Complete Course List

Javier López-Contreras González

November 2022

This is a comprehensive list of all the universitary courses that I have taken during my Undergraduate at the Polytechnic University of Catalonia and during my time as a Visiting Student at the University of California Berkeley. A ★ indicates that a course was specially interesting to me.

Graduate Courses Audited

For the duration of the academic year 2022-23, I am a Visiting Student at the University of California Berkeley, developing my Honors Thesis in Number Theory. At Berkeley, I have had the opportunity of auditing graduate courses in Mathematics, which is something that my home university doesn't offer. Because my research scholarship does not cover tuition, I audited these courses unofficially: my assistance was agreed with the professors but I was not graded.

For Spring 2023, I plan to take the continuation of the subjects I am auditing now, Math 254B and Math 256B, in Class Field Theory and in Cohomological Theories and Introduction to Algebraic K-Theory respectively.

Fall 2022

Math 256A. Algebraic Geometry II ★

Lecturer:	Yunqing Tang
References:	- Hartshorne, Robin. Algebraic Number Theory. Springer-Verlag. Graduate Texts in Mathematics, No. 52 - Vakil, Ravi. The Rising Sea Foundations of Algebraic Geometry.
Topics:	Schemes, Finiteness, Separability, Coherent Sheaves, Line and Vector Bundles, Ample Line Bundles, Sheaf of Differentials

Math 254A. Algebraic Number Theory ★

Lecturer:	Martin Olsson
References:	- Jurgen Neukirch. Algebraic number theory. 1992. - Jean-Pierre Serre. Local fields. 1979.
Topics:	Dedekind Domains, Hilbert Ramification, Valuations, Different and Discriminant, L-series, Introduction to Class Field Theory.

Undergraduate Degree in Mathematics

Spring 2022

Algebraic Geometry ★

ECTS Credit:	6	Semester:	Spring 2022
Subject Type:	Elective	Grade:	9.7/10
Lecturer:	Pere Pascual Gainza		
References:	- Casas Alvero, Eduardo. Singularities of plane curves. Cambridge: Cambridge University Press, 2000. ISBN 0521789591. - Fulton, William. Curvas algebraicas. Barcelona, etc: Reverté, 1971. ISBN B10488923.		
Topics:	Algebraic Curves, Bezout Thm., Noether Thm., Riemann Surfaces, Riemann-Roch Thm., Resolution of Singularities		

Partial Differential Equations

ECTS Credit:	7.5	Semester:	Spring 2022
Subject Type:	Required	Grade:	9.0/10
Lecturer:	Xavier Cabre Vilagut		
References:	- Shearer, Michael; Levy, Rachel. Partial differential equations : an introduction to theory and applications. Princeton: Princeton University Press, [2015]. ISBN 978-0691161297. - Pinchover, Yehuda ; Rubinstein, Jacob. Introduction to partial differential equations. Cambridge: Cambridge University Press, 2005. ISBN 978052161323X.		
Topics:	First order equations, Banach Spaces, operators and semigroups, Wave Eq., Heat Eq., Laplacian and Poisson Eq.		

Statistics

ECTS Credit:	7.5	Semester:	Spring 2022
Subject Type:	Required	Grade:	8.5/10
Lecturer:	Jose Antonio Sánchez Espigares		
References:	- De Groot, M.H. & Schervish, M.J. Probability and statistics. 4th ed. Boston: Pearson, 2012. ISBN 9780321709707 - Casella, G., & Berger, R.L. Statistical inference. 2nd ed. Pacific Grove: Duxbury, Pacific Groove, CA, USA., 2002. ISBN 0534243126.		
Topics:	Point Estimation, Evaluation of Estimators, Hypothesis Testing, Interval Estimation, Linear Models		

Fall 2021

Abstract Algebra ★

ECTS Credit:	3	Semester:	Fall 2021
Subject Type:	Elective	Grade:	10/10
Lecturer:	Josep Alvarez Montaner		
References:	- Lafon, Jean-Pierre. Les formalismes fondamentaux de l'algèbre commutative. Paris: Collection Enseignement des Sciences, No. 20. Hermann, 1974 - Rotman, J.J. An introduction to homological algebra [on line]. Academic Press, 1979		
Topics:	Categories and Functors, Module Theory, Algebras and algebraic varieties		

Combinatorics and Graph Theory ★

ECTS Credit:	6	Semester:	Fall 2021
Subject Type:	Elective	Grade:	7.0/10
Lecturer:	Simeon Michael Ball Marks		
References:	- Flajolet, Philippe ; Sedgewick, Robert. Analytic combinatorics [on line]. Cambridge: Cambridge University Press, 2009. - Diestel, Reinhard. Graph theory. 3rd ed. Berlin [etc.]: Springer, 2005. ISBN 3540261826		
Topics:	The symbolic method, Polya Enumeration, Finite geometry, Graph connectivity, Matching, Graph Coloring, Extremal Graph Theory		

Ordinary Differential Equations

ECTS Credit:	7.5	Semester:	Fall 2021
Subject Type:	Required	Grade:	8.5/10
Lecturer:	Pau Martin De La Torre		
References:	- Meiss, J.D. Differential dynamical systems. 2007. Philadelphia: Society for Industrial & Applied Mathematics, 2007 - Tenenbaum, Morris; Pollard, Harry. Ordinary differential equations: an elementary textbook for students of mathematics, engineering, and the sciences. New York: Dover Publications, 1985		
Topics:	Fundamental theorems, Solving simple ODEs, Linear equations and linear systems, Qualitative theory of ODEs		

Probability Theory

ECTS Credit:	7.5	Semester:	Fall 2021
Subject Type:	Required	Grade:	9.6/10
Lecturer:	Anna De Mier Vinué		
References:	- Grimmett, G.R.; Stirzaker, D.R. Probability and random processes. 3a ed. Oxford [etc.]: Oxford University Press, 2001. ISBN 9780198572220. - Pitman, Jim. Probability [on line]. New York [etc.]: Springer, cop, 1993		
Topics:	Probability spaces, Random variables, Discrete random variables, Continuous random variables, Characteristic functions and exponential families, Convergence of Random Variables		

Spring 2021

Real Analysis

ECTS Credit:	7.5	Semester:	Spring 2021
Subject Type:	Required	Grade:	9.4/10
Lecturer:	Juan José Rue Perna		
References:	- Bartle, Robert Gardner. The elements of integration and Lebesgue measure. New York: Wiley, 1995. ISBN 0471042226. - Marsden, Jerrold E ; Hoffman, Michael J. Elementary classical analysis. 2nd ed. New York: W.H. Freeman, cop. 1993. ISBN 0716721058.		
Topics:	Topology in the space of continuous functions, Fourier series, Lebesgue measure and integration in R		

Differential Geometry

ECTS Credit:	7.5	Semester:	Spring 2021
Subject Type:	Required	Grade:	7.0/10
Lecturer:	Jaume Amoros Torrent		
References:	- Carmo, Manfredo Perdigão do. Differential geometry of curves and surfaces. Englewood Cliffs, NJ: Prentice Hall, 1976. ISBN 0132125897 - Shifrin, Theodore. Differential geometry: A First Course in curves and surfaces [on line]. University of Georgia, 2016.		
Topics:	Plane and space curves, Elementary theory of surfaces, Gauss curvature, Examples of surfaces, Fundamental equations of surface theory, Geometry on a surface, Some global results, Introduction to differential manifolds		

Fall 2020

Algebraic Structures ★

ECTS Credit:	7.5	Semester:	Fall 2020
Subject Type:	Required	Grade:	9.6/10
Lecturer:	Jordi Guardia Rubies		
References:	- Garrett, P.B. Abstract algebra [on line]. Boca Raton, FL: Chapman & Hall/CRC, 2008. ISBN 9781584886891 - Paulsen, W. Abstract algebra : an interactive approach [on line]. ISBN 978-1-4987-1977-3.		
Topics:	Rings, Fields, Groups and Modules		

Numerical Calculus

ECTS Credit:	7.5	Semester:	Fall 2020
Subject Type:	Required	Grade:	9.2/10
Lecturer:	Juan Ramon Pacha Andujar		
References:	- Stoer, J.; Bulirsch, R. Introduction to numerical analysis. 3rd ed. Springer-Verlag, 2002. - Ortega, J. M.; Poole, W. G. An introduction to numerical methods for differential equations. Pitman Pub. Inc., 1981.		
Topics:	Approximation, Numerical Integration, Solving nonlinear equations, Solving nonlinear systems, Introduction to numerical solution of ordinary differential equations		

Spring 2020

Physics ★

ECTS Credit:	7.5	Semester:	Spring 2020
Subject Type:	Required	Grade:	9.3/10
Lecturer:	Narciso Roman Roy		
References:	- José, Jorge V.; Saletan, Eugene J. Classical dynamics : a contemporary approach. Cambridge: Cambridge University Press, 1998. ISBN 0521636361. - Alonso, Marcelo; Finn, Edward J. Física. Ed. revisada y aumentada. México: Pearson & Addison-Wesley, 2000.		
Topics:	Dynamics of a particle. Newton Laws. Work and Energy, Changes of reference systems, Dynamic of a system of particles. Rigid Solid, Gravity field, Electrostatics, Electrokinetics, Magnetostàtics, Time dependent fields. Maxwell Equations.		

Complex Variable Functions

ECTS Credit:	7.5	Semester:	Spring 2020
Subject Type:	Required	Grade:	8.0/10
Lecturer:	Jordi Villanueva Castelltort		
References:	- Ortega Cerdà, J. Anàlisi complexa [on line]. Barcelona: Universitat Politècnica de Catalunya. Departament de Matemàtica Aplicada I, 1997 - Ahlfors, L. V. Complex analysis : an introduction to the theory of analytic functions of one complex variable. 3rd. McGraw Hill, 1979.		
Topics:	Holomorphic functions, Local Cauchy theory, Global Cauchy theory, Conformal applications and harmonic functions, Other topics.		

Topology ★

ECTS Credit:	7.5	Semester:	Spring 2020
Subject Type:	Required	Grade:	9.8/10
Lecturer:	Jordi Quer Bosor		
References:	- Sieradski, A. An introduction to topology and homotopy. Boston: PWS-KENT, 1992. ISBN 0534929605 - Kosniowski, Czes. Topología algebraica. Barcelona: Reverté, 1992. ISBN 978-84-291-5098-8.		
Topics:	Metric spaces, Topological spaces, Building topological spaces, Compactness, Connectedness, Introduction to homotopy, Applications to plane topology, Compact surfaces classification, Fundamental Group and Van Kampen Th.		

Fall 2019

Multilinear Algebra and Geometry

ECTS Credit:	7.5	Semester:	Fall 2019
Subject Type:	Required	Grade:	8.7/10
Lecturer:	Pedro Pascual Gainza		
References:	- Greub, Werner Hildbert. Multilinear algebra. New York: Springer-Verlag, 1967. - Reventós i Tarrida, Agustí. Geometria projectiva. Bellaterra: Servei de Publicacions UAB, 2000. ISBN 84-490-1978-8		
Topics:	Jordan canonical form, Multilinear algebra, Projective geometry, Projectivities, Quadrics.		

Integral Calculus

ECTS Credit:	7.5	Semester:	Fall 2019
Subject Type:	Required	Grade:	8.6/10
Lecturer:	Andres Marcos Encinas Bachiller		
References:	- Marsden, Jerrold E.; Hoffman, Michael J. Elementary classical analysis. 2nd ed. New York: W.H. Freeman and Company, 1993. ISBN 0716721058. - Zorich, Vladimir A. Mathematical Analysis II. Berlin: Springer, 2004. ISBN 3540406336		
Topics:	Improper Integrals and Numerical Series, Multiple Integrals, Line and Surface Integrals, Integral Theorems, Differential Forms		

Mathematical Programming

ECTS Credit:	7.5	Semester:	Fall 2019
Subject Type:	Required	Grade:	8.3/10
Lecturer:	Jordi Castro Pérez		
References:	- Bertsimas, Dimitris ; Tsitsiklis, John Tsitsiklis. Introduction to linear optimization. Belmont: Athena Scientifc, 1997. ISBN 1886529191. - Nocedal, Jorge ; Wright, Stephen J. Numerical optimization [on line]. 2nd ed. Springer Science + Business Media, 2006		
Topics:	Linear Programming, Integer Linear Programming, Unconstrained Nonlinear Programming, Constrained Nonlinear Programming.		

Spring 2019

Numerical Linear Algebra

ECTS Credit:	7.5	Semester:	Spring 2019
Subject Type:	Required	Grade:	8.6/10
Lecturer:	Maria Mercedes Olle Torner		
References:	- Golub, G.H.; Van Loan, C.F. Matrix computations. 4th ed. The Johns Hopkins University Press, 2013. ISBN 9781421407944 - Bonet, C. et al. Càlcul numèric. Barcelona: Edit. UPC, 1994.		
Topics:	Linear systems of equations: decomposition methods, Error propagation and handling, Linear systems of equations: iterative methods, Computation of Eigenvalues and eigenvectors		

Differential Calculus

ECTS Credit:	7.5	Semester:	Spring 2019
Subject Type:	Required	Grade:	8.2/10
Lecturer:	Narciso Roman Roy		
References:	- Marsden, Jerrold E.; Hoffman, Michael J. Elementary classical analysis. 2nd ed. New York: Freeman and Co., 1993. ISBN 0716721058. - Mazón Ruiz, José M. Cálculo diferencial: teoría y problemas. Valencia: Universidad de Valencia, 2008.		
Topics:	Topology of Rn. Sequences of vectors, Limits and continuity of functions., Differentiability, Theorems of differentiable functions, Taylor formula. Local extrema., Submanifolds of Rn and constrained extrema.		

Affine and Euclidean Geometry

ECTS Credit:	7.5	Semester:	Spring 2019
Subject Type:	Required	Grade:	9.0/10
Lecturer:	Miguel Angel Barja Yañez		
References:	- Coxeter, H.S.M. Introduction to geometry. 2nd ed. John Wiley and Sons, 1969. ISBN 0471182834. - Audin, M. Geometry. Berlin: Springer Verlag, 2003. ISBN 3540434984.		
Topics:	Affine Space, Affine Maps, Euclidean Geometry, Movements, Conics and Quadrics.		

Discrete Mathematics ★

ECTS Credit:	7.5	Semester:	Spring 2019
Subject Type:	Required	Grade:	8.6/10
Lecturer:	Oriol Serra Albo		
References:	- Biggs, Norman L. Matemática discreta. Barcelona: Vicens-Vives, 1994. ISBN 8431633115 - West, Douglas Brent. Introduction to graph theory. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2001. ISBN 0130144002.		
Topics:	Enumerative Combinatorics, Recursions and Generating Functions, Discrete Probability, Introduction to the probabilistic method, Introduction to Graph Theory: Trees, Eulerian and Hamiltonian Cycles, Planarity, Coloring and Matching		

Fall 2018

Linear Algebra ★

ECTS Credit:	7.5	Semester:	Fall 2018
Subject Type:	Required	Grade:	9.6/10
Lecturer:	Marta Casanellas Rius		
References:	- Strang, Gilbert. Introduction to linear algebra. 5th ed. Wellesley: Cambridge Press, cop. 2016. ISBN 978-09802327-7-6 - Poole, David. Álgebra lineal: una introducción moderna. 3a ed. 2013. ISBN 978-607-481-608-2.		
Topics:	Matrices, determinant and linear systems, Vector spaces, Linear Maps, Diagonalitzation, Orthogonality		

Single Variable Calculus

ECTS Credit:	7.5	Semester:	Fall 2018
Subject Type:	Required	Grade:	9.6/10
Lecturer:	Marcos Noy Serrano		
References:	- Strang, Gilbert. Calculus [on line]. Wellesley-Cambridge Press, - Spivak, Michael. Calculus. 3rd ed. Barcelona: Reverte, 2012. ISBN 84-291-5137-0.		
Topics:	Introduction to Calculus, Sequences and numerical series, Continuous functions and limits, Derivatives, Integrals		

Math Fundamentals

ECTS Credit:	3	Semester:	Fall 2018
Subject Type:	Required	Grade:	9.0/10
Lecturer:	José Luis Díaz Barrero		
References:	- Bloch, Ethan D. Proofs and fundamentals [en línia]. 2nd ed. Boston: Springer Science + Business Media, 2011 ISBN 0817641114. - Rosen, Kenneth H. Matemática discreta y sus aplicaciones [en línia]. 5a ed. Madrid: McGraw-Hill Interamericana, 2004		
Topics:	Propositional Logic, Proof Theory, Introduction to Set Theory, Relations and operators, Numerability, Complex Numbers, Arithmetic and Polynomials, Basic Algebraic Structures		

Undergraduate Degree in Computer Science

Spring 2022

Programming Languages

ECTS Credit:	6	Semester:	Spring 2022
Subject Type:	Elective	Grade:	10/10
Lecturer:	Jordi Petit Silvestre		
References:	- Wilhelm, R.; Maurer, D. Compiler design. Addison-Wesley, 1995. ISBN 978-0201422900 - Mitchell, J.C. Concepts in programming languages. Cambridge University Press, 2003. ISBN 978-0521780988.		
Topics:	Introduction to programming languages, Introduction to compilers, Functional languages, Type systems, Higher-order programming, Modeling and Specification using functional languages, Scripting languages		

Logics in Information Technology ★

ECTS Credit:	6	Semester:	Spring 2022
Subject Type:	Elective	Grade:	9.7/10
Lecturer:	Robert Nieuwenhuis		
References:	- Logic for computer scientists - Schöning, U, Birkhäuser, 2008. ISBN: 9780817647636 - Handbook of constraint programming - Rossi, F.; van Beek, P.; Walsh, T. (eds), Elsevier , 2006. ISBN: 0444527264		
Topics:	Propositional Logic, Deduction in Propositional Logic: Satisfability problems, First-Order Logic, Deduction in First-Order Logic. Logical Programming: Horn SAT		

Fall 2021

Programming Projects

ECTS Credit:	6	Semester:	Fall 2021
Subject Type:	Required	Grade:	9.0/10
Lecturer:	Alicia Maria Ageno Pulido		
References:	- Budd, T. An introduction to object-oriented programming. 3rd ed. Addison-Wesley, 2002. ISBN 0201760312. - Binder, R.V. Testing object-oriented systems: models, patterns and tools. Addison-Wesley, 2000. ISBN 9780321700674.		
Topics:	Software Engineering Principles, Object Oriented Programming, Interface Programming, Design Patterns in Java, Software Life Cycle, Debugging		

Theory of Computation ★

ECTS Credit:	6	Semester:	Fall 2021
Subject Type:	Elective	Grade:	10/10
Lecturer:	Maria Del Carme Alvarez Faura		
References:	- Sipser, M. Introduction to the theory of computation. 3rd ed. Cengage Learning, 2013. ISBN 9781133187790 - Hopcroft, J.E.; Motwani, R.; Ullman, J.D. Introduction to automata theory, languages, and computation. 3rd ed. Pearson/Addison Wesley, 2007. ISBN 0321462254.		
Topics:	Formal languages, Finite automata, Context-free grammars, Regular expressions, Pushdown automata, Non-regularity and non-context freeness, Turing machines, Decidability, Computability		

Artificial Intelligence

ECTS Credit:	6	Semester:	Fall 2021
Subject Type:	Elective	Grade:	8.4/10
Lecturer:	Javier Vazquez Salceda		
References:	- Russell, S.J.; Norvig, P. Artificial intelligence: a modern approach. 3rd ed. Prentice Hall, 2010. ISBN 9781292153964. - Brachman, R.J.; Levesque, H.J. Knowledge representation and reasoning. Elsevier, 2004. ISBN 1558609326.		
Topics:	Problem-Solving by means of Search, Knowledge representation and reasoning, Planning, Machine Learning, Other Artificial Intelligence techniques, areas and applications		

Spring 2021

Business and Economic Environment

ECTS Credit:	6	Semester:	Spring 2021
Subject Type:	Required	Grade:	7.4/10
Lecturer:	Joan Carles Gil Martin - Jose Maria Cabré Garcia		
References:	- Bernanke, B.S.; Frank, R.H. Principios de economía. 3a ed. Mc Graw Hill, 2007. ISBN 9788448156725. - Mochón, F. Economía: teoría y política. 6a ed. McGraw-Hill, 2009. ISBN 9788448170844.		
Topics:	Key Economics Concepts, Specialization, Exchange And Money, Spanish Tax System, Gross Domestic Product, Fiscal Policy And Monetary Policy, Management, Entrepreneurship And Intra-Entrepreneurship, Human Resources, Finance, Sales And Marketing, Operations		

Algorithms ★

ECTS Credit:	6	Semester:	Spring 2021
Subject Type:	Elective	Grade:	9.5/10
Lecturer:	Maria Jose Serna Iglesias		
References:	- Kleinberg, J.; Tardos, E. Algorithm design. Pearson, 2014. ISBN 9781292023946. - Dasgupta, S.; Papadimitriou, C.; Vazirani, U. Algorithms. McGraw-Hill, 2008. ISBN 9780073523408		
Topics:	Greedy Algorithms, Dynamic Programming, Network Flows, Advanced Data Structures And Algorithms		

Parallelism

ECTS Credit:	6	Semester:	Spring 2021
Subject Type:	Required	Grade:	10/10
Lecturer:	Eduard Ayguadé Parra		
References:	- Grama, A.; Karypis, G.; Kumar, V.; Gupta, A. Introduction to parallel computing. 2nd ed. Pearson Education, 2003. ISBN 0201648652 - OpenMP application programming interface: version 5.0. OpenMP, 2018		
Topics:	Shared-memory programming: OpenMP, Analysis of parallel applications, Introduction to parallel architectures, Task Decomposition, Data Decomposition		

Graphics

ECTS Credit:	6	Semester:	Spring 2021
Subject Type:	Elective	Grade:	9.3/10
Lecturer:	Carlos Antonio Andujar Gran		
References:	- Angel, E.; Shreiner, D. Interactive computer graphics : a top-down approach with WebGL. 7th ed., global ed. Harlow: Pearson, 2015. ISBN 9781292019345. - Akenine-Moller, T. [et al.]. Real-time rendering. 4th ed. CRC Press, 2018. ISBN 9781138627000.		
Topics:	Computer graphics applications areas, Graphical Pipeline OpenGL, Shaders, Textures, Illumination, Transparency, Ray Tracing, Ray-Intersection Geometry		

Fall 2020

Computer Architecture

ECTS Credit:	6	Semester:	Fall 2020
Subject Type:	Required	Grade:	8.7/10
Lecturer:	Jose Francisco Llosa Espuny		

References:

- Hennessy, John L.; Patterson, D. Computer architecture: a quantitative approach. 6th ed. Elsevier, Morgan Kaufmann, 2019. ISBN 9780128119051.
- Bryant, R.E.; O'Hallaron, D.R. Computer systems: a programmer's perspective. 3rd ed. Pearson, 2016. ISBN 9781292101767.

Topics: Fundamentals of computer design and evaluation, High-level/assembly language interface, Memory Hierarchy, Storage Systems, Instruction set design, Pipelining and parallelism in computer design

Interaction and Interface Design

ECTS Credit:	6	Semester:	Fall 2020
Subject Type:	Required	Grade:	7.2/10
Lecturer:	Marta Fairen Gonzalez		

References:

- Nielsen, J.; Loranger, H. Prioritizing web usability. New Riders, 2006. ISBN 9780321350312.
- Shneiderman, B. [et al]. Designing the user interface: strategies for effective human-computer interaction [on line]. 6th ed., global ed. Pearson Education Limited, 2017

Topics: Introduction to interactive systems, Design user interfaces, Programming Interface, Processing and evaluation of 2D and 3D geometry, Developing user-centered, Architecture and programming of graphics cards

Introduction to Software Engineering

ECTS Credit:	6	Semester:	Fall 2020
Subject Type:	Required	Grade:	9.0/10
Lecturer:	Ernest Teniente Lopez		

References:

- Larman, C. Applying UML and patterns: an introduction to object-oriented analysis and design and iterative development. 3rd ed. Prentice Hall PTR, 2005. ISBN 0131489062.
- Pressman, R.S.; Maxim, B.R. Software engineering: a practitioner's approach. 9th ed. New York: McGraw Hill Higher Education, 2020. ISBN 9781260548006.

Topics: Software requirements and software specifications, UML software system specification, Introduction to object-oriented design, Test design in an object-oriented context

Computer Networks

ECTS Credit:	6	Semester:	Fall 2020
Subject Type:	Required	Grade:	9.6/10
Lecturer:	Llorenç Cerdà Alabern		
References:	- Kurose, J.F.; Ross, K.W. Computer networking: a top-down approach [on line]. 7th ed. Pearson, 2017 - Stallings, W. Data and computer communications. 10th ed. Pearson/Prentice Hall, 2014. ISBN 0133506487.		
Topics:	IP Networks, TCP protocol, Local Area Networks, Network applications, CISCO routers, ACLs and NAT with IOS, Switches		

Spring 2020

Databases

ECTS Credit:	6	Semester:	Spring 2020
Subject Type:	Required	Grade:	10/10
Lecturer:	Antoni Urpi Tubella - Carme Quer Bosor		
References:	- Sistac, J. (coord.). Tècniques avançades de bases de dades. Barcelona: EDIUOC, 2000. ISBN 8484291065. - Ramakrishnan, R.; Gehrke, J. Database management systems. 3rd ed. Boston: McGraw-Hill, 2003. ISBN 0071151109.		
Topics:	Relational model, Relational Algebra and SQL, Logical database components, Stored Procedures and Triggers, Introduction to the design of relational databases, Transactions and concurrency, Physical storage structures and access methods, NOSQL		

Computer Interfacing

ECTS Credit:	6	Semester:	Spring 2020
Subject Type:	Required	Grade:	10/10
Lecturer:	Manel Frigola Bourlon		
References:	- Huang, H.-W. PIC microcontroller: an introduction to software and hardware interfacing. Thomson/Delmar Learning, 2005. ISBN 1401839673. - Patterson, D.A.; Hennessy, J.L. Computer organization and design: the hardware/software interface. 5th ed. Elsevier Morgan Kaufmann, 2014. ISBN 9780124077263.		
Topics:	Microcomputer architecture, Input/output ports, Interrupts, Analogue Interfaces, Serial communication interfaces, Buses and DMA		

Operating Systems

ECTS Credit:	6	Semester:	Spring 2020
Subject Type:	Required	Grade:	10/10
Lecturer:	Yolanda Becerra Fontal		
References:	- Silberschatz, A.; Galvin, P.B.; Gagne, G. Operating system concepts. Global ed., 10th ed. Hoboken: John Wiley & Sons, 2019. ISBN 9781119454083 - Stallings, W. Operating systems: internals and design principles [on line]. 9th ed. Harlow: Pearson Education Limited, 2017		
Topics:	Process Management, Threads, Scheduling, Memory management, File Systems, Management of input / output, Linux/Unix Architecture		

Fall 2019

Computer Organization

ECTS Credit:	7.5	Semester:	Fall 2019
Subject Type:	Required	Grade:	8.7/10
Lecturer:	Joan Manuel Parcerisa Bundo		
References:	- Patterson, D.A.; Hennessy, J.L. Estructura y diseño de computadores: la interfaz software/hardware [on line]. Barcelona: Reverté, 2011		
Topics:	Assembler and basic data types, Program Translation, Arrays, Integer and floating point arithmetic, Cache Memory, Virtual Memory, Exceptions / Interrupts		

Data Structures and Algorithmics

ECTS Credit:	6	Semester:	Fall 2019
Subject Type:	Required	Grade:	10/10
Lecturer:	Enric Rodriguez Carbonell - Salvador Roura		
References:	- Cormen, T.H.; Leiserson, C.E.; Rivest, R.L.; Stein, C. Introduction to algorithms [on line]. 3rd ed. Cambridge: MIT Press, 2009 - Weiss, M.A. Data structures and algorithm analysis in C++. 4th ed int. Boston: Pearson, 2014. ISBN 0273769383		
Topics:	Analysis of Algorithms, Divide and conquer, Hash Tables, Balanced Binary Trees, Priority Queues, Graphs.		

Physics

ECTS Credit:	7.5	Semester:	Fall 2019
Subject Type:	Required	Grade:	10/10
Lecturer:	Joaquim Casulleras Ambros		
References:	- Giró, A.; Canales, M.; Rey, R.; Sesé, G.; Trullàs, J. Física per a estudiants d'informàtica [on line]. Barcelona: Fundació per a la Universitat Oberta de Catalunya, 2005 [Consultation: 08/05/2020]. - Cogdell, J.R. Foundations of electrical engineering. 2nd ed. Prentice Hall, 1996. ISBN 0130927015.		
Topics:	Direct Current, Alternating Current, Electronics and logic gates, Waves		

Spring 2019

Programming II

ECTS Credit:	7.5	Semester:	Spring 2019
Subject Type:	Required	Grade:	10/10
Lecturer:	Borja Valles Fuente		
References:	- Weiss, M.A. Data structures and problem solving using C++. 2nd ed. Upper Saddle River: Pearson Education International, 2003. ISBN 0321205006. - Musser, D.R.; Derge, G.J.; Saini, A. STL tutorial and reference guide: C++ programming with the standard template library. 2nd ed. Boston: Addison-Wesley, 2000. ISBN 9780321702128		
Topics:	Linear data structures, Tree data structures, Iterative program correctness, Recursive programming, Recursive data types		

Fall 2018

Programming I

ECTS Credit:	7.5	Semester:	Fall 2018
Subject Type:	Required	Grade:	9.4/10
Lecturer:	Jose Carmona Vargas - Lluis Padro Cirera		
References:	- King, K.N. C programming: a modern approach. 2nd ed. W.W. Norton and company, 2008. ISBN 978-0-393-97950-3 - Oualline, S. Practical C++ programming [on line]. 2nd ed. Sebastopol, CA: O'Reilly, 2003		
Topics:	Basic programming principles, Iterative instructions, Traversal and search paradigms, Functions, Recursion, Tables, Sorting Algorithms, Binary Search		

Introduction to Computers

ECTS Credit:	7.5	Semester:	Fall 2018
Subject Type:	Required	Grade:	10/10
Lecturer:	Juan J. Navarro Guerrero		
References:	- Navarro, J.J.; Juan, T. Introducción a los computadores - Gajski, D.D. Principios de diseño digital. Prentice Hall, 1997. ISBN 8483220040.		
Topics:	Binary and 2-Complement representation, Combinational logic circuits, Sequential logical circuits, Special purpose processors, General processing unit, General control unit, Storage and input/output, Machine and assembly languages, Single-cycle processors, Multicycle processors		