

DATA SCIENCE AND ENGINEERING

MASTER OF SCIENCE

ACCREDITATION

National Accreditation by the French Ministry of Education, Higher Education and Research. The degree can lead to enrollment in a PhD program.

KEY WORDS

Big Data, Data Science, Machine Learning, Data Mining, Deep Learning, Business Intelligence, Web Science, Artificial Intelligence, Knowledge Graph, Computer Vision, Natural Language Processing, Recommender System.

STRONG POINTS OF THE PROGRAM

- > During their Master, students will have access to cutting edge technological platforms within Eurecom's Wireless
- > Communications Laboratory
- > Students are supervised by internationally renowned researchers
- > A 6-month paid internship which provides a cutting-edge experience. Eurecom has its own database of internship offers in several countries
- > A fully dedicated team providing administrative support to international students
- > Strong international exposure providing essential intercultural tools (only school in France with 2/3 of international students and professors)
- > The teaching program benefits from a unique location and from the expertise of renowned industrial partners
- > Eurecom is located in Sophia Antipolis, Europe's largest technology park, a hotbed of internships and jobs opportunities for students
- > Eurecom is a consortium of leading international universities and top ICT companies and has established a synergy with the local industrial environment on advanced research topics

SCHOOL OFFERING THE MASTER

Eurecom, a "Grande Ecole" with a 100% curriculum in English. It is located on the French Riviera, between Nice and Cannes. The degree is co accredited by Institut Mines-Télécom (IMT).

INDUSTRIAL PARTNERS

BMW Group, IABG, Orange, Monaco Telecom, SAP, Symantec.

LANGUAGE OF TEACHING

100% teaching in English. French is taught as a foreign language throughout the program. A 3-week program of intensive French language courses is organised in September.

ENVIRONMENT

The "Big Data" phenomenon is rooted in the field of data science and engineering, which aims at developing both computer and mathematical tools for data storage, processing and analytics. An increasing volume of data is daily produced by modern day industrial processes (in fields such as energy, intelligent transport systems, health, tourism and many others...), and fuelled by the rise of multimedia content being shared and the Internet of Things in our daily life. Artificial Intelligence is now empowering applications which requires large scale and smart processing of data to build accurate predictive models. The master in Data Science and Engineering aims at combining computer and statistical sciences to develop cutting-edge and fundamental tools to efficiently address data processing problems. Beyond its importance in scientific research and industry, data analysis helps develop methods, algorithms and software able

to extract value out of huge masses of heterogenous data with several dimensions.

The curriculum offers a cohesive blend of technical classes in Machine and Deep learning, data mining, distributed systems coupled with fundamentals in Business, Innovation and Project Management to develop profiles which are highly valued by corporate recruiters.

COMPETENCES ACQUIRED

- > Provide the theoretical background and the applied knowhow to manage and improve large-scale distributed systems
- > Acquire tools and methods to develop algorithms of data analysis and conceive data storage and processing systems
- > Develop an in-depth understanding of the fundamentals in other relevant fields such as: image and speech processing, Semantic Web and knowledge graph technologies; communications and computer security...
- > Acquire managerial knowledge to provide and lead innovation in Business Intelligence and Data Analytics (Project Management, Organization, innovation management...)
- > Get an Introduction to advanced research topics

PROGRAM

The Master's program is a full-time program made of 3 semesters of courses followed by a 6-month Msc thesis in industry or in a research lab.

Scientific and technical modules

- > Database Management System Implementation
- > Machine Learning and Intelligent System
- > System and Network Security
- > Distributed systems and cloud computing
- > Introduction to statistical learning
- > Operating systems
- > Fundamentals of Optimization
- > Mathematical methods for engineers
- > Algorithmic machine learning and data mining
- > Advanced Statistical Inference
- > Modern computer architectures
- > Secure Communications
- > Semantic Web and Information Extraction Technologies
- > Speech and Audio processing
- > Cyber crime and Computer forensic
- > Distributed software and middleware
- > Software development methodologies
- > Information theory
- > Mobile application and services
- > Interaction Design and Development of Modern Web
- > Applications

Soft skills/management modules

- > Introduction to Management
- > Personal Development and new product development
- > Entrepreneurship and Capital Venture
- > Innovation and product development
- > Intellectual property Law
- > Sustainable ICTs
- > Business Simulation
- > Sociological approaches of Telecom
- > Technologies
- > General Introduction to Law: contracts, setting up business
- > Project Management

DATA SCIENCE AND ENGINEERING

MASTER OF SCIENCE

Also part of the program

- > Company visits and seminars
- > Scientific and Technical Projects
- > French language
- > Professional coaching (workshops on CV/professional interviews)
- > 6-month thesis in Industry or Research lab

ADMISSION REQUIREMENTS

- > A Bachelor's degree (3 years min) in the engineering fields covered by the Master's program (Electrical engineering/computer sciences/communication engineering...)
- > B2 level in English

LANGUAGE REQUIREMENTS

English (at least one of the following)

- > Mother tongue
- > English Language Qualification:
 - > TOEFL 564 (PBT), 213 (CBT), 80 (IBT)
 - > IELTS: 5.5
 - > TOEIC: 750
 - > Cambridge CAE

TYPICAL JOBS

The Master in Data Science and Engineering opens to a wide array of industries and business domains (client relation management, logistics, production, finance, marketing...).

The need for trained specialists in Big Data is constantly growing as shown by recent studies and results in very good employment prospects for future graduates.

Some of the targeted fields:

- > Retail
- > Finances and banking
- > Manufacturers (car, aviation)
- > Services providers (Telecommunication, energy...)
- > Science and research

PROFESSIONS

- > Data Scientist
- > Big Data architect
- > Research and development engineer
- > Product Manager for Big Data solutions
- > Business Intelligence Analyst
- > Business Analytics solutions provider
- > Knowledge scientist
- > Data product manager

COST

Tuition fees for the full program (2 years):

- > €12,000
- > €6,000 (European Union and Erasmus zone)

Possible partial fee waivers and scholarships.

DURATION

2 years (starting in september):

3 semesters of courses followed by a 6-month paid internship in a lab or company. Some of the companies offering internship opportunities to our students: SAP, BMW, Symantec, IABG, Orange, Amadeus, Renault, Siemens, ARM, Fortinet, PSA, KMPG, Nokia, Accenture, HP, Magnetti Marelli, DLR...

LODGING

Accommodation is organized with the administration staff or Eurecom in public and private student halls rooms or shared flats. Eurecom has an online platform of accommodation offers, from public student residents to flat-sharing in villas and individual studio options. Eurecom students live in several cities nearby: Antibes (a charming city by the seashore), Nice (5th biggest French city); Valbonne or Biot.

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APPLYING

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The web site provides full information on admission procedures:

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SCHOOL CONTACTS

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Campus SophiaTech,
450 Route des Chappes, CS 50193
06904 Biot Sophia Antipolis cedex
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www.eurecom.fr

Admissions:

admission@eurecom.fr

Tel: +33 (0)4 93 00 81 00

Skype: admission.eurecom

Academic Coordinator:

Raphaël Troncy

raphael.troncy@eurecom.fr

DIGITAL SECURITY

MASTER OF SCIENCE

ACCREDITATION

National Accreditation by the French Ministry of Education, Higher Education and Research.

The degree can lead to enrollment in a Phd program.

KEY WORDS

Security, Network Security, Software Security, Malware Analysis, Intrusion Detection, Cryptography, Watermarking, Biometrics, Digital Forensics.

STRONG POINTS OF THE PROGRAM

- > During their Master, students will have access to cutting edge technological platforms within Eurecom's Wireless
- > Communications Laboratory
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- > A 6-month paid internship which provides a cutting-edge experience. Eurecom has its own database of internship offers in several countries
- > A fully dedicated team providing administrative support to international students
- > Strong international exposure providing essential intercultural tools (only school in France with 2/3 of international students and professors)
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INDUSTRIAL PARTNERS

SAP, BMW, Symantec, IABG, Orange, Amadeus, Renault, Siemens, ARM, Fortinet, PSA, KMPG, Nokia, Accenture, HP.

LANGUAGE OF TEACHING

100% teaching in English. French is taught as a foreign language throughout the program. A 3-week program of intensive French courses is organised in September.

ENVIRONMENT

Ranging from simple spoofing or tampering of personal data to distributed denial of service attacks jeopardizing global network operation, security problems are viewed as the major impediment to further development in the computer and communications field. As the main countermeasure to these problems, security of communications and computer systems became an important requirement both for users of on-line services and for technical specialists involved in the design of networks and applications. Security mechanisms therefore are embedded as an essential building block of all computer and communications systems at early stages of the design. Recently designed systems like wireless and mobile standards, peer-to-peer applications all include sophisticated security mechanisms as opposed to their earlier counterparts like the original Internet protocols that were severely lacking security functions.

COURSE AIMS

The master in Digital Security aims at providing a solid background in the design and management of security in major areas of communications and computer science. The professional training in security will be offered as a complement to an advanced program in computer networking, mobile services and imaging. Graduates will thus be able to tackle security problems encountered in networking, distributed software applications and image processing. Various technical areas ranging from secure software to cryptographic mechanisms and practical countermeasures against network attacks through watermarking of images and biometric identification techniques will be addressed in several courses and laboratories.

PROGRAM

The Master's program is made of 4 full-time semesters: 3 semesters of courses followed by a 6-month Msc thesis in industry or in a research lab.

Scientific and technical modules

- > Computer architecture
- > Image & Video Compression
- > Digital Image Processing Information theory
- > Network Modeling
- > Introduction to computer networking and internet
- > Operating systems
- > Software development methodologies
- > Secure communications
- > System and Network Security
- > Emulation and simulation methodologies
- > Information theory
- > Mobility Modeling
- > Mobile application and services
- > Mobile communication systems
- > Network Modeling

Soft skills/Management modules

- > Introduction to Management
- > Personal development and Team
- > Leadership
- > Entrepreneurship and Capital Venture
- > Innovation and new product development
- > Business Simulation
- > Sociological approaches of telecom technologies (course given in French)
- > Project Management
- > Sustainable ICT's (Green IT)
- > Intellectual Property Law
- > General Introduction to Law

Also part of the program

- > Company visits and seminars
- > Scientific and Technical Projects
- > French language
- > Professional coaching (workshops on CV/professional interviews)
- > 6-month thesis in Industry or Research lab

REQUIREMENTS

Entry requirements include a Bachelor's degree in the engineering fields covered by the Master program (Electrical engineering/computer sciences/communication engineering...).

DIGITAL SECURITY

MASTER OF SCIENCE

LANGUAGE REQUIREMENTS

English

- > Mother tongue or English proficiency test such as:
 - > TOEFL: 564 (PBT), 213 (CBT), 80 (IBT)
 - > IELTS: 5.5
 - > TOEIC: 750
 - > Cambridge: CAE

No prerequisite in French.

COMPETENCES ACQUIRED

- > Solid background in design & management of security in computer and communication systems
- > Design of secure communications systems
- > Protection of existing systems
- > Expertise in theoretical foundations of security
- > Hands-on experience with software and networked systems
- > Knowledge of security applications in communications and information systems
- > Security skills as a complement to networking (mobile & fixed), image processing and software engineering

TYPICAL JOBS

- > Security architect
- > Security officer
- > Network manager
- > Security consultant
- > Software Engineer with strong security expertise
- > System Engineer with strong security expertise
- > Telecommunications Engineer with strong security expertise

PROFESSIONS

By providing security skills as well as a solid competence in widely demanded fields like mobile networking, web engineering and image processing this Master broadens the employment sector from security specialists to a range of companies in the IT field that need and highly value additional security expertise. Potential employers thus include companies specialized in security fields such as:

- > Network and Software Security Manufacturers (Firewall, IDS, Antivirus...)
- > Network and Software Security Service Providers (Security consulting, ethical hacking services)
- > But also companies in the broader field of ICT as follows
- > Hardware and software manufacturers
- > Professional Services (consulting, project management)
- > Communication equipment manufacturers
- > Network operators
- > Application providers

COST

Tuition fees for the full program (2 years):

- > €12,000
 - > €6,000 (European Union and Erasmus zone)
- Possible partial fee waivers and scholarships.

DURATION

2 years (starting in september):

3 semesters of courses followed by a 6-month paid internship in a lab or company. Some of the companies offering internship opportunities to our students: SAP, BMW, Symantec, IABG, Orange, Amadeus, Renault, Siemens, ARM, Fortinet, PSA, KMPG, Nokia, Accenture, HP, Magnetti Marelli, DLR...

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Tel: +33 (0)4 93 00 81 00

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Academic Coordinator:

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INTERNET OF THINGS

MASTER OF SCIENCE

ACCREDITATION

National Accreditation by the French Ministry of Education, Higher Education and Research. It can give access to Phd Studies.

KEY WORDS

Sensors, Actuators, Low-energy communication, Big Data, Data Semantic, Machine Learning, Security, Business Intelligence.

STRONG POINTS OF THE PROGRAM

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INDUSTRIAL PARTNERS

ORANGE, SYMANTEC, SAP, Monaco Telecom, BMW Group Research & Technology, IABG.

LANGUAGE OF TEACHING

100% English.

French is taught as a foreign language throughout the program. A 3-week program of intensive French courses is organised in September.

ENVIRONMENT

The Internet of Things (IoT) represents a new stage in the digital revolution, fully contributing to the construction of a digital society. Several sectors of the digital society use or will use the internet of objects to improve deployment, exploitation and industrialization procedures. These include intelligent transport, smart grids, smart city, industry 4.0, and so on. The issues concerning the mastery of the technologies and processes around the internet of objects are enormous and require a very high level of expertise with cutting-edge skills in multi disciplinary areas.

COURSE AIMS

The Master of Science in Internet of Thing offers the necessary technical knowledge and advanced skills to create IoT innovations at the cutting edge of Big Data/sensor/cloud technologies.

PROGRAM

The Master's program is a full-time program made of 3 semesters of courses followed by a 6-month Msc thesis in industry or in a research lab.

Scientific and technical modules

- > Emulation and simulation methodologies
- > Mobility Modeling
- > Mobile communication systems
- > Introduction to computer networking
- > Distributed Systems and Cloud computing
- > Standardization activities
- > UML for Embedded Systems
- > Computing and internet
- > Operating systems
- > System and Network Security
- > Advanced Data Science Topics
- > Machine Learning and Intelligent System
- > Mobile application and services
- > Network Modeling
- > Fundamentals of Optimisation
- > Software development methodologies
- > IoT Application Protocols
- > IoT Communication Protocols
- > An Introduction to Semantic Web technologies
- > Algorithmic Machine Learning
- > Deep Learning
- > Mobile Networking
- > Network Softwareization
- > Security applications in networking and distributed systems

Management modules

- > Entrepreneurship and Capital-Venture
- > Innovation & new product development
- > Introduction to management
- > Intellectual property law
- > Personal Development and Team Leadership
- > Business Simulation
- > General introduction to law
- > Project management

Also part of the program

- > Career Preparation workshops (CV, interviews)
- > Company visits
- > 6-month Paid Internship in Industry in France or Abroad (Eurecom provides students with a database of Internship opportunities)

LOCATION

Eurecom is located on the French Riviera (between Nice and Cannes), at the Heart of Sophia Antipolis (largest Techno Park in EUROPE, a major employment hub in France). The campus provides the following facilities: sports facilities, wireless network, library, associations, etc.

ADMISSION REQUIREMENTS

The Master of Science is open to applicants with at least a scientific Bachelor's degree in a relevant discipline (Computer Science, Electrical Engineering, Applied Mathematics...).

INTERNET OF THINGS

MASTER OF SCIENCE

LANGUAGE REQUIREMENTS

English

- > Mother tongue or English proficiency test such as:
 - > TOEFL: 564 (PBT), 213 (CBT), 80 (IBT)
 - > IELTS: 5.5
 - > TOEIC: 750
 - > Cambridge: CAE

No prerequisite in French.

STRONG POINTS OF THE SCHOOL

- > Internationally renowned Faculty with a high publishing rate in top conferences
- > Access to Cutting-edge technological tools and platforms
- > Hands-on approach to learning and tight links with the Industry
- > A Human-sized school offering a favorable Student/Professor ratio
- > A Paid 6-month Master's thesis in industry
- > Access to a regularly updated and large database of Master's thesis opportunities in companies or labs
- > Career Preparation Program (CV and Interview workshops, Recruitment Fairs, Company Visits...)
- > Free Program of French language and Cultural visits before the start of the program (3 weeks)
- > Individual assistance and help with all administrative issues in France
- > A pick up at the airport and train station
- > Partial Tuition fee waivers based on academic excellence
- > Numerous Students activities (trips abroad, International Meal, fresher's weekend, sport and cultural clubs...)
- > An unparalleled natural environment on the worldwide famous French Riviera (300 days of sun per year)

COMPETENCES ACQUIRED

The curriculum offers a cohesive blend of mandatory technical courses coupled with courses in Management/Entrepreneurship to foster a spirit of business initiative among students. It relies on very hands-on approach with many laboratory works, supervised semester-long projects on a topic of industrial relevance and a paid 6-month internship in a company

- > Design tools for processing and analyzing large amounts of data from sensors
- > Design and develop IoT applications and services adapted to industrial needs
- > Understand and design communication mechanisms adapted to the constraints of the sensors (energy consumption, lack of computing capacities)
- > Acquire dual competences technical courses in advanced fields (data exploitation, software development, communication networks in constrained environments, Machine Learning, sensor security) associated with courses in Innovation, Project Management, Entrepreneurship...
- > Acquisition of written and oral communication skills to make a compelling technical presentation
- > Project planning skills : Organizational and Team Leadership competences

TYPICAL JOBS

- > IoT Consultant
- > IoT Developer
- > IoT Innovation Manager
- > IoT Solutions Architect
- > IoT Project Manager
- > Data Scientist

SCHOLARSHIPS

Partial Tuition Fee Waiver for students from University partners and highly ranked students.

Scholarships from French Embassies...

CALENDAR

One intake per year in September.

3 academic semester at Eurecom followed by a 6-month paid internship in a company. Some of the companies offering internship opportunities to our students: SAP, BMW, Symantec, IABG, Orange, Amadeus, Renault, Siemens, ARM, Fortinet, PSA, KMPG, Nokia, Accenture, HP, Magnetti Marelli, DLR...

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<https://housing.eurecom.fr/en/>

COST

Tuition fees for the full program (2 years):

- > €12,000
 - > €6,000 (European Union and Erasmus zone)
- Possible partial fee waivers and scholarships.

APPLYING

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Skype: [admission.eurecom](https://www.eurecom.fr/en/teaching/master-science)

Academic Coordinator:

Adlen Ksentini

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MOBILE COMPUTING SYSTEMS

MASTER OF SCIENCE

ACCREDITATION

National Accreditation by the French Ministry of Education, Higher Education and Research. The degree can lead to enrollment in a Phd program.

KEY WORDS

Wireless communication and computing, Mobile communication Systems, Mobile networking and computing, Mobile Applications and Services, Telecommunications, Signal Processing Technology.

STRONG POINTS OF THE PROGRAM

- > During their Master, students will have access to cutting edge technological platforms within Eurecom's Wireless Communications Laboratory
- > Students are supervised by internationally renowned researchers
- > A 6-month paid internship which provides a cutting-edge experience. Eurecom has its own database of internship offers in several countries
- > A fully dedicated team providing administrative support to international students
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INDUSTRIAL PARTNERS

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LANGUAGE OF TEACHING

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ENVIRONMENT

This Master provides a comprehensive set of competences in Communication Systems: from physical layer (wireless communications theory and implementation aspects), mobile computing systems (based on SDN, NFV, MEC, IPv6 among the others), to applications (for smartphone, tablets...). Sophia-Antipolis is considered The European Silicon Valley for telecommunications research and development in southern France. Eurecom has established over the years a synergy with both local and international industrial environment on advanced research topics.

COURSE AIMS

- > Provide the theoretical background and the applied knowhow for engineers in Mobile Communications Systems
- > Learn to tackle problems from a system viewpoint, spanning across all the layers taking a vertical cut
- > Acquire and master tools and methods to follow the rapid evolution of technology and provide solutions leading to future generation of wireless communication and computing systems
- > Acquire managerial knowledge to provide innovation in Mobile Communications Systems (Project Management, Organization, innovation management...)

PROGRAM

The Master's program is made of 4 full-time semesters: 3 semesters of courses followed by a 6-month Msc thesis in industry or in a research lab.

Scientific and technical modules

- > Information theory
- > Essential Mathematical Methods for Engineers
- > Mobility Modeling
- > Fundamentals of Optimisation
- > Distributed Systems and Cloud Computing
- > Operating systems
- > Secure communications
- > Software development methodologies
- > Mobile Communication Systems
- > Mobile Communication Techniques
- > Advanced topics in Wireless communication
- > Digital Communication
- > Statistical Signal Processing
- > Mobile application and services
- > Network modeling
- > Radio Engineering
- > Wireless Access technologies
- > Mobile Networking
- > Mobile Advanced Networks
- > Signal Processing Technologies
- > Channel Coding theory
- > Signal Processing for Communications

Management modules

- > Introduction to Management
- > Personal development and Team
- > Leadership
- > Entrepreneurship and Capital Venture
- > Innovation and new product development
- > Business Simulation
- > Sociological approaches of telecom technologies (course given in French)
- > Project Management
- > Sustainable ICT's (Green IT)
- > Intellectual Property Law
- > General Introduction to Law

Also part of the program

- > Company visits and seminars
- > Scientific and Technical Projects
- > French language
- > Professional coaching (workshops on CV/professional interviews)
- > 6-month thesis in Industry or Research lab

MOBILE COMPUTING SYSTEMS

MASTER OF SCIENCE

ADMISSION REQUIREMENTS

- > A Bachelor's degree (3 years min) in the engineering fields covered by the Master's program (Electrical engineering/ computer sciences/communication engineering...)
- > B2 level in English

LANGUAGE REQUIREMENTS

English (at least one of the following)

- > Mother tongue
- > English Language Qualification:
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 - > IELTS: 5.5
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 - > Cambridge CAE

COMPETENCES ACQUIRED

- > A global view of the major challenges of future Mobile Communications Systems
- > A strong theoretical background in communications and networking to address the fixed/wireless convergence
- > Knowledge of the most recent industrial developments and standards
- > Introduction to advanced research topics

TYPICAL JOBS

The Master in Mobile Computing Systems gives access to the Telecom Equipment industry, to the Telecom Operators industry and to the academic/theoretical research world. All national and international institutions in the field of communications systems provide career opportunities to graduated students:

- > Operators
- > Telecommunications industry
- > Consulting companies in Information Technologies
- > Regulators
- > Software editors
- > Semi conductor industry
- > Other industries (car manufacturers...)

PROFESSIONS

- > Research and development in Communication Systems
- > Network Consulting
- > Network Architect
- > Communications Software Development
- > Communications Hardware Development
- > Project Management
- > Telecom Policy Making

COST

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- > €12,000
 - > €6,000 (European Union and Erasmus zone)
- Possible partial fee waivers and scholarships.

DURATION

2 years (starting in september):

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Academic Coordinator:

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