

ZACATECAS

YOUR STRATEGIC PARTNER



Following the planning of the State Executive, we work in adherence to the following programmatic structure.

3.2 Innovation, Science and Technology.

- 3.2.1 Encourage the training of human resources with a scientific-technological profile in the state.
- 3.2.2 Promote the entrepreneurship of technological innovation companies in the state.
- 3.2.3 Strengthen the technological science park and its link with the zacatecana economy.
- 3.2.4 Promote social appropriation and dissemination of science, technology and innovation in Zacatecan society.
- 3.2.5 Fortalecer el sector de tecnologías de la información, industrial y de servicios, a través de certificaciones internacionales en tecnologías de la información.



GENERAL PURPOSE

Strengthen the information technology sector, providing the necessary tools to increase its competitiveness, in infrastructure, technical and business capabilities and equipment. Promote the use of information technologies in the productive processes and services of state companies.

SUMMARY EDUCATIONAL SECTOR IN THE MATTER OF INFORMATION TECHNOLOGIES SCHOOL CYCLE 2016 – 2017



Description	Quantity
Educational institutions with careers related to the IT sector	14
Number of races offered	13
Graduates cycle 2016 - 2017	505
New entry 2016 - 2017	936
Enrollment 2016 y 2017	2950

Careers	Number of Institutions that offer it
Computer Engineering	1
Informatic Engineering	4
Computer System Engineering	11
Software Engineering	1
Engineering in Information Technology and Communications	3
Bachelor's of Engineering in Robotics and Mechatronics	1
Bachelor's of Computer Systems Engineering	1
Superior University Technician in Mechatronics, Automation Area	1
Superior University Technician in Mechatronics, Flexible Manufacturing Systems Area	1
Higher University Technician in Information and Communication Technologies, Networks and Telecommunications Area	1
Senior University Technician in Information and Communication Technologies, Multimedia and Communication Area	1
Higher University Technician in Information and Communication Technologies, Computer Systems Area	1
Senior University Technician in Information and Communication Technologies Information Area	1

HIGHER EDUCATION INSTITUTIONS OF ZACATECAS



- 1 INSTITUTO TECNOLÓGICO SUPERIOR DE ZACATECAS OCCIDENTE
- 2 INSTITUTO TECNOLÓGICO SUPERIOR DE ZACATECAS NORTE
- 3 INSTITUTO TECNOLÓGICO SUPERIOR DE FRESNILLO
- 4 UNIVERSIDAD POLITÉCNICA DE ZACATECAS
- 5 INSTITUTO TECNOLÓGICO SUPERIOR DE JEREZ
- 6 INSTITUTO TECNOLÓGICO DE ZACATECAS
- 7 UNIDAD ACADÉMICA DE INGENIERÍA ELÉCTRICA ZACATECAS
- 8 UNIDAD INTERDISCIPLINARIA DE INGENIERÍA CAMPUS ZACATEAS (IPN)
- 9 UNIVERSIDAD SIERRA MADRE
- 10 UNIVERSIDAD TECNOLÓGICA DEL ESTADO DE ZACATECAS
- 11 INSTITUTO TECNOLÓGICO SUPERIOR DE LORETO
- 12 UNIDAD ACADÉMICA DE PINOS
- 13 INSTITUTO TECNOLÓGICO SUPERIOR ZACATECAS SUR
- 14 INSTITUTO TECNOLÓGICO SUPERIOR DE NOCHISTLAN

 FEDERAL ROAD

 INTERNATIONAL AIRPORT OF ZACATECAS

EDUCATIONAL INSTITUTIONS HIGHER LEVEL OF ZACATECAS RELATED TO THE INFORMATION TECHNOLOGY SECTOR



Name of Institution	Municipality	Careers	Graduates 2016-2017	New Entrants 2017-2018	Registration 2017-2018
Instituto Tecnológico de Zacatecas.	Zacatecas	Computer engineering	19	7	60
		Computer System Engineering	62	55	220
Instituto Tecnológico Superior de Fresnillo.	Fresnillo	Computer engineering	19	0	47
		Computer System Engineering	8	37	122
Instituto Tecnológico Superior de Jerez.	Jerez de García Salinas	Computer System Engineering	7	23	112
Instituto Tecnológico Superior de Loreto.	Loreto	Computer System Engineering	44	86	195
Instituto Tecnológico Superior de Nochistlan.	Nochistlán	Computer System Engineering	7	31	121
Instituto Tecnológico Superior de Zacatecas Norte.	Río Grande	Computer System Engineering	10	51	185
		Engineering in Information and Communication Technologies	0	20	31
		Computer engineering	5	0	23
Instituto tecnológico Superior de Zacatecas Occidente	Sombrerete	Computer engineering	0	16	71
		Computer System Engineering	11	17	65
Instituto Tecnológico Superior Zacatecas Sur	Tlaltenango	Computer System Engineering	23	29	113

EDUCATIONAL INSTITUTIONS HIGHER LEVEL OF ZACATECAS RELATED TO THE INFORMATION TECHNOLOGY SECTOR



Name of Institution	Municipality	Careers	Graduates 2016-2017	New Entrants 2017-2018	Registration 2017-201
Universidad Autónoma de Zacatecas.	Zacatecas	Computer Engineering	18	62	314
		Ingeniería en software	20	73	228
Unidad Académica de Ingeniería Eléctrica. Zacatecas.	Zacatecas	Bachelor's of Engineering in Robotics and Mechatronics	0	112	230
Universidad Tecnológica. Unidad Académica de Pinos.	Pinos	Engineering in Information Technology and Communications	19	0	30
Unidad Interdisciplinaria de Ingeniería Campus Zacatecas. Instituto Politécnico Nacional.	Zacatecas	Computer System Engineering	20	60	189
Universidad Politécnica de Zacatecas.	Fresnillo	Computer System Engineering	22	36	98
Universidad Sierra Madre.	Zacatecas	Bachelor's of Engineering in Computer Systems	0	20	42
		Computer System Engineering	0	3	3
Universidad Tecnológica del Estado de Zacatecas	Guadalupe	Engineering in Information Technology and Communications	50	0	84
		TOTAL	364	738	2,583

EDUCATIONAL INSTITUTIONS HIGHER LEVEL OF ZACATECAS RELATED TO THE INFORMATION TECHNOLOGY SECTOR



Name of Institution	Municipality	Careers	Graduates 2016-2017	New Entrants 2017-2018	Registration 2017-201
Universidad Tecnológica. Unidad Académica de Pinos.	Pinos	Higher University Technician in Information Technology and Communication Computer Area	27	25	49
Universidad Tecnológica del Estado de Zacatecas.	Guadalupe	Senior University Technician in Mechatronics, Flexible Manufacturing Systems Area	33	25	79
		Superior University Technician in Mechatronics, Automation Area	37	84	135
		Senior University Technician in Information and Communication Technology, Networks and Telecommunication Area	17	22	36
		Higher University Technician in Information and Communication Technology, Computer Systems Area	16	33	49
		Higher University Technician in Information and Communication Technology, Multimedia and Communication Area	11	9	19
		TOTAL	141	198	367

Center for Research in Mathematics (CIMAT) AC, Zacatecas Unit located in the QUANTUM Technology Park City of Knowledge.

Professors: 1 Principal Investigator B, 4 Researchers (1NC, 3NI), 3 CONACYT Chairs, 4 Academic Technicians.

Research laboratories:

Laboratory Human Computer Interface

Software Assurance Laboratory

Improvement of industrial processes

Improvement of software processes



(MIS) Master of Software Engineering (2007 to date):

Software Assurance

Human computer interface

Process improvement

Data engineering

84 graduates to date.

In relation to Training and Certification, the Ministry of Economy of the State of Zacatecas, works with strategies of transformation and strengthening of human capital, according to the needs of each company in the Information Technology sector.

TRAINING AND CERTIFICATION PROJECTS CARRIED OUT 2016-2017



ZACATECAS | SECRETARÍA DE ECONOMÍA

No	IES	Course	Certificates	% of approval	Date
1	Instituto Politécnico Nacional	Development of business applications on android platform	14	82	2016 June
2	Universidad Autónoma de Zacatecas	Programming of video games in Unity	20	100	2016 April
3	Universidad Autónoma de Zacatecas	Development of business applications on android platform	18	90	2016 June
4	Instituto Tecnológico Superior Zacatecas Occidente Sombrerete	Python Programmer Jr	20	100	2016 may
5	Instituto Tecnológico Superior Zacatecas Occidente Sombrerete	Introduction to Microcontrollers with Arduino	20	100	2016 October
6	Quarksoft S A P I de CV	Upgrade to Java SE 7 Programmer	10	83	2017 August
7	Quarksoft S A P I de CV	Android application development	12	80	2016 July
8	Quarksoft S A P I de CV	Certified Ethical Hacker CPEH	6	100	2016 June
9	Quarksoft S A P I de CV	Scrum Master Certified (SMC)	10	100	2016 may
10	Abierto	Thechnical Community Manager	15	100	2016 August
11	Abierto	Professional Community Manager	12	80	2016 August
12	Instituto Tecnológico de Zacatecas	Oracle certified professional, Java SE 6 Programmer	12	60	2017 December
13	Abierto	Certification in Social Business	19	100	2017 March

TRAINING AND CERTIFICATION PROJECTS CARRIED OUT IN 2015



No	IES	Course	Certificates	% of approval	Date
1	Instituto Tecnológico Superior de Loreto	AutoCad Certified User	30	100	June
2	Instituto Tecnológico Superior de Loreto	Dreamweaver Web Communication	32	100	June
3	Universidad Tecnológica del Estado de Zacatecas	Dreamweaver Web Communication	90	100	June/July
4	Universidad Tecnológica del Estado de Zacatecas	Photoshop	63	68	June/July
5	Universidad Tecnológica del Estado de Zacatecas	Flash Rich Media Communication	20	100	August
6	Universidad Tecnológica del Estado de Zacatecas	Maya Certified User	20	100	August
7	Universidad Tecnológica del Estado de Zacatecas	Autocad Certified User	29	88	September
8	Universidad Tecnológica del Estado de Zacatecas	Autodesk Inventor Certified User	25	100	September
9	Universidad Tecnológica del Estado de Zacatecas	Autodesk 3D Max Certified User	20	91	October
10	Universidad Tecnológica del Estado de Zacatecas	Premiere:Video Communication	20	100	June
11	Universidad Tecnológica del Estado de Zacatecas	Maya Certified User	18	90	September
12	Universidad Tecnológica del Estado de Zacatecas	In Desing: Print & Digital Media Publication	18	90	Agugust
13	Instituto Tecnológico Superior de Fresnillo	Dreamweaver Web Communication	14	93	June



ISO/IEC 29110: Set of international standards in software development for small entities (maximum 25 people).

Goals:

- Strengthen state development companies, as suppliers of software and high quality systems
- Promote the teaching of the ISO29110 standard to replicate the model from academic institutions

Advantages of implementation of the Standard ISO 29110:

- Improve the quality of the software and hardware products that they develop
- Improvement in the management and implementation of software and hardware projects
- Reduction of re-work in the development of software and hardware products (between 10% and 18%)
- Reduction in software development times and costs
- Rapid implementation of the standard due to the certification of 2 development processes.
- Market expansion nationally and internationally Mejora en la gestión e implementación de proyectos de software y hardware

ACCOMPLISHED ACTIONS:

- Training for 11 companies in the interpretation and implementation of the ISO / IEC 29110 Standard in 2017.
- Training for 11 companies and 13 academic institutions in the workshop Workshop for the implementation of ISO / IEC 29110 in 2017, given by Dr. Claude Y Laporte.
- Development by the CIMAT (Mathematics Research Center) of the Action Plan with specific activities for the implementation of ISO / IEC 29110 in Zacatecas.
- Advice through CIMAT in the preparation of the certification process of 8 small organizations.
- Certification in the ISO / IEC 29110 standard basic profile of 8 small organizations (4 companies and 4 software development centers)



COMPANIES AND INSTITUTIONS CERTIFICATES IN 2017

STANDAR ISO/IEC 29110



No.	Companies or Intitutions	What they do:
1	HAS IT S.C.	Desarrollo de Software embebido y FPGA, Diseño electrónico y diseño PCB (Printed circuit board), Servicios de asistencia y capacitación en el uso de nuevas tecnologías. Productos desarrollados: Control climático para invernaderos, control de riego, lámparas led para la minería, monitoreo y control de procesos
2	Nómada Industries	Software embebido, diseño electrónico, robótica, mecatrónica, Internet de las Cosas, generación de código automático para micro controladores
3	Servicios en TI Aplicados SC	Implementaciones de soluciones empresariales, capacitación, CRM (Software de gestión de relación con los clientes), aplicaciones Web
4	WOTBI S.A. DE C.V.	Software a la medida / software para móviles / sistema para control de una institución educativa. Sistema de transferencia de tecnología, el cual ayude en los trámites ante el IMPI, con el abogado, pagos de patentes, negociación y comercialización de la tecnología, así como su seguimiento / administración de gimnasio.
5	ITSZS Instituto Tecnológico Superior Zacatecas Sur	Desarrollan Software de proyectos internos del instituto así como a clientes de pequeñas empresas de la región (iniciativa privada y presidencias municipales).
6	ITSZN Instituto Tecnológico Superior Zacatecas Norte	Desarrollan Software de proyectos internos del instituto (control de inventarios, control escolar, credencialización y control de pagos)
7	ITS Instituto Tecnológico de Zacatecas	Desarrollan Software de proyectos internos del instituto y realizan desarrollo a clientes externos tales como aplicaciones para control de restaurantes
8	UTZAC Universidad Tecnológica del Estado de Zacatecas	Desarrollan Software de proyectos Administrativos, Transaccionales, Tiempo real y Software a la medida.

WHAT IS BEING DONE 2018:

- Training for 13 companies and 11 educational institutions in the interpretation and implementation of ISO / IEC 29110 Standard and software quality assurance workshop based on the standard taught by Dr. Claude Y Laporte.
- Continuous improvement program to follow up the implementation of new software projects using the ISO / IEC 29110 standard and detect improvement opportunities in the implementation process of the ISO / IEC 29110 standard.



WHAT IS BEING DONE 2018:



- Consultoría especializada a los prospectos a certificarse en 2018 en el Estándar ISO/IEC 29110 para asegurar la adopción del estándar en sus procesos de desarrollo y prepararlos para la certificación.
- Training for companies and educational institution development centers in the areas of: software project management, software process management and English language.
- Achieve certification in the ISO / IEC 29110 standard of at least 8 other small software development organizations.



In the issue of quality certifications in software development, we are the only government at a national level that promotes as a strategy the implementation of the international standard ISO29110 "quality in software development", aimed at micro and small businesses and development centers of educational institutions, improving the quality of software products and increasing their competitiveness.

As of 2017, we have the permanent advice of Dr. Claude Y. Laporte, in charge of the development of the ISO / IEC 29110 Standard, who in coordination with CIMAT Unidad Zacatecas, advise on the implementation of the standard in the State software organizations. of Zacatecas



Secretaría de Economía Zacatecas

23 de febrero de 2017

La #SEZAC, el Centro de Investigación en Matemáticas (CIMAT) y el catedrático canadiense Claude Y. Laporte, firmaron un convenio de colaboración para implementar un programa de apoyo para certificar empresas zacatecoanas en la Norma ISO/IEC29110





The Information Technology sector has found in Zacatecas an ideal environment to develop

1. Privileged location and modern infrastructure
2. Stable workforce
3. Favorable environment for business.
4. Legal security
5. Incentives for productive investment, by the Government of the State of Zacatecas.
6. Easy access to national and international markets.
7. Government committed to maintaining favorable conditions for the competitiveness of companies.
8. High quality of life in a low cost region.
9. High level human capital conformed by highly competitive technicians and professionals.



ZACATECAS

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