

SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

SYNTHESIZED SCHOOL PROGRAM

ACADEMIC UNIT:	Escuela Superior de Cómputo		
ACADEMIC PROGRAM:	Ingeniería en Sistemas Computacionales		
LEARNING UNIT:	Software Engineering for Mobile Devices	LEVEL: III	

AIM OF THE LEARNING UNIT:

The student develops software systems for mobile devices through different platforms.

CONTENTS:

- I. Introduction to mobile applications development
- II. User Interface for mobile applications
- III. Mobile design
- IV. Mobil applications process development
- V. Case study

TEACHING PRINCIPLES:

The teacher will apply a Projects-Based learning process, through heuristic method, which will be the development of inquiry skills,, analysis and design of the different elements that make up the design environment of mobile applications, using the different techniques of modeling and design appropriate to the different platforms. The activities to be carried out in class will encourage in students some techniques, such as: collaborative work, participatory, brainstorming, graphic organizers, inquiry documentary, worksheets, an exhibition of complementary subjects directed discussion. Moreover, an autonomous learning will be encouraged by the development of a final software project.

EVALUATION AND PASSING REQUIREMENTS:

The program will evaluate the students in a continuous formative and summative way, which will lead into the completion of learning portfolio. Some other assessing methods will be used, such as revisions, practical's, class participation, exercises, learning evidences and a final project.

Other means to pass this Unit of Learning:

- Evaluation of acknowledges previously acquired, with base in the issues defined by the academy.
- Official recognition by either another IPN Academic Unit of the IPN or by a national or international external academic institution besides IPN.

REFERENCES:

- Ballard, B. (2009). Designing the Mobile User Experience. England : John Wiley & Sons Ltd. ISBN 9780470033616.
- B'Far, R. (2005). Mobile Computing Principles. México: United Kingdom. Ed. Cambridge University Press. ISBN 9780521817332
- Filing, B. (2009). *Mobile Design and Development*. Estados Unidos de América: Ed. O'Reilly. ISBN: 9780596155445.
- Lee, V. (2004). *Mobile Applications*. Estados Unidos de América: Prentice Hall. ISBN 9780131172638.
- Mehta, N. (2008). Mobile Web Development. Estados Unidos de América: Packt Publishing ISBN 9781847193438.



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ACADEMIC UNIT: Escuela Superior de Cómputo. ACADEMIC PROGRAM: Ingeniería en Sistemas Computacionales LATERAL OUTPUT: Analista Programador de Sistemas de Información. FORMATION AREA: Professional. MODALITY: Presence. LEARNING UNIT: Software Engineering for Mobile Devices. TYPE OF LEARNING UNIT: Theorical - Practical, Optative. VALIDITY: August, 2011 LEVEL: III. CREDITS: 7.5 Tepic, 4.39 SATCA

ACADEMIC AIM

This learning unit contributes to the graduate profile of the Engineer in computational systems, to develop the skills of analysis and design of applications for mobile devices by knowing the different modeling techniques and design as well as the best practices to obtain applications tied to the standards of quality and the extent of existing architectures. Moreover, stimulate the powers of creative thinking, critical and reflexive, assertive communication and collaborative work.

This unit has the units Software Engineering, Oriented Object Program and Web Technologies as antecedents. The consequente units are Terminal Work I and II.

AIM OF THE LEARNING UNIT:

The student develops software systems for mobile devices through different platforms.

CREDITS HOURS	LEARNING UNIT DESIGNED BY: Academia	AUTHORIZED BY: Comisión de Programas Académicos del Conseio
THEORETICAL CREDITS / WEEK: 3.0	de ingeniena de Conware.	General Consultivo del IPN
PRACTICAL CREDITS / WEEK: 1.5	REVISED BY:	
THEORETICAL HOURS / SEMESTER: 54	Subdirección Académica	
PRACTICAL HOURS / SEMESTER: 27		Ing. Rodrigo de Jesús Serrano
AUTONOMOUS LEARNING HOURS: 54	Ing. Apolinar Francisco Cruz Lázaro.	Secretario Técnico de la Comisión de
CREDITS HOURS / SEMESTER: 81	Fresidente del CTCE	Programas Academicos



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LEARNING UNIT:

Software Engineering for Mobile Devices PAGE: 3 OUT OF 10

THEMA	Image:							
UNIT OF COMPETENCE The student compares the elements that make up different environments for the development of mobile applications on the basis of the requirements posed by the client.								
No.	CONTENTS	Teacher led- instructionAuton LearHOURSHOURS		omous rning URS	REFERENCES KEY			
			P	т	P			

		т	Р	т	Р	
1.1	History of Mobile Devices	0.5	0.5	0.5		1B,2B,3B,4B
1.2	Elements of mobile applications	1.5	0.5	1.5	1.5	
1.2.1	Nertworks types					
1.2.2	Devices					
1.2.3	Platforms					
1.2.4	Operating Systems					
1.2.5	Application Frameworks					
1.2.6	Services					
1.2.7	Users					
1.3	Types of Mobile Applications	0.5	0.5	3.5	1.0	
1.3.1	SMS					
1.3.2	Mobile web applications					
1.3.3	Native Applications					
1.3.4	Games					
1.4	Mobile Information Architecture	0.5		0.5	0.5	
	Subtotals:	3.0	1.5	6.0	3.0	

TEACHING PRINCIPLES

This thematic unit must begin with a framing of the course and the formation of teams, will be Projects-Based learning strategy, trough heuristic method, what will allow for the consolidation of the following learning techniques: brainstorming, inquiry documentary, comparative tables, directed discussion, mental maps, project proposal (taking into account the collection of requirements posed by the client), exhibition in team of supplementary issues and implementation of practices.

LEARNING EVALUATION

Diagnostic Test	
Project Portfolio:	
Charts	15%
Mind Maps	10%
Cooperative Presentation	10%
Proposal of project	5%
Report of Practicals	20%
Self-Evaluation Rubrics	5%
Cooperative Evaluation	5%
Written Learning Evidence	30%
C C	



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DIRECCIÓN DE EDUCACIÓN SUPERIOR

LEARNING UNIT:

Software Engineering for Mobile Devices PA

PAGE: 4 **OUT OF** 10

THEMA			TITLE: (Jser Interfa	ace for mob	oile applications											
	UNIT OF COMF	PETENC	E														
The student designs the graphical user interface based on design standards.																	
No.	CONTENTS	Teacher led- instruction HOURS		Teacher led- Au instruction I HOURS	Teacher led- instruction HOURS		Teacher led- instruction HOURS		r led- Autonomous tion Learning RS HOURS		eacher led- nstruction Learning HOURS HOURS		Teacher led- instructionAuton LeaHOURSHO		Teacher led- instructionAutonomous Learning HOURS		REFERENCES KEY
		т	Р	т	Р												
2.1	The elements of mobile design	1.5		0.5		1B,2B,5B,7C											
2.1.1	Context																
2.1.2	Designing mobile generic user interface																
2.2	Designing for different screen sizes	0.5		1.5													
2.3	Using UML for modeling generic user interface	1.0		0.5													
2.4	Modeling multimodal user interfaces			0.5													
2.5	Mobile Design tools	0.5		0.5	1.5												
		1.0	1.5	1.0	1.5												
		4.5	4.5	4.5													
		4.5	1.5	4.5	3.0												
TEACHING PRINCIPLES Will be Projects-Based learning strategy, trough heuristic method, what will allow for the consolidation of the following learning techniques: brainstorming, inquiry documentary, comparative tables, directed discussion, comparative tables, UML diagrams, exhibition in team of supplementary issues, advance of the project and practical and the production of the learning evidences																	
	EVALUATION OF TH	IE LEAF	RNING														
Projec	t Portfolio:																
	Charts 10%																
	UML diagrams 15%																
	Advance of the Project 5%																
	Cooperative Presentation 10%																
	Report of Practicals 20%																
	Self-Evaluation Rubrics 5%																
	Cooperative Evaluation 5%																
	written Learning Evidence 20%																



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LEARNING UNIT:

Software Engineering for Mobile Devices

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TITLE: Mobile Design

THEMATIC UNIT:III

UNIT OF COMPETENCE

The student designs mobile applications on the basis of the development cycle and the Unified modeling language.

No. CONTENTS		Teacher led- instruction HOURS		Autonomous Learning HOURS		REFERENCES KEY
		т	Р	т	Р	
3.1 3.1.1	Mobile Web Applications versus Native Applications Mobile 2.0	0.5	0.5	1.0	0.5	1B,2B,3B,4B,6C 8B,11C
3.2	Web standars	1.0	0.5	1.0	1.0	
3.3	Designing for multiple web browsers	0.5		1.5		
3.4	UML-Based development cycle for mobile applications	0.5		1.5	1.5	
3.5	Mobile design principles	0.5		1.5		
3.6	Architectural patterns for mobile applications	0.5		1.0		
3.7	Wireless Connectivity	1.0		1.5		
3.7.1	Characteristics and Quality of Service					
3.8	Synchronization and Replication of Mobile Data	0.5	0.5	1.5	1.5	
3.8.1	Using UML to represent data replication and synchronization schemes					
3.8.2	Modeling security with UML					
3.9	Mobility and location-based services	1.0		1.5	3.0	
3.9.1	Representing location with UML					
	Subtotals:	6.0	1.5	12.0	7.5	

TEACHING PRINCIPLES

Will be Projects-Based learning strategy, trough heuristic method, what will allow for the consolidation of the following learning techniques: brainstorming, inquiry documentary, comparative tables, directed discussion, comparative tables, UML diagrams, exhibition in team of supplementary issues, advance of the project documentation, and practical and the production of the learning evidences.

EVALUATION OF THE LEARNING

Project Portfolio:	
Charts	5%
Cooperative Presentation	10%
Advance of the Project	5%
Report of Practicals	20%
UML diagrams	30%
Self-Evaluation Rubrics	5%
Cooperative Evaluation	5%
Written Learning Evidence	20%



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LEARNING UNIT:

Software Engineering for Mobile Devices PAGE: 6 OUT OF 10

THEMA	THEMATIC UNIT:IV TITLE: Mobile applications process development						
UNIT OF COMPETENCE							
The student compares the programming languages that enable the deployment of mobile applications, based on its							
advantages and disadvantages.							
No.	CONTENTS	Teacher led- instruction HOURS		Auton Leai HO	omous ming URS	REFERENCES KEY	
			Б	т	Б		

		т	Р	т	Р	
4.1	Applying the wisdow methodology to moble development	0.5		0.5		2B,3B,6C, 7C 10C 11C
4.2	UML-based developmet cycle	0.5		0.5		10,100,110
4.3	Problems with building location-based applications	0.5		0.5		
4.4	Best practices of development	0.5		1.0		
4.5	Programming languages and testing mobile applications	1.0	1.5	1.5	3.0	
4.6	Validating the mobile uses cases before development	0.5		1.5	1.5	
4.6.1	Stress testing and scalability issues					
4.6.2	Testing location-based functionality					
	Subtotals:	3.5	1.5	5.5	4.5	

TEACHING PRINCIPLES

Will be Projects-Based learning strategy, trough heuristic method, what will allow for the consolidation of the following learning techniques: brainstorming, inquiry documentary, comparative tables, directed discussion, comparative tables, UML diagrams, exhibition in team of supplementary issues, implementation y validation of project, and practical and the production of the learning evidences.

EVALUATION OF THE LEARNING

Project Portfolio:	
Charts	5%
Comparative Chart	15%
Final Project	40%
Cooperative Presentation	10%
Report of Practicals	20%
Self-Evaluation Rubrics	5%
Cooperative Evaluation	5%



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LEARNING UNIT:

Software Engineering for Mobile Devices

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THEMA	THEMATIC UNIT: V TITLE: Case study										
The stu	UNIT OF COMPETENCE The student applies for best development practices based on the type of mobile application.										
No.	CONTEN	тs	Teacher le instruction HOURS		Teacher led- instruction HOURS		cher led- Auton struction Lea IOURS HO		Autonomous Learning HOURS		REFERENCES KEY
			т	Р	т	Р					
5.1 5.2	Mobile developer frameworks Case Study Location based application Web Social features Emergency responce applications	on	1.0 1.0		1.0 2.0		1B,2B,7C,12C				
5.3 5.4	Adapting to devices Best practices in mobile applic	ation developmet	1.0 0.5	0.5	1.0 1.5	2.5					
		Subtotals:	3.5	0.5	5.5	2.5					
Will be learning UML di practica	TEACHING PRINCIPLES Will be Projects-Based learning strategy, trough heuristic method, what will allow for the consolidation of the following learning techniques: brainstorming, inquiry documentary, comparative tables, directed discussion, comparative tables, UML diagrams, exhibition in team of supplementary issues, implementation of best practices in the project, and practical and the production of the learning evidences										
		EVALUATION OF TH	IE LEAF	RNING							
Projec	t Portfolio: Charts Comparative Chart Cooperative Presentation Final project with best practices integrated Report of Practicals Self-Evaluation Rubrics Cooperative Evaluation	5% 15% 10% 40% 20% 5% 5%									



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RECORD OF PRACTICALS

No.	NAME OF THE PRACTICAL	THEMATIC UNITS	DURATION	ACCOMPLISHMENT LOCATION		
1	Framework for mobile applications	I	4.5	Computer Labs.		
2	Graphic User Interface	П	4.5			
3	Native Applications	Ш	9.0			
4	Mobile device game implementation	IV	6.0			
5	Adapting the practical 4 to another device	V	3.0			
		TOTAL OF HOURS	27.0			
EVALUATION AND PASSING REQUIREMENTS:						
The practical are considered mandatory to pass this unit of learning. The practical mean 20% in each thematic unit.						



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LEARNING UNIT:			Software Engineering for Me	obile Devices	PAGE:	9	OF	10	
PERIOD	UN	IT		EVALUATION TERMS					
1	I		Continuous evaluation Written learning evidence	70% 30%					
	П		Continuous evaluation	80%					
				20%					
2			Continuous evaluation	100%					
3	IV y V		Continuous evaluation	100%					
			 The learning unit I and II is 30% worth of the final score The learning unit III is 30% worth of the final score The learning unit IV and V is 40% worth of the final score Other means to pass this Learning Unit: Evaluation of acknowledges previously acquired, with base in the issues defined by the academy. Official recognition by either another IPN Academic Unit of the IPN or by a national or international external academic institution besides IPN. If accredited by Special Assessment or a certificate of proficiency, this will include a practical part which contribute 50% of the grade and a theoretical part that will provide 						
KEV	B	C	the remaining 50%, based o		/ the academy.				
1	X		Ballard B. (2009). <i>Designing the</i> ISBN 9780470033616	Mobile User Experience. Ingla	aterra: John Wiley	& So	ns Ltd.		
2	x		B'Far R. (2005). <i>Mobile computi</i> 9780521817332	<i>ng principle</i> s. Inglaterra: Camb	bridge University P	ress.	ISBN		
3	x		Filing B. (2009). <i>Mobile Design and Development</i> . Estados Unidos de América: O'Reilly. ISBN 978-0-596-15544-5				3N		
4	X		Lee V. (2004). <i>Mobile Applicatio</i> 9780131172638	ns. Estados Unidos de Améric	a: Prentice Hall.	ISBI	١		
5	Х		Mehta N. (2008). Mobile Web De	evelopment. Inglaterra: Pack F	^o ublishing. ISBN 9	7818	471934	438	
6		Х	Mikkonen T. (2007). <i>Programm.</i> 9780470057384	<i>ing Mobile Devices,</i> _Estados L	Jnidos de América	: Wile	∍y. ISB	N	
7		Х	Moll C. (2008). <i>Mobile Web Des</i> 9780615185910	ign. Estados Unidos de Améri	ca: Cameronmoll.	ISBI	١		
8	Х		Piattini M., García F(2007). <i>Cali</i> 388 págs. ISBN 9789701512678	dad de Sistemas Informáticos. 3	. México Alfaomeg	a. Mé	xico 2	007.	
9		х	Pressman R(2005). <i>Ingeniería d</i> Hill ISBN 9701054733.	'el software: Un enfoque Práct	tico (8va. Ed.) Méx	ico: N	/Ic Gra	w	
10		х	Salmre I (2005). Writing Mobile Applications. Estados Unidos de	Code: Essential Software Eng América: Addison-Wesley. I	ineering for Buildir SBN 97803212693	ng Ma 17	obile		
11		х	Sommerville I(2008). <i>Ingeniería</i> 9789702602064.	<i>de Software<u>(</u>4ta.</i> Ed.) España	a: Addison Wesley.	ISB	N		
12		х	Golding P (2008). Next Generation ISBN 978-0-470-72506-1.	ion Wireless Applications. Gre	eat Britain: John W	iley	& Sons	3.	



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TEACHER EDUCATIONAL PROFILE PER LEARNING UNIT

1. GENERAL INFORMATION

ACADEMIC UNIT: Escuela Superior de Cómputo					
ACADEMIC PROGRAM:	Ingeniería en Sistemas Computacionales		LEVEL		
FORMATION AREA:	Institutional	Basic Scientific	Professional	Terminal and Integration	
ACADEMY: Ingeniería de Software		LEARNING UNIT:	Software Engineering for Mobile Devices		
SPECIALTY AND ACADEMIC REQUIRED LEVEL: Masters Degree or Doctor in Computer Science.					

SPECIALTY AND ACADEMIC REQUIRED LEVEL:

2. AIM OF THE LEARNING UNIT:

The student develops software systems for mobile devices through different platforms.

3. PROFESSOR EDUCATIONAL PROFILE:

KNOWLEDGE	PROFESSIONAL EXPERIENCE	ABILITIES	APTITUDES
 Unified Modeling Language Software Engineering Programming Languages. Web Technologies English Knowledge of the Institutional Educational Model. 	 Two years in Analisys and design Web Applications. Two years handling Web Technologies. Two years in collaborative work. A year experience in the Institutional Educational Model 	 Cooperative Leadership Fluidez verbal de ideas Capacidad de traspasar conocimientos Manejo de estrategias para fomentar el aprendizaje autónomo en el alumno Manejo de estrategias didácticas centradas en el aprendizaje Applications of Institutional Educational Model. 	 Responsible Honest Respectful Tolerant Assertiv Collaborative Participative

DESIGNED BY

REVISED BY

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M. en C. Mónica Rivera de la Rosa. COORDINATING PROFESOR

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