



Bachelor of Software Engineering Tracks

Effective Fall 2019

Cybersecurity Track

Security is a forefront concern for software vendors and customers and an indispensable quality attribute of software given the high level of interconnectivity of systems running critical software functions and storing confidential data. There is a multitude of attacks that attempt to exploit software systems to gain illegitimate access to functionalities and data. Despite the continuous exposure to threat, software systems cannot simply cease operations as a countermeasure and they are expected to be available and deliver business value to its stakeholders reliably. The Software Engineering Department, part of the College of Engineering at Alfaisal University, has approved a cybersecurity track. This track will equip students with the necessary skills and respond to challenges in cybersecurity, data privacy, network security, socio-technical issues in addition to learning how to develop secure systems by practicing proper secure software engineering principles. Students in the Bachelor of Software Engineering program at Alfaisal University are eligible to opt for this track starting from Fall 2019.

Track Course Requirements (15 CRHs):

In addition to completing the core course **SE 330 – Introduction to Cybersecurity**, students should complete any four technical electives of their choice from the following courses:

- SE 445 – Information and Software Security (Pre-requisite: STA 212, SE 324)
- SE 448 – Blockchain Development (Pre-requisite: SE 324)
- SE 450 – Cryptography and Data Privacy (Pre-requisite: STA 212, SE 330)
- SE 451 – Secure Software Engineering (Pre-requisite: SE 310, SE 330)
- SE 452 – Network Security (Pre-requisite: EE 305, SE 330)
- SE 453 – Security Risk Management & Control (Pre-requisite: SE 330)
- SE 454 – Ethical Hacking and Systems Defense (Pre-requisite: SE 330)

Suggested Track Plan:

4th Year			
Fall	Course Code	Course-Title	CRHs
	SE 445 (Or SE 451)	Information and Software Security (Or Secure Software Engineering)	3 (3-0-0)
	SE 450	Cryptography and Data Privacy	3 (3-0-0)
Total			6
Spring	Course Code	Course-Title	CRHs
	SE 452	Network Security	3 (3-0-0)
	SE 453 (Or SE454)	Security Risk Management & Control (Or Ethical Hacking and Systems Defense)	3 (3-0-0)
Total			6



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Artificial Intelligence & Big Data Track

The world is growing at an exponential rate and so is the size of the data collected across the globe. Current and future sources of data are enabled devices which is utilizing the Internet of Thing (IoT) technology in addition to social networks and business applications. Big data infrastructure and analytics are emerging as key concepts to sorting, managing analyzing this massive amounts of generated data from connected objects and applications which helps to take the initiative to improve decision making. Thus, data is becoming more meaningful and contextually relevant, breaking new grounds for new computing concepts such as Machine Learning (ML) and Artificial Intelligence (AI). These concepts will introduce a new approach to shift the traditional computing concepts related to data from just collecting structured data to understanding it, to turning this massive amounts of data into knowledge, conclusions, and intelligent actions.

In this track, students will be able to study new emerging technologies in the area of Artificial Intelligence and Big Data. Students enrolled in the Software Engineering program are eligible to register in this track.

Track Course Requirements (15 CRHs):

In addition to completing the core course **SE 322 – Internet of Things Application Development**, students should complete any four technical electives of their choice from the following courses:

- SE 443 Cloud Computing for Software Engineers (Pre-requisite: SE 324, EE 305)
- SE 444 Artificial Intelligence (Pre-requisite: SE 214, SE 324)
- SE 446 Introduction to Big Data (Pre-requisite: SE 312, SE 314)
- SE 447 Introduction to Machine Learning (Pre-requisite: SE 312, SE 314)
- SE 448 Blockchain Development (Pre-requisite: SE 324)
- SE 449 Data Analytics (Pre-requisite: SE 312, SE 314)

Suggested Track Plan:

4th Year			
Fall	Course Code	Course-Title	CRHs
	SE 446	Introduction to Big Data	3 (3-0-0)
	SE 444 (Or SE 447)	Artificial Intelligence (Or Introduction to Machine Learning)	3 (3-0-0)
Total			6
Spring	Course Code	Course-Title	CRHs
	SE 443	Cloud Computing for Software Engineers	3 (3-0-0)
	SE 449 (Or SE 448)	Data Analytics (Or Blockchain Development)	3 (3-0-0)
Total			6