Bachelor's Degree

COMPUTER SCIENCE

ENGLISH-TAUGHT SEMESTER

IUT ANNECY
UNIVERSITÉ SAVOIE MONT BLANC

INFO-RA

SOFTWARE APPLICATION DEVELOPMENT

30 ECTS

AUTUMN SEMESTER · BACHELOR'S DEGREE (BSC)

The Software Application Development Semester is designed for both French and international exchange students who have completed two years of higher education in computer science and wish to specialise as software applications developers.

During the Autumn semester of the 3rd and final year of the Bachelor's Degree (Semester 5), students will study at IUT Annecy, gaining in-depth knowledge and hands-on experience. All courses are taught entirely in English, and classes bring together both French and international students, fostering a rich intercultural experience and a global perspective on the industry.



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MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE
Liberté
Égalité
Fraternité

UNIVERSITÉ SAVOIE MONT BLANC
Membre de l'alliance européenne
UNITA universitas montium
La Région Auvergne-Rhône-Alpes

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IUT ANNECY - USMB

With 2,800 students, 24 Bachelor's Degrees, and 9 departments, IUT Annecy stands out as a dynamic and innovative institution. As one of the 7 schools of Université Savoie Mont Blanc (USMB), it offers a high-quality education that combines academic excellence with strong industry connections.

As a key player in higher education in Haute-Savoie region, IUT Annecy thrives in a dynamic ecosystem, collaborating closely with leading companies of the French Alps. Thanks to its solid industry network and specialised programmes, it has naturally established itself as the ideal partner for training experts and specialists in the IT industry.

14,500 students

1,400 staff members

240 PhD students

UNIVERSITÉ SAVOIE MONT BLANC

18 research labs

1 foundation

1 enterprise club

1 universitas montium





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PROGRAMME OVERVIEW

The Software Application Development Bachelor's Degree focuses on the software life cycle: from the expression of the client's needs, to the design, programming, validation, and maintenance of the application.

It qualifies students to work as application designers and developers (mobile, web, Internet of things, video games, etc).

English-taught Semester (Semester 5 | Year 3 - Fall semester)

This full-time exchange semester offers a strong combination of theory and practice. Students work in teams to design, develop and deliver complete business-oriented software solutions. The curriculum emphasises professional project methodology, software quality standards, and advanced technologies.

Competence-based learning: the 3-year Bachelor's Degree aims to develop six core IT graduate competences called UEs (*unités d'enseignement* / learning units):

- UE1: Carrying out an application development
- UE2: Optimising computer applications
- UE3: Running complex communication computer systems
- UE4: Managing information data
- UE5: Conducting a project
- UE6: Working as part of an IT team

The 3rd-year English-taught fall semester curriculum **focuses on units 1, 2 and 6**. Each learning unit accounts for 10 ECTS ; validating all the semester units is required to validate a full semester.

Admission Requirements

To join this semester, candidates must have:

- Completed at least **120 ECTS credits** in a relevant Computer Science or IT programme
- Solid knowledge of programming, especially object-oriented programming
- Experience with databases, web technologies, and basic software engineering practices
- English proficiency (minimum B2 level recommended)

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LEARNING OUTCOMES

By the end of the semester, students will be able to:

- Adapt applications across platforms
- Analyse and optimise existing applications
- Work efficiently in a team-based development process
- Apply modern development paradigms and automation tools
- Communicate technical content
- Manage a software development project from planning to delivery

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At the heart of the semester lies a **15-ECTS group project**.

Working in teams of five, students create a complex software application in response to specifications administered by the professor.



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CURRICULUM

Semester 5 - Courses, Competences (UE) & ECTS.

Course List	UE1	UE2	UE6	ECTS
Team Management			●	0.9
Professional Communication or French			●	1.3
Guidance	●	●	●	0.6
Algorithmic Quality	●	●		0.8
Advanced Programming	●	●		1.6
Multimedia Programming	●	●	●	0.6
Automation	●		●	0.8
Development Quality	●	●		1.2
Advanced Virtualisation	●	●		0.9
New Databases	●	●		1.6
Decision-making Support		●		0.7
Mathematical Modelling		●		1.3
Sustainable and digital economy	●		●	0.7
Professional Communication in English	●	●	●	2
Project (Group Work)	●	●	●	15
ECTS	**10**	**10**	**10**	**30**

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PROJECT DESCRIPTION | SAE 5.A.01

The project consists of:

- 2 back-end components:
  - one for data management (CRUD)
  - one for information processing, data mining, prediction or classification
- 1 front-end application, fully functional and connected
- Use of at least one external service (e.g. Facebook, Twitter, Google Maps, OpenStreetMap, Amazon Alexa...)

The project must be developed using agility and iterative integration

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Technical Stack & Methods

Students explore and combine a wide range of modern technologies:

- Back-end development (General: .NET | Information Processing: Python/Flask)
- Front-end: Blazor, or JS frameworks such as Angular, React, Vue
- Programming paradigms: REST APIs, Web Services
- Advanced data manipulation: Data analysis, prediction, clustering, classification, text mining

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Expected Deliverables (Professional Standards)

- Project tracking and planning documents
- Functional and technical analysis
- Fully documented source code
- Test plans and test data
- Final client presentation with a live demo
- User manual / technical guide

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SYLLABIS

R5.01 - TEAM MANAGEMENT (8 hrs)

- management and organisation of an IT project team (preparing and managing an IT team, project forecasting, performance and self-efficacy of an IT team)
- behavioural and cross-functional skills of the manager (managerial skills, human skills and behavioural skills)

R5.A.02 - PERSONAL AND PROFESSIONAL PROJECT (GUIDANCE) (8 hrs)

- building your e-reputation
- drafting a professional network
- professional conduct in the context of recruitment

R5.03 - PROFESSIONAL COMMUNICATION (12 hrs) + FRENCH AS A FOREIGN LANGUAGE

- several levels of French available
- conflict management in an intercultural context

R5.A.04 - ALGORITHMIC QUALITY (16 hrs)

- complexity of algorithms
- metrics (e.g. execution time, memory usage, load increase, etc.)
- use of audit tools

R5.A.05 - ADVANCED PROGRAMMING (36 hrs)

- Flask API : Hello World!
- IA : Frameworks and datasets
- Flask API : Database connectors, view, model
- IA : Timeseries prediction
- Flask API : Contexts and Blueprints
- IA : Image ML and Deep
- Flask API : Development
- Flask API : Implementation

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R5.A.06 - MULTIMEDIA PROGRAMMING (16 hrs)
- image manipulation (2D, 3D, etc.) with Blender and Python

R5.A.07 - AUTOMATION OF THE PRODUCTION LINE (12 hrs)
- continuous integration and development
- use of containers

R5.A.08 - QUALITY OF DEVELOPMENT (26 hrs)
- quality characteristics (e.g. robustness, maintainability, portability, extensibility, etc.)
- inspection techniques (e.g. code review, walkthrough, etc.)
- documentation (e.g. user manuals, training, etc.)
- API.NET / DTO / Blazor / E2E Tests / DB tests

R5.A.09 - ADVANCED VIRTUALISATION (16 hrs)
- partitioning, service isolation
- container technology (e.g. Docker, Kubernetes, Nomad, etc.)
- virtual networks (e.g. virtual private server (VPS), virtual environment (VE), etc.)
- cluster management and configuration (e.g. cloning, backup, restoration, etc.)

R5.A.10 - NEW DATABASE PARADIGMS (36 hrs)
Concepts, data structures and query languages (e.g. mobile databases, embedded databases, object databases, NoSQL databases – deductive, key-value, document, columnar, graph, etc.)

R5.A.11 - OPTIMISATION METHODS FOR DECISION SUPPORT (13 hrs)
- modelling problems in the form of linear programmes (simplex method, etc.)
- heuristic methods for solving problems (e.g. classification, regression, knapsack, travelling salesman, etc.)

R5.A.12 - MATHEMATICAL MODELLING (36 hrs)

Mathematical modelling and calculations related to a specific field of application (e.g. imaging, algebra, artificial intelligence, cloud computing, analytical geometry, video games, particle systems, advanced data visualisation, etc.) :

- Parallelisation
- Exploratory data analysis
- PCA and dimensionality reduction
- Linear and multi-linear regression
- Gradient descent
- Classification
- Perceptron + neural networks
- Deep learning
- Deep learning 2

R5.A.13 - SUSTAINABLE & DIGITAL ECONOMY (8 hrs)

- Serious games

R5.A.14 - PROFESSIONAL ENGLISH (32 hrs)

- International CV updates : experience & skills
- Advanced Photoshop
- Selling an IT solution

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APPLICATIONS

Programme Coordinator

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Selection process

- File analysis and interview (videoconference possible)

Not open to free movers

French people in vocational re-training

- The cost of the course is not the same as for students. You are advised to contact the IUT's Continuing Education Service to find out about funding arrangements.

Exchange students from partner universities

- No fees.
- Please contact the International Office of your university to apply.