UNISEC MÉXICO
University Space Engineering Consortium

UNISEC-México

40th Virtual UNISEC-Global Meeting

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Outline

1. The Aerospace Sector in Mexico,
2. Chapter activities,
3. Future actions,
4. Final remarks.

The Aerospace Sector in Mexico

- ✓ In the last ten years, the Mexican aerospace sector has created a competitive industrial environment in the world,
- ✓ The strategies designed to achieve the national priorities of increasing existing capacities and generating conditions that allow development at the national and regional levels,
- ✓ Current undergraduate and postgraduate educational plans aligned to the trend of the aerospace sector,

The Aerospace Sector in Mexico: Social Needs

Human capital formation	• A high demand has been detected for engineers with training in the aerospace area with skills to join either the aeronautical or space sector.
Development of indigenous technology	• There is a strong technological dependence, not only in the civil and commercial sectors, but also the military. • Lack of testing and certification centers for aerospace products.
Transversal collaboratorion	• Lack of collaboration between the triple helix actors (academia, industry and government), to foster the aerospace sector.
Remote sensing for early warning alert	• Civil protection and national security strategies, through the development of technological projects for disasters caused by natural phenomena and human activity.
Communications: coverage and access	• Development of broadband infrastructure. • Connectivity throughout the country to promote health and education.

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The Aerospace Sector in Mexico

#	ESTADO	COMPAÑÍAS
1	Baja California	97
2	Sonora	58
4	Chihuahua	52
3	Querétaro	50
5	Nuevo León	33
10	Coahuila	14
9	Ciudad de México	13
8	Tamaulipas	12
6	Jalisco	10
7	Estado de México	10
12	Guanajuato	5
15	Durango	3
11	San Luis Potosí	2
13	Yucatán	2
14	Puebla	2
17	Zacatecas	2
16	Aguascalientes	1
18	Hidalgo	1
19	Oaxaca	1
	TOTAL	368

257 (70%)

The Mexican aerospace sector is mainly aeronautical. However, there are important efforts around the country for the industry to evolve and consolidate the space sector, such as the Querétaro Aerocluster

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The Aerospace Sector in Mexico: Space branch

AEM
AGENCIA ESPACIAL MEXICANA

Regional Space Development Center (CEDRE)

State of México

State of Zacatecas

CONAHCYT
CONSEJO NACIONAL DE HUMANIDADES CIENCIAS Y TECNOLOGÍAS

LAN

LN-INGEA
CONACYT 232660
Laboratorio Nacional de Ingeniería Espacial y Automotríz

LANCE
Laboratorio Nacional de Clima Espacial

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The Aerospace Sector in Mexico: Space branch

The higher technical level degree (TSU):

1. TSU in Aeronautical Maintenance,
2. TSU in Aeronautical Manufacturing in precision machining,
3. TSU Aviator.

Undergraduate Degrees:

1. Aeronautical Engineering,
2. Airport and Air Business Administration Department,
3. Aeronautical Mechanical Design Engineering,
4. Engineering in Electronics and Control of Aircraft Systems,
5. Aircraft Systems Engineering,
6. Aerospace Engineering.

Graduate Degrees:

1. M.S. and Ph.D. in Aeronautical and Aerospace Engineering,
2. M.S. and Ph.D. in Remote Sensing and Space Physics

The Aerospace Sector in Mexico: Space branch

Table 4 CubeSats launched by Mexico

Name	Organization	Year of launch	CubeSat type	Application
Painani-I	SEDENA	August 2019	3 U	Military
AztechSat-1	UPAEP	December 2019	1 U	Science, Technology, and Education
NanoConnect-2 (SAI-1)	ICN-UNAM	February 2021	2 U	Science, Technology and Education
D2/AtlaCom-1	SpaceJLTZ	June, 2021	6 U	Science, Technology and Education
Painani-II	SEDENA	August 2021	3 U	Military

Ferrer-Pérez, J.A., Gaviria-Arcila, D., Romo-Fuentes, C., Chávez-Moreno, R.G., Ramírez-Aguilar, J.A., López-Parra, M. (2022). The Development of CubeSats in Latin America and Their Challenges on the Design of Thermal Control Systems. In: Froehlich, A. (eds) Space Fostering Latin American Societies. Southern Space Studies. Springer, Cham. https://doi.org/10.1007/978-3-030-97959-1_3

The Aerospace Sector in Mexico: Space branch

Chapter activities

UNISEC México active since November 2014.

UNISEC University Space Engineering Consortium NORTH-MEXICO

(2014)

UNISEC México in 2024.

- M. I. Antonio Gómez Roa. UABC, FCITEC, Tijuana, Baja California.
- M. C. I. E. Oscar Martínez Hernández. UTA e IEST, Tamaulipas.
- Dra. Ana María López Beltrán. UAS. Sinaloa
- Dr. Hermes Moreno Álvarez, UACH, Chihuahua, Chihuahua.
- Dr. Juan Sumaya Martínez, UAEM, Estado de México
- M. C. Silvia Karina Reyes Lio. ITN, Nogales, Sonora.
- Dra. Flor Araceli García Castillo, UANL, Nuevo León.
- Ing. Josué Mancilla Cerezo, IEMS, Puebla.
- Dr. Rafael Guadalupe Chávez Moreno, UAT-FI-UNAM, Querétaro.
- Dra. Bárbara Bermúdez Reyes. FI-UNAM
- Dr. Jorge Alfredo Ferrer Pérez. UAT-FI-UNAM, Querétaro.
- M. C. Rosa María Martínez Galván. ITP, Puebla.

9 states,
10 universities.

Chapter activities

- Annual cansat courses: 2015, 2016 y 2017
- National contests cansat (telemetry and comeback): 2015, 2016, 2017, 2018, 2019, 2022, 2023
- Training of human resources: Engineering and master degree students
- Academic exchange: UANL, UNAM, UABC, UACH
- Collaborations between national and international universities
- Local Events
- PDR publications of cansat contests

Mexican Aerospace Fair

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Chapter activities

2023

20 teams, 99 students, 10 universities, 12 sponsors

Chapter activities

UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

PROYECTO DE CREACIÓN
DEL PLAN Y LOS PROGRAMAS DE ESTUDIO DE LA
LICENCIATURA DE INGENIERÍA AEROESPACIAL

ENTIDAD ACADÉMICA RESPONSABLE:

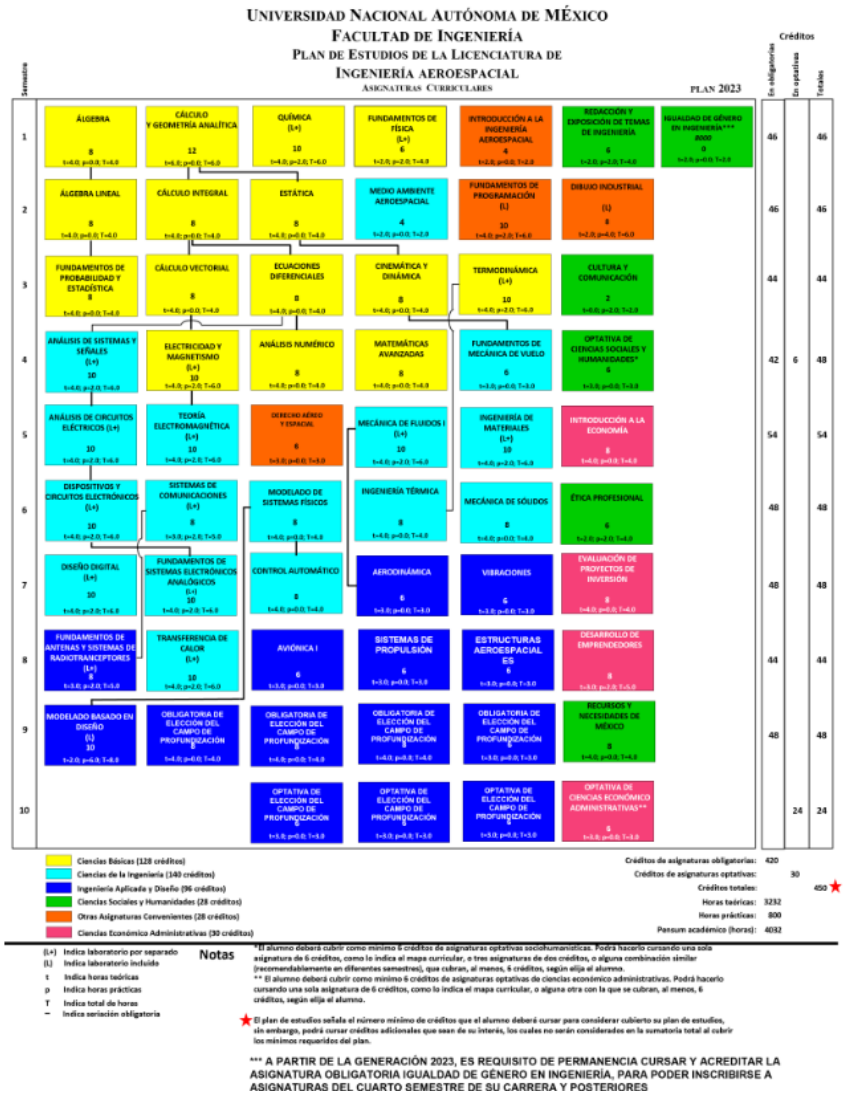
FACULTAD DE INGENIERÍA

ENTIDADES ACADÉMICAS ASESORAS:

INSTITUTO DE GEOGRAFÍA UNAM
INSTITUTO DE CIENCIAS APLICADAS Y TECNOLOGÍA UNAM
PROGRAMA ESPACIAL UNIVERSITARIO (PEU)
CENTRO NACIONAL DE TECNOLOGÍAS AERONÁUTICAS (CENTA)
LABORATORIO NACIONAL DE CLIMA ESPACIAL (LANCE)
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN (UANL)
LABORATORIO NACIONAL DE INGENIERÍA ESPACIAL Y AUTOMOTRIZ (LN-INGEA)
LABORATORIO NACIONAL DE OBSERVACIÓN DE LA TIERRA (LANOT)
LABORATORIO NACIONAL DE MANUFACTURA ADITIVA, DIGITALIZACIÓN 3D Y TOMOGRAFÍA COMPUTARIZADA (LN-MADIT)
CONSEJO MEXICANO DE EDUCACIÓN AEROESPACIAL (COMEA)
UNIVERSITY SPACE ENGINEERING CONSORTIUM (UNISEC-MÉXICO)

CAMPOS DE CONOCIMIENTO QUE COMPRENDE:
AERONÁUTICO
ESPACIAL

TÍTULO QUE SE OTORGA:
INGENIERO (A) AEROESPACIAL



https://www.ingenieria.unam.mx/programas_academicos/licenciatura/aeroespacial.php

Future actions

1. Increase the number of members to represent each of the 32 states,

2. Continue the CanSat Competition,

3. Articulate transversal projects between members,

4. Create space courses within undergraduate and graduate programs,

5. Establish partnerships with industry and government,

6. Continue fostering the importance of the space sector among students.

Final remarks

1. México needs to develop the Space Industry to close the loop,

2. Follow up of the new space sector policies and procedure standards to develop local technology,

3. Need of funding from the government or private sector to conceive space projects based on the social needs of México,

4. Encourage new generations of young students to continue building the national space sector,

5. Foster win-win partnerships.

Thank you!

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