIS	463	Bioinformatics	3	Finish 90 Credit Hours
22	CIS	465	Expert Systems	3	Finish 90 Credit Hours

## 12. Program advisory committee

Members of the Advisory Committee (1441/1442H) for the Computer Engineering and Networks Program:

	Name	The role	Employer
1	Dr. Madallah Mukami Alruwaili	Chair	Dean of College of Computer and Information Sciences
2	Dr. Ahmad Saad Almadhor	Member	Chair of Computer Engineering and Networks Department
3	Dr. Hani Sayaf Alharby	Member	Tabouk university
4	Lieutenant-Colonel Mekhas Faleh Alrasasmah	Member	Public Security - Ministry of Interior

5	Dr. Mohamed Vall Mohamed	Member	Member of Computer Engineering and Networks Department
6	Dr. Fayez Mohammed Al - Sarhani	Member	Member of Computer Engineering and Networks Department

### Roles of the Advisory Committee

- ✓ Contribute to developing future plans to meet current and future challenges.
- ✓ Improving research, development and consulting methods.
- ✓ Provide advice, guidance and advice regarding the development of the academic program.

## 13. Regulations

The rules and regulations can be found through the website of Jouf University or one of these links:

Skills Record	● <a href="https://bit.ly/38FTQQk">https://bit.ly/38FTQQk</a>
Students Council Rules	● <a href="https://bit.ly/3oIPiOr">https://bit.ly/3oIPiOr</a>
Students Discipline Regulations	● <a href="https://bit.ly/3oJi4yx">https://bit.ly/3oJi4yx</a>
Students Rights and Obligations	● <a href="https://bit.ly/2LKmV3W">https://bit.ly/2LKmV3W</a>
Non-Smoking Regulations	● <a href="https://bit.ly/2LPwQoJ">https://bit.ly/2LPwQoJ</a>
Students Clubs Regulations	● <a href="https://bit.ly/35ET7wR">https://bit.ly/35ET7wR</a>
Students Complaints Regulations	● <a href="https://bit.ly/3nH1Zs3">https://bit.ly/3nH1Zs3</a>



## 14. Services provided to students of the program

### a) Students academic advising

The main tasks of the Academic Advising Committee are as follows:

- Raising awareness of the importance of academic accreditation for the department's program through indicative meetings.
- Maximizing the concept of academic advising and the role of the academic advisor in guiding the student to plan for his educational future.
- Preparing, distributing and collecting the necessary questionnaires for academic accreditation regarding academic advising.
- Analyze its results and make recommendations to the program accordingly.
- Deepening trust between students and faculty.
- Receiving and responding to students' suggestions or complaints
- Educate students about supportive services.
- Developing a plan for academic advising for the semester.
- Facilitating the integration of new students through customized meetings and programs.
- Academic, professional and psychological counseling for students.
- Solving male and female students' problems.

- Providing various counseling services for the benefit of students (deleting / adding / following up students' commitment to the plan / ... etc).
- Early precautionary advice to study delay students.
- Follow-up of defaulting students.
- Motivating the out standing students by diverse forms.
- Discover gifted students and provide them with all facilities.

### **b) Learning resources**

Learning resources depend on:

- Requests submitted by faculty members who teach the course.
- Course instructors are asked to choose books or references that are commonly used in the best universities in the world.
- It also asks them to specify other educational materials they need.
- The program coordinator submits all department requests as appropriate to the library management through the department head.
- In addition, for books or references, you must ensure that they fully cover the course specifications.

### **c) Student activities**

The development of life skills empowers students to make informed decisions regarding their lives, academic and professional paths, enhances their self-confidence, and promote their motivation for success and positive expectations for their future.

These skills prepare them to enjoy a productive life and enhance their aptitudes in adopting responsible, healthy livelihoods and positive behavior with the aim of self-reliance, adaptation with others and facing challenges. They are often overlooked in the traditional educational system and its methods that focus on the academic aspect and neglect personal and social skills, which puts students in front of serious challenges when they have to make a decision regarding their studies and careers.

The program offers:

- Trainings to improve "SOFT SKILLS" as a basis and starting point for the non-curricular activities and supporting students in their transitional stages inside and outside the university. Soft skills' training has proven its ability to achieve a qualitative leap in students' behavior, and their ways of thinking. Therefore, improving their educational attainment and their ability to manage themselves and their lives in a conscious and responsible manner in order to achieve success.
- Supporting students in developing a positive identity for them by enhancing their awareness of their attitudes, personal characteristics, values, abilities and tendencies, and developing communication skills to enable them to express themselves confidently and firmly. This would enhance their academic and social responsibility.

Non-curricular activities include all activities outside the classroom, i.e. outside the scheduled lectures in their academic schedule, and therefore include sports among other activities as follows:

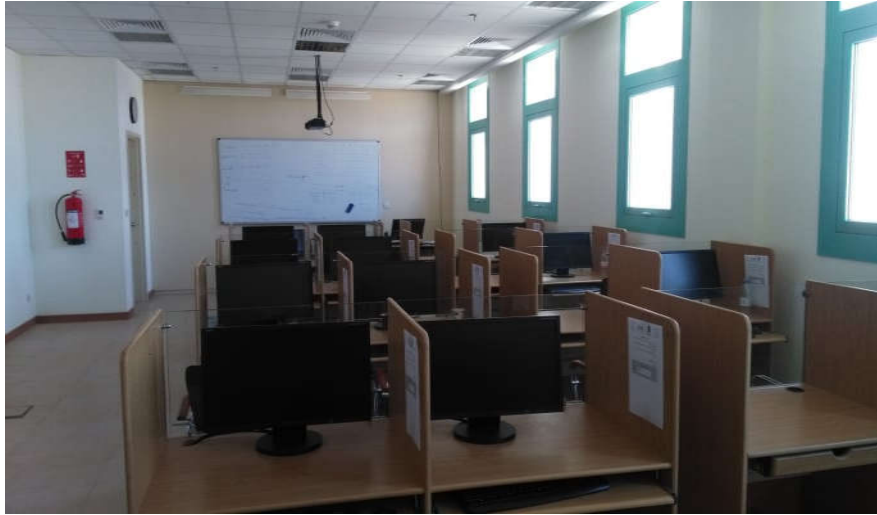
- Inviting students to participate in college clubs.
- Urge students to serve the community and become initiatives.
- Motivate students to participate in the courses offered by the professional-academy.
- Encouraging students to attends academic advising workshops and events.
- Organizing various competitions.
- Organizing celebrations and other gatherings.

### **d) Classrooms, laboratories and equipment**

The department that manage the program currently has computer labs equipped with computers with installed programs used to teach the programming-courses and simulation-tools used in teaching some courses such as data communication, networks and digital control. In addition, the department has several labs the covers logic design, electronics and electrical circuits, robotics, graduation projects, integrated circuits, microprocessors, and other labs as well. These labs would contribute effectively to the quality educational process.

The labs have recently been established in line with modern technologies. These labs would help the faculty members in the department who have rich expertise in several specialties such as smart systems, networks, and artificial intelligence to help the students to complete their graduation projects efficiently.





### **e) E-learning**

E-learning is utilizing electronic technologies to access educational curriculum outside traditional classrooms. Recently, it became pervasive as courses, programs and some degrees are delivered completely online. The evolution of information and communication technology (ICT) as well as the widespread use of computers and the Internet has strongly influenced academic institutions in their adoption of e-Learning in the educational processes. As a result, those in the educational sector are constantly in pursuit of new and innovative ways to provide the right academic and professional services for the next generation .

Following the recent technological advances, students who are enrolled in the program of Computer Engineering and Networks can benefit from the available infrastructure that are provided by Jouf University (JU). JU makes available one of the best Learning Management Systems (LMS), i.e., Blackboard, as an e-learning infrastructure to

facilitate educational and training programs for its students and trainees. In addition, distance learning relies on e-learning and telecommunication for its survival. In this sense, JU has been very successful in promoting several programs, either training or academic, through its available technological means and its well-trained staff. To continue the educational and academic activities in the unforeseeable circumstance like COVID-19, JU has everything set up for a smooth and uninterrupted services.

One may consider e-learning as a method of education that depends on ICT and multimedia to provide educational content and convey skills and concepts to the learners. E-learning allows students to actively interact with the content, instructors, and colleagues simultaneously or asynchronously in time, place, and pace that suit the learner. It is obvious that e-learning is a key enabler for distance learning and perfectly manages learners' activities.

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**Best Regards**  
**Computer Engineering and Networks Program**