Engineering Program

Specialization	**Smart Device Engineering**
Course Number	**20412251**
Course Title	**Smart Devices Architecture**
Credit Hours	**3**
Theoretical Hours	**3**
Practical Hours	**0**

وصف المادة الدراسية:

❖ Resource management in mobile devices. Study mobile devices operating systems, their API Eg. Symbion, Androids. Programming languages and framework uses for mobile devices.

أهداف المادة الدراسية:

Upon Completion of the subjects:

1. Study resource management in small limited resource devices.
2. Study of Android Operating System and its application infrastructure
3. Study of Symbion operating system and application infrastructure.

الوصف العام:

رقم الوحدة	اسم الوحدة	محتويات الوحدة	الزمن
1.	**Why Phones Are Different**	1.1 The Origins of Mobile Phones 3 1.2 From 2G to 3G 5 1.3 Mobile Phone Evolution 6 1.4 Technology and Soft Effects 7 1.5 Disruption and Complexity 9 1.6 The Thing About Mobile Phones 10	**2 weeks**
2.	**The History and Prehistory of Symbian OS**	2.1 The State of the Art 15 2.2 In the Beginning 17 2.3 The Prehistory of Psion 20 2.4 The Beginnings of Symbian OS 22 2.5 The Mobile Opportunity 26 2.6 Background to the First Licensee Projects 27 2.7 Device Families 31 2.8 Operating System Influences 37	**1 week**
3.	**Introduction to the Architecture of Symbian OS**	3.1 Design Goals and Architecture 45 3.2 Basic Design Patterns of Symbian OS 49 3.3 Why Architecture Matters 49 3.4 Symbian OS Layer by Layer 52 3.5 The Key Design Patterns 56 3.6 The Application Perspective 65 3.7 Symbian OS Idioms 71 3.8 Platform Security from Symbian OS v9 83	**2 weeks**
4.	**Introduction to Object Orientation**	4.1 Background 87 4.2 The Big Attraction 88 4.3 The Origins of Object Orientation 90 4.4 The Key Ideas of Object Orientation 92 4.5 The Languages of Object Orientation 10	**1 week**
5.	**The Symbian OS Layered Model**	5.1 Introduction 111 5.2 Basic Concepts 111 5.3 Layer-by-Layer Summary of the Symbian OS v9.3 Model 117 5.4 What the Model Does Not Show 119 5.5 History 119	**1 week**
6.	**The UI Framework Layer**	6.1 Introduction 121 6.2 Purpose 122 6.3 Design Goals 123 6.4 Overview 123	**1 week**

		6.5 Architecture 124 6.6 A Short History of the UI Architecture 128 6.7 Component Collections 129	
7.	**The Application Services Layer**	7.1 Introduction 133 7.2 Purpose 134 7.3 Design Goals 134 7.4 Overview 135 7.5 Legacy Application Engines 137 7.6 Architecture 137 7.7 Component Collections 149	**1 week**
8.	**The OS Services Layer**	8.1 Introduction 165 8.2 Purpose 166 8.3 Design Goals 168 8.4 Overview 170 8.5 Architecture 171 8.6 Generic OS Services Block 171 8.7 Multimedia and Graphics Services Block 177 8.8 Connectivity Services Block 192	**1 week**
9.	**The Comms Services Block**	9.1 Introduction 199 9.2 Purpose 201 9.3 Design Goals 204 9.4 Overview 206 9.5 Architecture 206 9.6 Comms Framework 210 9.7 Telephony Services 220 9.8 Networking Services 230 9.9 Short-link Services 245	**1 week**
10.	**The Base Services Layer**	10.1 Introduction 255 10.2 Purpose 255 10.3 Design Goals 256 10.4 Overview 257 10.5 Architecture 258 10.6 Component Collections 270	**1 week**
11.	**The Kernel Services and Hardware Interface Layer**	11.1 Introduction 279 11.2 Purpose 280 11.3 Design Goals 281 11.4 Overview 283 11.5 EKA1 and EKA2 283 11.6 Singleton Component Collections 284 11.7 Kernel Architecture Block 285 11.8 Kernel Architecture Component Collections 295	**1 week**
12.	**The Java ME**	12.1 Introduction 301	**1 week**

	Subsystem 301	12.2 Requirements of the Java ME Subsystem 302 12.3 Design Goals for the Java ME Subsystem 302 12.4 Evolution of Java on Symbian OS 303	
13.	**Notes on the Evolution of Symbian OS**	13.1 The State of the Art 319 13.2 Summary of Symbian OS v6 Releases 319 13.3 Summary of Symbian OS v7 Releases 321 13.4 Summary of Symbian OS v8 Releases 324 13.5 Summary of Symbian OS v9 Releases 326	**1 week**

طرق التقييم المستخدمة:

التاريخ	نسبة الامتحان من العلامة الكلية	الامتحانات
التاريخ: / /	20%	الأول
التاريخ: / /	20%	الثاني
التاريخ: / /	10%	أعمال الفصل
التاريخ: / /	50%	الأمتحانات النهائية

طرق التدريس:

❖ Lecture

الكتب و المراجع:
الكتاب المقرر:

1. The Symbian OS Architecture Sourcebook: Design and Evolution of a Mobile Phone OS, Ben Morris, ISBN: 978-0-470-01846-0