College of Engineering
Digital Graphic Design Academy

Bachelor in Digital Graphic Design Engineering
Program Review
2013

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1. Introduction.

This document presents the results generated by the Academy of Digital Graphic Design Engineering for the Digital Graphic Design Engineering program review process. The Academy of Digital Graphic Design Engineering is comprised by the following faculty members:

- M.S. Miriam Bautista (Chair) – Tijuana Campus.
- M.S. Fabián Bautista – Tijuana Campus.
- M.S. Dania Licea – Mexicali Campus.
- M.S. Lucía Beltrán – Ensenada Campus.

The Digital Graphic Design Engineering program was launched in 1996 in Tijuana, in 2008 in Mexicali and in 2009 in the Ensenada Campus. Since 1996 it has undergone around 2 major reviews, the latest being in 2005. In 2010, the Digital Graphic Design Engineering program began its program review process, led by the Academy of Digital Graphic Design Engineering, following the guidelines established by the CETYS Periodic Academic Program Review Process. Work was done via face to face workshops, as well as taking advantage of technology, such as e-mail and videoconferencing for distance interaction.

The review components that are presented in this document reflect the methodology followed by the academy to undergo the review process, which began with an analysis of the Mission and Vision of the program, as well as its educational objectives and learning outcomes, following with the curricular mapping and assessment processes, identifying indicators for student achievement, and the analysis of students, faculty and support resources. It also includes the information gathered from comparative analysis with other programs' external reviewers. The areas of opportunity and recommendations identified by the academy during the process, and reflected in this document are presented to the College of Engineering, who in turn will present them to the Vice-Presidency of Academic Affairs, to be considered for implementation in the 2014 versions of the academic programs.

2. Revision of the Mission and Vision of the Program.

For the analysis of the Mission and Vision of the Digital Graphic Design Engineering program, we began by identifying some important historical and contextual information, as well as significant achievements of the program:

- The first professionals in the area of digital graphic design graduated from the program in 2001.
- Students have been involved in different digital graphic design projects with local and international companies such as Eaton, DJO Globan, MIT, to name a few.
- Some graduates have created important design companies for the Tijuana region (Boxel interactive, Stilo Creativo).
- Graduates of the program have contributed for more than 12 years with IT and Digital Graphic Design knowledge to several companies and the government (municipal and state).

The total number of graduates from the program for the Tijuana Campus is around 200 students, for Mexicali Campus around 10 (one generation has graduated so far), and for Ensenada, the first generation with 5 students is about to graduate.

Three aspects are considered in the analysis of the Mission and Vision of the Digital Graphic Design Engineering Program: alignment with the institutional Mission and Vision, impact in the regional and national development, and level of alignment of the program with the current educational objectives.

The Bachelor in Digital Graphic Design Engineering Program is focused on the following Primary Areas of Knowledge, also called Professional Formation Lines:

a) Graphic Design
b) Computer Science
c) Computer Animation
d) Video Production

In addition to the above mentioned elements the CETYS University educational model promotes the integral development of its professionals, which includes critical thinking, global and international mindsets, information literacy, values and the contribution to social, economic and technological development and sustainability.

At first there was no particular vision and mission for the in Digital Graphic Design Engineering program, they were developed as the review of the program started.

The mission of CETYS University as well as the mission of the Bachelor in Digital Graphic Design Engineering Program point out the importance of the development of “intellectual capacity.” However, the mission of the program does not explicitly specify

the importance of the “moral capacity” development in the students, but by “professionals” it means a “high standard of professional ethics, behavior and work activities while carrying out one's profession” and thus implicitly refer to the “moral capacity” as mentioned in the institutional mission.

The mission statement of CETYS University is as follows:

It is the purpose of the Centro de Enseñanza Técnica y Superior to contribute in the education of persons with the moral and intellectual capacity required to participate in an important way in the economic, social, and cultural improvement of the country. CETYS University seeks, as a result, to make indestructible those values that have traditionally been considered as basic so man can live in society in a peaceful way, and satisfy the needs that his capacity to do work allows him.

The institutional mission points out the following points regarding students:

- Moral and intellectual capacity for the economic, social, and cultural improvement of the country.
- Basic values for living in society in a peaceful way and the satisfaction of his needs that his capacity to do work allows him.

We understand as moral capacity that the students should be decent, respectful, and noble persons; regardless of the profession they choose to undertake. This would allow them to live a successful life despite of the socioeconomic level. The institutional mission points out the intellectual capacity of alumni suitable for successfully carrying out the work that their profession demands. In other words, the value of students as persons and as professionals should be guided towards the “economic, social, and cultural improvement of the country.”

The second part of the institutional mission points out that the students must be able to satisfy their needs through their work and by living in peace with the rest of the people. Once again, we can detect the existence of the students’ ability in their profession as well as the respect to others.

Taking the above components and elements as guidelines and always with the Institutional Mission and Vision as fundamental foundation blocks, the Academy of Digital Graphic Design Engineering, through a process of review and analysis, has re-defined the Mission and Vision of the Digital Graphic Design Engineering program as follows:

The mission of the Engineering in Digital Graphic Design program is to educate professionals that are capable of solving complex visual communication problem from the precise and innovative use of digital technology.

The spirit of our engineers is based on a holistic, multidisciplinary, entrepreneurial and sustainable vision that allows them to communicate the content in benefit of the economic, social and cultural growth of their community.

The knowledge that our graduates possess of graphic design, computer programming and its solid ethical education, distinguishes them as indispensable leaders for sustainable development of the organizations requiring to communicate their values and attitudes through the newest digital graphics.

The mission of the academic program strengthens the institutional commitment of training professionals capable of excelling within the work field, but it only implicitly states their role as a person and their commitment with society through a “successful professional life”.

While the institutional mission focuses on the development of the country, the vision of the program adopts a more local perspective. This represents an opportunity to develop Program Level Learning Outcomes, and an assessment program that responds to the proposed challenge in the vision.

The vision of the academic program reassures the institutional commitment of educating persons with the moral capacity, but it adds the following:

- Digital Graphic Design professionals
- Professionals able to solve complex visual communication problems from precise and innovative use of digital technology

The vision of the program points out in a clear way that the program should move towards creating innovative solutions using digital technology and based on methodology and design management. This would have to be reflected in the curricular and co-curricular courses, departments, and support and infrastructure centers that in one way or another impact the academic program.

The following Educational Objectives stem from the institutional mission and the academic program:

- The students of this program will be an essential part of the economic, cultural and social development thanks to its capacity to visually communicate the values of the most important organizations that make up its community.

- Students will propose innovative visual communication strategies in support of digital technologies with a sustainable and entrepreneurial attitude and an ethical and social responsibility.

- An Engineer in digital graphic design will be able to continue their professional growth through postgraduate studies.

3. Review of the Program's capacity.

3.1 Structure of the Program.

CETYS University's academic programs at the Bachelor level have the following structure and degree obtainment requirements:

- Accreditation of 42 subjects (totaling 328 credits).
- Completion of 400 hours of professional practice.
- Completion of 500 hours of social service.
- Completion of the corresponding EGEL (undergraduate exit test) examination administered by CENEVAL (organization in México that offers various examination services).

The curriculum for the Digital Graphic Design Engineering program contains the following courses:

CODE	SUBJECT	SEMESTER
DG400	INTRODUCTION TO DGDE	1
CC400	PROGRAMMING METHODS I	1
MA400	MATHEMATICS	1
MC400	COMPUTER DRAWING	1
CS401	THINKING SKILLS	1
CC402	PROGRAMMING METHODS II	2
MA411	SELECTED TOPICS OF MATHEMATICS I	2
DG431	CONTEMPORARY STYLES	2
DG432	NATURAL DRAWING	2
CS400	ADVANCED COMMUNICATION IN SPANISH	2
CS403	CULTURAL I	2
MA412	SELECTED TOPICS OF MATHEMATICS II	3
CC416	PROGRAMMING IN MULTIMEDIA	3
DG433	VISUAL COMPOSITION	3
DG442	ILLUSTRATION AND ANIMATION IN 2 DIMENSIONS	3
ID400	ADVANCED COMMUNICATION IN ENGLISH	3
CS404	CULTURAL II	3
DG441	DESIGN METHODOLOGY	4
FI403	CONCEPTUAL PHYSICS	4
CC421	COMPUTER GRAPHICS	4
DG434	GENERAL TYPOGRAPHY	4
CC403	COMPUTER SYSTEMS AND COMPONENTS	4
DG435	GLOBAL PICTURE MANUAL	5
DG436	DIGITAL PHOTOGRAPHY	5
CC404	DATA STRUCTURE	5
MA413	PROBABILITY AND STATISTICS	5
EC400	GLOBALIZATION AND ECONOMIC DEVELOPMENT	5
SI403	DATABASE	6
DG437	ELECTRONIC MEDIA DESIGN	6
MK400	MARKETING MANAGAMENT	6
CS402	RESEARCH METHODOLOGY	6
HU400	HUMAN BEING AND THE ENVIRONMENT	6
DG418	VIDEO PRODUCTION	7
DG438	DIGITAL MODELING	7
CC406	OPERATIVE SYSTEMS	7
DG419	MULTIMEDIA	7
HU401	HUMAN BEING, HISTORY AND SOCIETY	7
DG420	3D ANIMATION	8
CE417	NETWORKS AND DATA TRANSMISSION	8
DG439	E-COMMERCE	8
DG440	STRATEGIC BUSINESS DEVELOPMENT	8
HU402	HUMAN BEING AND ETHICS	8

3.2 Program and Institutional Learning Outcomes.

The Student Learning Outcomes for an academic program are comprised by two main blocks: Institutional Learning Outcomes and Program Learning Outcomes. The Institutional Learning Outcomes are defined and reviewed by the Academy of Institutional Learning Outcomes. The Program Level Learning Outcomes are defined and reviewed by the Academies.

The Institutional Learning Outcomes are four and focus on: Verbal and Written Communication Skills, Critical Thinking, Continuous Learning/Information Literacy and Tolerance to Diversity.

The Program Level Learning Outcomes, for the programs offered by the College of Engineering are divided into two blocks: learning outcomes common to all engineering programs (with a strong emphasis on basic sciences and problem solving) and learning outcomes specific to the academic program (with a strong emphasis on the primary and complementary areas of knowledge of the program.

This document will focus on the analysis and review process for the Program Level learning outcomes done by the College of Engineering and the Academy of Computer Science and Software Engineering.

The Program Level Learning Outcomes that apply to all engineering programs, defined in the previous program review process (included in Evidence #35 of the Capacity Report for the WASC Initial Accreditation), were five and were identified as follows:

The student of a CETYS University Bachelor in Engineering Program will…

- SLO_ENG1: …correctly apply to engineering, the tools provided by the basic sciences, such as physics, calculus, probability, statistics and programming to the solution of diverse problems.
- SLO_ENG2: …design analytic and functional models, quantitatively and qualitatively, for the analysis and improvement of systems for diverse applications.
- SLO_ENG3: … effectively use software tools and technologies to build solutions to engineering problems.
- SLO_ENG4: … effectively design and manage projects.
- SLO_ENG5: … (Clear and effective communication in English) … be able to express his ideas clearly and with an appropriate language, in a verbal, written, and visual way in English.

Review of these learning outcomes took into consideration the following three general guidelines:

1. Since these learning outcomes apply to all engineering programs, all Academies should participate in the review process.

2. As a part of the WASC process, recommendations were made with regards to the amount of learning outcomes with regards to assessment implications, thus integration of learning outcomes to reduce the amount is desirable.
3. The learning outcome that has to do with “Clear and effective communication in English” must be included.

The Academies analyzed the five original learning outcomes and re-defined them into the following three Program Level Learning Outcomes that apply to all engineering programs:

The student of a CETYS University Bachelor’s in Engineering Program will…

- SLO_ENG1: …solve problems relating to the improvement of diverse systems, correctly applying the knowledge and tools provided by the basic sciences and/or software technologies.
- SLO_ENG2: … effectively design and manage projects.
- SLO_ENG3: … (Clear and effective communication in English) … be able to express his ideas clearly and with an appropriate language, in a verbal, written, and visual way in English.

This re-definition allows for a more clear identification of the learning outcomes expected for all engineering programs, and also allows the design of a more manageable program level assessment process and plan (which will be explained in further sections of this document).

Also as a part of the previous program review process, Program Level Learning Outcomes that apply to specific engineering programs were defined (also included in Evidence #35 of the Capacity Report for the WASC Initial Accreditation). These learning outcomes, for the Digital Graphic Design Engineering program were six and were identified as follows:

The student of the Bachelor in Digital Graphic Design Engineering program will…

- SLO_IDGD1: Properly implement the knowledge provided by basic sciences (physics, calculus, probability and statistics) as well as tools and software technologies for the identification and solution of problems requiring the analysis and improvement of systems for various applications.
- SLO_IDGD2: Devise and manage projects effectively.
- SLO_IDGD3: Express his ideas clearly and with appropriate language in verbal, visual and written English.
- SLO_IDGD4: Generate graphic communication solutions for the development of a global image, led to social and productive sectors, based on design methodologies, using digital technologies as the main tools.
- SLO_IDGD5: Develop Web sites that integrate a structure and functionality with graphic design, using database, e-commerce and multimedia technologies.
- SLO_IDGD6: Develop models and 2D and 3D animations, in a way that they can create digital productions and short films with visual and interactive effects and an approach to digital media: digital TV, digital cinema, etc..

The Academy of Digital Graphic Design Engineering analyzed the original learning outcomes and re-defined them into the following three Program Level Learning Outcomes that apply specifically to the Digital Graphic Design Engineering program:

The student of the Bachelor in Digital Graphic Design Engineering program will…

- SLO_IDGD1: design audiovisual and multimedia strategies grounded in the argumentation of speech in order to persuade an audience, using an optimal selection of digital technology for production and transmission.
- SLO_IDGD2: Develop graphic content for interactive digital media applications, 3D and 2D digital animation, video games, movies and special effects, Internet and e-learning based on basic science, computer programming and media production technologies in order to solve visual communication problems in the educational and business area and in the entertainment industry and services.
- SLO_IDGD3: Evaluate the scope and relevance of digital graphic design products as well as audiovisual and multimedia production technologies.

This re-definition also allows for a more clear identification of the learning outcomes expected for the Digital Graphic Design Engineering program, and updates them, taking into account assessment considerations.

The curricular mapping for the program level learning outcomes, in their redefined versions according to section 3 of this document, considers the following levels:

- INTRODUCTORY (I): *"At the end of the course, the students know, understand, comprehend and are familiar with the course topics".* It is expected that students have little or no knowledge of the course topics previous to the course. Knowledge and abilities acquired from previous courses may be used to develop students in the solution of problems of low to medium level complexity. New topics are introduced with a basic application level, sufficient enough for the student to comprehend implications for further applications. It is expected for the student to relate previous concepts and integrate them to his or her new base of knowledge, identifying applications via the identification and solutions of problems and cases at a basic level.

- REINFORCEMENT (R): "At the end of the course the students are able to analyze and apply course topics in various contexts, which present diverse levels of difficulty". Knowledge, skills and abilities acquired from previous courses are used to develop solutions to application problems, of mid to high level complexity, relating to the area of knowledge of the profession. It is expected that the student develop a higher level of analysis skills and learn to use in a more efficient manner the tools and methodologies relating to the area of knowledge of the profession.

- EVALUATION - (E): *"At the end of the course, the students exhibit an integrated understanding of the course topics and their application, knowing when and how to apply them".* Knowledge, skills and abilities acquired throughout previous courses are used to identify and solve problems, where the student is expected to design, integrate and evaluate tools and methodologies relating to the area of knowledge of the profession.

It is important to note that the curricular mapping of the Institutional Level Learning Outcomes for all academic programs uses a three level scale that is consistent with the above levels, using different nomenclature (Sufficient, Improvable, Outstanding). This scale is also consistent with the program level scale of Introductory, in Development and Developed.

The following table presents the curricular mapping for the Digital Graphic Design Engineering program (Program Level Learning Outcomes):

CURRICULAR ELEMENTS		ENGINEERING BACHELOR'S PROGRAMS STUDENT LEARNING OUTCOMES			BACHELOR'S IN DIGITAL GRAPHIC DESIGN STUDENT LEARNING OUTCOMES		
		SLO_ENG1	SLO_ENG2	SLO_ENG3	SLO_IDGD1	SLO_IDGD2	SLO_IDGD3
CODE	SUBJECT	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL
DG400	INTRODUCTION TO DGDE		I	I	I	I	
CC400	PROGRAMMING METHODS I	I	I	I	I		
MA400	MATHEMATICS	I	I	I	I		
MC400	COMPUTER DRAWING	I	I	I	I	I	
CS401	THINKING SKILLS			I	I	I	
CC402	PROGRAMMING METHODS II	I	I	I		I	
MA411	SELECTED TOPICS OF MATHEMATICS I	I	I	I	I		
DG431	CONTEMPORARY STYLES		I	I	I	I	I
DG432	NATURAL DRAWING		I	I	I	I	
CS400	ADVANCED COMMUNICATION IN SPANISH		I	I	I		
CS403	CULTURAL I			I	I		
MA412	SELECTED TOPICS OF MATHEMATICS II	I	I	I	I		
CC416	PROGRAMMING IN MULTIMEDIA	I	I	I	I	R	I
DG433	VISUAL COMPOSITION		I	I	I	R	I
DG442	ILLUSTRATION AND ANIMATION IN 2 DIMENSIONS		I	I	I	R	I
ID400	ADVANCED COMMUNICATION IN ENGLISH		I	I	I	I	
CS404	CULTURAL II			I		R	
DG441	DESIGN METHODOLOGY		I	I	R	E	R
FI403	CONCEPTUAL PHYSICS	I	I	I	I	R	
CC421	COMPUTER GRAPHICS	I	I	I	R	R	
DG434	GENERAL TYPOGRAPHY		I	I	R	R	R
CC403	COMPUTER SYSTEMS AND COMPONENTS	I	I	I	I	I	
DG435	GLOBAL PICTURE MANUAL		R	R	E	R	E
DG436	DIGITAL PHOTOGRAPHY		R	R	R	R	
CC404	DATA STRUCTURE	I	I	I	I	R	
MA413	PROBABILITY AND STATISTICS	I	I	I	I		
EC400	GLOBALIZATION AND ECONOMIC DEVELOPMENT		R	R	I		
SI403	DATABASE	R	R	I	R	R	
DG437	ELECTRONIC MEDIA DESIGN	R	R	R	R	R	I
MK400	MARKETING MANAGAMENT	R	R	R	R	E	E
CS402	RESEARCH METHODOLOGY				E	E	R
HU400	HUMAN BEING AND THE ENVIRONMENT				R		
DG418	VIDEO PRODUCTION		E	E		E	
DG438	DIGITAL MODELING	R	R	R		E	
CC406	OPERATIVE SYSTEMS	R	R	R		E	
DG419	MULTIMEDIA	R	E	E		E	
HU401	HUMAN BEING, HISTORY AND SOCIETY				I		
DG420	3D ANIMATION	R	E	E		E	E
CE417	NETWORKS AND DATA TRANSMISSION	R	E	E		E	
DG439	E-COMMERCE		E	E		E	E
DG440	STRATEGIC BUSINESS DEVELOPMENT		E	E	E	E	E

It is important to note that, in the case of SLO_ENG3 (“Clear and effective communication in English”), there are curricular elements such as the Advanced Communications in English course (5th semester), and also program level courses offered in English beginning in 5th semester. The development of clear and effective communication in English is developed primarily via the co-curricular ESL program that all students must go through, and which is managed by the English Language Center.

Once the curricular mapping was concluded, the lessons learned during the process are the following:

- Clarity with which each course relates to each Learning Outcome.
- There is an important amount of involvement and engagement, as well as ownership by faculty members of the Academy that participated in the process.
- Course content and evaluation criteria were unified.
- Discussion on how students learn and should learn throughout the academic program was achieved among faculty.
- Key moments for the assessment of student learning throughout the academic program were identified.
- Experience was obtained for further program review processes.

3.3 Faculty participating in the Program

The program has chairs by Campus, who are full time faculty that are in charge of the program, and are involved in enrollment and promotional activities, student guidance and alumni follow up, program review, accreditation projects, etc.:

- M.S. Fabián Bautista – Tijuana Campus.
- M.S. Miriam Bautista – Tijuana Campus.
- M.S. Dania Licea – Mexicali Campus.

The Faculty associated with the program, (most members of the Academy of Digital Graphic Design Engineering) are:

Name	**Degree**	**Area of knowledge**	**Institution**	**Type**	**Campus**	**Level English**
Miriam Bautista	Master's in Science	Design and Multimedia	IBERO	Full	Tijuana	100%
Fabián Bautista	Master's in Science	Design	UAM	Full	Tijuana	90%
Rossana Torres	Master's in Science	Design	UABC	Associate	Tijuana	80%
Alejandro Pacheco	Doctor's in Education	Design	IBERO	Associate	Tijuana	80%
Dania Licea	Master's in Science	Computer Graphic and Database System	ITESM	Full	Mexicali	70%
Josefina Becerra	Master's in Science	Software Engineering	CETYS	Full	Mexicali	80%
Francisco Chavez	Master's in Science	Programming Fundamentals	CETYS	Aggregate	Mexicali	85%

Alfonso Rodriguez	Master's in Science	Architecture and Organization	CETYS	Aggregate	Mexicali	80%
Amelia Resendez	Master's in Science	Algorithms and Complexity	CETYS	Aggregate	Mexicali	85%
Roberto Gonzalez	Master's in Science	Algorithms and Complexity	ITESM	Associate	Mexicali	70%
Lucía Beltrán	Master's in Science	Information Systems	CETYS	Half	Ensenada	70%
Leopoldo Uribe	Master's in Science	Software Development	CETYS	Full	Tijuana	100%
Francisco Tovar	Master's in Science	Software Development	CETYS	Associate	Tijuana	90%
Jaime Ramos	Master's in Science	Database Systems	Inst. Tec. De Tijuana	Part	Tijuana	70%
Carol Camacho	Master's in Science	Software Development	CETYS	Part	Tijuana	100%
Wendy Trujillo	Master's in Science	Intelligence Systems	ITT	Associate	Tijuana	70%
Enrique Fitch	Master's in Science	Mathematics	ITSON	Full	Tijuana	100%
Moises Sanchez	Doctor's in Engineering	Redes	CETYS	Half	Tijuana	100%
Salvador Chiu	Doctor's in Administration	Administration	CETYS	Aggregate	Tijuana	100%
Roberto Salas	Master's in Science	Fisica	CETYS	Full	Tijuana	100%
Rodrigo Matus	Master's in Science	Mathematics	CETYS	Part	Tijuana	100%
Arturo Escoto	Master's in Progress	Control Engineering	ITESM	Full	Tijuana	95%
Jonathan Ortega	Digital Graphic Design Engineer	3D animation and Video Production	CETYS	Part	Tijuana	90%
Luis Llerenas	Graphic Desginer	Graphic Design	CETYS	Part	Tijuana	90%
Alejandro Romo	Digital Graphic Design Engineer	Multimedia and Web Design	CETYS	Part	Tijuana	100%
Galo Carrillo	Digital Graphic Design Engineer	3D animation and Videogames	CETYS	Part	Mexicali	100%
Ramón Rodríguez Esquer	Master's in Science	Graphic Design	IBERO	Part	Mexicali	80%

The following table shows the Tijuana Campus faculty distribution regarding the courses for the Digital Graphic Design Engineering Program:

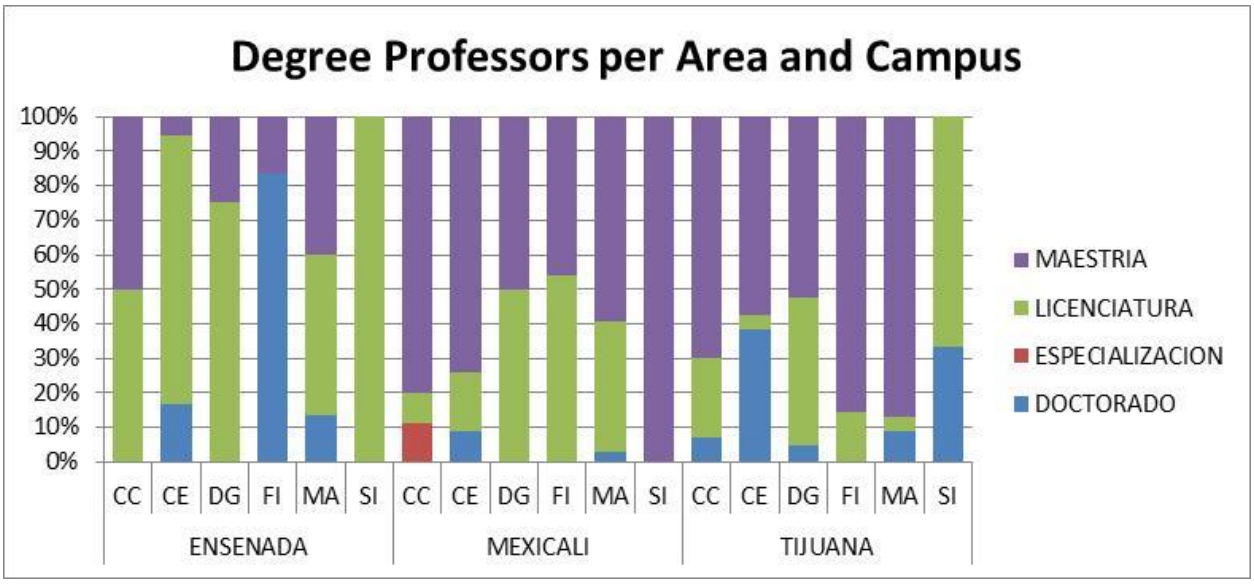
CODE	SUBJECT	PROFESSORS	
DG400	INTRODUCTION TO DGDE	Fabián Bautista	Rossana Torres
CC400	PROGRAMMING METHODS I	Wendy Trujillo	Jaime Ramos
MA400	MATHEMATICS	Mauricio Odreman	Rodrigo Matus
MC400	COMPUTER DRAWING	Ivan Caldelas	
CC402	THINKING SKILLS	Wendy Trujillo	Jaime Ramos
MA411	PROGRAMMING METHODS II	Mauricio Odreman	Rodrigo Matus
DG431	SELECTED TOPICS OF MATHEMATICS I	Fabián Bautista	Luis Llerenas
DG432	CONTEMPORARY STYLES	Rossana Torres	Rosa María Sanchez
MA412	SELECTED TOPICS OF MATHEMATICS II	Mauricio Odreman	Rodrigo Matus
CC416	PROGRAMMING IN MULTIMEDIA	Miriam Bautista	
DG433	VISUAL COMPOSITION	Rossana Torres	Felipe Torres
DG442	ILLUSTRATION AND ANIMATION IN 2 DIMENSIONS	Miriam Bautista	Luis Llerenas
DG441	DESIGN METHODOLOGY	Fabián Bautista	Alejandro Paz
FI403	CONCEPTUAL PHYSICS	Josué Domínguez	
CC421	COMPUTER GRAPHICS	Miriam Bautista	Leopoldo Uribe
DG434	GENERAL TYPOGRAPHY	Rossana Torres	
CC403	COMPUTER SYSTEMS AND COMPONENTS	Arturo Escoto	
DG435	GLOBAL PICTURE MANUAL	Alejandro Pacheco	Alejandro Paz
DG436	DIGITAL PHOTOGRAPHY	Ingrid Hernández	
CC404	DATA STRUCTURE	Julio Cuanalo	
MA413	PROBABILITY AND STATISTICS	Juan Coronado	Rodrigo Matus
SI403	DATABASE	Julio Cuanalo	
DG437	ELECTRONIC MEDIA DESIGN	Miriam Bautista	
MK400	MARKETING MANAGAMENT	Lorena Jáuregui	Eduardo Díaz
DG418	VIDEO PRODUCTION	Jonathan Ortega	Alvaro Zendejas
DG438	DIGITAL MODELING	Jonathan Ortega	Alvaro Zendejas
CC406	OPERATIVE SYSTEMS	Alejandro Romo	Galo Carrillo
DG419	MULTIMEDIA	Miriam Bautista	Alvaro Zendejas
DG420	3D ANIMATION	Jonathan Ortega	Alvaro Zendejas
CE417	NETWORKS AND DATA TRANSMISSION	Moisés Sánchez	
DG439	E-COMMERCE	Victor Siliceo	Iván Caldelas
DG440	STRATEGIC BUSINESS DEVELOPMENT	Salvador Chiu	

The following table shows the Mexicali Campus faculty distribution regarding the courses for the Digital Graphic Design Engineering Program:

CODE	SUBJECT	PROFESSORS	
DG400	INTRODUCTION TO DGDE	Dania Licea Verduzco	
CC400	PROGRAMMING METHODS I	Dania Licea Verduzco	Francisco Javier Chavez
MA400	MATHEMATICS	Susana Salome Dominguez	
MC400	COMPUTER DRAWING		
CC402	THINKING SKILLS	Dania Licea Verduzco	Francisco Javier Chavez
MA411	PROGRAMMING METHODS II	Susana Dominguez	
DG431	SELECTED TOPICS OF MATHEMATICS I	Ramon Rodriguez Esquer	
DG432	CONTEMPORARY STYLES		
MA412	SELECTED TOPICS OF MATHEMATICS II	Susana Salome Dominguez	
CC416	PROGRAMMING IN MULTIMEDIA	Dania Licea Verduzco	
DG433	VISUAL COMPOSITION	Ramon Rodriguez Esquer	
DG442	ILLUSTRATION AND ANIMATION IN 2 DIMENSIONS	Miriam Bautista	
DG441	DESIGN METHODOLOGY	Ramón Rodríguez Esquer	
FI403	CONCEPTUAL PHYSICS		
CC421	COMPUTER GRAPHICS	Dania Licea Verduzco	
DG434	GENERAL TYPOGRAPHY		
CC403	COMPUTER SYSTEMS AND COMPONENTS	Alfonso Rodriguez Lagunes	
DG435	GLOBAL PICTURE MANUAL		
DG436	DIGITAL PHOTOGRAPHY	Alfonso Rodriguez Lagunes	
CC404	DATA STRUCTURE	Roberto Gonzales	Amelia Resendez
MA413	PROBABILITY AND STATISTICS	Susana Salome Dominguez	
SI403	DATABASE	Dania Licea Verduzco	María Josefina Becerra
DG437	ELECTRONIC MEDIA DESIGN	Josue Pizano	
MK400	MARKETING MANAGAMENT		
DG418	VIDEO PRODUCTION		Alvaro Zendejas
DG438	DIGITAL MODELING	Galo Carrillo	Jesus Humberto Orozco
CC406	OPERATIVE SYSTEMS	Roberto Gonzales	
DG419	MULTIMEDIA	Galo Carrillo	
DG420	3D ANIMATION	Jesus Humberto Orozco	Alvaro Zendejas
CE417	NETWORKS AND DATA TRANSMISSION	Carlos Maytorena	
DG439	E-COMMERCE	Josue Pizano	
DG440	STRATEGIC BUSINESS DEVELOPMENT	Adriana Eguia	

The following table shows the Mexicali Campus faculty distribution regarding the courses for the Digital Graphic Design Engineering Program:

CODE	SUBJECT	PROFESSORS	
DG400	INTRODUCTION TO DGDE	Susana Gonzalez	Gustavo Romero
CC400	PROGRAMMING METHODS I	Luis Aguirre Loera	Lucía Beltrán Rocha
MA400	MATHEMATICS	Nadia NIebla Nuñez	Carlos Contreras
MC400	COMPUTER DRAWING	Gerardo Sierra	Gustavo Romero
CC402	THINKING SKILLS	Luis Aguirre Loera	Lucía Beltrán Rocha
MA411	PROGRAMMING METHODS II	Luisa Rosas Hernández	
DG431	SELECTED TOPICS OF MATHEMATICS I	Susana Gonzalez	Sialia Mellink
DG432	CONTEMPORARY STYLES	Michelle Mcunne	Esther Gamez
MA412	SELECTED TOPICS OF MATHEMATICS II	Luisa Rosas Hernández	
CC416	PROGRAMMING IN MULTIMEDIA	Eduardo Venegas Garcia	Claudia Fimbres
DG433	VISUAL COMPOSITION	Sialia Mellink	
DG442	ILLUSTRATION AND ANIMATION IN 2 DIMENSIONS	Luis Llerenas	Gustavo Romero
DG441	DESIGN METHODOLOGY	Susana Gonzalez	Ada Garin
FI403	CONCEPTUAL PHYSICS	Isaac Azuz Adeath	
CC421	COMPUTER GRAPHICS	Eduardo Venegas Garcia	Claudia Fimbres
DG434	GENERAL TYPOGRAPHY	Cecilia Castro	
CC403	COMPUTER SYSTEMS AND COMPONENTS	Sergio Robles	Alejandro Ramos
DG435	GLOBAL PICTURE MANUAL	Susana Gonzalez	
DG436	DIGITAL PHOTOGRAPHY	Rodolfo Ramirez Diaz	
CC404	DATA STRUCTURE	Luis Aguirre Loera	
MA413	PROBABILITY AND STATISTICS	Socorro Lomeli Sanchez	Luisa Rosas Hernandez
SI403	DATABASE	Francisco Villegas	Luis Aguirre
DG437	ELECTRONIC MEDIA DESIGN	Gustavo Romero	
MK400	MARKETING MANAGAMENT	Daniela Camargo	
DG418	VIDEO PRODUCTION	Jonathan Ortega	
DG438	DIGITAL MODELING	Alvaro Zendejas	
CC406	OPERATIVE SYSTEMS	Martin Marmolejo	
DG419	MULTIMEDIA	Jonathan Ortega	
DG420	3D ANIMATION	Jonathan Ortega	
CE417	NETWORKS AND DATA TRANSMISSION	Luis Monge	
DG439	E-COMMERCE	Adrian Garces	
DG440	STRATEGIC BUSINESS DEVELOPMENT	Daniela Camargo	



Count of Cve_Grupo	Column Labels				
Row Labels	DOCTORADO	ESPECIALIZACION	LICENCIATURA	MAESTRIA	Grand Total
ENSENADA	**10**		**42**	**20**	**72**
CC			9	9	18
CE	3		14	1	18
DG			9	3	12
FI	5			1	6
MA	2		7	6	15
SI			3		3
MEXICALI	**3**	**4**	**34**	**82**	**123**
CC		4	3	28	35
CE	2		4	17	23
DG			6	6	12
FI			7	6	13
MA	1		14	22	37
SI				3	3
TIJUANA	**19**		**26**	**108**	**153**
CC	3		10	30	43
CE	10		1	15	26
DG	1		9	11	21
FI			2	12	14
MA	4		2	40	46
SI	1		2		3
Grand Total	**32**	**4**	**102**	**210**	**348**

3.4 Research lines of the program.

CETYS UNIVERSITY's System, has many years of research in the fields stated on its Mission: Engineering, Administration and Social Sciences and Humanities. The research is primarily of the applied type, and with a focus on solving problems of the region of Baja California. The cases are reported in the documents that have been delivered to CONACYT to endorse the RENIECYT registration. It has also been documented in the applications and endorsements made by the Institution to belong to the National Register of Quality Postgraduate Programs.

The institution's strategic plan towards the year 2020 (CETYS 2020 PLAN) has several strategies defined in order to strengthen its faculty and research in the institution in order to ensure that this activity is an essential part of their academic functions, and in turn, take this ability to assist in the economic, social and cultural development of the region of Baja California. The three strategies are defined as follows:

(1) Strengthening its faculty through support to develop research activities in some cases, and obtaining doctoral degrees in others.
(2) Recruitment of faculty with doctoral degree and with experience in research and publication of results.
(3) Creation of three Centers of Excellence to conduct research and technology development projects that will significantly impact on the productive, social and cultural sectors of Baja California.

To properly align all research efforts, and in turn, coexist in harmony with the teaching activities, the Institution took on the task of defining a research plan which sets out the guidelines and policies that describe the operational framework of this activity. This plan also sets targets and indicators to be achieved in the short, medium and long term. It stands as one of them, for example, that our faculty members are members of the National Researchers System of CONACYT.

Due to the ordering of research and including its graduate programs in the National Register of Quality Graduate Programs (PNPC for its Spanish acronym), and encourage research in their careers, the Institution instructed each of its academic areas (Engineering, Business and Administration, and Social Sciences and Humanities) to define their areas of research, as well as organizing its faculty to form academic bodies in each of them. Thus the following lines were established for the area of Engineering:

(1) **Information and Multimedia Technology.** This research line addresses the problems related to the design and the development of computer systems applied to process automation and information management using the internet platform and associated technologies. It also addresses the problems of designing the electronic systems required in specialized processes, mainly control. Nine full-time professors are working on this LGAC (4 with Doctoral degree, and 4 in doctoral education). The following academic programs are in this line:

1. Electronic Cybernetics Engineering
2. Computer Science Engineering
3. Digital Graphic Design Engineering
4. Software Engineering
5. Master of Science in Engineering with emphasis in Information and Multimedia Technology.

Design and manufacturing processes. This research addresses the problems related to the design and engineering of products, considering the selection of materials, structural analysis, product testing, as well as the processes required for its manufacture. Six full-time professors are working this LGAC (1 Doctor, and 3 in doctoral training). The following academic programs can be found in this line:

1. Mechanical Engineering
2. Mechatronics Engineering
3. Master of Science in Engineering with emphasis in Design and Manufacturing.

Systems and industrial processes. This research addresses the problems related to the analysis and improvement of processes in the field of production of goods and services, using statistical techniques and operations research as well as methods for quality improvement. Nine full-time professors are working this LGAC (5 doctors and 1 in doctoral training). The following academic programs are in this line:

1. Industrial Engineering
2. Master of Science in Engineering with emphasis in Systems and Industrial Processes.

These lines were defined according to the needs found in the different sectors of the region in which the institution desires to impact with the formation of high-level human resources, and the development of research and technological development. According to the Strategic Plan's indicators, significant progress has been made in strengthening its faculty and considering these LGACs and their specific topics for hiring and doctoral training of the faculty.

Academic bodies are created for each line of research at a system-level, so that professors are integrated to develop research and teaching activities with their respective academic group in both undergraduate and graduate studies. In turn, there are collegiate bodies in the institution for reviewing and monitoring each of its academic programs, the purpose of these groups is the learning assessment, student assessment and periodic review of the academic programs.

On that terms the Master of Science Engineering is covering all the lines with their three areas of emphasis, it means that the program is completely aligned with the lines of research defined by the College of Engineering.

The strategy for doing research is based in that all students are forced to do an applied research project with the tutoring and advisory of professors from CETYS in accord with the emphasis area they selected.

3.5 Facilities, laboratories and book collection of the program.

All classrooms have projector equipment and wireless Internet connection. Some classrooms have sound equipment. Faculty cubicles have computer and Internet connection.

The library has carried out considerable improvements, especially in the acquisition of electronic books and data bases.

Within the supporting programs we have departments that manage their own resources and strengthen the student's holistic education, such as:

- Student Life is a department that carries out sporting, cultural, and social activities and supports integration and the student body operation.
- Entrepreneurial Development Center promotes the student body participation in the Management and Economic Simulation Exercise program (MESE in Spanish) which strengthens the training for business decision making process through simulators.

Coupled to this, the Center promotes the visits to companies and seminars in the institution.

- Student Development Center supports students since before the enrollment process through vocational guidance services, and it accompanies them throughout their undergraduate studies with tutorials, workshops, and psychological guidance.
- English Language Center supports students in the accreditation of TOEFL-equivalent test.
- Computer Services is provided by Information Services who manages computer resources in both software and hardware, as well as the necessary multimedia resources for course instruction, Blackboard platform, secure Internet access, local network connections, databases, e-mail and videoconference services.
- General Computer Laboratories provide computer resources for general hardware and software use.

In addition, the engineering programs offered by the College of Engineering have the following laboratories by campus:

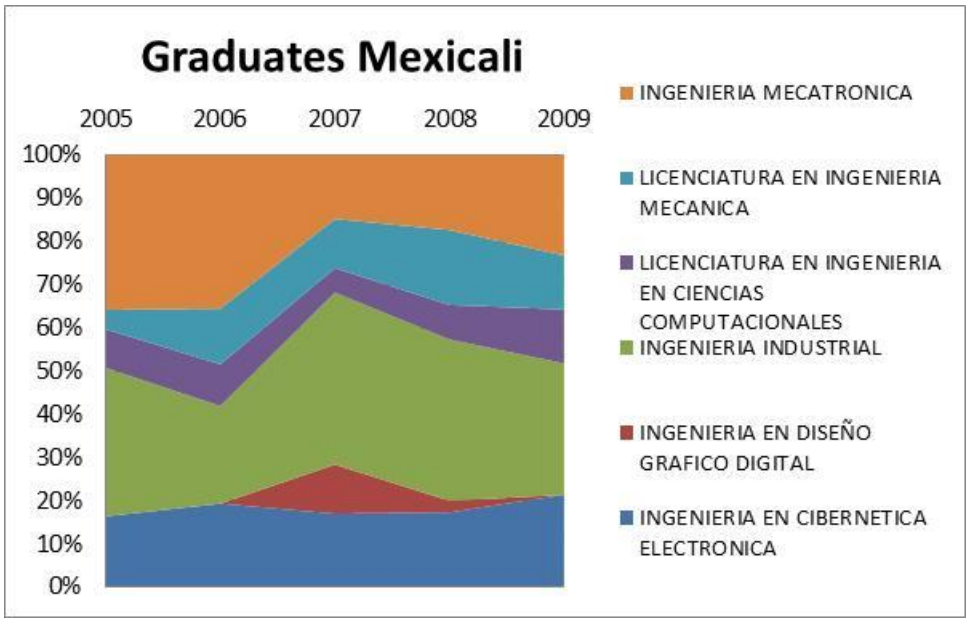
- Mexicali: Physics, Computer Science Engineering Computer Laboratory, Chemistry, Machine Shop, Production Systems, Processes Laboratory.

- Tijuana: Physics, Digital Art Computer Laboratory, Computer Network Laboratory, General Electronics, Production Systems, Industrial Computer labs.

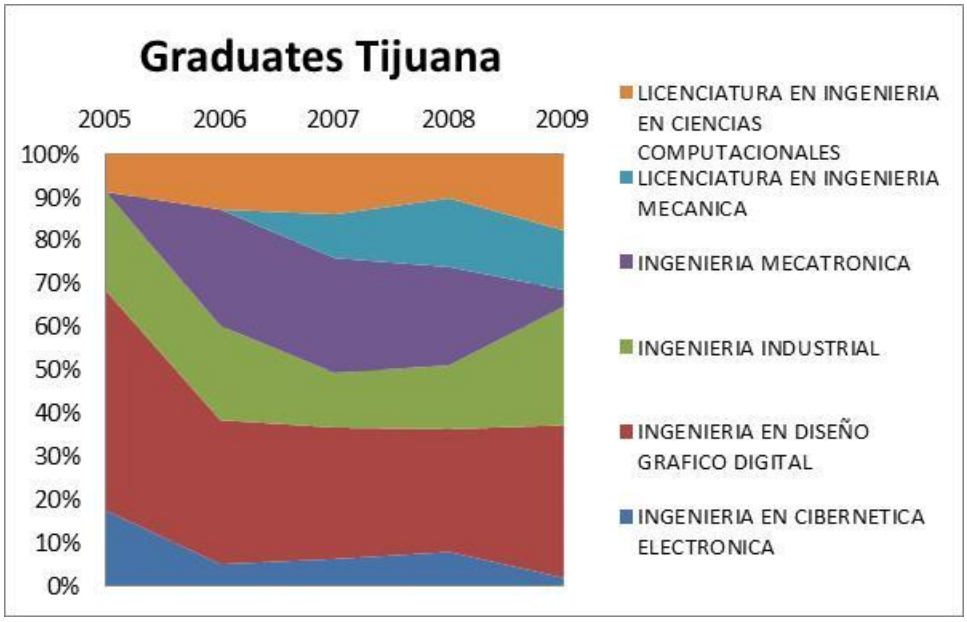
- Ensenada: Physics, Computer Laboratory, General Electronics, Chemistry, Production Systems, Industrial Computer labs.

4. Revision of the program's educational effectiveness

4.1 Graduates of the Program



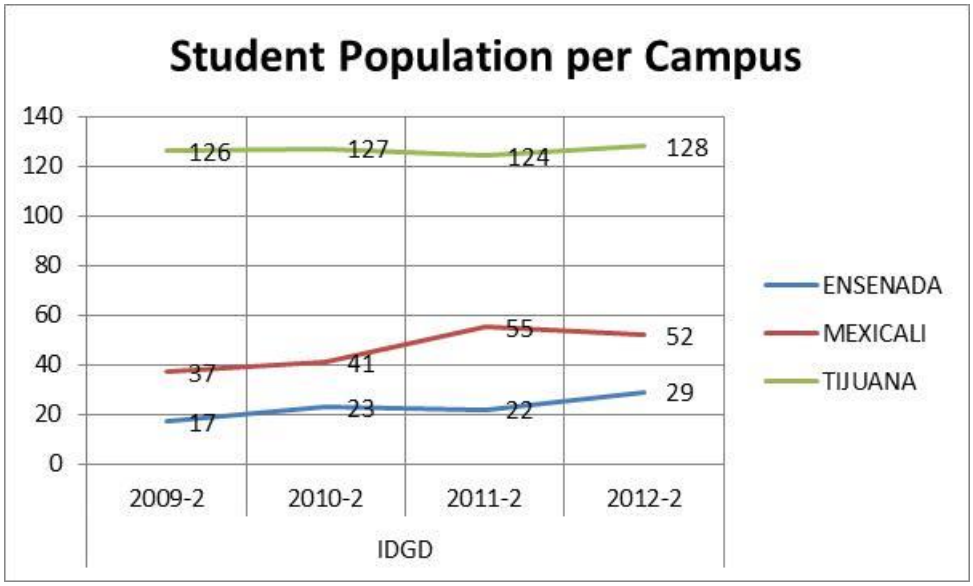
	2005	2006	2007	2008	2009	TOTAL
INGENIERIA EN CIBERNETICA ELECTRONICA	11	12	15	13	12	63
INGENIERIA EN DISEÑO GRAFICO DIGITAL			10	2		12
INGENIERIA INDUSTRIAL	23	14	35	28	17	117
INGENIERIA MECATRONICA	24	22	13	13	13	85
LICENCIATURA EN INGENIERIA EN CIENCIAS COMPUTACIONALES	6	6	5	6	7	30
LICENCIATURA EN INGENIERIA MECANICA	3	8	10	13	7	41
Escuela	67	62	88	75	56	



	2005	2006	2007	2008	2009	TOTAL
INGENIERIA EN CIBERNETICA ELECTRONICA	**10**	**4**	**5**	**7**	**1**	**27**
INGENIERIA EN DISEÑO GRAFICO DIGITAL	**29**	**26**	**24**	**25**	**18**	**122**
INGENIERIA INDUSTRIAL	**13**	**17**	**10**	**13**	**14**	**67**
INGENIERIA MECATRONICA	**0**	**21**	**21**	**20**	**2**	**64**
LICENCIATURA EN INGENIERIA EN CIENCIAS COMPUTACIONALES	**5**	**10**	**11**	**9**	**9**	**44**
LICENCIATURA EN INGENIERIA MECANICA	**0**	**0**	**8**	**14**	**7**	**29**
Escuela	**57**	**78**	**79**	**88**	**51**	

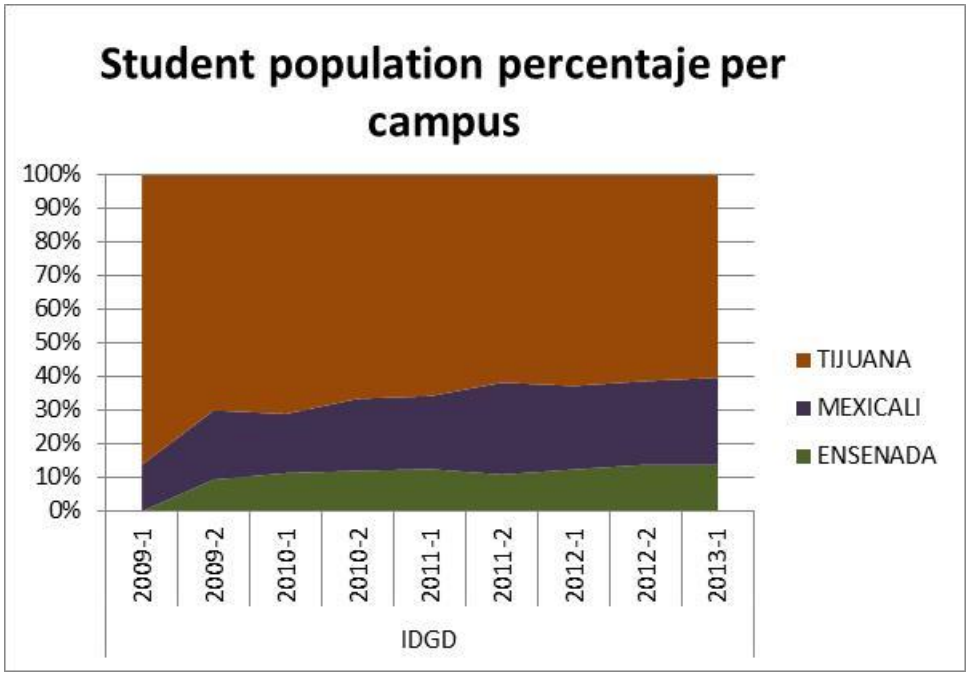
As shown in the figure for the Tijuana Campus, the student population has been steady with a high number of students compared to other engineering programs, while in the Mexicali campus, in the 2008 period, the population decreased compared to the previous cycle, but it has increased gradually in the following years. The Ensenada campus has not had any graduates up to year 2012.

4.2 Student Population



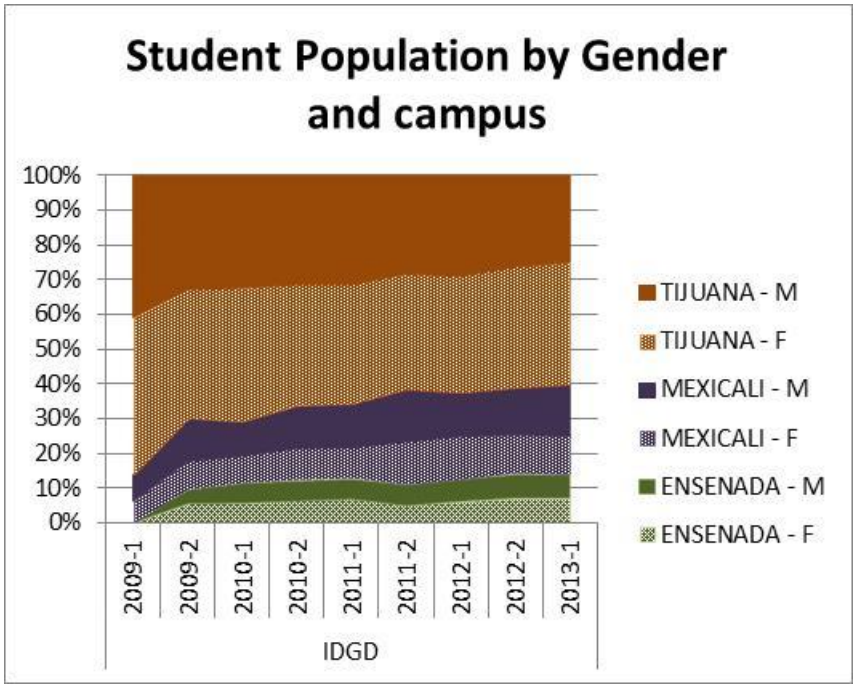
Row Labels	ENSENADA	MEXICALI	TIJUANA	Grand Total
IDGD				
2009-2	17	37	126	180
2010-2	23	41	127	191
2011-2	22	55	124	201
2012-2	29	52	128	209

As shown in the figure, in the Tijuana Campus the student population has been almost constant, while in the Mexicali campus, in the 2011-2 period, the population increased and has been steady since then. In the Ensenada campus, the student population has shown a steady growth.



Sum of textbox2	Column Labels			
Row Labels	ENSENADA	MEXICALI	TIJUANA	Grand Total
IDGD				
2009-1		22	137	159
2009-2	17	37	126	180
2010-1	20	31	125	176
2010-2	23	41	127	191
2011-1	22	38	115	175
2011-2	22	55	124	201
2012-1	24	48	121	193
2012-2	29	52	128	209
2013-1	27	51	118	196

As shown in the figure, the most students of Digital Graphic Design Engineering are in the Tijuana Campus.
In the Mexicali Campus we can see around 25% of the total of the population, and approximately 14% in the Ensenada Campus.



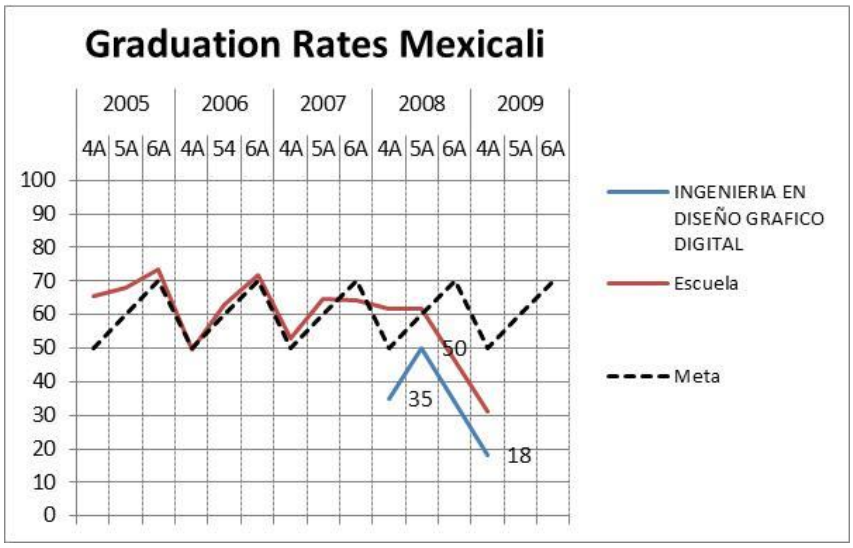
Nombre_Departamento	DE INGENIERIA					

Sum of textbox2	Column Labels					
	ENSENADA		MEXICALI		TIJUANA	
Row Labels	F	M	F	M	F	M
IDGD						
2009-1			10	12	72	65
2009-2	10	7	15	22	67	59
2010-1	10	10	14	17	68	57
2010-2	12	11	18	23	67	60
2011-1	12	10	16	22	60	55
2011-2	10	12	25	30	67	57
2012-1	12	12	24	24	65	56
2012-2	15	14	24	28	73	55
2013-1	14	13	22	29	69	49

The gender behavior over time in the Ensenada and Mexicali campuses has behaved roughly stable with almost a 50/50 percentage for each gender.
The gender behavior in the Tijuana Campus over time is stable; it can be seen that the female population represents around 60% of the total population.

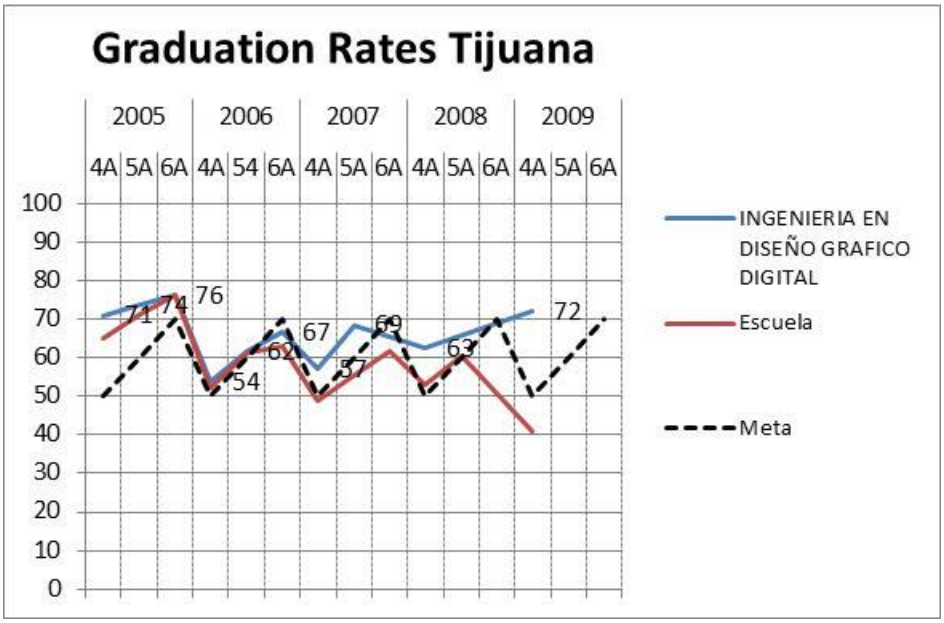
4.3 Retention analysis and graduation rate.

The retention analysis shown below is only for the Mexicali and Tijuana Campuses, since are the only ones that had graduation rates.



	2005			2006			2007			2008			2009		
	4A	5A	6A	4A	54	6A	4A	5A	6A	4A	5A	6A	4A	5A	6A
INGENIERIA EN CIBERNETICA ELECTRONICA	60	67	73	50	61	67	72	83		88			40		
INGENIERIA EN DISEÑO GRAFICO DIGITAL										35	50		18		
INGENIERIA INDUSTRIAL	70	85		44	48	52	63	71	73	62	67		55		
INGENIERIA MECATRONICA	66	75		54	73	85	67	72		63	68		30		
LICENCIATURA EN INGENIERIA EN CIENCIAS COMPUTACIONALES	31	46		33	56	67	22	44	56	60			25		
LICENCIATURA EN INGENIERIA MECANICA	100			67	78	89	42	53		62			19		
Escuela	65	68	73	50	63	72	53	65	64	62	62	###	31	##	##
Meta	50	60	70	50	60	70	50	60	70	50	60	70	50	60	70

As it can be seen in the graphic, in the Mexicali Campus, the program presented a graduation rate below the general behavior target. However, the entire school's graduation rate decreased in relation to the expectations.



	2005			2006			2007			2008			2009		
	4A	5A	6A	4A	54	6A	4A	5A	6A	4A	5A	6A	4A	5A	6A
INGENIERIA EN CIBERNETICA ELECTRONICA	75	83		44		56				31	54		17		
INGENIERIA EN DISEÑO GRAFICO DIGITAL	71	74	76	54	62	67	57	69		63			72		
INGENIERIA INDUSTRIAL	80	87		60	64	68	50	56		62			61		
INGENIERIA MECATRONICA				56		62	59		62	64	71		13		
LICENCIATURA EN INGENIERIA EN CIENCIAS COMPUTACIONALES	33	42		47	59		48	52		50	56		40		
LICENCIATURA EN INGENIERIA MECANICA							31	46	62	48			44		
Escuela	65	71	76	52	61	63	49	56	62	53	61	###	41	##	##
Meta	50	60	70	50	60	70	50	60	70	50	60	70	50	60	70

Regarding the Tijuana Campus, the Digital Graphic Design engineering program showed a graduation rate above the general behavior target of the Engineering School. The school's graduation rate decreased in relation to the expectations, while the digital graphic design engineering program has been constant with a high number of graduates.

4.4 Learning Assessment Process

The rest of this section will focus on the assessment plan and program developed to assess program level learning outcomes.

Assessment at the program level is something new, due to the fact that the focus has been on developing an infrastructure of knowledge and resources, as well as culture, to support assessment at the institutional level. The result of these efforts, as well as the information that has been generated is just now being used to obtain indicators for program review.

At the program level, the College of Engineering decided to designate an Assessment Officer to design a pilot assessment plan and program for the August-December 2010 semester for all Engineering Programs offered by the College. The responsible for this process was M.S. Jorge Sosa López, with the collaboration of the Deans of the Schools of Engineering and Chairs of each Academy.

This pilot project is divided into two stages, the first to be deployed during the second semester of 2010 focuses on program level learning outcomes common to all engineering programs. The second stage focuses on program level outcomes specific to the academic program, in this case the Bachelor in Graphic Design Engineering, as well as external assessment data relating to the EGEL exit test administered by CENEVAL.

This assessment plan has the goal to not only define a structure and methodology for assessment at the program level for the College of Engineering, that can be integrated as seamlessly as possible to the academic dynamic of the courses offered by the College of Engineering, but also with a strong faculty participation in the design of the assessment plan and process, providing a case study that not only integrates what has been achieved by the institutional process, but builds upon it. The complete documentation regarding the Assessment Plan for the College of Engineering may be found in the corresponding document, separate from this program review document.

The process and methodology that was defined consists of 6 key components:

1) Selection of Learning Outcomes: Each Academy, based upon the set of Program Level Learning Outcomes (common and specific), defined for the academic programs, will select at least one learning outcome to assess during each assessment cycle.

2) Course selection for assessment: Based upon the curriculum, and curricular mapping, each Academy, with the aid of the Deans of the Schools of Engineering, will define in which courses the assessment process will be implemented. It is important that the selected courses span the length of the academic program.

3) Design of Instruments for Assessment: Each Academy will design or select instruments to assess the selected learning outcomes. Examples of these may be various types of rubrics. Participation of various faculty members is not only encouraged, but strongly recommended.

4) Definition of learning activities and evidence of learning: Once learning outcomes, and courses are defined, learning activities and their corresponding evidence of learning are identified and defined. The congruency between this and the instruments defined in 3) is important. Both 3) and 4) may be done concurrently.

5) Training of faculty: With the aid of the Deans of the Schools of Engineering, faculty who will participate in assessment during the cycle are provided training regarding terminology, methodology as well as the instruments to be used. Close collaboration with faculty is a key to the success of the process.

6) Assessment during semester: The learning outcomes are assessed in the selected courses, using the defined instruments for the learning activities and corresponding learning evidence. This part of the process is supervised by the Deans of the Schools of Engineering in each Campus.

7) Analysis of results: At the end of the cycle, results are presented to the Academies and analyzed to identify areas of opportunity to be included as a part of the program review process.

For the second semester of 2010 (August-December 2010):

1) Selection of Learning Outcomes: The Academies decided that, for this first assessment cycle, all programs would assess the first two Program Level Learning Outcomes that are common to all Engineering Programs, meaning SLO_ENG1 and SLO_ENG2.

2) Course selection for assessment: Based upon the course offering for the August-December 2010 semester, 16 courses were selected for assessment. Since institutional learning outcomes assessment is also being done during the same semester, courses were selected with an effort to have compatibility and congruency with the institutional level assessment process, and also so as to not overburden faculty members.

3) Design of Instruments for Assessment: Each Academy made proposals for instruments to be used to assess SLO_ENG1 and SLO_ENG2, and these were analyzed and integrated, resulting in the definition of two rubrics, a holistic one for SLO_ENG1 and an analytical one for SLO_ENG2.

4) Definition of learning activities and evidence of learning: The 16 courses were divided between each Academy, according to areas of knowledge, and each Academy worked with their faculty members to identify learning activities and evidence of learning that could be used for the assessment of SLO_ENG1 and SLO_ENG2, considering the normal coursework that faculty do during a regular semester in which the courses are offered, and also in congruency with the instruments defined in 3) Each academy delivered a learning activity and evidence of learning description document. Following the same mentality described in 2), activities were selected in which both SLO_ENG1 and SLO_ENG2 could be assessed (and if possible, also institutional learning outcomes). It is not surprising that most activities follow a project and/or problem based learning scheme.

5) Training of faculty: With the aid of the Deans of the Schools of Engineering, each Campus trained the group of faculty who would teach the selected courses during the August-December 2010 semester, and therefore would participate in assessment during the cycle.

6) Assessment during semester: The assessment cycle was deployed during the August-December semester and results, including evidence of learning, were gathered by each School Director for each Campus.

7) Analysis of results: Results were analyzed by each academy during the first semester of 2011 and have been integrated into the program review documentation.

To assess the program level specific outcomes the following stages were defined:

1. Definition of rubrics.
   Faculty for each campus define a proposal of the type and format for the rubrics to be applied during the semester. These proposals are analyzed by the Academy as a group and validated for use.

2. Definition of period for assessment.
   At the beginning of each semester, the Academy will define which rubrics will be applied during the semester.

3. Identification of courses where assessment will be applied.
   Based upon the curricular mapping for the academic program, courses are selected for assessment.

4. Notification to faculty involved in assessment activities.
   Faculty is notified and trained in the use of the rubric if necessary.

5. Definition of learning activities and evidence. Faculty select learning activities and evidence for assessment, according to the selected course and curricular mapping.

6. Students upload their work to the electronic portfolio during the semester.
   Students do the assigned learning activity and upload their work to the electronic portfolio.

7. Faculty evaluate and provide feedback to students.
   Faculty evaluate student work using the previously designed rubrics and provide feedback to the students, as well as a general summary of assessment results.

8. Faculty generate a summary of assessment results.

   Each faculty member generates a summary of assessment results for student learning based upon the selected course and rubric.

9. The Academy analyzes the summary of assessment results.
   The Academy analyzes assessment results as a group, identifying areas of opportunity and improvement. If expected learning is not achieved, then an action plan is defined. The analysis of assessment results seeks to answer the question: what does this data mean with regards to student learning?

For the first semester of 2012 (January-June 2012):

1. Definition of rubrics.
   Faculty designed, validated and agreed upon two rubrics. The first rubric is to measure student learning related to the design of strategies for audiovisual communication and multimedia studies grounded in argumentation of speech in order to persuade an audience. (SLO_IDGD1). (Appendix A)

   The second rubric is to measure student learning related to the development of graphic content for interactive digital media applications, 3D and 2D digital animation, video games, films, special effects, Internet and e-learning based on basic science, and computer programming and audiovisual production technologies (SLO_IDGD2):

2. Definition of period for assessment.
   The academy defined that the rubrics would be applied every semester according to the following calendar:

SLOs	**Assessment**
SLO_IDGD2	January-June 2012
SLO_IDGD1	August-December 2012
SLO_IDGD3	January-June 2013

3. Identification of courses where assessment will be applied.
   For the second rubric (SLO_IDGD2) the following course for the January-June 2012 semester were identified for assessment:

Course	**Semester**	**Mexicali**	**Tijuana**	**Ensenada**
Programing Methods II	2	X	X	X
Design Methodology	4	X	X	X
Electronic media Design	6	X	X	X

4. Notification to faculty involved in assessment activities.
   Only one group per course was offered in each campus, and the corresponding faculty members were trained in the use of the rubric as well as the electronic portfolio.

5. Definition of learning activities and evidence.
   The selected faculty members defined the learning activities and evidence for assessment and uploaded this information into the electronic portfolio.

6. Students upload their work to the electronic portfolio during the semester.
   Students worked on the assigned activities during the semester and uploaded their work to the electronic portfolio.

7. Faculty evaluates and provides feedback to students.
   Faculty evaluated student work using the rubric for SLO_IDGD2.

8. Faculty generates a summary of assessment results.

Each faculty member generated a summary of assessment results for student learning based upon the selected course and rubric, and these were integrated by the academy for analysis.

9. The Academy analyzes the summary of assessment results.
   The Academy analyzed the assessment results as a group and found the following results with regards to SLO_IDGD2.

For following assessment cycles, it is expected that an assessment scheme that allows for assessment of institutional and both program level types of learning outcomes be designed, however, the bulk of workload that this would imply needs to be analyzed with detail.

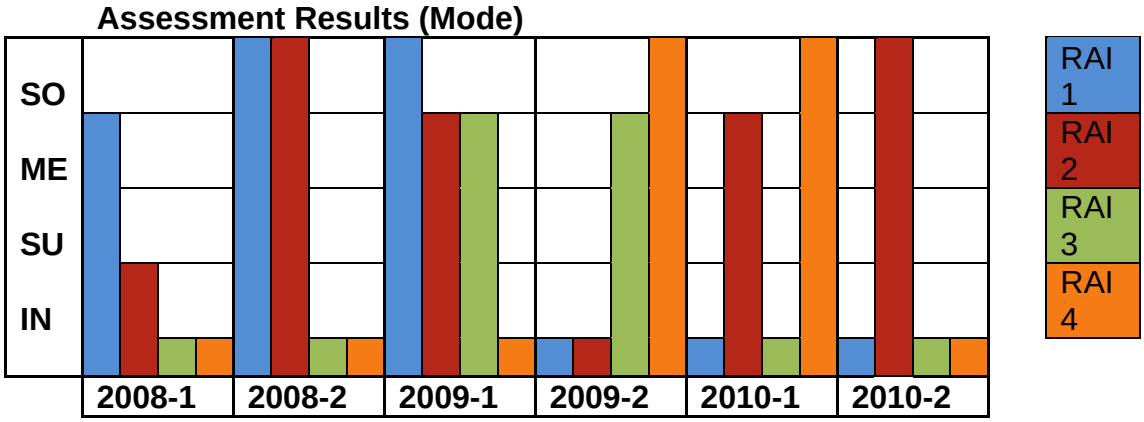
4.5 Learning Assessment Outcomes

Much work has been done at the institutional level regarding Assessment. An assessment plan and program began in 2008 with a focus on the gradual and systematic assessment of all institutional level learning outcomes for all academic programs. This has been a work in progress, in which areas of improvement have been identified and addressed, such as faculty participation and the integration and use of the electronic portfolio.

The institutional assessment process now gathers and stores information via the electronic portfolio, which is a custom design, developed by the Information Technologies Department of CETYS University.

The results of the assessment of institutional learning outcomes are delivered to the Deans of the Schools of Engineering at the end of each assessment cycle, which are by semester. The academies use this information as general input for the program review process.

INSTITUTIONAL ASSESSMENT RESULTS.
The results presented to the Academy by the CDMA (Center for Academic Development and Improvement) in the “Institutional Assessment Report Summary” are as follows:



Where: IN = Insufficient
SU = Sufficient
ME = Improvable
SO = Outstanding

RAI1 = Clear and effective communication in Spanish
RAI2 = Continuous learning
RAI3 = Critical thinking
RAI4 = Cultural diversity.

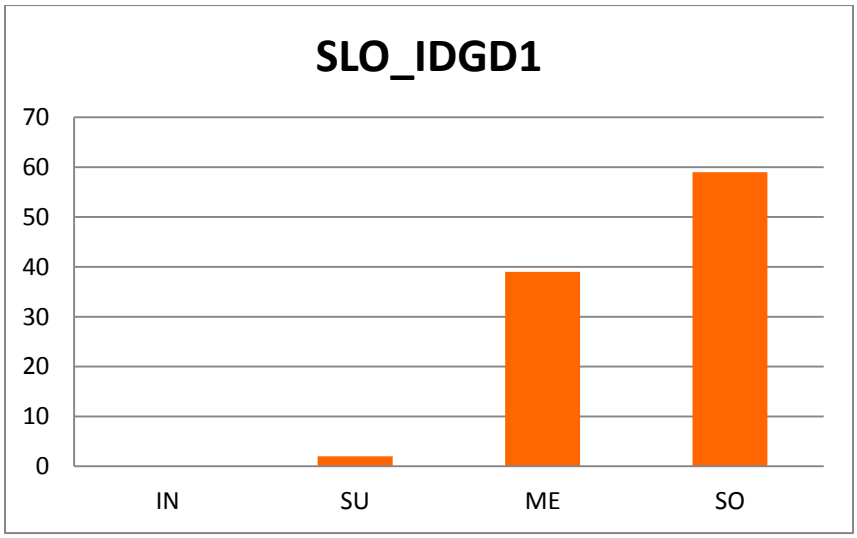
In general terms, the assessment results show a variation in learning achievement levels in each of the four institutional learning outcomes, without achieving outstanding or improvable levels consistently. This may be due to various factors that should be analyzed in conjunction with the Centers for Student Development (CEDEs) of each Campus.

Work has been done to support student development through the CEDEs of each Campus, due to the diverse academic achievement profiles of our students. This is done via workshops and student monitoring in conjunction with the academic coordinators. However, the academy identifies the importance of the course offering and content for fundamental areas relating to the four institutional learning outcomes.

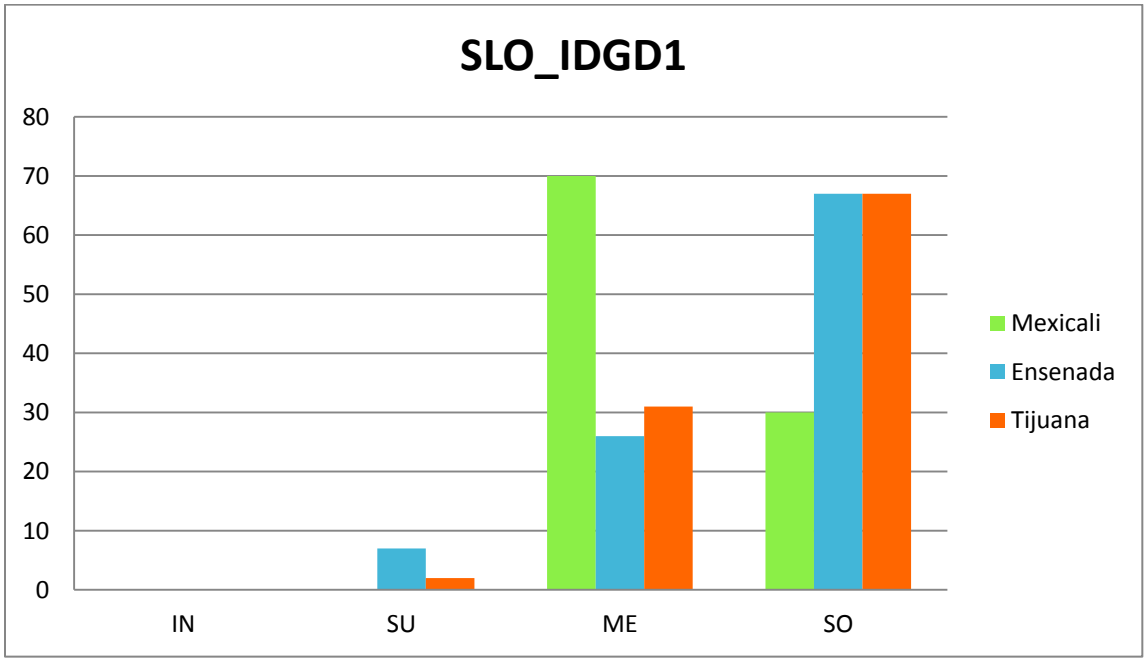
Also, the Academy identifies a need to disaggregate data for each academic program to provide program specific information regarding institutional assessment for program review purposes.

PROGRAM ASSESSMENT RESULTS.

Regarding SLO_IDGD1 (…design of strategies for audiovisual communication and multimedia studies …), in general, near 40% of engineering students of all campuses obtained learning achievement level ME (With room for improvement) and near 60% obtained learning achievement level SO (Outstanding):



By campus, 70% of Mexicali students obtained learning achievement level ME (With room for improvement) and the rest obtained learning achievement level SO (Outstanding). In Ensenada and Tijuana, near 70% obtained learning achievement level SO (Outstanding).



4.6 Improvement actions derived from the learning assessment

Currently analysis is still in process and improvement actions are yet to be derived. Some aspects inferred from the charts are:

- The results were consistent in both the Ensenada and Tijuana Campus, but differs in Mexicali.
- The results are acceptable and are congruent with student learning expectations according to the current curricular mapping done for the academic program.

4.7 Student performance in CENEVAL's EGEL

This program does not have an EGEL from CENEVAL test yet.

4.8 Program accreditations and recommendations

This program has not been accredited by the external accreditations bodies.

4.9 Follow up on the recommendations of the accrediting bodies

This program has not been accredited by the external accreditations bodies.

4.10 Faculty productivity

The faculty of engineering colleges in addition to their work as teachers carries out various scientific researches related to research lines in: manufacturing, aerospace design, renewable energy, software development. These research areas have been defined as part of the needs identified in the 20-20 plan of CETYS University System. The results of this research are published in articles by teachers in conferences, articles in journals and books.

Another important activity of the faculty is industry-related projects which most times are funded through the stimulus for innovation awarded by organizations such as CONACYT. These projects arise from innovation needs of Industry to improve their products and / or manufacturing processes, these Companies go to CETYS asking for support in the specialty areas of the University.

The services required to the Institution are basically giving technical consultancy to develop an engineering project such as making an innovation. The results of these investments are documented as technical reports which describe that participation involved with the company, main activities and results obtained.

To CETYS is important that teachers are continually conducting research, publishing and participating in projects linked to the industry for this reason CETYS supports and recognizes teachers for their productivity. The help provided to teachers, who conduct research and publish, consists in give a balance in the quantity of courses assigned, one less course than normal quantity of courses (four instead of three courses); so teachers have the time to publish and conduct research.

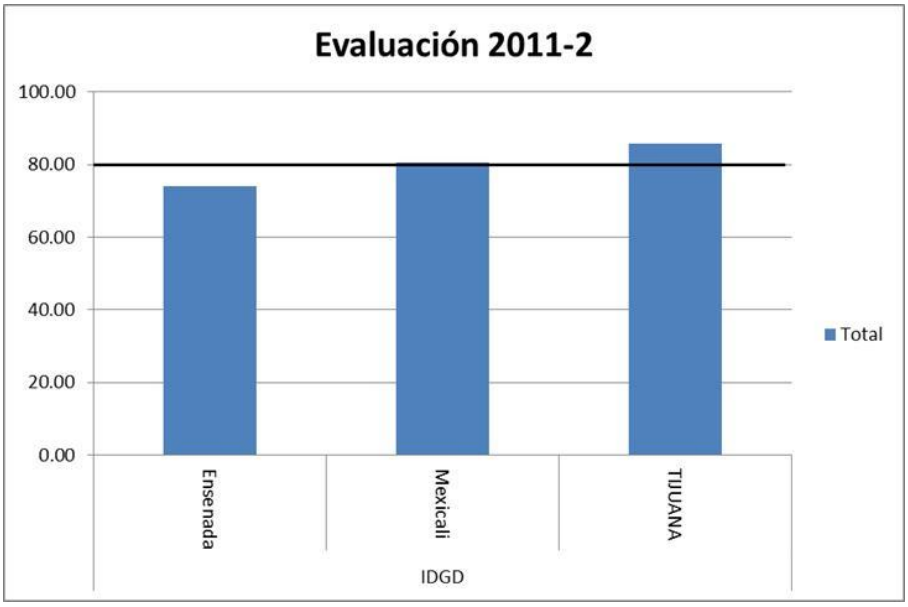
Each year CETYS University launches a call with different categories to invite teachers to participate in the award given to those with more publications, research and outreach activities with industry.

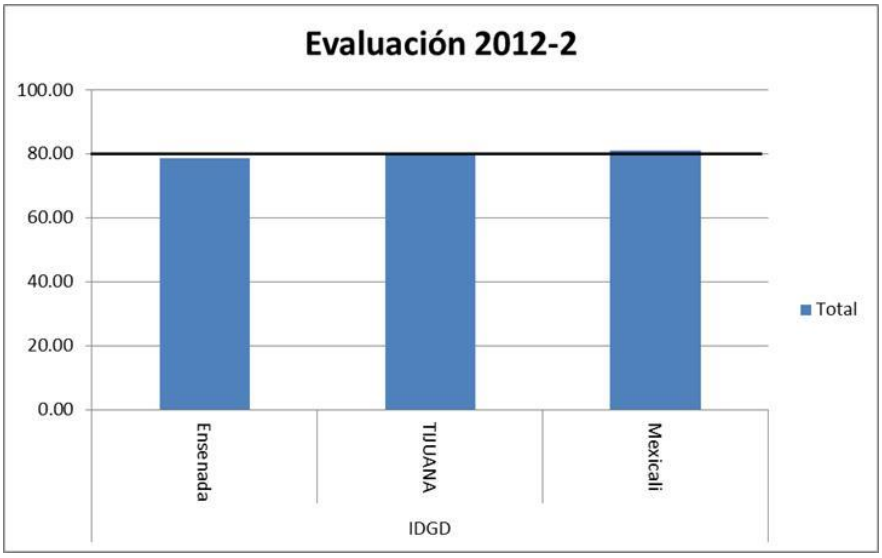
The faculty productivity is considered in the following aspects:

-Publications: articles in conferences, articles in journals, books
-Participation in projects linked to Industry
-Certifications and trainings
-Patents
-Level of SNI (National System of Researchers).

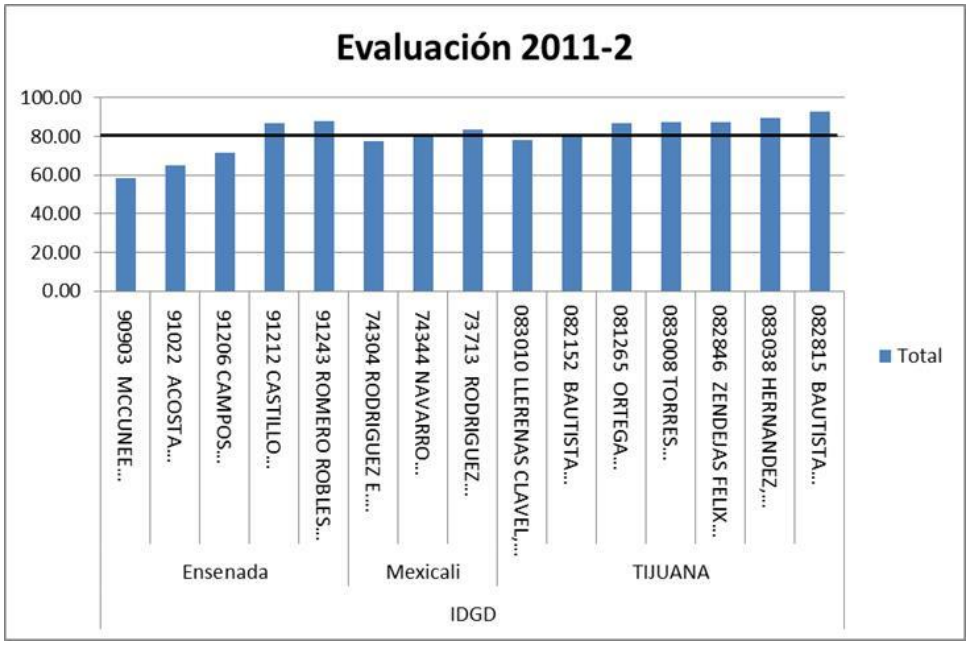
4.11 Faculty Evaluations.

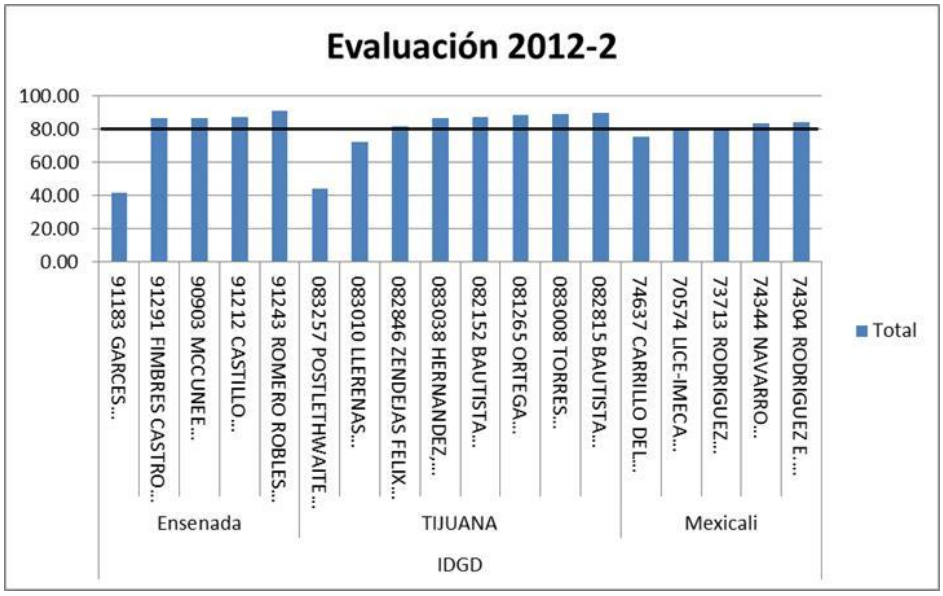
The evaluations are collected from the teacher evaluation system. The last two semesters are displayed as a sample, from August to December, 2011 and 2012. As it is shown in the chart, the overall level has an evaluation of 8 out of 10 as a minimum, which is Tijuana campus, however overall it is a good evaluation.





When analyzing teacher evaluations we can see that there are opportunities for improvement in some of them that are below the standard, of at least 8 out of 10. To improve teachers that get low points, there is a “Teaching Improvement Program”, to which teachers are invited to attend.





5. Program Review by External Experts.

• Introduction:

The program has already established a clear Mission, Vision, and Educational Objectives. The Bachelor's in Digital Graphic Design Engineering Program is focused on:

1. Graphic Design
2. Computer Science
3. Computer Animation
4. Video Production

• Faculty already in place:

Tijuana Campus:
- M.S. Miriam Bautista (Chair)
- M.S. Fabian Bautista

Mexicali Campus:
- M.S. Dania Licea

Ensenada Campus:
- M.S. Lucia Beltran

*Note: It seems like Tijuana Campus has a lot of activities in Digital Graphic Design Engineering.

• Structure of the Program:

- Accreditation 42 courses (totaling 328 credits)
- Completing 400 hours of professional practice
- Completing 500 hours of social service
- Completing corresponding EGEL examination administered by CENEVAL or equivalent.

• Graduates of the Program:
- Mexicali: 67 in 2005; 62 in 2006; 88 in 2007, 75 in 2008, and 56 in 2009
- Tijuana: 57 in 2005, 78 in 2006, 79 in 2007, 88 in 2008, and 51 in 2009

• The student performance:
This Program does not have EGEL and CENEVAL yet.

• The student population:
In Tijuana Campus has been almost constant, Mexicali Campus increased and now steady, Ensenada Campus also steady growth .

• The Learning Assessment and Outcomes:
Detailed, outlined, in place and appropriate

• Faculty Evaluation:
Received high student evaluations

• Student's Interview:
Interviewed a classroom of students in Mexicali campus. Students expressed their need in offering more in-depth elective courses in more focused areas of study (i.e. 3-D motion), possibly more math and physics, more qualified (expert faculty) and better food choices in cafeteria.

5.1 Academic profile of the external reviewer

Dr. Sean Monemi

Education:
Ph.D., Vanderbilt University, Electrical Engineering, Nashville, TN, December 1999
M.S., Vanderbilt University, Electrical Engineering, Nashville, TN, August 1985
B.S., Alabama A&M University, Electrical Engineering, Huntsville, AL, May 1980

Program Review and Assessment Experience:

- California State University, Fullerton
  - Master in Software Engineering (existing program)
- California State University, Bakersfield
  - New Bachelor in Electrical Engineering (new program)
- California State Polytechnic University, Pomona
  - ABET preparation and program review for Electrical and Computer Engineering
  - WASC preparation and study for all programs

Academic & Professional Experience:

- California State Polytechnic University, Pomona, CA
  Professor (current), Chair, Graduate Program Coordinator (2001- Present)
- Vanderbilt University, Nashville, TN
  Faculty, Research Scientist & Sr. Research Assoc. Professor, Project Manager (1998-01)
- TVA-NES (Nashville Electric Service), Nashville, TN (1987-1998)
  Supervisor - Technical Support (1995-1998)

Project Manager and Sr. Electrical Engineer (1987-1995)

- Draughons Jr.College, Nashville, TN, Program Development Coord. & Faculty (1986-87)
- United Technical Institute, Nashville, TN, Director of Education & Instructor (1985-86)
- Nashville State Technical College, Nashville, TN, Instructor (1985-86)
- Victor Technologies, Nashville, TN, Software Specialist (Summer Intern 1983)

- Litton Industries (Louis Allis Division), Atlanta, GA, Project Coordinator/Electrical Engineer/Technical Account Specialist (1981-1982)

Academic Affairs Experience:

- Experience and familiarity with:
    - CBA (Collective Bargaining Agreement)
    - CSU policies on Academic Affairs and Faculty Affairs
    - Faculty/Staff matters such as conflicts and grievance procedure
    - Diverse faculty and Staff recruitment
    - RTP (Reappointment, Tenured, Promotion) policies and procedures
- Actively participated in:
    - Faculty Development Advisory Council
    - Faculty Affairs Committee of Academic Senate
- Initiated evaluation forms and survey for department chair reviews
- Wrote/Update/Reviewed University Policies as follows:
    - Policy on Student Evaluation of Teaching
    - Policy on Management Personnel Plan (MPP) Appointments
    - Policy on The Academic Department Chair
    - Policy on Reappointment, Tenure, and Promotion (RTP) Policy and Procedures
    - Sabbatical Leaves and Difference-in-Pay Leaves Procedure
    - Faculty Performance Review Form (RTP Form)
    - Periodic Evaluation of Tenured Faculty Form
    - Periodic Evaluation of Temporary Faculty Form
    - Faculty Recruitment and Appointment Procedures
    - Academic Freedom and Professional Responsibility Acknowledgement

Professional Activities& Honors:

- Program Assessment (ABET & WASC): Assessment of ECE students by preparing and presenting senior exit exams, ABET program contribution by providing course curriculum, notebooks and department coordination, Attendees of Annual Assessment workshop, WASC program, faculty speaker for video recording, Southern CA Forum on Engineering & Technology Assessment, WASC program participation.

- Professional Activities: Advancement Coordinator of ECE department, Member of Scholarship Committee, College of Engineering open house, Moderator and participation in College of Engineering symposium, Presenting MSEE degree to graduate students in annual commencement, Presenter for ECE student orientations, Participation in student's project and student's club and activities, Member of Industry Action Council

- Members of: Instructional and Informational Technology Executive Committee, Faculty Development Advisory Committee (FDAC), Member of Student Health Advisory Committee (SHAC), Member of Faculty Affairs Subcommittee of Academic Senate, CSU Statewide Academic Senate, Geographic Information System Advisory Board (GIS)

- Community Service learning activities: NSF, Integrating Service-Learning into Engineering Curricula, several Mini Grants in Service-Learning as pedagogy for Engineering: Developing a course project on "Teaching, Service Learning to the Community and Reforming Undergraduate Senior Project course (Voice Controlled

Wheelchair), Service learning workshops attended in Lake Elmo, MN, Service learning workshop by the Director of Community Service Learning, CPP, Service learning workshop, presented and prepared a forum on “Engaged Department Institute”, CPP, Service learning projects with students in “Traffic study electrical and civil engineering joint team senior project”, CPP, Emergency Evacuation Plan for CPP

- Seminars/ Symposium/Summit/Expositions/Forum/Workshops: Woman’s Healthcare at City of Hope, IEEE Communication Society Foothill Chapter, IEEE SWE, Symposium on CPP Annual Engineering Symposium, Wireless Telecommunication Symposium, Summit on Annual Engineering Research Council summit, Washington, DC, Exposition on Annual GIS Exposition

- Awards: The best paper award titles “Integrated Diagnostics for Electric Utilities”, from IEEE 4th World Multi-conference on Systemics, Cybernetics and Informatics (SCI) 2000, in Orlando, FL., Microsoft Corporation teacher scholar awardees’ for work in software engineering and contribution in book publication on operating systems for graduate program by Microsoft.,
- Teacher-Scholar Summer Institute, Cal Poly San Luis Obispo: Collaborative Learning: Teaching & Assessing, What is Hard to “See”, The Effective Use of Academic Technology, Information, Technology, & Teaching, 2004.

- Paper Review: IEEE Paper Evaluation: IEEE Transaction on Vehicular Technology on “Embedded Instruction Memory in Automotive Engine Controller”, IEEE Aerospace Conference paper review annually, VTC 2004 (Vehicular Technology Conference) paper review, ASEE (American Society for Engineering Education), Wireless Telecommunication Conference

- Text Book Review: (John Wiley & Sons, Inc – “Data Structures with JAVA” by Koffman and Wolfgang, John Wiley & Sons, Inc – “Objects, Abstraction, Data Structures and Design Using JAVA” by Koffman and Wolfgang, McGraw Hill– “Object-Oriented and Classical Software Engineering” 6th edition by Schach, McGraw Hill– “Object-Oriented and Classical Software Engineering” 7th edition by Schach, Microsoft Press– “Windows Internals” by Russinovich and Solomon, John Wiley & Sons, Inc. – “Software Engineering: Modern Perspective”, 2nd edition by Braude)

- Memberships in professional organizations: American Society for Engineering Education (ASEE), Institute of Electrical and Electronics Engineers (IEEE), Association for Computer Machinery (ACM), Urban and Regional Information Systems Associations (URISA), Geospatial Information and Technology Association (GITA), Society for Design and Process Science(SDPS), Scientific Research Society(Sigma Xi)

5.2 Recommendations of the Reviewer

The Digital Graphic Design Engineering Program seems in place, matured and eligible for the accreditation. Please note to increase the number of eligible and qualified full time faculty to fully support the program.

6. Conclusions and long-term goals (4 years) for the program.

ABOUT STUDENTS

Conclusions:

NEW ENROLLMENT AND RE-ENROLLMENT STUDENTS TREND

• The population in the Tijuana Campus has shown a constant behavior with a high number of students.

• The population in the Mexicali Campus has gradually increased over the years.

• The population in the Ensenada Campus shows stability with a trend to enroll in the last year.

• The distribution of the total population of the program is approximately 60% in the Tijuana Campus, 25% in the Mexicali Campus and 15% in the Ensenada Campus.

RETENTION AND GRADUATION RATE

• The Tijuana campus showed a graduation rate exceeding the goal of the engineering school and has remained constant with a high number of graduates.

• The Mexicali campus showed a graduation rate below the goal; however the whole school has a trend of dropouts.

CENEVAL RESULTS

• Performance levels obtained in the equivalent test of CENEVAL have been favorable. More than 80% of the students obtained a score between and Improvable. The rest is in the range of Sufficient

Proposals:

NEW STUDENTS AND RE-ENROLLMENTS

• Instituting remediation subjects in mathematics and computing for those students who have achieved a score lower than 1,100 points in the test.

INSTITUTIONAL AND PROGRAM LEARNING

• Analyze the results obtained by generations according to the assessment plan.

• Analyze the assessment plan and provide it to all the professors who teach subjects in the program.

• Ensure that the students selected for assessment are evaluated in its entirety for more accurate data.

CENEVAL PERFORMANCE

• Review the content and structure of the exercises of the new CENEVAL exam for Graphic design.

• An analysis must be performed of the subjects included in the program and its contents to see if it is necessary to strengthen a particular area.

ABOUT PROFESSORS

Conclusions:

ACADEMIC DEGREES

The academic degree of the professors who teach professional subjects at each campus is as follows:

• In the Mexicali campus 43% of the subjects are taught by professors with bachelor's degrees, the rest by professors with master's degrees (57%).

• In the Tijuana campus 40% have a bachelor's degree, 50% a master's degree and 10% a PhD.

• In the Ensenada campus only 30% have a master's degree and the rest has a bachelor's degree.

ASSESSMENT IN THE TEACHING-LEARNING PROCESS

The presented assessments were taken from the professor’s evaluation system.

• Although it only shows the results of the 2012-2 semester, the general behavior of results indicates that most professors had a higher evaluation to 8, which is the minimum expected.

• To improve the performance of professors who do not get a higher evaluation than 8, workshops and courses for professor’s education are offered and professors are invited to attend.

EVALUATION IN: SERVICES / PARTNERSHIPS / RESEARCH PUBLICATIONS

The area where the academy has contributed the most is in Partnerships.

• Various activities and projects have been completed to date in the area of partnerships. Some projects are done in multidisciplinary team to meet the

industry's demands; others involve only the participation of students from DGD. All projects are contacted through the CETYS's partnerships department and are supervised by professors.

• In the area of research, some professors have published in design forums and participated in international exhibitions and local conferences.

Proposals:

NUMBER OF PROFESSORS

• Increase the number of professors with specialties in the area of digital graphic design to develop applied research projects.

• Promoting professors that are currently working in the academy and in the WASC program.

EVALUATION

• Evaluation: offer professor training workshops and courses special for professors of subjects with high practical content, so that they can attend all the indicators from the assessment test.

RESEARCH / PUBLICATIONS

• Establish incentives and provide an opportunity for professors to conduct publications.

ACADEMIC CREDENTIALS

• It is strongly recommended to provide opportunities for professors who are currently collaborating in the program can obtain their doctoral degrees.

SERVICE / PARTNERSHIP

• Strengthen partnerships with the industry, with the collaboration of projects. Give extra incentive for professors to participate not only leading but also in the development of the project.

EXTERNAL RECOMMENDATION:

• Increase the number of qualified professors who are fully supporting the program.* Dr. Sean Monemi Reviewer

ABOUT THE CURRICULUM

Conclusions:

SUBJECTS OF THE PROGRAM: The distribution of subjects helps the program in vocational subjects, however there are subjects in the area of computer science that are not fully linked to the digital graphic design area and tend to be general training subjects instead of training students in the professional area.

RESOURCE	SITUATION
Book collection	• Selection and acquisition of specialized books and magazines for the professional area of Digital Graphic Design.
Facilities	• The institutional development plan in 2020 is currently underway, which is intended to operate a multi-campus system with the infrastructure and services needed to support the kind of education that aims to be achieved in the 2020 Plan.
Team	• The acquisition of licenses for new software is complicated and prevents from using new or updated tools in the classroom.
Professors in subjects within the professional area	• Very few full time or part time professors in the three campuses, nearly all subjects are taught by teaching assistants.
EDECs	• All elements can be found in the program; some directly and others indirectly (extracurricular activities).

It is suggested to:

• Update the program to add or change content in some areas, including new subjects that are important in the field of digital graphic design, change the subjects that are not providing high impact knowledge to the student's training. The update can be done based on the learning outcomes of the program and based on the requirements of companies that hire DGD graduates.

• Form the more specialized multimedia lab aimed at creating interactive media with the right elements for the realization of multimedia projects. (priority for Mexicali and Ensenada). Update and acquire specialized software for the three campuses.

• Update the programs also in literature and in case of not having such book collection, proposing the acquisition in library.

• Establish agreements with international universities that grant degrees or certificates in graphic design.

• Offer more online courses and encourage professors to design them.

• Consider the electives that easily allow the student’s mobility program.

• Get a national accreditation.

• Create a development agency that offers professional visual communication digital graphic design services.

7. Attachments

A: SLO_IDGD1

SLO 1	Diseña estrategias de comunicación audiovisual y multimedia fundamentadas en la argumentación de discursos con el objetivo de persuadir a una audiencia, mediante la selección óptima de la tecnología digital para su producción y transmisión.			
Aspecto analizado	Insuficiente 0–69	Suficiente 70–76	Mejorable 80–92	Sobresaliente 93–100
Valor	17 máximo	19 máximo	23 máximo	25 máximo
Concepto de comunicación visual. Mensaje.	El concepto no es capaz de comunicar el mensaje. No existe análisis que soporte la comunicación visual. El concepto es producto de la improvisación. El usuario no logra comprender el mensaje. No existe un proceso de diseño evidente.	El concepto presenta problemas para comunicar el mensaje. Existe un análisis débil que propicia imprecisiones en la comunicación visual. El concepto es producto en gran medida de la improvisación. La inteligibilidad no es inmediata y exige un gran esfuerzo por parte del usuario. El proceso muestra inconsistencias ya que suprime fases importantes como la investigación, bocetos o el desarrollo de prototipos.	El concepto comunica con cierta precisión el mensaje. Si bien se analiza el problema de diseño, éste no es suficiente para determinar una estrategia conceptual precisa. Existe cierta improvisación en la construcción del concepto. La inteligibilidad no es inmediata y exige cierto esfuerzo por parte del usuario. Existe un proceso de diseño que no es completo.	El concepto comunica con precisión el mensaje. Surge a partir de un análisis estructurado del problema de diseño. Elude la improvisación al favorecer la planeación estratégica. Su comprensión (inteligibilidad) es instantánea. El usuario requiere no más de 10 segundos para discernir el tópico del producto de diseño. Se presenta un proceso que incluye investigación, bocetos y prototipos finales.
Diseño de Interface. Composición visual.	La composición visual obstaculiza el acceso a la información. La interfaz es un elemento distractor. La legibilidad de la información es nula. El diseño no se soporta en retícula alguna.	La composición visual presenta dificultades al usuario para acceder a la información. La interfaz se convierte en un elemento distractor. Su presencia limita la legibilidad de la información. La retícula otorga estructura a muy pocos elementos de la composición.	La composición visual permite el acceso a la información. La interfaz se convierte en un elemento visible en el diseño. Su presencia puede distraer y complicar la legibilidad de la información. El diseño está basado en una retícula sin embargo algunos elementos no están organizados en torno a ella.	La composición visual permite un acceso ágil y trasparente a la información. Es intuitiva de modo que el contenido está disponible para el usuario sin que se ejerza esfuerzo. La interfaz es funcional y transparente, ubica en el espacio los elementos sin distracciones. El diseño está basado en una retícula que organiza el acceso a la información.
Redacción y ortografía.	Los textos no logran comunicar el mensaje. La redacción es deficiente y se presenta una cantidad excesiva de errores ortográficos.	Los textos presentan problemas para comunicar el mensaje. La redacción es confusa y se presentan errores ortográficos sucesivos.	Los textos comunican con cierta efectividad el mensaje. La redacción es apropiada y se presentan algunos errores ortográficos.	Los textos en el producto de diseño comunican de manera efectiva el mensaje a través de una redacción concisa y una ortografía impecable.
Aspectos técnicos. Plataforma tecnológica.	La implementación tecnológica es incapaz de desplegar los contenidos. Es errónea la selección de la técnica y su plataforma para comunicar el mensaje. Se presentan severas anomalías en detrimento de la calidad, limpieza y resolución de los elementos de diseño.	La implementación tecnológica despliega los contenidos con dificultades. La selección de la técnica y su plataforma no es adecuada para comunicar el mensaje. Se presentan diversos detalles negativos en la calidad, limpieza y resolución de los elementos de diseño.	La implementación tecnológica despliega los contenidos con algunas dificultades. La selección de la técnica y su plataforma es adecuada pero presenta limitaciones para comunicar el mensaje. Existen algunos detalles negativos en la calidad, limpieza y resolución de los elementos de diseño.	La implementación tecnológica permite un despliegue ágil y óptimo de los contenidos. La selección de la técnica y su plataforma favorecen la comunicación. La calidad, limpieza y resolución de cada uno de los elementos de diseño facilita la comprensión del mensaje.

B: SLO_IDGD2

SLO 2	Desarrolla contenido gráfico para aplicaciones digitales interactivas y multimedia, animación digital 3D y 2D, videojuegos, cine, efectos especiales, Internet y e-learning fundamentado en las ciencias básicas, la programación computacional y las tecnologías de producción audiovisual con el propósito de solucionar problemas de comunicación visual en ámbitos educativos, empresariales y en la industria del entretenimiento y de servicios.			
Aspecto analizado	Insuficiente 0–69	Suficiente 70–76	Mejorable 80–92	Sobresaliente 93–100
Valor	17 máximo	19 máximo	23 máximo	25 máximo
Contenido	El contenido carece de fundamento en una investigación del usuario y contexto del proyecto a desarrollar. La redacción y la ortografía de los textos tienen problemas y dificultan la comunicación de la información.	El contenido se fundamenta en una investigación incompleta del usuario y contexto del proyecto a desarrollar. La redacción y la ortografía de los textos tienen varios problemas para comunicar con precisión la información.	El contenido se fundamenta en una investigación que analiza el usuario y parte del contexto del proyecto a desarrollar. La redacción y la ortografía de los textos tienen algunos problemas para comunicar con precisión la información.	El contenido se fundamenta en una investigación completa que analiza el usuario, su contexto y el estado del arte del proyecto a desarrollar. La redacción y la ortografía de los textos comunican con precisión la información.
Organización de los Elementos	No existe un orden en los elementos del diseño y por lo tanto no se logra una comunicación adecuada. La plataforma tecnológica carece de estructura.	Algunos elementos de diseño están ordenados y logran comunicación poco efectiva. Hay una estructura poco clara en la plataforma tecnológica.	La mayor parte de los elementos de diseño tienen orden y logran una comunicación efectiva. Hay una estructura clara en la mayoría de la plataforma tecnológica.	Se ordenan todos los elementos de diseño para lograr una comunicación efectiva. Hay una estructura clara e íntegra en toda la plataforma tecnológica.
Aspectos Técnicos	La selección de la tecnología es inapropiada para el proyecto de diseño. La plataforma tecnológica desarrollada no da soporte al proyecto de diseño.	La selección de la tecnología es poco apropiada para el proyecto de diseño. La plataforma tecnológica desarrollada da poco soporte al proyecto de diseño.	Se selecciona la tecnología apropiada para el proyecto de diseño. Desarrolla la plataforma tecnológica que da soporte al proyecto de diseño.	Se selecciona la tecnología más apropiada para el proyecto de diseño. Desarrolla de forma óptima la plataforma tecnológica que da soporte al proyecto de diseño.
Diseño	Se diseña sin comprensión de los contenidos. Se diseña en base a conocimientos débiles de la composición, la psicología del color y la pregnancia de la forma (fondo – figura). El diseño tipográfico dificulta la comunicación de el contenido. El desarrollo no soluciona el problema que plantea el proyecto de diseño.	Se diseña con poca comprensión de los contenidos. Se diseña en base a algunos conocimientos de la composición, la psicología del color y la pregnancia de la forma (fondo – figura). El diseño tipográfico comunica con algunos problemas el contenido. El desarrollo soluciona parte de el problema que plantea el proyecto de diseño.	Se diseña de manera legible. (comprensión de los contenidos). Se diseña en base a conocimientos de la composición, la psicología del color y la pregnancia de la forma (fondo – figura). El diseño tipográfico comunica el contenido sin distracciones ni sensacionalismo. El desarrollo soluciona en mayor parte el problema que plantea el proyecto de diseño.	Se diseña de manera legible e intelegible (comprensión de los contenidos). Se diseña mostrando un dominio de la composición, la psicología del color y la pregnancia de la forma (fondo – figura). El diseño tipográfico comunica de manera eficiente el contenido sin distracciones ni sensacionalismo. El desarrollo soluciona el problema que plantea el proyecto de diseño.