Handbook

Computer Science Program

DEPARTMENT OF COMPUTER SCIENCE

NAJRAN UNIVERSITY

Message from the Coordinator
of
Department of Computer Science

On behalf of our faculty, administrators and department staff members and students, we have the pleasure to welcome you to the Department of Computer Science at Najran University.

Our department is dedicated to excellence in teaching, research and community services to be distinguished among the best departments in computer science and the fields which are related to computer science.

You are invited to browse through our website as a student, parent, alumni or stakeholder and we welcome your feedbacks and comments.

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Overview

We strive to be one of the leading departments in computer science nationally and internationally, which produce graduates capable of conducting high-quality scientific research. We also attempt to adhere to global standards of teaching computer science, and to enable the students to locate, utilize, and evaluate information and knowledge. It is also paramount to provide a stimulating educational environment that helps students realize their full potential and graduate as educated, competent professionals who stay current on the developments in Information and Communication Technology (ICT) as well as their specialty of computer science.

Department Goals

1) To utilize various methods for teaching and evaluation to ensure the attainment of learning outcomes for our programs.

2) To produce scientific research focusing on applied computer science.

3) To create qualitative and quantitative standards to assess the quality of the educational process and ensure the accomplishment of departmental goals.

4) To perform periodical assessment of departments and programs using global quality standards in order to obtain academic accreditation for the department.

5) To create integrated solutions to problems related to local community and market demand.

Program Offered and Name of Degree

Currently the Computer Science program is offered by the department and the name of degree is Bachelor of Science in Computer Science (B.Sc. in CS)

Overview of CS Program

Computer Science program is considered as modern and renewable specialization. Computer Science is one of the important disciplines necessary to build modern societies with strong economies that put the state in the ranks of the industrially and technically advanced in the twenty-first century. Computer Science program is updated regularly to suit the spirit of the recent changes and new skills.

Program Vision

To be well recognized in the field of Computer Science through quality education, research and effective contribution to the community.

Program Mission

1) Prepare qualified computer science graduates according to international standards.
2) Contribute significantly in computing research.
3) Provide training, consultancy and services to the community.
4) Provide supportive environment to foster professional development.

Program Educational Objectives (PEOs)

After graduation, the graduates of the Computer Science Program are expected to:

1. Join successful profession in the fields of computing.
2. Follow-up life-long learning in the course of higher education, research and professional development.
3. Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.

Program Learning Outcomes

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline

(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

(c) An ability to design, implements, and evaluate a computer-based system, process, component,or program to meet desired needs

(d) An ability to function effectively on teams to accomplish a common goal

(e) An understanding of professional, ethical, legal, security and social issues and responsibilities

(f) An ability to communicate effectively with a range of audiences

(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society

(h) Recognition of the need for ability to engage in continuing professional development

(i) An ability to use current techniques, skills, and tools necessary for computing practice.

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

(k) An ability to apply design and development principles in the construction of software systems of varying complexity.

The CS mission statement is considered as the main driving force for program's planning and activities. Therefore after the formulation and the approval of CS mission statement according to the procedures described above. It was sent to the strategic planning committee, which was working on developing a strategic plan for the college, to use it for the formulation of the main goals and objectives. The goals and objectives of the college were then adopted by the program's council. In addition to that a set of educational objectives were formulated in light of the CS program mission and passed through the same procedures of revision and approval.

Alignment of the mission of the CS program with the mission of the college of CSIS:

The Mission of the Computer Science Program	The Mission of the College of Computer Science and Information Systems (CSIS)		
	Prepare high quality graduates through well-chosen and continuously developed programs.	Conduct consistent high quality scientific research for the academic and community development	Provide high quality training and consultation services to meet the community needs.
Prepare qualified computer science graduates according to international standards.	√		
Contribute significantly in computing researches.		√	
Provide training, consultancy and services to the community.			√

Provide supportive environment to foster professional development.		√	

Alignment of the mission of the CS program with the mission of Najran University (NU):

The Mission of the Computer Science Program	Main Elements of the Mission of Najran University		
	Distinctive education that meets the needs of society and the labor market	Contribute effectively to the sustainable development through applied research, the optimal use of modern technologies	The active partnership at the local, regional and global levels
Prepare qualified computer science graduates according to international standards.	√		
Contribute significantly in computing researches.		√	
Provide training, consultancy and services to the community.	√		√
Provide supportive environment to foster professional development.		√	√

Alignment of the Program Educational Objectives of the CS Program with the mission of Najran University

The mission of Najran University mainly focuses on 3 elements as shown in the following table.

	Main Elements of the Mission of Najran University		
Program Educational Objectives (PEOs) of the CS Program	Distinctive education that meets the needs of society and the labor market	Contribute effectively to the sustainable development through applied research, the optimal use of modern technologies	The active partnership at the local, regional and global levels
Join successful profession in the fields of computing.	√	√	√
Follow-up life-long learning in the course of higher education, research and professional development.	√		√
Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.		√	√

Relationships of Program Education Objectives and Student Outcomes

The following table shows the mapping of the Program Educational Objectives (PEOs) and Student Outcomes (SOs).

ABET point of view:

Student Outcomes (SOs)	Program Educational Objectives (PEOs)		
	Join successful profession in the fields of computing	Follow-up life-long learning in the course of higher education, research and professional development.	Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.
a) An ability to apply knowledge of computing and mathematics appropriate to the discipline	√	√	√
b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution	√	√	
c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	√	√	
d) An ability to function effectively on teams to accomplish a common goal	√	√	√
e) An understanding of professional, ethical, legal, security and social issues and responsibilities			√
f) An ability to communicate effectively with a range of audiences		√	√
g) An ability to analyze the local and global impact of computing on individuals, organizations, and society			√
h) An ability to recognize the need for and to engage in continuing professional development	√	√	
i) An ability to use current techniques, skills, and tools necessary for computing practice	√	√	
j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices	√	√	
k) An ability to apply design and development principles in the construction of software systems of varying complexity	√	√	

NCAAA point of view:

No	NQF Learning Domains and Learning Outcomes			
1.0	**Knowledge**			
2.0	**Cognitive Skills**	PEO_1: **Join successful profession in the fields of computing**	PEO_2: **Follow-up life-long learning in the course of higher education, research and professional development.**	PEO_3: **Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.**
2.1	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline;	√	√	√
2.2	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;	√	√	
2.3	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;	√	√	
2.4	An ability to use current techniques, skills, and tools necessary for computing practice;	√	√	
2.5	An ability to apply mathematical foundations,	√	√	

		PEO_1: **Join successful profession in the fields of computing**	PEO_2: **Follow-up life-long learning in the course of higher education, research and professional development.**	PEO_3: **Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.**
	algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices;			
2.6	An ability to apply design and development principles in the construction of software systems of varying complexity.	√	√	
3.0	**Interpersonal Skills & Responsibility**	PEO_1: **Join successful profession in the fields of computing**	PEO_2: **Follow-up life-long learning in the course of higher education, research and professional development.**	PEO_3: **Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.**
3.1	An ability to function effectively on teams to accomplish a common goal;	√	√	√
3.2	An understanding of professional, ethical, legal, security and social issues and responsibilities;			√
3.3	An ability to analyses the local and global impact of computing on individuals, organizations, and society;			√
3.4	An ability to recognize the need for and to engage in continuing professional development;	√	√	

4.0	Communication, Information Technology, Numerical	PEO_1: Join successful profession in the fields of computing	PEO_2: Follow-up life-long learning in the course of higher education, research and professional development.	PEO_3: Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.
4.1	An ability to communicate effectively with a range of audiences		√	√

The following table providesall the program learning outcomes required for graduation with the appropriate assessment methods and teaching strategies:

	NQF Learning Domains and Program Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
2.0	Cognitive Skills		
2.1	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline;	• Lecture: Teacher gives concepts theoretically and by applying those to a real-world case study to be discussed using different examples on different situations. • Discussions: the teacher gives an idea to students and asks them to give their viewpoints, as well as, their reasoning regarding it. • Cooperative Learning: Teacher divides students into groups who are given problem-based assignments and homework to be submitted on a specified deadline.	**Direct Methods:** 1. Course Learning Outcomes assessment (Each Semester) 2. Performance Indicators with a set of rubrics (once every assessment cycle)
2.2	An ability to analyze a problem, and identify and define the computing		

	requirements appropriate to its solution;	• Student-centred learning should be designed to facilitate the learner in doing, thinking, manipulating, constructing, testing, analysing and reflecting.	<u>Indirect Methods:</u> 1. Exit Survey (Each Semester)
2.3	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;	• Organizing the flow of thoughts. • Increasing teaching efficiency by use of software. • Participating in tutorial classes and open lab. • Use more real life examples in the lecture relating to the surroundings of the students to draw attention that certainly helps them to concentrate more on the specific topic. (b-i-3)	2. Current Student Survey (Each Semester)
2.4	An ability to use current techniques, skills, and tools necessary for computing practice;	• During laboratory hours all concepts of theory are discussed through applying them to a case study. During this discussions between the teacher and students regarding open-ended problems are taking place. • Website visits.	3. PAC Meeting and Discussions (Once a Year) 4. Alumni Survey
2.5	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices;	• Give an assignment that includes critical problem which can be answered by internet search, reading the provided outcome and to analyse it. • Pick one student who fully understood a specific topic and let him describe in front of the class in his own manner. • Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term.	5. Employer Survey
2.6	An ability to apply design and development principles in the construction of software systems of varying complexity.	• Before start a new topic or at the end of each topic, students are given couple of minutes to imagine the real life scenarios relating to that topic including implementation, advantages, deficiencies etc. to improve their logical thinking.	
3.0	**Interpersonal Skills & Responsibility**		

	An ability to function effectively on teams to accomplish a common goal;	• Lectures in which students are made aware of the significance of time management. c-ii-2. Creation of interactive teaching and learning environment.	**Direct Methods:**

1. Course Learning Outcomes assessment (Each Semester) |
| 3.2 | An understanding of professional, ethical, legal, security and social issues and responsibilities; | • Discussions with students on ethical behaviour in conducting research.
• Quiz competition among groups.
• Individual counselling on assignments, research project and subject matter difficulties. | 2. Performance Indicators with a set of rubrics (once every assessment cycle) |
| 3.3 | An ability to analyze the local and global impact of computing on individuals, organizations, and society; | • Group assignments and discussions where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with his peers.
• Developing the awareness and confidence among students about their interpersonal know how. | **Indirect Methods:**

1. Exit Survey (Each Semester) |
| 3.4 | An ability to recognize the need for and to engage in continuing professional development; | • Students' counselling and advising.
• Making students alert about class attendance, timing, cleanliness and manner inside the class.
• Encouraging a self-critical evaluation of student existing knowledge and behaviour pattern in solving problems in classroom.
• During laboratory hours all concepts of theory are discussed through applying them to a case study. During this discussions between the teacher and students regarding open-ended problems are taking place. This strengthens both decisions making skills when choosing among a couple of alternatives and communication skills among them because the teacher is expected **that**all students participate in such discussions. | 2. Current Student Survey (Each Semester)

3. PAC Meeting and Discussions (Once a Year)

4. Alumni Survey

5. Employer Survey |
| **4.0** | **Communication, Information Technology, Numerical** | | |
| 4.1 | An ability to communicate effectively with a range of audiences | • Assigning projects/assignments where students must search the relevant material/resource from internet to finish the task.
• Deliver lectures in a steady pace with a loud voice and clear-perfect pronunciation.
• Ask about different ideas on a | **Direct Methods:**

1. Course Learning Outcomes assessment (Each Semester)

2. Performance Indicators with |

		specific topic in the lecture.	a set of rubrics (once every assessment cycle)
		• Class participation by oral questioning and answering. • Encourage students to consult the specialist in the computer lab or IT department for help on web-based material. • Assign research papers that must include analysis of material taken from acceptable web sites. • Demand the use of power point when giving presentations in specific topics of lectures, assignments, and projects . • Solving lots of problems in programming and database systems, its performance, and design. • Require that written homework be typed in proper format. • Numerical skills assessed during orientation. Special tutorials provided for those in need. • Assignments include numerical analysis whenever relevant to topic concerned. • Students will be divided into groups and given programming-based assignments which will help them to work collaboratively, decide independently, and learn more skills to communicate with people. • During laboratory hours all theoretical concepts are discussed through applying them to a case study. During this discussions between the teacher and students regarding open-ended problems are taking place. This strengthens both decisions making skills when choosing among a couple of alternatives and communication skills among them because the teacher is expected to all students participate in such discussions.	**Indirect Methods:** 1. Exit Survey (Each Semester) 2. Current Student Survey (Each Semester) 3. PAC Meeting and Discussions (Once a Year) 4. Alumni Survey 5. Employer Survey

Coordinator of the Department

Name of teacher: Zakaria Saeed Toukal

Last degree name and year of passing: PhD,   2000

Specialization

General: Industrial Data Processing

Specific: Distributed Intelligent Systems and Robotics

University name as per last degree: Val de Marne University, France

Teaching experience: From 1997 to till date

1. Research Interest : Distributed Architecture Based on Multi-agent System For Driving Mobiles Robots, Operations Scheduling by Negotiation, Mobile robot localization using active sensing based on Bayesian network inference

Nu-e-mail: zstoukal@nu.edu.sa

Contact Information

Dr. Zakaria Saeed Toukal

Coordinator of the Department of Computer Science.

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Faculty Members Short Bio-data

Name of teacher: Addin Osman Moahmed Addin	
Last degree name and year of passing: Ph.D., 2007	
Specialization — General: Intelligent Systems / Specific: Optimization Problems	
University name as per last degree: University Putra Malaysia	
Teaching experience: Algorithm Design and Analysis, Computer Graphics, Artificial Intelligence, Programming Languages (C, C++, Java, VB and Delphi), Compiler Design, Theory of Computation, Internet Technologies, Project Management and Software Engineering	
Research Interest : Bayesian Networks, Genetic Algorithms, Data Mining and Software Engineering	
Nu-e-mail: aomaddin@nu.edu.sa	

Name of teacher: Khairan Rajab	
Last degree name and year of passing: PhD	
Specialization — General: / Specific:	
Ph.D. In Computer Science & Engineering, University of South Florida, USA	
Teaching experience:	
Research Interest :	
Nu-e-mail: kdrajab@nu.edu.sa	

Name of teacher: Anwar Ali Yahya Esmail	
Last degree name and year of passing: PhD - 2007	

Specialization	General: Computer Science
	Specific: Soft Computing

University name as per last degree: University Putra Malaysia

Teaching experience:
Assistant Professor
Oct. 2010- Present
Faculty of Computer Science and Information Systems
Najran University – Najran – Kingdom of Saudi Arabia
Assistant Professor
March 2009- Sep. 2010
Faculty of Computer Science and Information Systems
Thamar University – Thamar – Yemen
Part-time Lecturer
Oct. 2009 – Sep. 2010
Faculty of Computer Science and Information Systems
Yemeni Jordanian University – Sana'a – Yemen
Part-time Lecturer
Mar. 2010 – Sep. 2010
Faculty of Engineering and Information Systems
Andulus University – Sana'a – Yemen
Lecturer
Nov. 2002 – Mar. 2003
Faculty of Computer Science and Information Systems
Thamar University – Thamar – Yemen
Lecturer
Nov. 1998 – Sept. 1999
Faculty of Computer Science and Information Technology
Thamar University – Thamar – Yemen
Tutor
Nov. 1997–Oct.1998
Faculty of Computer Science and Information

Technology
Thamar University – Thamar – Yemen
Tutor
Mar. 1997–Oct. 1997
Faculty of Science – Thamar University
Thamar – Yemen

Research Interest :

Soft Computing techniques such as Machine learning, Evolutionary Algorithms, Swarm Intelligence, Fuzzy Logic and their applications to solve problems in various areas, particularly Natural Language Processing, Text Mining, Satellite data, and Bioinformatics

Nu-e-mail: aaesmail@nu.edu.sa

Name of teacher: Mohammad Arif Siddiqui

Last degree name and year of passing: Ph.D., 2010

| Specialization | General: Computer Science |
| | Specific: Wireless communications and networking |

University name as per last degree: Integral University, India

Teaching experience: 3.5 years

Research Interest : WPAN and WMN

Nu-e-mail: masiddiqui@nu.edu.sa

Name of teacher: Ashraf Ahmad Karray

Name of the Department: Computer Science

Last degree name and year of passing: Ph.D.   2008

| Specialization | General: Computer Science |
| | Specific: |

University name as per last degree: University of Bordeaux 1 - France	
Teaching experience: Modern Topics in Computer Science, Computer Algorithm and Data Structures, Object Oriented Programming using Java, Imperative Programming in C language, Database modeling : the entity-relationship model	
Research Interest : Distributed Systems, Communications security, Secure Computing, Smart Card Technology	
Nu-e-mail: akaray@nu.edu.sa	

Name of teacher: Adlan B. A. Alshokri	
Last degree name and year of passing: Master	
Specialization	General: Computer Sciences
	Specific:
University name as per last degree: University Of Khartoum	
Teaching experience: University of Khartoum ,Alamiah for Education and Training , Najran University	
Research Interest :My research interests lie in the intersection of theoretical computer science and machine learning. In particular, I am interested in the design and analysis of algorithms for variable selection, sparse approximation and function estimation.	
Nu-e-mail: abahmed@nu.edu.sa	

Name of teacher: Samiul Islam	Photo Graph
Last degree name and year of passing: Master of Science in Digital Communications Networks; 2004.	
Specialization	General: Computer Science and Engineering

	Specific: Digital Communications Networks	
University name as per last degree: London Metropolitan University		
Teaching experience: 7 years		
Research Interest : Wireless Communication Systems		

Name of teacher: Md. Kafil Uddin		
Last degree name and year of passing: MASTERS OF COMPUTER SCIENCE AND ENGINEERING, AUG 2009.		
Specialization	General: COMPUTER SCIENCE AND ENGINEERING	
	Specific: WIRELESS SENSOR NETWORKING (WSN), RADIO FREQUENCY IDENTIFICATION (RFID)	
University name as per last degree: PUSAN NATIONAL UNIVERSITY, PUSAN, REPUBLIC OF KOREA.		
Teaching experience: 2 Years.		
Research Interest : Wireless Sensor Networking (WSN), Ubiquitous Computing, Streaming Database, RFID systems and RFID middlewares		
Nu-e-mail:		

Name of teacher: Muhammad Akram	
Last degree name and year of passing: MS Computer Science, 2008	
Specialization	General: Computer Science
	Specific: Web Programming and Computer Networks
University name as per last degree: Blekinge Institute of Technology, Karlskrona, SWEDEN	
Teaching experience: 6+ Years	
Research Interest : Computer Networks and Information Security	
Nu-e-mail: maakram@nu.edu.sa	

Name of teacher: SAM Matiur Rahman	
Last degree name and year of passing: M.Sc., 2004	
Specialization	General: Software Engineering
	Specific: Software Design Pattern
University name as per last degree: University of Sherbrooke, Canada	
Teaching experience: From 2004 to till date	
Research Interest : Software Design Pattern	
Nu-e-mail: smrahman@nu.edu.sa	

Name of teacher: Md. Selim Reza	
Last degree name and year of passing: M. Sc(Thesis group), 2005	
Specialization	General: Computer Science and Engineering
	Specific: Image Processing(Artificial Intelligence)
University name as per last degree: Islamic University(Bangladesh)	
Teaching experience: Four (4) Years	
Research Interest : Biomedical Image Processing(Artificial Intelligence)	
Nu-e-mail: msreza@nu.edu.sa	

Name of teacher: HAJI MOINUDDIN	
Last degree name and year of passing: MASTER OF COMPUTER APPLICATIONS, 2002	
Specialization	General: APPLICATION
	Specific: NETWORKS
University name as per last degree: VISHWARIAH TECHNOLOGY UNIVERSITY	
Teaching experience: 7	
Research Interest :WIRELESS NETWORKS	
Nu-e-mail: hmaddin@nu.edu.sa	

Name of teacher: Mohammad Gazi Golam Faruque	Photo Graph
Last degree name and year of passing: MSc in Computer Science & Technology, Year : March-2000	
Specialization — General: Computer Science & Technology,	
Specialization — Specific: Computer Science (Software)	
University name as per last degree: Rajshahi University, Bangladesh	
Teaching experience: More than 11 Years. (Started at April-2000)	
Research Interest : Embedded Systems design. Artificial Intelligent based Web Site design, Automated System Design	
Nu-e-mail: mgfaroog@nu.edu.sa	

Faculty Members Short Bio-data (Girls' Section)

Name of teacher: Dr. Shaidah Jusoh

Name of the Department: College of Computer Science & Information Systems

Last degree name and year of passing: Ph.D, 2006

Specialization	General: **Artificial Intelligence**
	Specific: **Natural Language Processing**

University name as per last degree: University of Guelph, Canada

Teaching experience: More than 10 years

Research Interest: Text Mining, Social Network

NU e-mail: sbjusoh@nu.edu.sa

Name of teacher: Samar Medawi Alqhtani

Name of the Department: Department of Computer Science

Last degree name and year of passing: Master degree in Information Technology, 2011

Specialization	General: **Information Technology**
	Specific: **Information Technology**

University name as per last degree: The University of NewCastle, Australia

Teaching experience: First year

Research Interest: Database, Management, Internet (Web design)

NU e-mail: smalqhtani@nu.edu.sa

Name of teacher: Nazeema Parveen

Last degree name and year of passing: MCA 2004

Specialization	General: Computer Science
	Specific: Computer Applications

University name as per last degree: IGNOU

Teaching experience: 7 years

Research Interest: Computer Network and Security

NU e-mail: nparveen@nu.edu.sa

Name of teacher: Nyla Khadam

Last degree name and year of passing: MS Computer Science   (2008)

Specialization	General: Computer Science
	Specific: Computer Networks

University name as per last degree: International Islamic University Islamabad, Pakistan

Teaching experience: 6+ years

Research Interest: Network Security

NU e-mail: nkkhadem@nu.edu.sa

Name of teacher: Ms.Raniah Zaheer

Last degree name and year of passing: M.Sc(IS)   Master Of Science in Information Systems

Year of passing----2004

Specialization	General: **Computer Applications**
	Specific: **Information Systems**

University name as per last degree: Osmania university

Teaching experience: 8 years

Research Interest: Data mining, databases, Grid Computing

NU e-mail: rzzaheer@nu.edu.sa

Name of teacher: Saira Banu Mohammed Rasool

Last degree name and year of passing: April 2002	
Specialization	General: Computer Science
	Specific: Computer Applications
University name as per last degree: University of Madras, India	
Teaching experience: June 2002 till date (10 years)	
Research Interest: Intelligence in Neural Systems	
NU e-mail: sbrasool@nu.edu.sa	

Name of teacher: Ms.Gulshan Aara	
Last degree name and year of passing: M.Tech **Year of passing----2005**	
Specialization	General**: Computer Science Technology**
	Specific**: Multimedia**
University name as per last degree: Janardhan Rai Nagar Rajesthan Vidya Peeth University	
Teaching experience: 10 years as a Lecturer, 4 years as Assistant Professor	
Research Interest :Computer Human Interaction, neural networks, Image processing	
NU e-mail: gaara@nu.edu.sa	

Name of teacher: Tasquia Mizan	
Last degree name and year of passing: M.Sc. in Computer Science	
Specialization	General: Computer Science and Engineering
	Specific: Network Security
University name as per last degree: University of Leicester	
Teaching experience: 6 years	
Research Interest: E-Learning, M-learning, Cloud Computing, Ad-hoc Networking and Generic Algorithm.	
NU e-mail: tmizan@nu.edu, tmtuni@gmail.com	

Name of teacher: Fahmida Khanam Ahmed Monjurul	
Last degree name and year of passing: M.S in Computer Science and Engineering, 2011	
Specialization	General: Computer Science and Engineering
	Specific: High-Speed TCP variants (Network Technology).
University name as per last degree: North South University	
Teaching experience: 1Year	
Research Interest: computer network.	
NU e-mail: fkahmed@nu.edu.sa	

Name of teacher: Enaam Abd Elgader Abd Allah

Last degree name and year of passing: Master in computer science & information/26-9-2004

Specialization	General: Mathematic & Computer in the faculty of science
	Specific: computer science & information

University name as per last degree: Gezira University - Sudan

Teaching experience:

- **Lecturer & coordinator of academic advising in Faculty of Computer Science and Information Technology, (Girls), period from March 2010 up to date, Najran University.**

- **Lecturer in Community College for Girls, period from Jan 2010 to March 2010, Najran University.**

- **Coordinator of Community College for Girls, period from Sep 2008 to Jan 2010, Najran University.**

- **Dean Faculty of Community College for Girls, period from April 2007 to Sep 2008, Najran University.**

- **Lecturer in education college for teachers, period from Aug 2006 to Sep 2007, in Najran University.**

- **Lecturer in Omdurman Ahlia University faculty of human development and technology-computer center from Jan 2001 to Aug 2006 - Sudan**

- **Lecturer in Jordanian Sudanese College for Science &Technology, period from Jan 2005 to Jun 2006 - Sudan**

- **Part-timer lecturer in Alimam Alhadi College, department of computer, period from Jan 2004 to Jul 2005 - Sudan**

- **Lecturer in Alemam Almahdi University faculty of human development and technology-computer center from Jan 2003 to May 2005 - Sudan**

- **Part-timer teaching Assistance in Sudan international University, faculty of business management & economy – department of computer & information systems, period from Oct 2000 to Oct 2001 - Sudan**

- **Part-timer teaching Assistant in Al Neelain University, faculty of science & technology, department of computer, period from May 2000 to May 2001 – Sudan**

Research Interest: IDEA (International Data Encryption Algorithm)

NU e-mail: eafarh@nu.edu.sa

Name of teacher: Soad Mohammed Fadalmula

Last degree name and year of passing: M.S.C Master in computer science,210

Specialization	General: computer science
	Specific: database

University name as per last degree: Sudan university of science and technology

Teaching experience: 2

Research Interest: database

NU e-mail: smfadlmula

Name of teacher: Zuhal Hamad Ahmed Gourashy

Last degree name and year of passing: Master of computer Science 2006

Specialization	General: computer Science
	Specific: computer Science

University name as per last degree: Sudan University of Science and Technology

Teaching experience: 9 years

Research Interest: Genetic programming

NU e-mail: zhgourashy@nu.edu.sa

Name of teacher: Engr. Muniba Shaikh

Name of the Department: Computer Science

Last degree name and year of passing:Masters and 2011

Specialization	General: Data Mining and AI
	Specific: Investigative Data mining, Database system (oracle), Internet Technologies, Machine Learning Algorithms

University name as per last degree: University of Southern Denmark (SDU), Odense, Denmark

Teaching experience:4 years

Research Interest: Data mining techniques and social networking

NU e-mail: msasadullah@nu.edu.sa

Name of teacher: Ebtsam AbdelHakam Sayed Mohammed

Name of the Department: Computer Science

Last degree name and year of passing:Master Degree in Computer Science 1/2013

Specialization	General: Computer Science
	Specific: Opinion Mining

University name as per last degree:Cairo University

Teaching experience:6 years from 7/2008 to 7/2013

Research Interest: Opinion mining - Bioinformatics

NU e-mail: no email until now

Teaching Assistants (Boys' Section)

Name of teaching assistant: Usaid Ibrahem saeed AL-Ibrahem

Last degree name and year of passing: Bachelor of Science, Computer Science, 2011.

University name as per last degree: ALbaha University

Experience: Teaching Assistant in NU

Research Interest : Databases

Nu-e-mail: uialibrahem@nu.edu.sa

Name of teaching assistant: Mohammed Abdullah Asiri

Last degree name and year of passing: - Bachelor of Computer Science- Computer Science (BCS) ,King KhalidUniversity graduation in 2006.

University name as per last degree: King Khalid University

Experience (Vice Chair of Students Activities - Western Section in Saudi Arabia),Computer   Teacher in Abha Technology collage1427\1428.

 Teaching Assistant in NU

Research Interest: Internet Technologies, Databases, Cloud Computing.

Nu-e-mail: maalasiri@nu.edu.sa

Teaching Assistants (Girls' Section)

Name of teaching assistant: **Hajer Hussein Hameed AlDeen**
Name of the Department: **Computer Science**
Last degree name and year of passing: **Bachelor in Computer Science, 1432H**
University name as per last degree: **Taif University**
Experience: **First year**
Research Interest: **Database – Internet Web**
NU e-mail: **Hhahmed@nu.edu.sa**

Name: Hala Yousif Adaln Mohamed

Last degree name and year of passing: B.SC in computer engineering in Al Neelain University-sudan

Specialization	General: computer engineering
	Specific: computer engineering

University name as per last degree: Al Neelain University-sudan

Teaching experience: laboratory Technical in Faculty of Computer Science and Information Technology, (Girls), period from 15-2-1432 up to date, Najran University.

Research Interest:

NU e-mail: hyadlan

Name of teaching assistant: Awatif Mohammed AlQahtani
Name of the Department: computer sciences
Last degree name and year of passing: Bachelor of Computer Science. in 1433 Higher Diploma in Education. in 1434
University name as per last degree: Najran university
Experience: -
Research Interest: -
NU e-mail: amalQahtany@nu.edu.sa

Name of teaching assistant: Zahrah Abass Meray Al Abbass
Name of the Department: Information System
Last degree name and year of passing: bachelor 1431
University name as per last degree: KKU
Experience: Teach 2 years in Najran University
Research Interest: -
NU e-mail: zaalabbass@nu.edu

Name of teaching assistant: Sahar Ayedh Saleh Alwadei
Name of the Department: Computer Science
Last degree name and year of passing: Bsc. of Computer Science – 2012
University name as per last degree: Najran University
Experience: 6 months
Research Interest: High processing computing and computer systems

NU e-mail: saalwadei@nu.edu.sa

Name of teaching assistant: Sahar Saeed Mohammad Aljarah

Name of the Department: Computer Science

Last degree name and year of passing: Bachelor 1433 h(2012)

University name as per last degree: Najran University

Experience: working at the Information Technology and communications Management for 11 months

Research Interest: Computation Theory

NU e-mail: ssaljarah@nu.edu.sa

Name of teaching assistant: Albetool Hashan Muhammed Almehthel

Name of the Department: Computer Science Department

Last degree name and year of passing: The Bachelor of Computer Science – 2012

University name as per last degree: Najran University

Experience: I worked in department of information technology and communication in Najran university for about 11 months

Research Interest: computer security , Internet technology, Networks

NU e-mail: ahmehthel@nu.edu.sa

Name of teaching assistant: Amal Saeed AlJarah
Name of the Department: Computer Science
Last degree name and year of passing: Bachelor in Computer Science (2012)
University name as per last degree: Najran University
Experience: Working in the General Administration of Information Technology and Communication at the Najran University in the maintenance and technical support for a period of 8 months.
Research Interest: Database management systems and information security
NU e-mail: asaljarah@nu.edu

Other Teaching Assistant

1. Ghada Alsarhani
2. Morade Alsoma
3. Ahood Al-Maleh

Administrative Staff (Boys' Section)

Name of admin staff: Mohammed Ali Abo-saq	
Responsibility: Department faculty members	**None**
Academic qualification: Bachelor	
Experience: 4 years	
Nu-e-mail: maabosaq@nu.edu.sa	

Administrative Staff (Girls' Section)

Name of admin staff:

Aisha Abdul Aziz Noman

Responsibility:

مسمى الوظيفةSecretary

Academic qualification:

بكالوريوس

Experience:

2 years

NU e-mail:

البريد الألكتروني   abood12339@hotmail.com

Name of teaching assistant: Kawkab Mohammed Ahmed AlKhater

Last degree name and year of passing: Bsc IS 1431-1430

University name as per last degree: Imam Muhammad bin Saud Islamic University in Riyadh

Experience: 5 years

Research Interest:

NU e-mail: kokh4ever@hotmail.com

Name of admin staff: **Sahar Ayedh Saleh Alwadei**
Responsibility: **Employees' and Students' Affairs**
Academic qualification: **Bachelor degree of Computer Science**
Experience: **2 months**
NU e-mail: **saalwadei@nu.edu.sa**

Name of admin staff: shahd Ahmed Al Rajb

Responsibility: Network Senior

Academic qualification: Diploma in Programming Technology

Experience: 2 years and 7 months

NU e-mail: sarajb@nu.edu.sa

Name of admin staff: Ebtesam Mohammed Adulrahman Alqahtani

Responsibility: College Administrator

Academic qualification: BS

Experience: 11years

NU e-mail: imalqahtani@nu.edu.sa

Name of admin staff: Aisha Abdulaziz Numan

Responsibility: Writer

Academic qualification: BS

Experience: 3 years

NU e-mail: aanuman@nu.edu.sa

Other Administration Staffs

1. Ebtasam Alnassib
2. Bashaer Al Mansour

Lab Assistant

Mr. Mohammad Hadi	
Tel.: Tel.: (+966) 7 5428612	

Education System

The college follows the semester system. Two semesters are offered in each academic year (each semester is called a level). The duration of each semester is fourteen weeks excluding examination, in addition to an optional 8-weeks summer semester.

Students Admission

Students who want to be admitted in The Department of Computer Science, Najran University, should satisfy the following requirements:

1. The student shall only be admitted to the University upon the calculation of his/her average as follows: 30% general aptitude, 30% achievement test and 40% general secondary (academic) if the student wishes to enroll in preparatory year. For all the other specializations, the average shall be calculated as follows: 30% aptitude and 70% general secondary.

2. The student should have obtained the general secondary certificate or its equivalent from the Kingdom or abroad.

3. No more than two academic years should have elapsed from the date of his/her obtaining such certificate or its equivalent.

4. The student should have a good conduct and proper behavior.

5. The student should successfully pass any exam or personal interview (if found).

6. The student should be medically fit.

7. The student should obtain approval from his authority to pursue his/her studies, if s/he works for any governmental or private body.

8. The student should not have been expelled from Najran University or any other university for academic or disciplinary reasons.

9. After the student is admitted, if it is turns out that he/she has already been expelled for disciplinary or academic reasons, his/her admission shall be considered as void.

10. The student meeting the requirements should present the documents stipulated by the Deanship of Admission and Registration at the University.

11. The student should not be enrolled for another university degree at the same university or at another university and should not have already obtained such degree.

12. Files of students who are late for admission tests (if found) shall be ruled out.

13. Files of students who are late for personal interviews (if found) and do not present an acceptable excuse shall be ruled out.

14. Students who are late in carrying out the admission procedures within the deadline set by the University, and who do not present an excuse acceptable by the Deanship of Admission and Registration shall have cancelled their admission.

Student admission and registration for Computer science (CS) is performed electronically through EDUGATE, supervised by the Deanship of Admissions and Registration. All admission information is described publicly in a clear and understandable way on the program websites, including the requirements, policies and procedures. The Deanship of E-Learning provides all the information regarding distance learning regulations, requirements, enrolment processand also supports students by providing E-learning training (Blackboard) and services through the websites. And these E-learning services were limited to the boys campus till the last academic year. Moreover, the faculty members of CS program experienced difficulties during their course registration process in blackboard at the beginning of this academic First semester 2013/2014. Hence the performance of using E-learning mode for the courses of CS program became unsatisfactory. All most all faculty members of our program play a vital role as an academic advisor to support students during their course registration process and are supervised by College's Academic Advising Unit.

Rules governing admission with credit for previous studies are clearly specified in the student handbook which is developed for CS program and complete information about the program, including the range of courses, program requirements, services and other relevant information is made publicly available to potential students and families prior to applications for admission through program website. At the beginning of each semester, the College arranges a comprehensive orientation program for prospective students to ensure thorough understanding of program requirements, the range of services and facilities available for them, and about their code of conduct & responsibilities.

Employment Zones

1) Computer system analyst for enterprise
2) Human resource management
3) Computer programmer
4) Database designer and administrator
5) Network administrator
6) Software developer
7) System administrator
8) Researcher
9) Teaching profession
10) Industrial data processing.

Medium of Instruction

Languages used for student-centered leaning at the college are Arabic, and English.

Methods of Teaching and Learning

The College of Computer Science and Information systems emphasizes on the student-centered learning should which facilitates the learner in doing, thinking, manipulating, constructing, testing, analyzing and reflecting.

Important methods of teaching and learning at the college are:

1) Lectures
2) Tutorials
3) Independent reading
4) Lab works
5) Individual and small group projects
6) Web browsing and searching
7) Seminars and symposium

Methods of Assessment

Important methods of assessment at the College are:

1) Class tests
2) Assignments and homework
3) Presentation
4) Mini project
5) Lab evaluation through lab reports, lab performance, and exams
6) Midterm exams
7) Final exam

Rules and Regulations for Registration of Courses

The student is automatically registered at the beginning of each semester for a number of units according to his academic standing. Students with lower GPA are eligible to register up to 12 units, while those of higher GPA are eligible for up to 18 units as maximum.

Dropping and Adding of a Course

The Processes of dropping and addingare performed by the student electronically in the first week of the semester through accessing the academic system of the University Deanship of Admission and Registration:

http://www.nu.edu.sa/gui/SubDefault.aspx?PageId=380

No student is allowed to register a course without passing its pre-requisite course.

Students, who pass all courses without failures, are registered in the courses of the subsequent level beginning gradually after the lower levels according to the study plans approved.

Students, who fail in some courses, are registered in courses that ensure their minimum study load in each semester taking into account the following points:

No clash in the course study schedule.

Satisfying the previous requirements of the course or courses to be registered.

Withdrawal Rules

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar for the current semester. No withdrawal is allowed during the last five weeks before the final examination. The student may get chance for the final examination if the college council accepted the student's excuse.

Class Attendance

For academic accomplishment at the college of computer science and information systems students should attend at least 75% of the lectures, tutorials, and practical and laboratory lessons in regular courses. Students failing to meet this requirement in any of his registered courses will be prohibited from attending the final examination of those courses and will have F grades that are zero grades for those courses.

Student Assessment

Student assessment is the process of judgment of students' skills and knowledge at course and program levels. Effective assessment helps to improve student's learning. Towards meeting the objectives of teaching and learning and improving the quality of teaching and learning it's vital to ensure effective assessment procedure throughout the program. The college of computer science and information systems (CSIS) at Najran University (NU) is therefore confidently assessing all students' activities at program and course levels. Faculty members of computer science (CS) program hence use a range of assessment measures including quizzes, assignments, projects, student portfolios, mid-terms and final examinations in order to obtain a clear picture of what students have learned; utilizing this variety of methods also avoids the potential weaknesses and give the chance for further improvement. These results are analyzed and an on-going process of improvement implemented in terms of student learning outcomes (SOs) at program level and course learning outcomes (CLOs) at course level. The CLOs and SOs are assessed and evaluated regularly to improve the quality of CS program. More specifically, faculty collects data from various sources (courses, surveys, etc.) and prepares them for evaluation. Then, the department evaluates the collected data and presents results to various stakeholders for approval. The approved improvements will then are implemented to ensure a systematic quality assurance system. By the end of each semester of the academic year, the department curriculum committee prepared a list of actions to be implemented at the course level, program level, other levels with assigned deadline and responsible people. In the next section (Continuous Improvement), we will explain in more details about approved list of actions taken or to be taken in order to improve the level of achievements of SOs. Our goal is to ensure that the average achievement of each one of the SOs is 65% in this assessment method (CLOs Assessment).

The CS program uses the following procedures to deal with situations where standards of student achievement are inadequate or inconsistently assessed. This is the paramount for the success of the students as well as the whole program of the CS department:

1. By the end of each semester, each instructor has to submit a course report for the corresponding course. The course report contains the achievements of each one of course learning outcomes (CLOs) based on students' performances and surveys. Moreover, if a CLO (students did not achieve the standard) is not achieved, the instructor has to prepare action to be taken in order to improve the achievement levels of students. The course report may also contain recommendations about the assessment methods used in the course.

2. The Curriculum Committee (CC) receives and reviews the course reports. CC approves recommendations/actions to be implemented at various levels in the program (course level, program level and level other than the program, etc.). Note that the approved recommendations are based on the course reports.

3. Student learning outcomes at the program level are assessed by using a set of rubrics. SO assessment groups collect all data and evaluate each one of the SOs. If an SO is not achieved, then an improvement plan must be prepared. Note that the improvement plan might contain actions related to all aspects of the program such as data collection, evaluation of data, facilities and resources, faculty members, etc.

Both direct and indirect assessment methods are used to measure students' performance. Direct assessment methods include quizzes, assignments, exams, etc.; indirect assessment methods include surveys, questionnaires including course survey, students' online survey, current students' survey, exit survey, alumni survey, etc. These exams and survey's results enable faculty to determine where skills and knowledge deficiencies of the students exist and most frequently develop.

Examination and Grading Systems

Examination assessment or evaluation system is based on the theoretical and practical exams and homework, exercises, projects and any other scientific activities. Full marks for each course of the curricula for computer science are equal to100 (hundred) points and is divided into two main sections, namely: course work and final examination.

Course work grade: The 50 (fifty) points are assigned for grading course work. Methods of grading include two midterm exam, class tests, quizzes, homework, assignments, exercises, mini projects, report writing, presentation of projects, lab report and lab exams, and any other scientific activities. Grades are distributed on different parts by course teacher depending on the nature of the course.

2. Final exam grade:

The total points for final exam are 50 points. The method of grading for the final exam includes a theoretical exam.

The pass mark in each course is 60%.

Exam evaluation system at the college is mentioned on the following tables:

Course (Without lab)

Assessment Process	Class test	Assignment/Project	Midterms	Final	Total
Maximum points	10%	10%	30%	50%	100%

Course (With lab)

Assessment Process	Class test	Midterms	Lab	Final	Total
Maximum points	06%	24%	20%	50%	100%

The Grading system of Najran University:

Letter of Grade	Mark (%)	Average Point
A+	95 – 100	5.00
A	90 – 94	4.75
B+	85 – 89	4.50
B	80 – 84	4.00
C+	75 – 79	3.50
C	70 – 74	3.00
D+	65 – 69	2.50
D	60-64	2.00
F	Below 60	1.00

Average and Cumulative GPA:

The Average and cumulative GPA are calculated every semester for the student automatically by the system.

Calculating the Semester Average:

The GPA is calculated considering the following points:

1. Determining the total points obtained in all courses of the semester.
2. Determining the total number of hours registered in the semester.

The average is calculated every semester according to the following equation:

$$\text{GPA} = \frac{\text{Total Points (Item 1)}}{\text{Numbers of Hours registers in the semester (Item 2)}}$$

A student's grade point average (GPA) is determined by dividing the cumulative point value of all courses attempted by the number of units in the student's semester schedule. An example is the following hypothetical student's report having six subjects in a particular semester.

Course	Credit-Hours	Letter Grade	Value Factor	Product (Total Grade Point)
1	2	B+	4.5	9
2	3	D	2	6
3	3	C	3	9
4	4	D+	2.5	10
5	1	B	4	4
6	4	C	3	12
Total	17			50

This student's semester grade point average is (50/17) = 2.94

CGPA (Cumulative GPA): For first semester, students' GPA is also equals to students' CGPA.[(total grade point for semester 1) + (total grade point for semester 2)+……+(total grade point for semester n)] / total credit taken in all semesters.

Example of calculating CGPA: In 1st semester student got 32 total grade points for 11 credits, and in 2nd student got 39 total grade points for 14 credits, the CGPA of this student is:

[(32) + (39)] / (11 + 14) = 2.84 CGPA

The cumulative grade point value is translated as follows:

Accumulative Points	Accumulative Grade
4.50 upwards	Excellent
3.75 - 4.50	Very Good
2.75 - 3.75	Good
2.00 - 2.75	Pass
Less than 2.00	Fail

Transfer Students and Transfer Courses

Internal transfer in college of Computer Science and Information Systems:

From	To	Minimum GPA	Max number of students allowing to transfer per semester/ term
Department of Computer Science	Department of Information Systems	2.5	5
Department of Information Systems	Department of Computer Science	3	10

Restrictions of the Final Examination

No student will be allowed to sit for a final examination after the lapse of 30minutes from the beginning of the examination. Also, no student will be allowed to leave the examination venue less than 30 minutes after the beginning of the examination   .

Undergraduate Project

Independent study course whereby a group of students (3 to 4) at level seven selects one of the proposals submitted by department faculty members with a timeline and evidence of research and analysis, meets with an advisor and co-adviser throughout the semester and then provides a final report regarding system requirement, analysis, and design and makes a formal presentation. In the next semester at level eight every group develops, simulates, implements, and tests software, database through the semester and then provides a final report, presents software, and makes a formal presentation.

The major intended learning outcomes of the project or research task:

1) Development of skills in planning, analyzing, designing, and carrying out a major research project

2) Development of practical skills of using various computer software, programs, programming languages, databases and implement in professional life

3) Improvement of analytical, writing, and communicative skills

4) Improvement of skills in effective time management

5) Improvement in ability to operate as a team member in a significant project

6) Improvement in ability to think critically, research in various aspects

7) Improvement in ability to respect social, ethical, and moral issues

Educational Assistance for Students

Students receive adequate educational assistance for our program both from institutional level (e.g. Deanship of Affairs, Deanship of Admission and Registration, Deanship of Library Affairs, Deanship of E-learning, Deanship of Post Graduate Studies and college level (e.g. Academic Advising Unit, Alumni Unit). Teaching staff of our program have reserved 10 hours per week from their total workload to provide educational assistance to the students by means of mentoring and counseling. In female campus (Attayba Campus), faculties schedule extra 3 hours apart from 10 office hours which is dedicated for academic counseling and advising. In the second semester of the academic year 2012/2013, 33 faculty members delivered 25 departmental courses to 154 undergraduate students in two campuses (Boys and Girls). The student-to-faculty ratio was 4.67:1. This shows the adequacy of faculty size for the offered program and the student population. There are more than 75088 books and other library materials. Out of which 5191 books are related to computer sciences and information systems. The electronic library in the department of Computer Science & Information Systems in Najran University is having 168 GB of data, which contains 119,779 e-books. The library uses an electronic gateway called OPAC and Saudi Digital Library (SDL). Through the OPAC and SDL, users can access the library catalogue, periodical indexes and databases and electronic

reference sources etc. Additionally some of the subject databases are could be useful, depending on the focus or research interest. Complete electronic library databases are available to students, faculty and staff from within the open library staff rooms on the campus using portal ID access. In Computer Science program, both male and female sections' classrooms are equipped with Smart Classrooms for audio/video presentations. Presentations and seminars with a large expected attendance are also scheduled in these two campuses. All the classrooms in College of Computer Science and Information Systems (CSIS) are well equipped with digital podium, smart board (Ketab) and enough seating arrangement for students. The College of CS and IS provides twelve on campus labs among which one is an open lab with internet connectivity, remains open from 8::00 AM till 2:00 PM from Sunday through Thursday. All twelve labs are equipped with Microsoft Windows XPand Microsoft Windows 7 or Linux operating systems. All computers have standard software for productivity, creativity, web browsing and multimedia. Printing is available in all the labs. All faculty members are provided suitable office space in the university campus. Each faculty office has a desktop table with chairs and a cabinet at least one workstation, at least one Ethernet jack and printer. Campus-authenticated wireless connectivity is also available through university gateway via numerous wireless access points in the building. All students have the option to use a university-wide MS Exchange e-mail account; students who prefer to bring their own laptops to campus can configure their systems so they can connect to an Ethernet port to use the internet or MS Exchange e-mail access. College of CS and IS uses University's internal automated communication system called Correspondence Tracking System (CTS) for all official communication including student academic counseling and advice to deal various students' appeals/requests.

Students' Academic Advising Unit

Academic advising unit of CS program governs by the College of CSIS aimed to provide absolute guidance to the students through efficacious counselling regarding students' academic and personal difficulties. However, this service is currently limited to academic concerns. Students are formed in a group according to their student ID and each group has been assigned to an academic advisor to ensure that all students get academic counselling throughout the program. All most all faculty members of the program are playing a role as an academic advisor as a part of their job responsibilities by following the guidelines set by academic advising unit and being monitored by the coordinator of this unit. At present, separate time for student advising in academic advisors' time table has not been enforced to schedule, however the unit is looking forward to implement this plan for the program in near future. Hence, academic counselling is carried out during weekly office hours (10 hours) of the academic advisors'. Each newly enrolled student is encouraged to meet his/her academic advisor and open a student filewhich should be kept and maintained by academic advisor as record. This file should reflect student progress mainly concerning on student's results. Academic advisors write a summary report on each student progress and based on this progress report, at the end of each semester, academic advisors produce a subject plan for the coming semester for each advisee student. After preparing a subject plan for a student, academic advisors are accountable to forward this plan to the academic advising unit and in parallel consult with the student about the proposed subject plan the graduating/higher level (level7,8,9) students depending on the students' necessity. For our along with their expected graduation time frame (part of their program plan). Counselling on career planning take place mostly for the graduating/higher level (level 7, 8, and 9) students depending on the students' necessity. For this program, students' academic appeals are mainly categorized by the form of 'Add/drop courses, absent excuses, Rechecking of exams and Make up exams'. Apart from these academic appeals, other appeals are also considered by the academic advising units by an adopted

mechanism. Each student is accountable to place an appeal through his/her academic advisor using case specific appeal form. All appeal forms are available on the university's website from where student can fetch. These forms are also available with academic advisors. Academic advisors are accountable to consult with the student in detail to spot students' need and provide guidance to fill out the appeal form. During this consultation process, academic advisors are responsible to fetch necessary record from corresponding student file to support his/her opinion.

When an appeal has been finalized and submitted by the student, academic advisors are accountable to attach necessary supporting documents such as student's transcript, medical excuses, add/drop form etc. with this appeal and forward this appeal to the academic advising unit through the University's correspondence tracking system (https://cts.nu.edu.sa/NajranCTS/start) for further processing. The coordinator of academic advising unit is accountable to check completeness and to verify the ground of each appeal based on university's regulations, college rules and program requirements.

If an appeal complies with all requirements, it has been carrying forwarded to the decision making authority (Dean of the college), else it has been returned to the correspondent academic advisor.

The decision making authority provides decision on the majority appeal cases by 7 days that appear in different places/format depending on the nature of the appeal.

Successful appeal for rechecking of exam is forwarded to the college coordinator. College coordinator is accountable to form an evaluation committee and send the review request to that committee. The evaluation committee should consist of at least 3 people (i.e. Program coordinator, subject coordinator, member of that subject's knowledge group) and is accountable to provide the outcome within 3 days.

College of CSIS also developed a system to handle students' complaints. Complaints are normally categorized in forms of general complaints, blind box complaints and direct E-

mail complaints. **General complaints** made by students have no specific allegation and normally related to class room facilities, difficulties with class schedule etc. To make this type of complaints, students have to visit their academic advisors and discuss about their issues. Academic advisors will pass the students complaints to the academic advising unit coordinator. The coordinator will review the complaint and if necessary, will pass it to the college council. College council will pass the decision to the academic advising unit's coordinator and finally the decision will reach to the academic advisor to notify the student about their complaint outcomes. **Blind Box complaints** are normally case specific with pointed allegation and handle with high confidentiality. There is a specific template/form for this type of complaint. The college provided a complaint and suggestion box at the ground floor of College of Computer Science and Information System building (beside Dean's office) with the specified forms. Students write down their complaints and suggestions in the suggested form and drop them in the complaint box. The box usually opened on 25th of each month by the complaint handling committee (in presence of at least 2 members) and passes the complaints (if any) to the college council for further actions. In **Direct E-mail complaints**, students from female campus are allowed to complain directly to the Dean of the college through a specified e-mail address and this kind of complaint is highly confidential and in this case Dean of the college takes the decision directly.

Faculty members are assigned students majoring in their field of expertise and are trained in counselling students regarding program requirements. Student meets with academic advisor either in the group or individually at any time throughout the semester. Advisor has no more than 17 students to advice for the independent study

Advisors major responsibilities are:
1) To make individual student file and keep students records
2) To offer courses for regular and summer semesters
3) To manage students' sick leaves
4) To handle excuses during semester
5) To keep the records of internal, midterms, lab, and final exams' marks

6) To declare marks of internal, and midterms to the students

7) To manage departmental procedures if any student wants to take summer courses in any other universities within the kingdom

8) To monitor students' academic and moral progress

9) To advice the students about program planning and career planning

Student Records

Najran University adopted fully automated system that inherits well defined regulations to keep up student records. This automated system is centrally organized and operated by University's 'Student Record and Registration Department'. Computer science (CS) program is also abided by that automated system. This student record system regularly provides aggregated statistical data required for planning, reporting and quality assurance. Clear rules are established and maintained governing privacy of information and controlling access to individual student records. This automated system supports eligibility checking for graduation in relation to program and course requirements.

Student Management

Computer science program adopted effective policies and regulations to establish fair and consistent processes of student management, with effective safeguards for independent consideration of disputes and appeals. Class Attendance requirements are made clear to students at the time of orientation and are monitored & enforced using automatic student attendance system. Student appeal and complaint procedures are specified in regulations, published and made widely known at the time of orientation. The college of CSIS developed different case specific academic appeal templates to make clear ground of academic appeals. These appeal and complaint procedures protect against time wasting on trivial issues, but still provide adequate opportunity for

matters of concern to students to be fairly dealt with and supported by student counseling provisions. Appeal and complaint procedures guarantee impartial consideration by persons or committees independent of the parties involved in the issue, or who made a decision or imposed a penalty that is being appealed against. Procedures have been developed to ensure that students are protected against subsequent punitive action or discrimination following consideration of a complaint or appeal. For CS program, appropriate policies and procedures are in place to deal with academic misconduct, including plagiarism and other forms of cheating.

Open Lab and Lab Supervising

Open lab is a lab at the college of computer science and information systems where students can spend their times for exercising and practicing their relevant lab works, tutorial works, making presentation in computer with the help of teaching staff. During the semester the open lab is opened from 8:00 AM to 5:00 PM with a short break from 12:00 PM to 1:00 PM. Every teaching staff including TAs is assigned for 2 hours in a week to supervise the open lab and to guide, assist and, help the students to their practice and studies in the lab.

Other than open lab, all other labs of the college are closely monitoring and supervising by the faculty staff members. One faculty member is assigned for one lab, and he is named as "lab supervisor".

Relationship between Sections for Male and Female Students

Computer Science program has the privilege of efficiently running and coordinating two sections for male and female students. Relationship between these two sections for male and female students is judged by the extent to which five good practices are followed in the program. These five good practices are summarized as shown below:

- Equitable distribution of facilities, resources and staffing in both male and female campuses,

- Effective communication system between male and female campus for planning and reporting processes,

- Proportionate female representation in different committees and councils,

- Adherence of a consistent standard for course delivery in both male and female sections,

- Consideration of the performance of both sections for evaluation of the quality of the program.

- Currently there are three methods of communication between the male and female such as Email correspondence of Najran University, CISCO IP phone and Teleconferencing. In a recent survey conducted among all faculty members, it is found that around 48% faculty members prefers Email communication, followed by IP Phone communication (31%) and teleconferencing (21%) regarding planning and reporting purposes. But there are still some problems and limitations in all these communication systems as suggested by the faculty members in both sections.

- On all levels, most of committees consist of male and female members equally participating in the discussions, and carrying out the required actions.The overall female representation in different committees is around 35% that is acceptable. Also recently a female faculty member is included in the College Council, which is ensuring the female participation in decision-making process.

College Learning Facilities

To serve all the departments of the College of computer science and information systems, the College contains a number of computer laboratories, namely: programming lab, database lab, assembly language lab, UNIX lab, artificial intelligence lab, computer graphics lab, networks lab, open lab, and digital lab. The College's physical facilities include:

1) Lecture halls
2) Computer laboratories
3) Digital laboratory
4) Seminar room
5) Open lab

Commitment to Quality Improvement in the Program

Quality development and its improvement of the program is directly controlled and managed by the University higher authority in form of University's President's undeviating involvement along with the deanship of development and quality's relentless supports, monitoring, and commitment to establish quality culture. The DQU of the college which is controlled by quality council, presided by the dean of the College, has formed numerous committees and sub-committees which include representatives from program's administrators, faculty members, and other staff members. Direct involvement of all the academic and administrative staffs of the program creates a generous quality environment in the college as well as in the department (CS) that supports further development, control, and improvement of the quality culture within the program. Committees and sub-committees of the DQU of the program supports and advice on mechanism, policies, procedures, management, and implementation of activities and tasks related to quality control and improvement in the program. The organizational structure of DQU of the program is illustrated in the figures bellow.
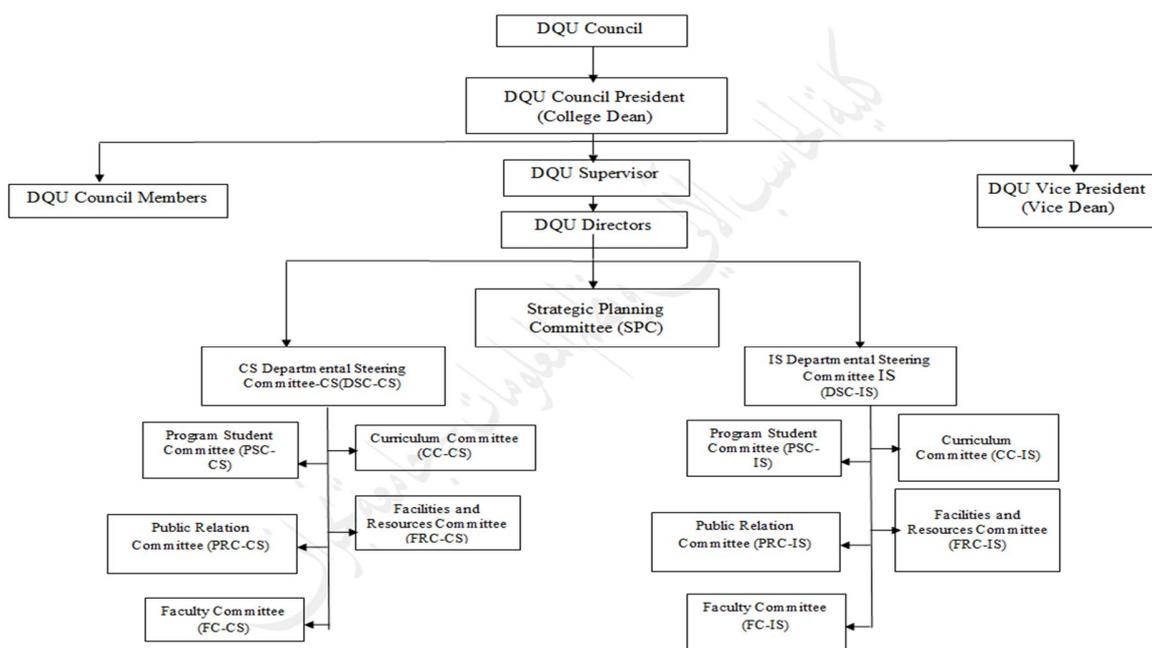
Figure: DQU unit of CS program's organizational structure.

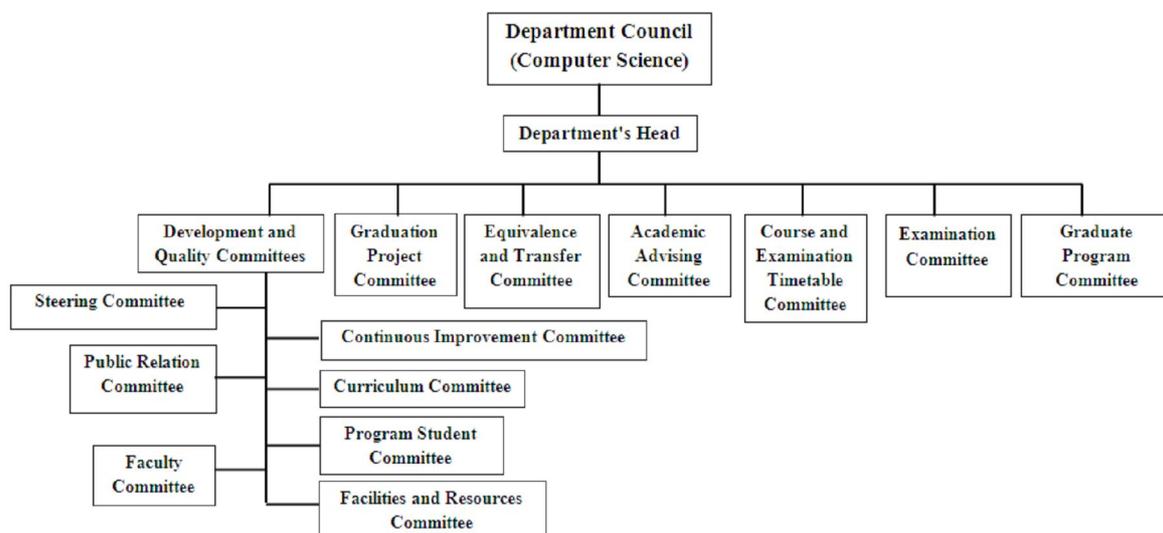CS Department (Program Level) Administrative chart:

Figure: CS Department (program level) administrative chart

Improvements in quality are appropriately acknowledged and great achievements recognized. Faculty members are involved in the quality improvement processes and their participation is required in all sorts of activities. Seminars, workshops, training

programs relating to quality have been provided by Deanship for development and quality, and also program's internal DQU unit that ensures continued quality monitoring. The program's continuous quality improvement processes are illustrated in figures bellow.

All academic and administrative staffs are members of various committees and sub-committees committed to ensure quality culture throughout the CS program in the college. In this academic year 2013/2014 CS Program on behalf of the college of computer science and information systems is going to submit its first report to NCAAA and final report to ABET for its accreditation, and this is the total quality efforts and supports from all academic and administrative staffs related to this program.

At the program level the DQU unit directs the overall program planning, delivery and evaluation by following up with:

1. The preparation of CLOs.
2. The preparation of course specifications.
3. The preparation of course reports.
4. The preparation of course files in each semester.
5. Guidelines to prepare CLOs and course files, course specifications and course reports.
6. Evaluating course report and take steps for its implementation.
7. Preparing and distributing examination guidelines, methods.
8. The preparation of program specification and reports.
9. Design and develop tasks related to academic program quality improvement activities.
10. Arranging seminars, workshops, meetings on quality assurance and management systems.
11. Provide annual plan of all committees those are directly related to quality culture .

12. Conduct various surveys related to academic and administrative staffs, students, alumni, employer, and other stakeholders.

13. Preparing reports on quality works and preparing plans for improvement.

14. Initiates and produces collaboration in between teaching, research, and community services in terms of continuous quality improvement process.

15. Getting approval of all quality planning, works, reports and surveys from college or program council.

16. Monitoring the total quality functionalities in the program.

17. Documenting all quality activities.

18. The preparation of national and international accreditation (NCAAA and ABET).

19. Review the progress of all committees related to the DQU.
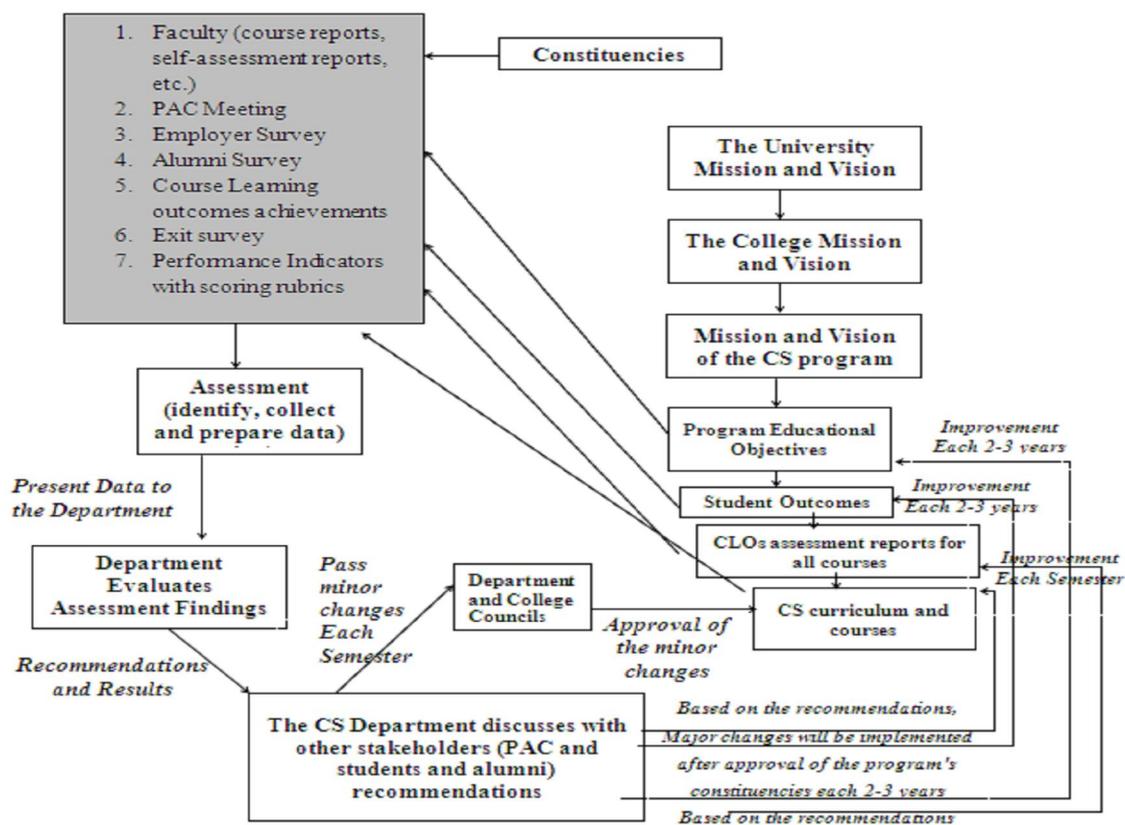
Figure: Continuous Quality Improvement Process for the CS Program

The following table illustrates the mapping of NCAAA standards to ABET criteria. It is clear from the table that a lot of common requirements exist between ABET and NCAAA.

Table: Mapping NCAAA standards to ABET Criteria

NCAAA		ABET	
Standard #	Standard	Criterion #	Criterion
1	Mission and Objectives	2	Program Educational Objectives
2	Program Administration	6	Faculty
3	Management of Program Quality Assurance	N/A	N/A
4	Learning and Teaching	3 5 4	Students Outcomes Curriculum Continuous improvement
5	Student Administration and Support Services	1	Students
6	Learning Resources	**part of ABET Criterion 7**	Facilities
7	Facilities and Equipment	7	Facilities
8	Financial Planning and Management	8	Institutional Support
9	Employment Processes	**part of ABET Criterion 6**	Faculty
10	Research	**part of ABET Criterion 6**	Faculty
11	Relationships with the Community	**part of ABET Criterion 2**	Program Educational Objectives

The key element of any quality assurance system is the existence of a systematic way to improve the quality of the program called Continuous Quality Improvement (CQI). Following figures show how a program fulfills CQI in NCAAA and ABET.
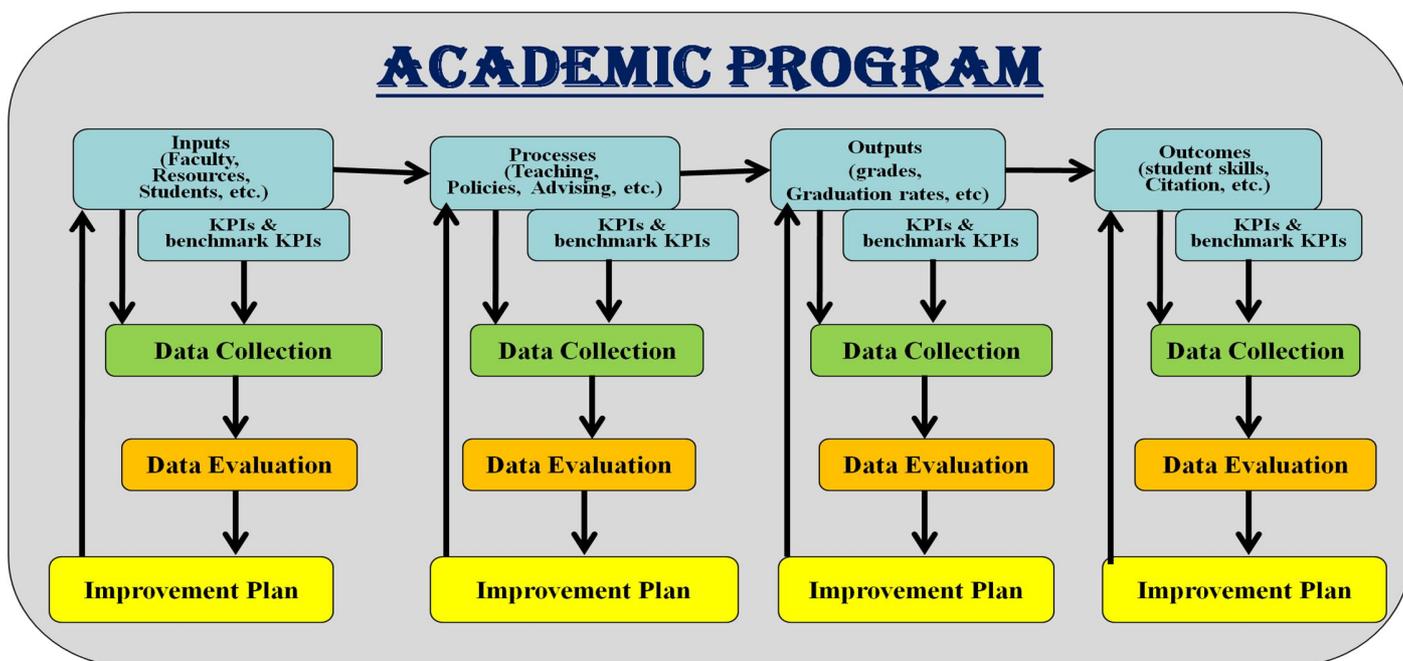

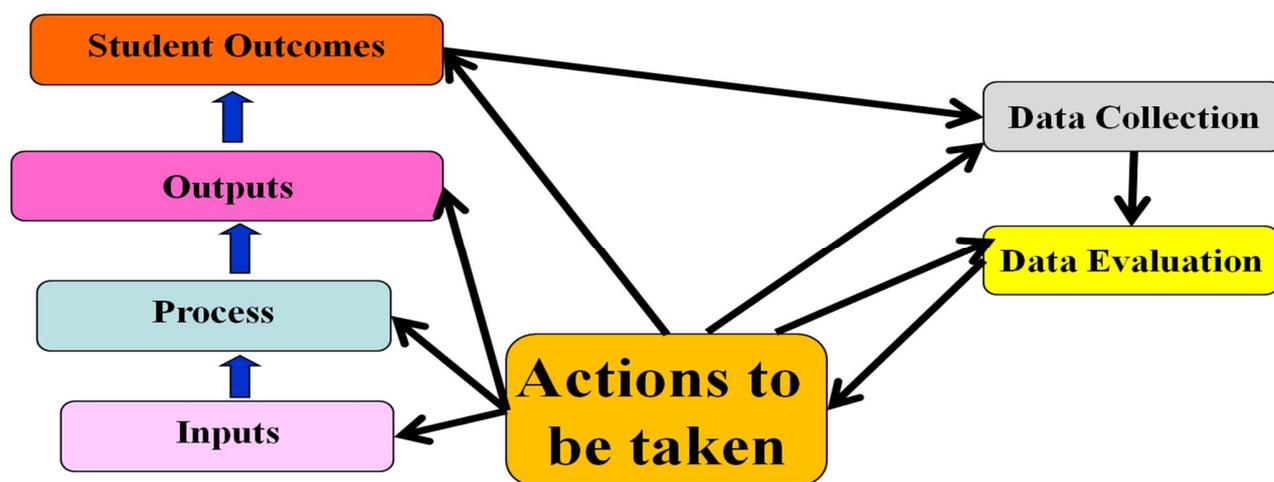Figure: Continuous Quality Improvement (CQI) from the NCAAA point of view

Figure: Continuous Quality Improvement (CQI) from the ABET point of view

Program Evaluation and Review

The main objective of the evaluation and review processes is to evaluate the quality of the CS program. More specifically, all aspects that affect the program (e.g. learning outcomes, facilities and resources, teaching strategies, etc.) are reviewed and assessed to improve the quality of the program, to show responsibility to the general community and to prospective students. The evaluation and review processes are designed to ensure that a sustainable and efficient continuous improvement system is applied to meet the following additional goals:

- To monitor the mission and objectives of the program.
- To foster academic excellence.
- To determine the weaknesses and strengths of all aspects related (e.g. academic, community service and research) to the program.
- To define how to improve the quality of the program.
- To ensure rigor implementation of actions in order to improve the program.
- To improve teaching strategies and other educational practices.
- To check and improve the extent to which each learning outcomes at various levels are being attained.
- To monitor and improve academic support and services provided to students.
- To check that resources and facilities are available and used effectively.
- To provide and improve direction related to administrative decisions on issues related to financial planning and employment processes.
- To maintain internal and external benchmarking and determine how the quality of the program has been improved.
- To obtain national and international accreditations (NCAAA and ABET).

The program is reviewed internally and externally through several assessment methods. The internal review system of the program includes the following:

1. Annual Program Report: The NCAAA annual report template is filled out every year and covers all issues related to the program. This report includes evaluation of learning outcomes and a general evaluation of the program using surveys. The information on enrolment of students, completion rates, records of student completion rates in all courses, and grades distributions are used quality indicators.

2. Curriculum Committee Report About Courses: By the end of each semester, the curriculum committee (CC) reviews all courses' reports (NCAAA format) and prepare a report that contains three sections 1) recommendations to be implemented at the program level 2)recommendations to be implemented for all courses 3) recommendations at specific course level. The recommendations are discussed by the program council and implemented and followed-up.

3. Exit Survey: This survey is filled-up by all students at the time of graduation. Specifically, this survey is given to them before they can make the final presentation of their Graduation Project II (492CSS-4). The purpose of this survey is to measure if the performance indicators for each student outcomes meet the required level of achievement (65% agree or strongly agree) or not. The exit survey explicitly addresses the SOs in terms of their PIs. The exit survey consists of several sections that allow students to give their opinions in advising, learning resources, professional preparation, teaching strategies and educational practices. They also can write comments about the program overall and suggest improvements.

4. University Online Course Survey: By the end of the semester, the quality of the courses is evaluated from the students' perspectives. This survey includes several sections such as 1) content of the course, 2) teaching strategies 3) assessment methods, 4) text books and 5) lecture materials etc. Students overall rating on the quality of their courses is discussed with all faculty members and improvement plan is prepared if needed.

5. Current Student Survey: The program adopted the NCAAA current student survey. This survey is distributed to students once a year. Moreover, this survey is used to take the opinions of students about issues such as 1) Academic Advising and Support provided to students, 2) Learning Resources and Equipment 3) Learning and Teaching 4) learning outcomes and 5) overall quality of the program.

6. NCAAA Course Reports: By the end of each semester, each instructor must submit the course report (NCAAA) that contains assessment of Course Learning Outcomes (CLOs) as well as improvement plan based on CLOs assessment. Improvement plan might be related to several aspects in the program such as facilities, teaching strategies, content of the course, etc.

7. Facilities and Resources Survey: This survey is conducted once a year to take the opinions of faculty members regarding the allocation of facilities and resources and their appropriateness and effectiveness. The Faculty and Resources Committee (FRC) are responsible for this survey.

8. Alumni and Employer Surveys: The alumni and employer surveys contain questions and feedback boxes to assess the achievement and the importance of the current Program Education Objectives. They also can give comments on each one of the PEOs. In addition, the alumni survey contains questions related to the curriculum and overall evaluation (facilities, advising, etc.) of the program. The surveys provide an insight on 1) whether the graduates have accomplished the program educational objectives and 2) the importance and relevance of the current program educational objectives.

9. Program Advisory Committee (PAC) Meeting and Survey: the chair of the department meets every year with the PAC to know whether the current SOs meet the needs of the labor market. PAC evaluates the importance of learning outcomes through survey and ensures that the outcomes are still in-line with the dynamic needs of the industry. In addition, PAC must be involved of any changes to improve the program.

10. Program Administration Survey: This survey is to take the opinion of faculty members about the administration of the program.

11. Questionnaire about the Internal Quality Assurance System: This questionnaire is conducted every year to evaluate the performance of the quality assurance systems in the college.

12. Text Book Evaluation and Availability Form: This form is filled out by all faculty member every semester to evaluate the relevancy of text books and references materials to the academic fields.

13. Evaluation Mechanisms: For each one of the NCAAA standards (11 standards), a set of evaluation mechanisms were developed and used to evaluate the results of the corresponding KPIs and the quality of relevant practices. Mechanisms to evaluate KPIs and standards include data about : when data are collected (e.g. Once a Year), responsible people to collect and evaluate the data (DQU and DSC and CC), Targeted group (Alumni), Assessment methods (Alumni survey), purpose of the mechanism and target (KPI).

Several committees and units are involved in the organization of surveys, data collections, and analysis of results. The DQU and DSC monitor the progress of other committees and ensure that review processes are implemented as planned. The data of the program review processes are collected and evaluated throughout the program by several working committees. Several reports are prepared and reviewed as follows:

- Reports related to the curriculum and academic issues such as courses, learning outcomes are discussed at the curriculum committee and improvement plans are created. The output of the curriculum committee needs approval from the program council and/or college council.

- All evaluation results and reports are discussed at the program council, and if needed, at the college council for approval. Improvement plans are created and followed.

- Major changes in the program must be discussed with all stakeholders of the program including PAC, faculty and students, etc. and finally approved by the program, college and institution councils.
- Minor changes need approval from the program council and can be implemented any time during the program review process (assessment cycle).

The following figure shows the review and evaluation processes of the program. The data are collected for all aspects of the program (KPIs, inputs, processes, outputs and outcomes) from various stakeholders. The data are then analyzed. The evaluation results are discussed by the CC and program and college council. Finally, actions are created and implemented and monitored to improve the quality of the program.
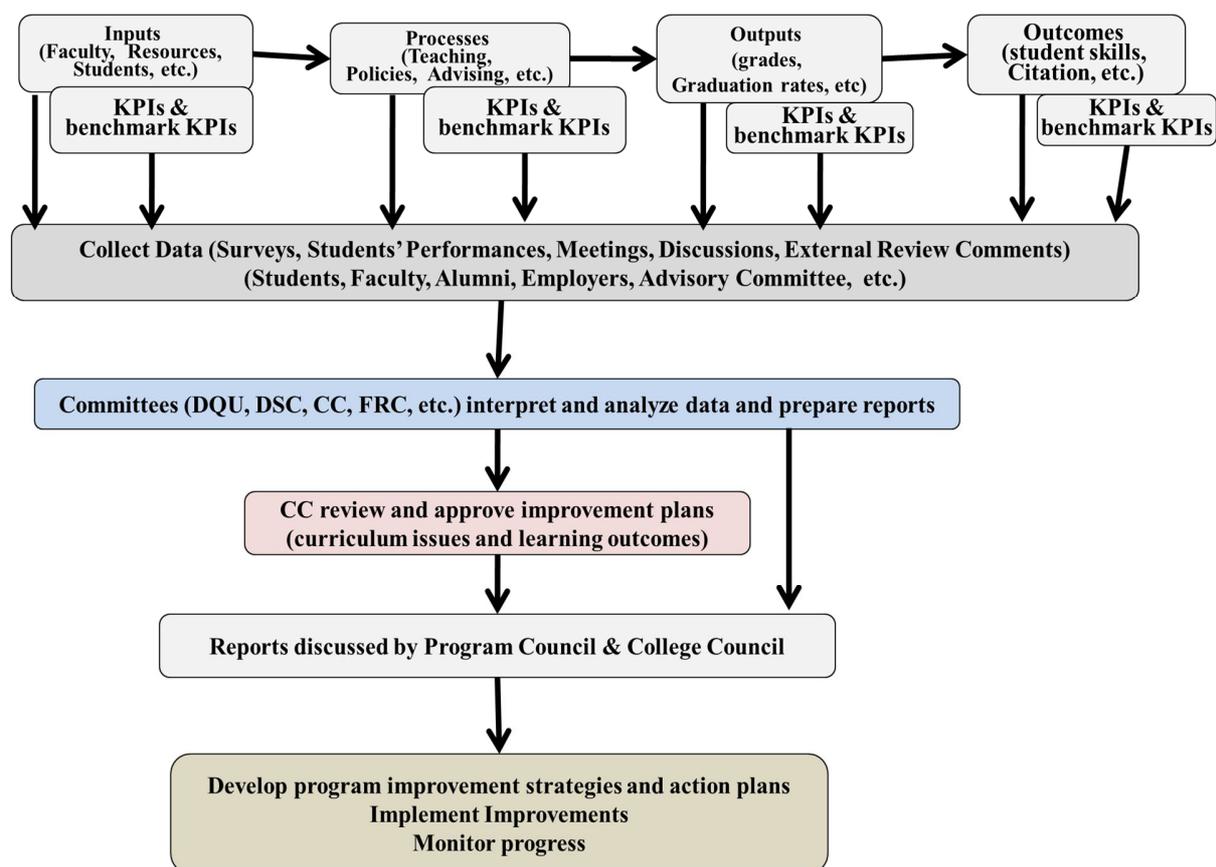
Figure: CS Program Evaluation and Review Processes

Program's Knowledge Group

The curriculum committee has decided and approved 11 knowledge areas for CS program. The knowledge areas are as follows:

i. Programming Languages Concepts
ii. Data Structures and Algorithms
iii. Computer Organization and Architecture
iv. Information Management
v. Operating Systems
vi. Software Engineering
vii. Intelligent Systems
viii. Computer Graphics and Human Computer Interaction
ix. Networking and Distributed Computing
x. Social and Professional Issues
xi. Basic Science

Teaching Staff and Student Involvement in Research

- Faculty of computer science and information systems is aware about the research outcomes in their career development and student educational studies. Regarding research faculty in contributing by involving student in graduation projects and publishing research at different levels to contribute latest educational development both at faculty and student level.

- College of computer science and information systems is well developed institute having clear and defined policies to conduct research at different level. These policy guidelines are internationally recognized and provide clear directions to conduct and published creative and original research.

- There is a mechanism that is operated in the college of computer science and information system that provides an opportunity to junior staff to build their

knowledge and skills to conduct quality research. This mechanism involves the faculty coordination on regular basis and thorough brainstorming on each and every research topic and assistance of seniors to produce quality research.

- The college of computer science and information system does not offer postgraduate program. To carry out Postgraduate research, the postgraduate program should be offered by the department so that students participate in research both individually and in groups at different levels.

- Presently there are no students involved in joint research projects.

The CSISs College's vision places equal emphasis on teaching and research. The CSISs College believes that research is one of three key pillars of academic excellence, along with teaching and community engagement. At CSISs College, we strive to continuously develop our scientific infrastructure to ensure that faculty and students have access to quality research space and resources they need such as classroom space, laboratory facilities, and equipment, access to computing facilities and associated software, private study facilities, and research equipment etc.

Research activities for the program

1. Books and journals and other materials are available in Arabic and English (or other languages) as required for the program and associated research (Available through Deanship of Library affairs website http://portal.nu.edu.sa/web/deanship-of-libraries-affairs/home)

2. Sufficient facilities are provided for both individual and small group study and research as required for the program (Available through deanship of Scientific Research and Research Unit in the college; website:http://dsr.nu.edu.sa)

3. Ready access to on-line data-bases and research and journal material relevant to the program (Available through Deanship of Library affairs website http://portal.nu.edu.sa/web/deanship-of-libraries-affairs/home)

4. Sufficient Budget available for conducting Scientific and Research Projects in the college. The Deanship of Scientific Research announces for Project Proposals, Accepted Projects will get required funding. (All the required information is available with the Deanship of Scientific Research)

5. Facilities meet the health and safety requirements for both faculty and students all over the university.

6. Teaching, laboratory facility is enough to continuing the academic and research activities.

7. Classroom and other Labs facility are easily accessible to all staff members with students.

8. Library catalogue is available on-line.

9. A high speed internet facility is available in central library for users.

Evaluation of community activities in the program

1. Najran University vision, mission and objectives clearly define the commitment towards the fulfillment of the community needs.

2. College of computer science & information system forms advisory board to get the opinion of community to improve the quality of programs at college.

3. Community contribution is one of the factors in faculty evaluation and promotion, which encourage the faculty members to address the community issues.

4. The college has a Research Unit that is working in close with the Centre for Scientific and Engineering Research at Najran University.

5. College of Computer Science and Information System are granted funding from the deanship of scientific research at Najran University and have the experience in dealing with requirements in fulfilling the research funding.

6. Appreciation certificates are awarded for faculty members who are involved in community services.

7. Alumni unit is well established and working. Unit is responsible to keep track the alumni and their contribution towards the community.

8. The alumni are responding to our inquiries.

Community Contribution

According to the 1433/1434 community contribution document done by the college, the researches that address the community needs are listed below:

- Cloud Commerce: Readiness Measurement of KSA.
- Local E-Government Based Cloud Commerce: KSA perspective.
- E-government Based on Cloud Computing with Rational Inference Agent.
- Is Saudi Arabia Ready for E-learning? – A Case Study.
- Mobile Learning in Saudi Arabia – Prospects and Challenges.
- Development of and ICT-based layer model for improving managerial decision making on water issues in arid and semi-arid regions.
- WSN-Based Support for Irrigation Efficiency Improvements in Arab Countries.
- Towards Design of Novel Low Power MAC Protocol for Wireless Body Area Networks.
- Multi-Radio Platform for Wireless Body Area Networks MAC Protocol.
- Seminar on Computer Security.

Study Plan

The education system is semester based (two semesters in a year) in the department of Computer Science. To be graduated from the department any student must complete a 107 credit hours length Computer Science program. The total credit hours are originated from three requirements: University Requirements(12credit hours), and College requirements(30credit hours) and Department requirements 65credit hours.

Analysis of 3 requirements for the computer science program

Requirements Name	Total Courses	Total Credit Hours
University Requirements	06	12
College Requirements	09	30
Department Requirements	21	65
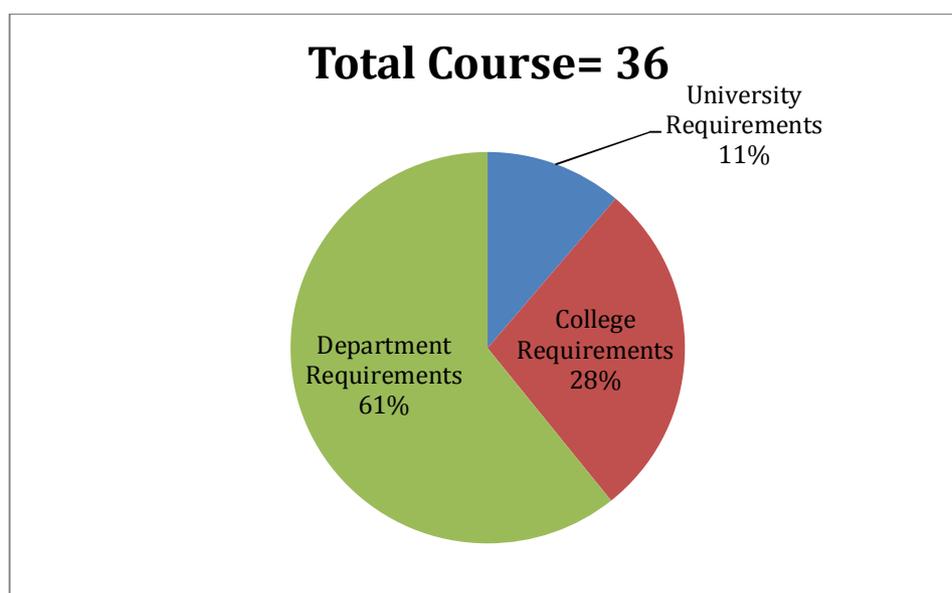
Figure: Analysis the requirements according to the percentage on the basis of total number of courses.
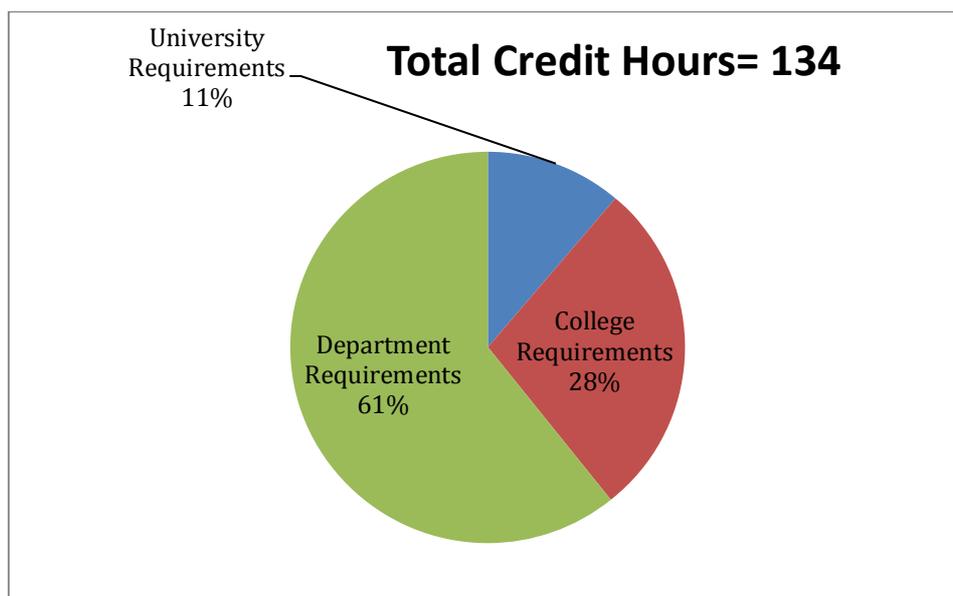
Total Credit Hours= 134

University Requirements 11%
College Requirements 28%
Department Requirements 61%

Figure: Analysis the requirements according to the percentage on the basis of total number of credit Hours.

University Requirements

University Requirements arecourses required toobtaina scientific degree, which consists of 6coursesandthe total number of credits hours are of 12unitsasshowninthe tablebelow:

University Requirements			
Sl. No.	**Course Code**	**Course Name**	**Credit Hour**
1	111ISL-2	Introduction to Islamic Culture	2 (2,0,0)
2	112ISL-2	Islamic Culture 2	2 (2,0,0)
3	113ISL-2	Islamic Culture 3	2 (2,0,0)
4	114ISL-2	Islamic Culture 4	2 (2,0,0)
5	201ARAB-2	Arabic Skills	2 (2,0,0)
6	202ARAB-2	Arabic Writing	2 (2,0,0)
		Total Credit Hours	**12**

College Requirements

The main objective of the college requirements is to provide knowledge and information to students essential to obtain a Bachelor's degree from the Faculty of Computer Science and Information Systems at the University of Najran. Requirements of the College consist of 09 different courses and a number of total 30 credit hours. The requirements of the College cover the courses of Mathematics, Statistics and Probability, Physics, Programming Languages, Data Structures, and Operating Systems as shown in the table below.

College Requirements				
Sl No.	Course Code	Course Name	Credit Hour	Prerequisite
1	106MATH-3	Introduction to Integration	3 (3,0,1)	
2	152MATH-3	Discrete Mathematics	3 (3,0,1)	
3	342MATH-3	Linear Algebra	3 (3,0,1)	
4	104PHIS-4	General Physics	4 (3,2,1)	
5	324STAT-3	Probabilities and Engineering Statistics	3 (3,0,1)	
6	111CSS-4	Programming Language 1	4 (3,2,1)	
7	113CSS-4	Object Oriented Programming	4 (3,2,1)	111 CSS-4
8	212CSS-3	Data Structures	3 (2,2,1)	111 CSS-4
9	227CSS-3	Operating Systems	3 (2,2,1)	111CSS-4
			Total Credit Hours	30

Department Requirements

The requirements of department consist of 21different courses with a number of 65 credit hours on the base of computer science program as shown in the table below:

	Department Requirements			
Sl No.	**Course Code**	**Course Name**	**Credit Hour**	**Prerequisite**
1	222CSS-4	Computer Organization and Architecture	4(3,2,1)	
2	235CSS-3	Theory of Computation	3(3,0,1)	
3	281CSS-3	Computer Graphics	3(2,2,1)	111CSS-4, 342MATH-3
4	474CSS-3	Algorithm Design and Analysis	3(3,0,1)	212CSS-3
5	328CSS-3	Human and Computer Interaction	3(3,0,1)	
7	329CSS-3	Data Communication and Computer Networks	3(2,2,1)	227CSS-3
8	342CSS-3	Software Engineering	3(2,2,1)	111CSS-4
9	361CSS-3	Artificial Intelligence	3(3,0,1)	
10	380CSS-3	Fundamentals of Database Systems	3(2,2,1)	
11	429CSS-3	Computer Security	3(2,2,1)	329CSS-3
12	457CSS-3	Internet Technologies	3(2,2,1)	
13	456CSS-3	Parallel and Distributed Systems	3(2,2,1)	329CSS-3
14	330CSS-3	Programming Paradigms	3(2,2,1)	113CSS-4
15	491CSS-4	Graduation Project 1	4(0,8,0)	342CSS-3

16	492CSS-4	Graduation Project 2	4(0,8,0)	491CSS-4
17	440CSS-3	Social, Ethical and Professional Issues	3(3,0,1)	
18	203MATH-3	Advanced Calculus	3 (3,0,1)	
19	105PHIS-3	Advanced Physics	3 (3,0,1)	
20	101BIOL-4	General Biology	3 (3,1,1)	
21	341CIS-3	Operational Research	3 (3,0,1)	
			Total Credit Hours	65

Symbols Used

Meaning of symbols used in this handbook is identified as follows:

Symbols used in the study plan

Symbols for Course Code	Interpretation
CSS	Computer Science
CIS	Information Systems
MATH	Mathematics
PHIS	Physics
STAT	Statistics
ISL	Islamic Culture
ARAB	Arabic Language
BIOL	Biology

Numbering System

The numbering system used for each course at this College is as follows:

Table of example

Course Code	Course Name
111 CSS-4	Programming Language 1

3 letters, 3 digits, and 1 digit

Explanation: 1. The 3 letters (e.g. CSS) indicate the name of the program

2. The first digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the level of program, it may be either beginning or medium, or higher (advance) level.

3. The second digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the path within the courses of the program.

4. The third digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the sequence of the courses of the program.

5. The 1 digit (e.g. 4) represents total credit hours of the course.

Credit Hours vs. Contact Hours of the program

Calculation of credit hours (credit hours) and hours of communication (contact hours):

"contact hours" refer to the amount of time that a student spends interacting directly with a faculty member at the time of lectures, laboratory (practical), and tutorial (exercises), whereas "credit hours" is the unit weight for the number of weekly classes of the subject which is determined by the university.

The format of credit hours for each course:

Number of credit hours (theoretical, laboratory (practical), exercises (tutorial))

Number of credit hours calculated from the hours of theoretical and laboratory

exercises, where:

Every hour (academic hour=50 minutes) of theory calculated one credit hour.

Every two hours of laboratory calculated one credit hour.

Each hour of tutorial (exercise) counted zero credit hours, in other words hours of exercises are not counted in credit hours.

Example:

If a 3-credit "Computer Architecture" course met from 11:00-11:50 on Saturdays, Mondays, and Wednesdays for 14 weeks, then the course would have 42 "credit hours" and 56 (Theoretical/ Lecture=42 + Lab=0 + Tutorial=14) "contact hours".

The above mentioned credit hours are determined by multiplying 1 hour (50-minute= 1 academic hour) classes by 3 (3 classes per week) and then by 14 (14 weeks of classes).

Semester Wise Course Distribution
Preparatory Year

Level One			
Course Code	**Course Name**	**Credit Hours**	**Prerequisite**
140TEC-3	Computer Skills	3	
140MATH-2	Introduction of Mathematics	2	
140SKL-2	Learning, Thinking and Research Skills	2	
140ENGG-2	English Language: Reading Skills	2	
141ENGG-2	English Language: Writing Skills	2	
142ENGG-2	English Language: Listening and Speaking Skills	2	
143ENGG-2	English Language: Grammars	2	
Total Number of Credit Hours		**15**	

Level Two			
Course Code	**Course Name**	**Credit Hours**	**Prerequisite**
150MAN-1	Occupational Ethics	1	
140MATH-4	Algebraic Sciences	4	
150SKL-2	Communication Skills	2	
150ENGG-3	English Language: Speaking	3	
151ENGG-2	Report Writing	2	
Total Number of Credit Hours		**12**	

Total 27 Credit Hours

Regular Semester

Level Three			
Course Code	**Course Name**	**Credit Hours**	**Prerequisite**
111ISL-2	Introduction to Islamic Culture	2	
104PHIS-4	Fundamental of Physics	4	
111CSS-4	Programming Language 1	4	
106MATH-3	Introduction to Integration	3	
152MATH-3	Discrete Mathematics	3	
Total Number of Credit Hours		**16**	

Level Four			
Course Code	**Course Name**	**Credit Hours**	Prerequisite
201ARAB-2	Arabic Language Skills	**2**	
342MATH-3	Linear Algebra	**3**	
113CSS-4	Object Oriented Programming	**4**	111 CSS-4
324STAT-3	Probabilities and Engineering Statistics	**3**	
203MATH-3	Advanced Calculus	**3**	
Total Number of Credit Hours		**15**	

Level Five			
Course Code	**Course Name**	**Credit Hours**	**Prerequisite**
112ISL-2	Islamic Culture 2	**2**	
212CSS-3	Data Structures	**3**	**111CSS-4**
105PHIS-4	Advanced Physics	**4**	**104PHIS-4**
222CSS-4	Computer Organization and Architecture	**4**	
330CSS-3	Programming Paradigms	**3**	**113CSS -4**
Total Number of Credit Hours		**16**	

Level Six

Course Code	Course Name	Credit Hours	Prerequisite
227CSS-3	Operating Systems	3	**111CSS-4**
113ISL-2	Islamic Culture 3	2	
342CSS-3	Software Engineering	3	**111 CSS-3**
101BIO-4	General Biology	4	
235CSS-3	Theory of Computation	3	
Total Number of Credit Hours		**15**	

Level Seven

Course Code	Course Name	Credit Hours	Prerequisite
281CSS-3	Computer Graphics	3	**111CSS-4, 342MATH-3**
361CSS-3	Artificial Intelligence	3	
457CSS-3	Internet Technologies	3	
380CSS-3	Fundamental of Database Systems	3	
329CSS-3	Data Communication and Computer Networks	3	**227CSS-3**
Total Number of Credit Hours		**15**	

Level Eight

Course Code	Course Name	Credit Hours	Prerequisite
491CSS-4	Graduation Project 1	4	**342CSS-4**
456CSS-3	Parallel and Distributed Systems	3	**329CSS-3**
114ISL-2	Islamic Culture 4	2	
328CSS-3	Human and Computer Interaction	3	

474CSS-3	Algorithm Design and Analysis	3	212CSS-3
Total Number of Credit Hours		**15**	

Level Nine			
Course Code	**Course Name**	**Credit Hours**	**Prerequisite**
492CSS-4	Graduation Project 2	**4**	**491CSS-4**
341CIS-3	Operational Research	**3**	
440CSS-3	Social, Ethical, and Professional Issues	**2**	
429CSS-3	Computer Security	**3**	**329CSS-3**
202ARAB-2	Arabic Writing	**3**	
Total Number of Credit Hours		**15**	

Total credit hours: 107

Level Wise Credit Hours' Analysis

Level No.	**Credit Hours**
Level 3	16
Level 4	15
Level 5	16
Level 6	15
Level 7	15
Level 8	15
Level 9	15
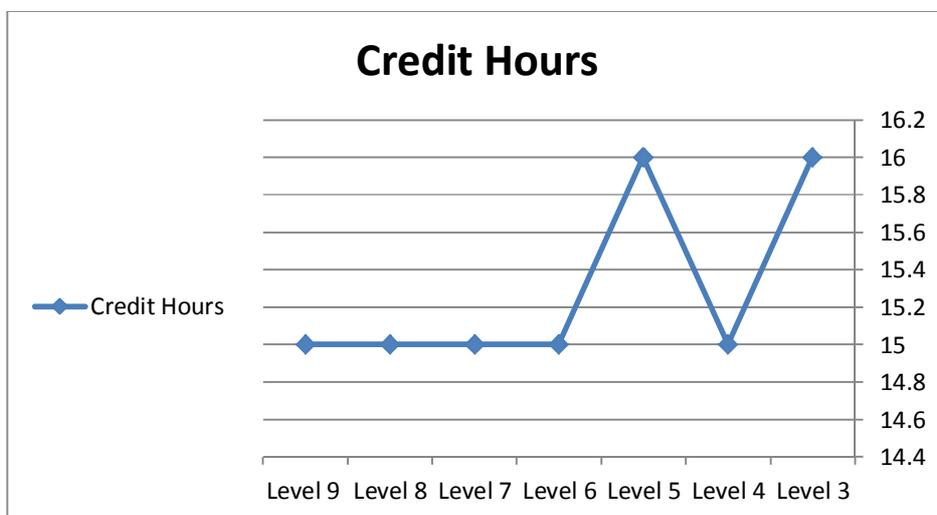
Credit Hours

Figure: Analysing the credit hours per level.

CS Program's Prerequisite Map

LEVEL 1	140TEC-3	140MATH-2	140SKL-2	140ENGG-2	141ENGG-2	142ENGG-2	143ENGG-2
LEVEL 2		150SKL-2	150MATH-4	150MAN-1	150ENGG-2		151ENGG-3

Preparatory Year

LEVEL-3	111ISL-2	104PHIS-4	111CSS-4	106MATH-3	152MATH-3
LEVEL-4	201ARAB-2	342MATH-3	113CSS-4	324STAT-3	203MATH-3
LEVEL-5	112ISL-2	212CSS-3	105PHIS-4	222CSS-4	CSC330-3
LEVEL-6	235CSS-3	113ISL-2	1O1BIOL-4	342CSS-3	227CSS-3
LEVEL-7	281CSS-3	361CSS-3	457CSS-3	380CSS-3	329CSS-3
LEVEL-8	328CSS-3	474CSS-3	114ISL-2	491CSS-4	456CSS-3
LEVEL-9	429CSS-3	341CIS-3	440CSS-3	492CSS-4	202ARAB-2

Computer Science Program

Course Description

Level-3/ Semester-3

Course Code	Course Name	Credit Hours	Prerequisite
104PHIS -4	**Fundamentals of Physics**	**4(3,2,1)**	

Course Contents:

Vectors; uniformly accelerated motion; Newton's laws; work, energy and power; oscillatory motion; wave motion; electrostatics; the electric field and the electric potential; electric current; magnetic fields and electromagnetic waves; atomic models; crystal structures and bonding in solids; free electron theories of solids; semiconductors; semiconductor devices.

Course Code	Course Name	Credit Hours	Prerequisite
111CSS-4	Programming Language 1	**4(3,2,1)**	

Course Contents:

Introduction to C programming language, algorithms, flowcharts, data types, identifiers, storage classes, constants, operators, expressions, statements, console I/O statements, selection statements, switch, iteration statements, jump statements, function calls, Arrays, pointers, structures, unions, enumerations, file I/O, and basic principles of the C++ programming language (e.g. data types, objects and classes).

Course Code	Course Name	Credit Hours	Prerequisite
106MATH -3	**Introduction to Integration**	**3(3,0,1)**	

Course Contents:

The integral and its properties, Riemann sums and the definite integral, area under a curve, formal properties: Additivity, linearity, triangle inequality, the fundamental theorem, indefinite integrals, integration by substitution, integration of powers of sinus and cosines, integration by parts, integration of rational functions with linear or quadratic denominator, and a variety of applications of integration.

Course Code	Course Name	Credit Hours	Prerequisite
152MATH -3	Discrete Mathematics	3(3,0,1)	

Course Contents:

Number systems; Logic: conjunctions, logical equivalence and arguments, predicate logic; propositional logics, methods of proofs. Sets: operations on sets, Cartesian products. Relations: Equivalence relations, order relations, functions, counting principles, permutations and combinations, trees and graph.

Level-4/Semester-4

Course Code	Course Name	Credit Hours	Prerequisite
342MATH -3	Linear Algebra	3(3,0,1)	

Course Contents:

Linear equations, matrix representation of linear equations, inverse of matrix, symmetric matrices, determinants, vector representation, relationship between vectors, vector spaces and subspaces, linear independence, basic of vector spaces, linear transformations, bases of vector spaces, linear transformations, rank of matrix, Eigen values and eigenvectors, and orthogonally and least squares.

Course Code	Course Name	Credit Hours	Prerequisite
113CSS-4	Object Oriented Programming	4(3,2,1)	111CSS-4

Course Contents:

Introduction to object oriented programming (OOP) concepts, basic Java syntax, introduction to objects and classes, data types, variables and operators, selection and control structures, array, properties of classes, inheritance, package and interface, abstract class, polymorphism, exception handling, thread, multithreading, file system, I/O, applet, Java Network, Interface, Interface Development Environment.

Course Code	Course Name	Credit Hours	Prerequisite
324STAT -3	**Probabilities and Engineering Statistics**	3(3,0,1)	

Course Contents:

Concepts of statistics and its applications in science and engineering, measure of central tendency, measure of dispersion, regression, correlation, and their applications. Concepts of probability and its applications in science and engineering, probability axioms, conditional probability, independent probability for events, some probability distributions and random variables: discrete and continuous random variables, some important probability distributions (discrete and continuous), computer applications using statistical software.

Course Code	Course Name	Credit Hours	Prerequisite
203MATH -3	**Advanced Calculus**	3(3,0,1)	

Infinite Sequences, Infinite series, convergence and divergence of infinite series, integral test, ratio test, root test and comparison test. Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals. Motion of particle in space, tangential and normal components of acceleration. Function in two or three variables, their limits, continuity, partial derivatives, chain Rule, directional derivatives, tangent planes and normal lines to equations, Extrema of Functions of Several Variables, Lagrange Multipliers, Double integral and its applications to area, volume, moments and center of mass. Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass. Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem.

Level-5/Semester-5

Course Code	Course Name	Credit Hours	Prerequisite
222CSS-4	**Computer Organization and Architecture**	**4(3,2,1)**	

Course Contents:

This course will develop Assembly Language programming to illustrate the role and interaction between computers main component, specifying on assembly instructions and addressing: data transfer instructions, arithmetic instructions, logical instructions, conditional and unconditional branch instructions, loop instructions, and procedure calls, macro instructions.
Then it will also discuss on the Number Systems (decimal, hexadecimal and binary) and their basic operations. Relating the computer basic units' organization and design such as memory, control, arithmetic and logic unit, and registers with computer instructions and addressing modes, timing and control, execution cycle of instructions, Input, output and interrupt.

Course Code	Course Name	Credit Hours	Prerequisite
212CSS-3	**Data Structures**	**3 (2,2,1)**	**111CSS-4**

Course Contents:

Study of common Abstract Data Types (ADTs), basic data structures and design and analysis of algorithms. Common ADTs: stack, queue, list, tree, priority queue, map and dictionary. Basic Data structures include arrays, linked lists, heaps, hash tables, search trees. Basic design and analysis of algorithms covers asymptotic notation, recursive algorithms, searching and sorting, tree traversal, graph algorithms.

Course Code	Course Name	Credit Hours	Prerequisite
330 CSS-3	**Programming Paradigms**	**3 (2, 2, 1)**	**113 CSS-4**

Course Contents:

Introduction to programming languages, the static and dynamic scope, communication between subprograms via parameter passing, and storage management (static and dynamic), languages using virtual machines: Java programming language is discussed as an example of languages that use virtual machines (VM); the main differences between C++ and Java, Introduction to functional programming (basic skills about Scheme programming language), general differences between the Scheme and the C programming language, logic programming, modern programming (e. g. Python and C#).

Course Code	Course Name	Credit Hours	Prerequisite
105PHIS-3	Advanced Physics	3(3, 1,1)	

Atomic structure: electronics configuration, classification of elements, energy levels. Crystal structure: lattice, symmetry, space group, examples for simple structure. Electrical properties of materials and electricity: classification of materials. Magnetic properties of materials and magnetism. Thermal properties of materials: thermal energy, thermoelectric power (Seebeck Effect). Mechanical properties of matter (Young's modulus, tensile materials).

Level-6/Semester-6

Course Code	Course Name	Credit Hours	Prerequisite
235CSS-3	Theory of Computation	3 (3,0,1)	

Course Contents:
Introduction to languages, Alphabets and strings, concatenation, languages, operations on strings and languages, regular expressions and regular languages. Analysis of Finite-state Automata, regular expressions and equivalence with automata, Non-deterministic FA and their equivalence to deterministic FA, and Pumping Lemma, Push-down Automata and equivalence with context-free grammars. Introduction to Turing Machines and various models of TM's and their equivalence. Study of Context-Free Grammars and languages, transitions between grammars and machines, derivations and derivation trees. Simplification of context-free grammars and Chomsky normal form. Brief introduction to Decidability, Reducibility, Un-decidability, Time Complexity including the classes P and NP.

Course Code	Course Name	Credit Hours	Prerequisite
227 CSS-3	Operating Systems	3 (2,2,1)	226 CSS-2

Course Contents:

Introduction, history and evolution of operating systems, operating system structure, process management and scheduling, inter process communication, process coordination and synchronization, threads (overview, multithreading model and threading issues), CPU scheduling (Basic concepts and scheduling algorithms), deadlocks (deadlock characterization, methods for handling deadlock), deadlock prevention, deadlock avoidance and detection, memory management, introduction to protection and security issues, introduction to file management and application.

Course Code	Course Name	Credit Hours	Prerequisite
342 CSS-3	Software Engineering	3 (2,2,1)	111 CSS-3

Course Contents:

Study of common Software Engineering, comprehensive introduction to software engineering. It gives an introduction to basic concepts, principles and techniques used in software engineering. It discusses the nature of software and software projects, software development models, software process maturity, project planning, management, and communication. This course gives an introduction to methods for analysis, design, testing, and implementation of large, complex software systems.

Course Code	Course Name	Credit Hours	Prerequisite
101BIOL-4	General Biology	3 (3, 1, 1)	

Level-7/Semester-7

Course Code	Course Name	Credit Hours	Prerequisite
281 CSS-3	Computer Graphics	3 (2, 2, 1)	111 CSS -4, MATH 342-3

Course Contents:

This course is dedicated to introduce the fundamental concepts in creating computer graphical images. Computer graphics is a multidisciplinary field which uses different ideas from art, mathematics, and computer science to create images. In this course the students study OpenGL that has combinations with C and C++ to create graphical images by writing frequent programs and solve problem sets. Topics to be covered in this course as: Introduction to graphics concepts, basic graphics programming and OpenGL (or 3D Max), basic raster graphics algorithms and primitives, scan conversion, graphics hardware, 2D geometrical transformations, 3D geometry and viewing, hierarchical modeling, input devices and techniques, lighting and color, projections, hidden surface removal, and shading and rendering.

Course Code	Course Name	Credit Hours	Prerequisite
361CSS-3	Artificial Intelligence	3 (3,0,1)	

Course Contents:

Introduction to Artificial Intelligence: Intelligent agents and knowledge representation (semantic networks, frames, propositional and high-order logics), Searching Techniques: Uninformed search algorithms (breadth first and depth first with related strategies; branch-and-bound and optimal path; memory-bounded search strategies), Heuristic search (Greedy search, A*-search, and hill climbing), Logic: Predicate and propositional logic, resolution and deductive proof techniques (e. g. generalized modus ponens), Planning: Planning operators/languages, planning
algorithms including (partial-order planning, re-planning, and conditional planning), Reasoning with uncertainty, decision making: Introduction to probability, Bayesian Rule, Belief Networks and inference with them; basic concepts of decision theory and decision making, Learning: General concepts of learning with introduction to PAC theory; learning algorithms including: decision trees and decision lists, hypothesis space learning, and perceptron, Agent interaction: Basic concepts of agent

communication and coordination, including adversarial search and game theory, Philosophical concerns: Including questions about possibility of achieving intelligent behavior, intentionality, Constraint Satisfaction Problems: Game playing, machine learning, natural language processing, expert Systems, vision and Robotics, Introduction to Prolog: Presentation of prolog (the program and query) and the facts (simple facts, facts with arguments and how to query).

Course Code	Course Name	Credit Hours	Prerequisite
380 CSS-3	**Fundamentals of Database Systems**	3 (2,2,1)	

Course Contents:

Study of fundamental concepts and techniques of modeling and design of databases and database programming languages. We begin with an introduction to Databases, architecture of Database Management Systems (DBMS), overview of database design and SQL programming language. Two database design models and notations: the entity relationship (E/R) and Object-Oriented (e.g. Object Definition Language ODL). Relational database theories, including the conversion of E/R to normalized relational databases, functional dependencies and normalization. Relational Algebra. Advanced SQL covers sub-queries and views, triggers integrity constraints. Brief overview of XML data model, data warehouse, data mining, and data security, if time permits.

Course Code	Course Name	Credit Hours	Prerequisite
457 CSS-3	**Internet Technologies**	3 (2,2,1)	

Course Contents:

Study the history and fundamentals of the internet, Common web applications, types of web pages, web publishing and to learn about Internet protocols (HTTP, TCP/IP and FTP), Client/Server Architecture and the MVC approach in Website design. Programming with HTML, XHTML, cascading style sheets (CSS), and JavaScript, client and server side scripting, develop dynamic web application with PHP or ASP and MySQL. Finally, evaluating web sites and applications and learning about web privacy and various security issues.

Course Code	Course Name	Credit Hours	Prerequisite
329CSS-3	**Data Communication and Computer Networks**	**3(2,2,1)**	**227 CSS-3**

Course Contents:

Data transmission and physical infrastructure, flow control and error control, layered models, LAN and WAN-systems, packet and circuit switching, internetworking and IP, transport layer protocols (e.g. TCP and UDP), communication Models, applications (DNS, SMTP, FTP, HTTP, Telnet, etc.).

Level-8/Semester-8

Course Code	Course Name	Credit Hours	Prerequisite
491CSS-4	**Graduation Project 1**	**4(4.0,1)**	**342CSS-3**

Course Contents:

This course provides to student with the opportunity to carry out a collective piece of supervised work; relevant to their degree. Writing and presentation skills, visibility study, specification of software requirements and software life cycles, software projects planning, assessment, control and scheduling, resources allocations, risk management, and other topics such as: software re-use, quality assurance, control and management, human factors in controlling people, leader and team building, maintenance and management tools (e.g. MS Project).

Course Code	Course Name	Credit Hours	Prerequisite
474CSS-3	**Algorithm Design and Analysis**	**3(3,0,1)**	**212CSS-3**

Course Contents:

This course introduces various algorithm design paradigms and the basics of computational complexity analysis using different models of computations with the overview of mathematical essentials, space and time complexities, asymptotic notations. Design and analysis of algorithms covers linear programming, greedy

algorithms, divide-and-conquer, backtracking, branch-and-bound, search methods, graph algorithms and introduction to NP-Completeness.

Course Code	Course Name	Credit Hours	Prerequisite
328CSS-3	Human and Computer Interaction	3(3,0,1)	

Course Contents:

Theoretical concepts of human-computer interaction (HCI), design principles for graphical computer interfaces, dimensions and multi-disciplinary nature of human computer interaction, user interface design, user requirements analysis, user modeling, task analysis, general principles in user interface design, principles, rules and models in human-centered design, design guidelines, standards and style guides, dialogue styles, , ergonomics and human factors, usability, toolkits, development environments and user interface management systems, formative and summative evaluation, user interfaces for the web, enhanced human-computer interaction, and advanced issues in human-computer interaction.

Course Code	Course Name	Credit Hours	Prerequisite
456CSS-3	Parallel and Distributed Systems	3 (3,0,0)	329CSS-3

Course Contents:

Introduction to parallel systems; Processes and processors; Parallel architectures (multi-computer, multi-processor); Performance of Parallel systems (speedup, efficiency, etc.); Characterization of distributed systems; System models; Inter-process communication; Remote invocation; Distributed operating system; and Distributed file systems.

Level-9/Semester-9

Course Code	Course Name	Credit Hours	Prerequisite
492CSS-4	Graduation Project 2	4 (0,8,0)	491 CSS-4

Course Contents:

During this course, every group must do oral presentations and present and describe the software they have developed for the project. At the end of the course and after the approval of the supervisor about what have been accomplished, the group must submit a complete package containing the software developed for the project, any devices that are essential for the project, preparation of a manual user specific model and a written report about the project satisfying the university report requirements. In addition, they have to present and defend their project.

Course Code	Course Name	Credit Hours	Prerequisite
429CSS-3	Computer Security	3 (2,2,1)	329CSS-3

Course Contents:

Introduction to Computer security and basic cryptography topics. Study the various developments in security, with emphasis on public-key encryption, secret key systems, the data encryption & Decryption standards , control and protection methods, elements of technical security: authentication, integrity, availability, auditing, non-repudiation, confidentiality/privacy/secrecy. Message authentication and hash functions, hash and MAC algorithms, digital signatures and authentication protocols, internet security, security flaws and vulnerabilities, malicious software, firewalls, intrusion detection methods.

Course Code	Course Name	Credit Hours	Prerequisite
440CSS-3	Social, Ethical and Professional Issues	3 (3,0,1)	

Course Contents:

This course aims at developing the ethical reasoning skills and sensitivities that computer professionals will need to make good decisions and to justify them. The

course includes a general introduction to ethical theories and their use in making and justifying decisions. It admits discussions and explorations of various issues and case studies, illustrating the kinds of problems that can arise from the use and misuse of computers and technology, the responsibilities of computing professionals, ethics on the internet (hacking, computer crime, netiquette), privacy and social issues.

Course Code	Course Name	Credit Hours	Prerequisite
341CIS-3	Operational Research	3 (3,0,1)	

Course Contents:

This course provides an introduction to the key aspects of operations research methodology. Students will model and solve a variety of problems using deterministic and stochastic operations research techniques. It provides an overview of the entire suite of techniques and some idea of how the elements fit together. This course includes the following topics:

Introduction to Operations Research: Optimization Models and Examples:
Linear Programming: Models, Graphical Solution, Simplex Algorithm
and Goal Programming, Sensitivity Analysis and Duality 2 , Transportation Models ,Network Models and Algorithms
Integer Programming: Modeling with integer variables, Branch and Bound Methods
Sequencing models: Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.
Dynamic Programming: Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.
Queuing Models
Nonlinear Programming: Nonlinear Models, KKT conditions, Constrained/Unconstrained optimization, Algorithms
Stochastic analysis: Game theory, Decision analysis, Inventory theory, Markov chains, Queuing analysis and simulation.

Graduation Project and Assessment System

Independent study course whereby a group of students (3 to 4) at level seven selects one of the proposals submitted by department faculty members with a timeline and evidence of research and analysis, meets with an advisor and co-adviser throughout the semester and then provides a final report regarding system requirement, analysis, and design and makes a formal presentation. In the next semester at level eight every group develops, simulates, implements, and tests software, database through the semester and then provides a final report, presents software, and makes a formal presentation.

The major intended learning outcomes of the project or research task.

1) Development of skills in planning, analyzing, designing, and carrying out a major research project
2) Development of practical skills of using various computer software, programs, programming languages, databases and implement in professional life
3) Improvement of analytical, writing, and communicative skills
4) Improvement of skills in effective time management
5) Improvement in ability to operate as a team member in a significant project
6) Improvement in ability to think critically, research in various aspects
7) Improvement in ability to respect social, ethical, and moral issues

Project's study courses offered by the program are mentioned below:

Level No (Semester/year)	Course code	Course Name	Prerequisites
8 (2/4)	491CSS-4	Graduation Project 1	342CSS-3
9 (1/5)	492CSS-4	Graduation Project2	491CSS-4

Relation of CS Courses to Student Outcomes

Table: Relation of CS courses in the curriculum to the Student Outcomes

Required CS Courses	Student Outcomes a-k										
	a. An ability to apply knowledge of computing and mathematics appropriate to the discipline;	b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.	c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.	d. An ability to function effectively on teams to accomplish a common goal.	e. An understanding of professional, ethical, legal, security and social issues and responsibilities.	f. An ability to communicate effectively with a range of audiences;	g. An ability to analyze the local and global impact of computing on individuals, organizations, and society;	h. An ability to recognize the need for and to engage in continuing professional development.	i. An ability to use current techniques, skills, and tools necessary for computing practice.	j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices[CS].	k. An ability to apply design and development principles in the construction of software systems of varying complexity[CS].
111CSS-4	√	√	√						√	√	√
113CSS-4	√	√	√				√	√	√	√	√
212CSS-3	√	√	√						√	√	√
222CSS-4	√					√			√	√	√
227CSS-3	√	√	√						√	√	√
235CSS-3	√	√	√			√		√	√	√	√

Course											
281CSS-3	√	√	√						√	√	
328CSS-3	√	√	√					√	√	√	√
329CSS-3	√	√	√						√	√	
330CSS-3	√	√	√						√	√	√
342CSS-3	√	√	√	√	√	√	√	√	√	√	√
361CSS-3	√	√	√						√	√	√
380CSS-3	√	√	√	√		√			√	√	√
429CSS-3	√	√	√	√					√	√	√
440CSS-3		√			√		√	√			
456CSS-3	√	√	√						√	√	
457CSS-3	√	√	√		√				√	√	√
474CSS-3	√	√	√						√	√	√
491CSS-4	√	√	√	√	√	√		√	√	√	√
492CSS-4	√	√	√	√	√	√		√	√	√	√

Non-CS Courses	Student Outcomes a-k										
	a. An ability to apply knowledge of computing and mathematics appropriate to the discipline;	b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.	c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.	d. An ability to function effectively on teams to accomplish a common goal.	e. An understanding of professional, ethical, legal, security and social issues and responsibilities.	f. An ability to communicate effectively with a range of audiences;	g. An ability to analyze the local and global impact of computing on individuals, organizations, and society;	h. An ability to recognize the need for and to engage in continuing professional development.	i. An ability to use current techniques, skills, and tools necessary for computing practice.	j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices[CS].	k. An ability to apply design and development principles in the construction of software system s of varying complexity[CS].
111ISL-2											
201ARAB-2											
104PHIS-4	√	√							√	√	
106MATH-3	√									√	

152MATH-3	√								√	
112ISL-2										
202ARAB-2										
342MATH-3	√								√	
324STAT-3	√									
113ISL-2									√	
114ISL-2										
111BIOL-4	√	√						√		
341CIS-3 Operational Research	√	√	√					√	√	√
105PHIS-4	√	√						√	√	
107MATH-3	√	√						√	√	

Relationship between Course Learning Outcomes (CLOs) and Student Learning Outcomes (SOs) for the CS courses

Relationship between CLOs and SOs

Courses	CLOs	SOs										
		A	b	C	d	e	f	g	h	i	j	K
Programming Language 1 111CSS-4	CLO_1: Describe the basic concepts of C programming.	√										
	CLO_2:Analyze computing problems to formulate practical solutions		√									
	CLO_3:Apply the concept of algorithm and flowchart in solving problems										√	
	CLO_4:Develop C programs involving various C statements , Arrays, Pointers, and data structures			√								√
	CLO_5: Apply functions related concepts (definition, parameters, function call … etc) to optimize and to facility C programs			√						√		

Course	CLO	1	2	3	4	5	6	7	8	9	10	11	12
	CLO_6: Assess program execution												√
Object Oriented Programming 113CSS-4	CLO_1: Describe principles, usage and benefits of Object Oriented Programming (OOP).	√											
	CLO_2: Recognize Java syntax and semantics.	√	√										
	CLO_3: Use of Java Standard classes.								√	√	√		
	CLO_4: Implement Object Oriented techniques to solve problems.		√	√						√		√	√
	CLO_5: Evaluate the workflow program including error handling.			√									
	CLO_6: Assess Object Oriented application			√								√	√
Data Structures and Algorithms 212CSS-3	CLO_1: Distinguish between Abstract Data Types (ADTs), data structures and algorithms.	√											
	CLO_2: Calculate the costs (space/time) of data structures and their related algorithms, both source code and pseudo-code using the asymptotic		√										

	notation (O())											
	CLO_3: Describe basic ADTs (stack, queue, array list, node list, priority queue, tree, map and dictionary) and their related data structure implementations (array, single linked structure, double linked structure, heap, hash table, binary search tree, AVL tree)	√									√	√	√
	CLO_4: Recognize basic concepts and techniques (recursive, sorting, searching, graph) used in design of basic algorithms.	√											√
	CLO_5: Implement basic algorithms and ADTs using different data structures strategies in Object Oriented Programming (OOP) language.			√							√	√	√
	CLO_6: Decide which type of data structures and algorithms best suits the problem they are solving		√	√								√	

Computer Organization and Architecture **222CSS-4**	**CLO_1:**Recognize the current architecture of computer systems (data representation, performance enhancement, CPU, memory hierarchy design, I/O design).	√											√		
	CLO_2: Apply conversion formula among different number systems used in digital computers.	√											√		
	CLO_3: Analyze differences of instruction set architectures and addressing modes.	√									√		√	√	
	CLO_4: Describe the basic processing unit of computers	√									√				√
	CLO_5: Define the process of designing computers with the modern architecture.	√											√		
	CLO_6: Discuss the latest technology in computer architecture.						√				√				
Operating Systems **227CSS-3**	**CLO_1:** Recognize operating system history, services, applications and types	√													
	CLO_2: Write UNIX commands to perform essential operations.	√	√									√			
	CLO_3: Describe various algorithms processes, threads, scheduling, synchronization, deadlock	√											√		

Course	CLO											
	and virtual memory											
	CLO_4: Explain operating system support for processes, threads, scheduling, synchronization, deadlock, virtual memory and file systems	√								√		
	CLO_5: Develop programs to make use of various systems calls and implement standard problems/algorithms related to operating systems concepts		√	√					√		√	
Theory of Computation **235CSS-3**	CLO_1: Describe the basic concepts of alphabets, strings, regular expressions, languages, derivation (leftmost and rightmost), finite state machines, pushdown automata, Turing machines, decidability, halting problems and time complexity.	√				√		√	√			
	CLO_2: Explain the relationships between regular expressions, different types of languages defined by grammars and abstract machines.	√						√				
	CLO_3: Construct finite automata, push down automata, Turing machines		√	√					√	√		

	and regular expressions that models different types of languages.										
	CLO_4: Design various models of computation	√	√								
	CLO_5: Assess the equivalence of DFA with NFA, PDA with context free grammars, and regular expressions with automata.		√								√
Computer Graphics **281CSS-3**	**CLO_1:** Demonstrate knowledge of fundamental and contemporary computer graphics hardware.	√									
	CLO_2: Demonstrate basic knowledge of mathematical background (vector and matrix computation) and algorithms underlying the basic computer graphics primitives	√	√							√	
	CLO_3: Apply the main OpenGL attributes that control the display characteristics of graphics primitives.			√					√		
	CLO_4: Implement basic geometrical transformations on simple 2D and 3D	√							√	√	

	computer objects using OpenGL in C++.										
	CLO_5: Create interactive and usable graphic applications in C++ using OpenGL programming interfaces.			√						√	
	CLO_6: Apply basic physics of light and its interaction in simple objects using OpenGL in C++.										√
	CLO_7: Illustrate good level of debugging, documentation and structuring skills in computer graphics programs.	√								√	
Human Computer Interaction **328CSS-3**	**CLO_1:**Define the theory of basic concepts of human computer interaction that concern human cognition, interfaces and interaction.	√									
	CLO_2: Identify the features of programming language comparative with Graphical User Interface (GUI) Programming Language.	√	√								
	CLO_3: Describe basic task analysis (why task analysis is at the heart of nearly all HCI activities, using of task	√								√	√	√

	analysis in computing-related) and the rules and models of the human centered design in interactive software applications.												
	CLO_4:Implement the environment and user interface management system			√						√	√	√
	CLO_5: Develop the GUI programming techniques to solve windows based applications.			√				√	√	√	√	
	CLO_6: Describe the usability of existing GUI based application.								√	√		
	CLO_7:Analyze the general features of the graphical user interface from usability point of view	√										√
	CLO_8:Explain the usability problems through the development of a model and graphical user interface and to evaluate using a questionnaire.		√	√							√	
Data Communication and Computer	CLO_1: Define the key terminologies and concepts of data communications and networking	√										

Networks **329CSS-3**	**CLO_2:** Describe concepts of physical and data link layer protocols, and design/performance issues in local area networks and wide area networks	√	√											
	CLO_3: Explain services and features of the various layers of data networks		√									√		
	CLO_4: Design different types of networks based on IP classes and different network topologies	√	√	√							√	√		
	CLO_5: Explain basic protocols of network, transport , and application layer, and how they can be used to assist in network design and implementation	√	√								√	√		
	CLO_1: Distinguish between several types of Programming Language paradigms	√												
	CLO_2: Recognize the basic syntax differences of common programming language types		√											

Course	CLO	1	2	3	4	5	6	7	8	9	10	11
Programming Paradigms 330CSS-3	CLO_3: Discuss the scope and memory management of several programming languages paradigms		√									
	CLO_4: Describe the basics of functional programming, object oriented programming, logic programming paradigms with proper examples		√					√				
	CLO_5: Choose specific programming language for types of real life problems									√		√
Software Engineering 342CSS-3	CLO_1: Describe the software engineering principles and techniques that are used in developing quality software products.	√	√			√			√			
	CLO_2: Select an appropriate and effective software process models for a given project.		√		√	√				√	√	
	CLO_3: Develop clear, concise and sufficiently formal software						√	√		√		

	requirements specification based on the true needs of users and other stakeholders											
	CLO_4: Apply design principles and architectures in designing software.		√									
	CLO_5: Create a number of different UML models and structure approach.		√				√					
	CLO_6: Develop a project plan for software development project using application management techniques with working a team leader and a member of a team									√	√	√
Artificial Intelligen ce 361CSS-3	CLO_1:Distinguish between a conventional system and an intelligent system and describe the key aspects of intelligent agents.	√		√							√	√
	CLO_2: Describe the concept of search strategies and solve problems by applying a suitable search method.		√									

Course	CLO											
	CLO_3: Represent knowledge using various different techniques			√							√	√	
	CLO_4: Describe an algorithm used in machine learning.	√	√	√									
	CLO_5: Apply Artificial Intelligent techniques in solving problems (Expert Systems, Natural Language Processing, Robotics).	√									√	√	√
	CLO_6: Implement solutions of AI problems in Prolog language.											√	√
Fundamentals of Database Systems 380CSS-3	CLO_1 : Explain the general concepts of database, database system, data, DBMS, database design, database programming languages	√											
	CLO_2 : Design the best E/R diagram data model for a realistic application		√	√							√	√	√
	CLO_3 : Construct an Object-Oriented data model for simple application		√	√							√	√	√
	CLO_4 : Create a normalized, well-structured relational data model by using database theories such as the	√										√	√

conversion from E/R to set of relational tables and functional dependencies, canonical covers, decomposition and normalization techniques		√									
CLO_5 : Solve simple queries by using the operations (selection, projection, join, Cartesian product) of the theoretical database language Relational Algebra			√						√		
CLO_6 : Manage the relational database schemas through the DDL SQL statements (Create, Drop, Alter) with either the MySQL or Oracle database server			√						√		
CLO_7 : Implement simple and complex SQL statements to specify or modify the relation/database instances.			√						√	√	
CLO_8 : Define Semi-Structured model (XML), data warehouse, data mining and security		√									
CLO_9: Solve effectively in teams the course project goal within time and				√							

	resource constraints										
	CLO_10: Practice communication skills in writing and presenting the course project.				√						
	CLO_1 : Identify factors driving the need for network security and classify different types of attacks (DOS attacks) and identify their point of vulnerability in networks.	√	√								
Computer Security **429CSS-3**	**CLO_2 :**Analyze & Apply cryptographic theories, principles & techniques that are used to establish security properties. (Symmetric & Asymmetric encryption: block ciphers, DES, AES, Triple DES, RC5, Public Key Cryptosystems, RSA)		√	√					√	√	√
	CLO_3 : Describe the mechanisms for security key distributions & management and differentiate between the authentication algorithms (digital signatures,								√	√	√

	MAC, Hash Also, MD5, and SHA) and should also recognize applications of these algorithms.									
	CLO_4 :Illustrate the security protocols &applications devised for internet. And distinguish between different firewalls.		√					√	√	√
	CLO_5 :Compare & contrast different types of malicious software, intruders and intrusion detection methods.	√	√	√						
Social, Ethical and Profession al Issues 440CSS-3	1: Understand the theory of computer ethics, and professional ethics.	√			√					
	CLO_2: Apply code of ethics in professional issues	√				√				
	3 : Determine privacy protection and technology risks	√								
	4: Propose strategies and enforcement of ethics rules in computer organization.				√					
	5: Solve various issues and case studies related to use and misuse of computers and technology.				√		√			

Parallel and Distributed Systems 456CSS-3	CLO_1 : Describe the basic concepts and terminologies of parallel and distributed systems	√									
	CLO_2 : Measure the performance and distinguish the different parallel and distributed units including pipelined and synchronous computing	√	√								
	CLO_3 : Explain various parallel and distributed computing paradigms and issues	√								√	
	CLO_4 : Analyzing the algorithms of parallel and distributed systems		√							√	
	CLO_5 : Implement the knowledge and methods of parallel and distributed systems in programming using java		√	√					√	√	
Internet	CLO_1:Understand fundamentals of internet, common web applications, their types, web security and privacy issues and social and	√									

Course	CLO												
Technologies **457CSS-3**	commercial issues of web apps.												
	CLO_2: Recognize browsing tools, web development tools and web publishing.	√											√
	CLO_3: Explain Internet protocols (HTTP, TCP/IP and FTP) and File/server, database server and 3-tier Client/Server Architecture.	√								√	√	√
	CLO_4: Design a web page using MVC and other design approaches.	√											√
	CLO_5: Develop dynamic web application with PHP or ASP and MySQL and programming with HTML, XHTML, cascading style sheets (CSS), and JavaScript, client and server side scripting language.	√	√	√						√	√	√
	CLO_6: Evaluate a web site	√				√						
Algorithm Design and Analysis **474CSS-3**	**CLO_1:** Describe important algorithmic problem types.		√									
	CLO_2: Measure the efficiency of algorithms by evaluating the time complexity of an algorithm using the		√								√	√

	asymptotic notation (Big-O(), Omega(), Theta())										
	CLO_3: Analyse the expected performance of a particular algorithm in a particular context.		√						√		
	CLO_4: Utilize mathematical techniques to analyse the efficiency of an algorithm and demonstrate the algorithmic correctness.								√	√	
	CLO_5: Evaluate how to deal with problems for which no fast algorithms exist (NP Completeness)	√							√	√	√
	CLO_1: Analyze a problem and user requirements		√								
	CLO_2: Make effective literature reviews to understand the key elements of the project.	√									
	CLO_3: Design the appropriate solution to the project's problem			√						√	√
	CLO_4: Use the appropriate techniques and tools necessary for designing the project								√		
	CLO_5: Solve effectively in teams the project goals within time and resource				√						

491CSS-4 **Graduation Project 1** **&** **492CSS-4Graduation Project 2**	constraints											
	CLO_6: Practice communication skills in writing and presenting the project.					√						
	CLO_7: Demonstrate originality in part of the project work.				√			√				
	CLO_8: Demonstrate an understanding of professional, ethical, security, and responsibilities.				√							
	CLO_9: Use software tools independently.		√							√		√

How the transcripts are to be interpreted

Meanings of the abbreviated terms those are using in students' transcript are mentioned in the Table below:

Table: Abbreviated terms and their meanings

Abbreviated Terms	Meaning
AHRS	Available or registered hours/ credit hours
EHRS	Earned or passed hours/ credit hours
QHRS	Cumulative hours
QPTS	Cumulative points
GPA	Grade Point Average
Hrs	Hours/ Credit hours
Pts	Points

Recognition of Outstanding Academic Performance

In addition, outstanding academic performance is recognized and rewarded. Whereas. There is an approved mechanism to support academic excellence of teaching staff members in our college. So almost every year outstanding faculty members are recognized and rewarded by certificates, crests, salary awards, research funds etc. The following table shows a record of past outstanding faculty members achievement which is extracted from.

Table 9.6 Record of Outstanding Faculty Members' Achievements

Outstanding Faculty Name	Year	Type of Support (e.g. Certificate, Crest, Award etc)	Outstanding Category (e.g. teaching, research etc)
Samiul Islam	1431 H	Certificate	Student Advising
Md. Kafil Uddin	2010	Certificate	Working on ABET
	2011	Certificate	Research Conference
	2012	Certificate	ABET Workshop
Haji Moinuddin	2010	Certificate	
	2011	Certificate	
Shah Masud	2010-11	Crest, Certificate	Initiatives, Ethics
	2009-10	Certificate	1/3 Best Website Award
Gazi Golam Faruque	2010	Crest	Teaching
	2011	Certificate	ABET Workshop
Dr. Addin Osman	2011	Certificate	Teaching
Dr. Zakaria Saeed Toukal	1431-32	Certificate, Award	Research
	1432-33	Certificate	Teaching, Administration
Mohammad Akram	2010	Certificate	Teaching
	2011-12	Fund	Research
Dr. Arif Siddique	2011	Sheild of Motivation	
Dr. Ahmad Taleb	2011-12	Certificate	Quality work for the program
	2011-12	Salary Award	
Dr. Anwar Ali	2011	Certificate	Coordinator
	2012	Certificate	Quality
Ahmed Monjurul Hasan	2013	Certificate	Students' Research Project
	2011-12	Certificate	NCAAA and ABET
	2012	Research Fund	Research

Department's Images

Image1: Teaching staff with the Dean.

Image 2: The Dean of the College H.E. Dr. Abdullah Alabas delivering his speech at the time of certificate giving ceremony among the staff members for their performance in the year: 2010-2011 AD.

References

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