

Institution Université François Rabelais Tours – Campus de Blois
(*University of Tours – Blois Campus*)

Specialization **Databases and software development**

Aim of the course At the end of the specialization, the students should have solid competences in computing and software engineering, and databases as well. They also receive a significative knowledge in operating systems and networks.

UE 501 – Local Networks		
Description IEEE 802 model and 802.3, 802.4, 802.5, FDDI protocols ; evolution of Ethernet networks (Fast, Giga, etc...); commutation in LANs (bridges et Spanning Tree); virtual networks (VLANs); wireless local networks		
Examination: written exam or project		
3,5 ECTS	34 hours/semester	Semester 1

UE 502 – Software Engineering		
Description : Informations systems modeling (MERISE method) – Lab on AMC*Designer. This course is an application of software engineering notions studied during the core modules (BSc. Y1 and Y2) with a new modelling tool (AMC*Designer) which is using a modelling language very well known in French companies (MERISE).		
Examination: written exam or project		
3 ECTS	24 hours/semester	Semester 1

UE 503 – Language Theory & Compilation		
Description : Application of language theory in a Project with LEX and YAKK		
Recapitulation of turing machines, finite state automata, lexical analysis, regular languages, context free grammar, top down and bottom up analysis. Application of language theory in a Project with LEX and YAKK		
Examination: written exam or project		
4 ECTS	44 hours/semester	Semester 1

UE 504 – Complexity		
Description : Computational models, standard complexity classes, complete problems and reduction, parallel and probabilistic complexity classes		
Examination: written exam or project		
4 ECTS	44 hours/semester	Semester 1

UE 505 – System Programming		
Description : Study and implementation of the functionalities of an operating system through its system calls. The files management, the processes management, the communication and synchronization inter-process are approached with for framework of application a Unix platform.		
Examination: written exam or project		
4 ECTS	44 hours/semester	Semester 2

UE 506 – Advanced Object Oriented conception		
Description : Exception, assertions, design by contract, using object oriented concepts for generic programming, design of graphic user interfaces , covariance et contravariance, conformance		
Examination: written exam or project		
3,5 ECTS	36 hours/semester	Semester 1

UE 507 – Operational Research		
Description : Linear programming (simplex algorithm), dynamic programming		
Examination: written exam or project		
3 ECTS	24 hours/semester	Semester 1

UE 507 & UE 607 – English		
Examination: written and oral exam		
3 + 3 ECTS	22 hours/semester	Semester 1

UE L4 & L5 – Free elective Modules		
Description : French language learning		
Examination: written exam and oral presentation		
3 + 3 ECTS	20 hours/semester	Semester 1 & 2

UE 601 – IP Networks		
Description : IETF role and works, network ISO level (IP, ICMP, addressing, subaddressing, static routing, dynamic routing)		
Examination: written exam or project		
2 ECTS	34 hours/semester	Semester 2

UE 602 – Relational Databases Project		
Description : Recapitulation of query languages, relational algebra and calculus, datalog, SQL, normal forms. Application in a project		
Examination: written exam or thesis about the project		
4 ECTS	44 hours/semester	Semester 2

UE 603 – Operating systems & shell programming		
Description : Memory management, I/O management, file systems organisation, security issues, shell programming.		
Examination: written exam or project		
3 ECTS	24 hours/semester	Semester 1

UE 604 – Statistics & Probabilities		
Description : Probabilities and set theory, discrete and continuous probability laws		
Examination: written exam or project		
4 ECTS	44 hours/semester	Semester 2

UE 605 – Software Engineering : modelling		
Description : UML ; inductive and deductive approaches ; conception by responsibility. This module is a repetition of a corresponding core module offered in BSc. Year 2. However, since language is very important in this module (from user requirements to modelling), this repetition should be useful for foreign students.		
Examination: written exam or project		
3 ECTS	24 hours/semester	Semester 2

UE 605 – Requirements Management and Software Engineering		
Description : Elicitation, analysis and specification of requirements, inductive and deductive approaches ; conception by responsibility, application of UML Diagramms		
Examination: written exam or project		
3 ECTS	24 hours/semester	Semester 2

UE 606 – Web applications		
Description : HTTP, Servlets, JSP, Tomcat, MVC, framework, Struts.		
Examination: written exam or project		
3 ECTS	34 hours/semester	Semester 2

UE C608 – Communication in French language		
Description		
Examination: written exam and oral presentation		
2 ECTS	22 hours/semester	Semester 2

UE 609 – Industrial Placement		
Description		
Examination: dissertation and oral presentation		
3 ECTS	14 weeks internship	Semester 2

Range of the marks From 0/20 to 20/20. ECTS validated with a mark higher than 10/20.

0-9	not sufficient
10-11	sufficient
12-13	satisfactory
14-15	good
16-17	very good
18-20	excellent