

ESCOM

SECRETARÍA ACADÉMICA DIRECCIÓN DE EDUCACIÓN SUPERIOR

	SYNTHESIZED SCHOOL PROGRAM		
ACADEMIC UNIT:	Escuela Superior de Cómputo		
ACADEMIC PROGRAM:	Ingeniería en Sistemas Computacionales.		
LEARNING UNIT:	High Technology Enterprise Management	LEVEL:	III

PURPOSE OF THE LEARNING UNIT:

The student builds a project of technological innovation, based on technological transfer processes.

CONTENTS:

- I. Technological innovation
- II. The strategy of technological innovation
- III. Strategic technological cooperation
- IV. The technology transfer process.
- V. Strategies of protection and development of technology
- VI. New products: conception, marketing and commercialization

TEACHING PRINCIPLES:

The unit of learning will govern from the strategy learning faced to projects. The skills that will help the chosen strategy are: rain of ideas, graphic organizers, documentary investigation, collaborated work, guided discussions, exhibition of topics, practices of laboratory and the achievement of a project of technological innovation. The methods of education that will be implemented are inductive and deductive.

EVALUATION AND PASSING REQUIREMENTS:

The present Unit of Learning will be evaluated from the structure of the project of technological innovation and of the briefcase of evidences, which is content of: diagnostic, formative and added assessment. The instruments of evaluation that will be applied are: lists of collation, guides of observation and rubrics. The added evaluation will consider the application of an evidence of learning written for the first and second period of evaluation and for the third period, the structure of the project of technological innovation with viability of being an object of technological transference.

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:

- Aggestam Maria (2008), Management Practices in High-Tech Environments. United Kingdom IGI Global. ISBN 9781599045641.
- Folz J. (2008) *Management Practices in High-Tech Environments*. United States of America: IGI Global. ISBN 9781599045641.
- Kenney, M. (2000). Understanding Silicon Valley: the anatomy of an entrepreneurial region. United States of America: Stanford Business Books. ISBN 0804737339.
- Morcillo Ortega, P. (2007) "Dirección Estratégica de la Tecnología e Innovación: un enfoque de competencias". Spain: Civitas. ISBN: 8447009106
- Russo D., Bleier R. (2010), 17 Rules Successful Companies Use to Attract and Keep Top Talent: Why Engaged Employees Are Your Greatest Sustainable Advantage. United States of America: Pearson ISBN: 97-8848-322-347-5





DIRECCIÓN DE EDUCACIÓN SUPERIOR

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: High Technology Enterprise Management. TYPE OF LEARNING UNIT: Theorical - Practical, Optative. VALIDITY: August, 2011 LEVEL: III. CREDITS: 7.5 Tepic, 4.39 SATCA

ACADEMIC AIM

This unit of learning contributes to the profile of graduation of the Computational Systems Engineer, by means of the development of competences of technological innovation sustained in the technology as cooperative strategic variable, transference of technology, strategies of protection, development, marketing and commercialization. The generic competences that are intensify are the work in team, the critical thought for the creation and project management of high technology, as well as the application of systemic solutions in complex problems, design and the management of the innovation in the organization.

It needs from the units of learning Software Engineering, Quantitative Methods for the Capture of Decisions, Administrative Management, and Management Project.

AIM OF THE LEARNING UNIT:

The student builds a project of technological innovation, based on technological transfer processes.

CREDITS HOURS

THEORETICAL CREDITS / WEEK: 3.0

PRACTICAL CREDITS / WEEK: 1.5

THEORETICAL HOURS / SEMESTER:

PRACTICAL HOURS / SEMESTER: 27

AUTONOMOUS LEARNING HOURS: 54

81

CREDITS HOURS / SEMESTER:

LEARNING UNIT DESIGNED BY: Academia de Proyectos Estratégicos y Toma de Decisiones.

REVISED BY: Dr. Flavio Arturo Sánchez Garfias. Subdirección Académica

APPROVED BY: Ing. Apolinar Francisco Cruz Lázaro. Presidente del CTCE AUTHORIZED BY: Comisión de Programas Académicos del Consejo General Consultivo del IPN

Ing. Rodrigo de Jesús Serrano Domínguez Secretario Técnico de la Comisión de Programas Académicos



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LEARNING UNIT:

Report of practice

Self evaluation Rubrics

Co evaluation Rubric

Evidence of learning

20%

5%

5%

40%

High Technology Enterprise Management

PAGE: 3 OUT OF 11

N° THEMATIC UNIT: I TITLE: Technological Innovative UNIT OF COMPETENCE The student determines the importance of the research and the development in an organization, based on innovative process, the management of the knowledge and the technology. No. CONTENTS Teacher led-instruction HOURS Autonomous Learning HOURS REFERENCK KEY 1.1 The conceptual frame of the technological innovation 0.5 0.5 1C,2B,3B,4	
UNIT OF COMPETENCE The student determines the importance of the research and the development in an organization, based on innovative process, the management of the knowledge and the technology. No. CONTENTS Teacher led-instruction HOURS Autonomous Learning HOURS REFERENCE No. CONTENTS T P T P P 1.1 The conceptual frame of the technological innovation 0.5 1.2,2B,3B,4	ation
No. CONTENTS Teacher led- instruction HOURS Autonomous Learning HOURS REFERENCE KEY 1.1 The conceptual frame of the technological innovation 0.5 0.5 1C,2B,3B,4	ו the
T P T P 1.1 The conceptual frame of the technological innovation 0.5 0.5 1C,2B,3B,4	CES
1.1 The conceptual frame of the technological innovation 0.5 0.5 1C,2B,3B,4	
1.2The concept of innovation and the terminology of the R+D (Research and development)1.00.51.2.1Some definitions of innovation0.5	4C
1.2.2 Basic investigation, applied investigation and technological development (R+D)	
1.3The innovative process0.51.01.01.3.1The lineal model1.3.2The model Marquis1.3.31.01.0	
1.3.4 The model of Kline 1.0	
1.4The innovation as source of competitiveness0.51.01.5The process of technological innovation in the0.52.0	
1.6 The management of the technological knowledge 1.5	
1.7 The characteristics of the environment: the 0.5 0.5 technological change	
1.8 The strategy as response to the evolution of the 0.5 competitive environment	
1.9 The technology and the structure of the market 0.5	
Subtotals: 3.0 1.5 6.0 3.0	
TEACHING PRINCIPLES	
Framing of the course and formation of teams. The present unit will be tackled from the strategy of learning faced to projects of technological innovation, the skill learning: rain of ideas, card of work, documentary investigation, guided discussion, conceptual maps, resolution problems, and exhibition in team of complementary topics and achievement of practices. The method of education will be implemented is the deductive one.	lls of on of that
LEARNING EVALUATION	
Diagnostic Test Project Portfolio: Card of work 5% Conceptual map 5%	
Exercises 10% Team Presentation 10%	



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LEARNING UNIT:

High Technology Enterprise Management

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N° THEMATIC UNIT: II TITLE: The strategy of technological innovation						
The stud	UNIT OF COMPET dent implements technological strategies according to gy and the management of resources.	TENCE	s that e	xist for th	e project a	analysis of high
No.	CONTENTS	Teach instru HOI	er led- iction JRS	Auton Lear HOI	omous ning JRS	REFERENCES KEY
		Т	Р	Т	Р	
2.1 2.1.1 2.1.2	The definition of technological strategy The technology as strategic variable The making of the technological strategy	0.5		1.5	0.5	1C,2B,4B,5C
2.2 2.2.1	Tools for the strategic reflection The counterfoil " technologies - products "	2.0	0.5	1.5	0.5	
2.2.2 2.2.3 2.2.4	The counterfoil ADL and the strategies The technological dual tree The counterfoil technological attraction technological		0.5		0.5	
2.2.5	position The systematical exploration of applications in other			1.5	0.5	
2.2.6	sectors: " the bunches " or technological "trees" The essential capacities (core competences)	0.5	1.0	1 5	1.0	
2.2.7 2.3	The process of managing the technology: the strategic plan of the technological development.	0.5		1.5		
	Subtotals:	3.0	1.5	6.0	3.0	
	TEACHING PRINC	IPLES	<u> </u>		I	1
The pres learning of calcul methods	ent unit will tackle from the strategy learning faced to pra will be applied: documentary investigation, card of work, ation, exhibition in team of complementary topics, propo	ctical ca guided sal of th ductive	ases and discussione project	the techno on, picture and achi	ological inr of compar ievement c	ovation, skills of isons, programs of practices. The
	LEARNING EVALU	JATION				

Assessment	
Project Portfolio:	
Card of work	5%
Conceptual map	5%
Exercises	10%
Team Presentations	10%
Report of practice	20%
Self evaluation Rubrics	5%
Co evaluation Rubric	5%
Evidence of learning	40%





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LEARNING UNIT:

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N° THEMATIC UNIT: III TITLE: Strategic technological cooperation

UNIT OF COMPETENCE The student establishes cooperation modalities and enterprise growth based on modalities of participation on high technology enterprises

No.	CONTENTS	Teach instru HO	er led- uction URS	Auton Lear HOI	omous ning URS	REFERENCES KEY
		Т	Р	Т	Р	
3.1	The strategic cooperation in growth.	0.5		1.0	0.5	1C,2B,3B,4C
3.2	The principal forms of cooperation.			1.5	1.0	
3.3	The motivations of the strategies of cooperation.	1.0	0.5			
3.4	The cooperation between different agents in the					
	development and absorption of technology.			1.0	1.0	
3.5	Technologies for the technological cooperation.	0.5				
3.6	Networks, clusters and networking.	1.0		1.0		
3.7	The Start-Ups and the joint ventures.		0.5		0.5	
3.8	Success or defeat of the agreements of cooperation.		0.5	1.5		
	Subtotals:	3.0	1.5	6.0	3.0	
			I		1	1

TEACHING PRINCIPLES

The present unit will tackle from the strategy learning faced to projects and the strategic technological cooperation, which will allow the consolidation of the following skills of learning: documentary investigation, card of work, guided discussion, picture of comparisons, program of calculation, exhibition in team of complementary topics, implementation of the project and achievement of practices. The methods of education that will implement inductive and deductive.

LEARNING EVALUATION

Assessment	
Project Portfolio:	
Card of work	5%
Table of Comparisons	5%
Projects with reports	20%
Team Presentations	10%
Advance of the project	30%
Report of practice	20%
Self evaluation Rubric	5%
Co evaluation Rubric	5%



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LEARNING UNIT:

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N° THEMATIC UNIT: IV TITLE: The technology transfer process				ransfer process		
The stuc and the	UNIT OF COMPET lent establishes the forms of transference of technology t strategies of transference of technology.	ENCE that exis	t basen	on the ma	rket, the ty	pes of contracts
No.	CONTENTS	Teach instru HO	er led- iction JRS	Autono Lear HOU	omous ning JRS	REFERENCES KEY
		Т	Р	Т	Р	
4.1 4.1.1 4.1.2	Transference of the technology: forms and strategies. The forms of the transference of technology. Motivations of the buyers and of the sellers of	0.5		0.5		1C,2B,4B,3C
	technology.				1.0	
4.1.3 4.2	Strategies of transference of technology. Analysis of the process of transference of technology.		0.5	1.0		
4.3	The market of the technology.	0.5		4 5		
4.3.1 4.3.2	The distribution channels.			1.5	0.5	
4.3.3	The price.					
4.4	The contract of transference of technology.	- -	0.5			
4.4.1 4 4 2	Legal frame.	0.5		15	0.5	

-

The present unit will be tackled from the strategy of learning faced to projects and the technological transference, which will allow the consolidation of the following skills of learning: documentary investigation, card of work, guided discussion, picture of comparisons, program of calculation, exhibition in team of complementary topics, implementation of the project and achievement of practices. The methods of education that will implement inductive and deductive **LEARNING EVALUATION**

Assessment	
Project Portfolio:	
Card of work	5%
Table of Comparisons	5%
Team Presentations	20%
Exhibition in team	10%
Advance of the project	30%
Report of practice	20%
Self evaluation Rubric	5%
Co evaluation Rubric	5%





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N° THEMATIC UNIT: V TITLE: Strategies of protection and development of the technol			
UNIT OF COMPETENCE			
The student establishes the s	trategies of protection and development of the technology based on the principal		

instruments that exist in the regulative international frame.

No.	CONTENTS	Teach instru HOU	er led- uction URS	Auton Lear HO	omous ming URS	REFERENCES KEY
		Т	Р	Т	Р	
5.1	The need to protect the innovations.	0.5		1.0		1C,3B,4B,6B
5.1.1	The principal instruments.					
5.1.2	Industrial property and intellectual property.					
5.2	The protection of the inventions (patents and models of	1.0	0.5			
	utility).			1.5		
5.2.1	The patents of invention.				0.5	
5.2.2	The ways to patent.					
5.2.3	The models of utility.				0.5	
5.2.4	The Industrial design (Models and industrial drawings).			1.5		
5.3	The distinctive signs (marks and trade names).	1.0	0.5			
5.3.1	The mark.				1.0	
5.3.2	The trade names.		0.5			
5.3.3	The European or community mark.			1.0		
5.4	Management of the intellectual property in the				1.0	
	organizations	0.5		1.0		
	-					
	Subtotals:	3.0	1.5	6.0	3.0	

TEACHING PRINCIPLES

The present unit will tackle from the strategy learning faced to practical cases and strategies of protection and development of the technology, which will allow the consolidation of the following skills of learning: documentary investigation, card of work, guided discussion, picture of comparisons, program of calculation, exhibition in team of complementary topics, implementation of the project and achievement of practices. The methods of education that will implement inductive and deductive.

Assessment	
Project Portfolio:	
Card of work	5%
Table of Comparisons	5%
Projects with reports	20%
Exhibition in team	10%
Advance of the project	30%
Report of practice	20%
Self evaluation Rubric	5%
Co evaluation Rubric	5%





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LEARNING UNIT:

Self evaluation Rubric

Co evaluation Rubric

5%

5%

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N° THEMATIC UNIT: VI	TITLE: New products: conception, marketing and commercialization
	UNIT OF COMPETENCE
The student plans technological strategies	of market position and new products launching, according to the needs of
the company of high technology	

No.	CONTE	NTS	Teacher led- instruction HOURS		Autonomous Learning HOURS		REFERENCES KEY
			Т	Р	Т	Р	
6.1	Introduction: new products	s, the vision from the	0.5		1.5		1C,2B,3B,5C
	marketing.						
6.2	Concept and position.		0.5				
6.2.1	Concept and test of the conce	ept.				0.5	
6.2.2	Position and strategies of ma	rketing.	- -		1.5	- -	
6.3	Three tools for the conception	n of the products.	0.5			0.5	
6.3.1	The deployment of the quality	function (QDF).		0 50			
6.3.2	The analysis of the value.			0.50	4 5		
6.3.3	The resolution of inventive pr	ODIEMS (TRIZ).		0.5	1.5		
6.4	The process of development.		0.5	0.5			
6.4.1	The design.	throwing	0.5				
0.0	The plan of marketing and the	e throwing.			4 5		
0.5.1	The plan of marketing.				1.5		
0.0.2	The test of marketing.			0.5			
0.0.0	Success and defeat of the ne	wproducts		0.5	2.0		
6.6.1	Results of the investigation of	0.50		5.0			
662	The importance of the comple	0.00			2.0		
6.7	A new paradigm for the development of new products					2.0	
0.7	Subtotals:			1.5	6.0	3.0	
		TEACHING PRINC	IPLES				
The pres	sent unit will tackle from the st	rategy learning faced to pro	ojects, c	onceptio	n, marketir	ng and corr	mercialization,
applying	the skills of learning: docum	entary investigation, card	of work,	guided	discussion	, picture o	f comparisons,
program	of calculation, exhibition in tea	am of complementary topic	cs, imple	ementatio	on of the p	roject and a	achievement of
practices	s. The methods of education th	at will implement inductive	and dec	ductive.			
		LEARNING EVALU	ATION				
Proiect F	Portfolio:						
, (Card of work	5%					
-	Table of Comparisons 5%						
F	Projects with reports 20%						
E	Exhibition in team	10%					
I	mplementation of the project	30%					
Report of practice 20%							





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RECORD OF PRACTICALS

PRACTICAL No.	PRACTICAL No. NAME OF THE PRACTICAL		DURATION	ACCOMPLISHMENT LOCATION
1	Implementation of an innovative process to the system development of calculation.	I	3.0	Computer Labs.
2	Determination of the competitive environment of a company of the branch of high technology.	I	1.5	
3	Implementation of a counterfoil ADL to a case of company of high technology	II	1.5	
4	Defining Core Competences of a company of high technology	II	3.0	
5	Implementation of strategies of technological cooperation.	Ш	1.5	
6	Implementation of a network, cluster and networking to a company of high technology	Ш	3.0	
7	Making a contract of technology transference	IV	1.5	
8	Implementing the use of criteria current and adapted for the record of a patent	IV	3.0	
9	Implementing the use of criteria current and adapted for the record of a model of utility	V	1.5	
10	Implementing the use of criteria current and adapted for the record of a mark	V	3.0	
11	Achievement of the hardware of the QFD to determine the added value of a product.	VI	3.0	
12	12 Implementation of a test of marketing to a product of high technology		1.5	
		TOTAL OF	27.0	
		HOURS	21.0	

EVALUATION AND PASSING REQUIREMENTS:

The practical are considered mandatory to pass this unit of learning. The practicals worth 20% in each thematic unit.



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LEARNING UNIT:

High Technology Enterprise ManagementPAGE:

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PERIOD	UNIT	EVALUATION TERMS					
1	I, II	Continuous assessment 60%					
		Evidence of learning 40%					
2	III, IV	Continuous assessment 100%					
3	V, VI	Continuous assessment 100%					
		The Learning Units I and II is 30% worth of the total of the final evaluation The Learning Units Unit III and IV is 30% worth of the total of the final evaluation The Learning Units Unit V and VI is 40% worth of the total of the final evaluation					
		In case of accreditation this Unit of Learning for Extraordinary Assessment or Sufficiency Assessment, this one will consist of a practical part that it will contribute 50% of the grade and a theoretical part that it will contribute 50% remaining, with base in the lineaments established by the Academy.					
		 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. 					

KEY	В	С	REFERENCES			
1		Х	Aggestam Maria (2008), Management Practices in High-Tech Environments. United Kingdom IGI Global. ISBN 9781599045641			
2	х		Folz J. (2008) <i>Management Practices in High-Tech Environments</i> . United States of America: IGI Global. ISBN 9781599045641			
3	х		Kenney, M. (2000). Understanding Silicon Valley: the anatomy of an entrepreneurial region. United States of America: Stanford Business Books. ISBN 0804737339			
4		х	Lee, C. Miller, W. Hancock, M., Rowen, H., Miller, W. Hankcock, M., Rowen, H.(2001) <i>The Silicon Valley Edge: A Habitat for Innovation and</i> <i>Entrepreneurship</i> . United States of America. Stanford Business Books. ISBN 9780804740630			
5		х	Molero, J. (2001), " <i>Innovación tecnológica y competitividad en Europa.</i> " Publishing House "Síntesis, Madrid". ISBN 9788477388296			
6	х		Morcillo Ortega, P. (2007) " <i>Dirección Estratégica de la Tecnología e Innovación: un enfoque de competencias.</i> " Publishing House "Civitas". Spain. ISBN 8447009106			
7	Х		Russo D., Bleier R. (2010), <i>17 Rules Successful Companies Use to Attract</i> <i>and Keep Top Talent: Why Engaged Employees Are Your Greatest</i> <i>Sustainable Advantage.</i> United States of America: Pearson ISBN 9780137146703			



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DIRECCIÓN DE EDUCACIÓN SUPERIOR

TEACHER EDUCATIONAL PROFILE PER LEARNING UNIT

1. GENERAL INFORMATION

ACADEMIC U	INIT:	Escuela Superior de Cómputo.					
ACADEMIC PROGRAM: Ingeniería en Siste			emas Computacionales.		LEVEL		
FORMATION	AREA:	Institutional	Basic Scientific	Professional	Termi Integ	inal and gration	
ACADEMY: Proyectos Estratégicos y Toma de LEARNING UNIT: High Technology Enterprise Management Decisiones							
SPECIALTY AND ACADEMIC REQUIRED LEVEL: Candidate to Master Degree in Administration. Master Degree							

LEVEL: Candidate to Master Degree in Administration, Master Degree or Doctor in Administration.

2. AIM OF THE LEARNING UNIT:

The student builds a project of technological innovation, based on technological transfer processes.

3. PROFFESSOR EDUCATIONAL PROFILE:

KNOWLEDGE	PROFESSIONAL EXPERIENCE	ABILITIES	APTITUDES
 Management of Resources. Skills of Management of the Knowledge. Tools of analysis for the capture of decisions. Intellectual Property. Marketing. Strategic Administration. English Language 	 Experience of one year in administrative area. Experience of two years in the handling of groups and in the team job. Experience of one year as Teacher of Top Level. 	 Analysis and synthesis. Leadership. Capture of decisions. Handling of Conflicts. Handling of groups. Verbal Fluency of ideas. Didactic Skills. 	 Collaborating. To take part in a team. Person in charge. Honest. Respectful. Tolerant. Assertive.

DESIGNED BY

REVISED BY

AUTHORIZED BY

Ariel López Rojas COORDINATING PROFESOR

Maribel Aragón García Elba Mendoza Macías. COLLABORATING PROFESSORS Dr. Flavio Arturo Sánchez Garfias Subdirector Académico Ing. Apolinar Francisco Cruz Lázaro Director

Date: 2011