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CHEMICAL ENGINEERING UNDERGRADUATE DEGREE PROGRAM
ACADEMIC YEAR 2008

DEPARTMENT OF CHEMICAL ENGINEERING
FEDERAL UNIVERSITY OF SÃO CARLOS, CAMPUS SÃO CARLOS
RODOVIA WASHINGTON LUIZ, KM 235, PO BOX 676. CEP 13.565-905. SÃO CARLOS – SP, BRAZIL

First academic year held: 1976
Nominal duration: 5 years
Main offering department: Chemical Engineering
Recognized in 1982. Last Accreditation: 2003

For further information concerning the degree program or to contact secretarial services, see the following websites and e-mail addresses:
- Federal University of São Carlos: http://www2.ufscar.br/english/
- Chemical Engineering Department: http://www.deq.ufscar.br
- E-mail: Course Coordination: coordeq@ufscar.br

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Historical Background

The Federal University of São Carlos is a public institution, linked to the Ministry of Education (MEC) of Brazil. It was established in 1968 and started its activities two years later, when it enrolled the first students for the undergraduate courses offered in Materials Engineering and Science. Currently there are 10,000 students (approximately 6,800 in undergraduate courses and 3,000 in graduate courses). The University offers 37 undergraduate courses and 50 graduate courses (20 in the Doctorate's program and 30 in the Master's degree program, besides many specialization courses).
Since the very beginning of the institution´s activities, its teaching staff (690 lecturers and researchers) stands out on account of their high-level qualifications, with approximately 99% holding doctorates and masters degrees. Moreover, nearly 98% of the faculty members work full-time. UFSCar also has 844 employees, working as technicians and administrative staff, to support all academic and research activities.
The university is located about the central area of the state of São Paulo, southeast region of Brazil. It has three campuses which are named according to the local cities: São Carlos, Araras, and Sorocaba. The main one is located in a vast area of 645 hectares within the limits of the city of São Carlos, and has 137 thousand square meters of constructed area.
The Araras campus offers undergraduate courses in Agronomical Engineering and Biotechnology. The newly created campus of Sorocaba has about 700 thousand square meters, where sustainability is the guideline to all activities.
The campuses have all the necessary facilities for adequate operation and functioning of University activities. There are more than 250 laboratories, a Community Library and sectorial branch libraries, ambulatories, theaters, amphitheaters, auditoriums, sport gymnasiums, sport grounds with 8 courts and 2 swimming pools, university restaurants, cafeterias and snack bars, 85 classrooms and over 370 student dormitory rooms.
The 31 academic departments of the University are grouped in four academic centers: Center of Biological Sciences and Health, Center of Exact Sciences and Technology, Center of Education and Human Sciences and Center of Agrarian Sciences.
The main source of UFSCar incomes is the Brazilian Ministry of Education, with a contribution of 165 million reais (about 96 million US dollars) in 2008. Approximately 80% of this amount covers personnel costs. The Institution budget is supplemented with incomes from several research projects supported by different governmental agencies as well as from services (extension projects) carried out by UFSCar researchers for industries and private companies. Direct contributions from members of Brazilian Congress have also become relevant recently and rendered 20 million reais (11.5 million US dollars) in 2007.
Reflecting the Institution's focus on the teaching, a document was drawn up establishing the "Profile of the Professional Educated at UFSCar". This document lists the competencies the University recognizes should be acquired through the education provided to its students, concomitantly to the acquisition of the specific competencies of each course. The document is based on the current requirements for an education that allies oral communication, scientific and technical competence with political insertion and an ethical posture.
At the international level, UFSCar is member of organizations such as the Association of Universities Montevideo Group; Association of Portuguese Language Universities; Tordesillas Group; International Association of Universities; Columbus Cooperation Program between European and Latin American Higher Education Institutions, and Organization of the Iberian-American States for Education, Science and Culture.

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Presentation of the Program

The Undergraduate Course in Chemical Engineering of Federal University of São Carlos (UFSCar) was created in 1976, offering initially places for 30 students. The program was officially recognized in 1982 (Federal Council of Education, Regulation nº 11 from 01/08/1982). In 1991, the number of beginning students was increased to 40. In 1999, this number was increased to 60 and in 2009 it will be 80, to cope with the increasing demand. The curriculum is distributed in 10 semesters, requiring full-time dedication of the students. The aim of the course is to form a professional with a broad knowledge, capable of working at all fields of the Chemical Engineering, including oil refinery and heavy chemical plants, biofuels production, food, beverages and pharmaceutical industries and so on. The course evolved quickly and recently has been recognized as one of the best in Brazil.
This outstanding position resulted mainly from the high qualification and diversity of the teaching staff as well as from the fully equipped lab facilities, assuring the quality of the provided education in Chemical Engineering. In fact, the main features that distinguish the Chemical Engineering Undergraduation Course of UFSCar from the other Brazilian counterparts are: i) emphasis on experimental activities as important tools to support, deepen and motivate learning; ii) usage of computational resources integrated with theoretical and experimental activities for modeling and simulation of chemical engineering typical problems. Team work, initiative and critical thinking are naturally developed during the learning activities. In addition, the Chemical Engineering Department, in which most of the lecturers and researchers are gathered, has five active, well-established Research Groups (Particulate Systems, Heterogeneous Chemical Reactors and Catalysis, Biochemical Engineering, Environmental Control and Process Simulation and Control).
All Research Groups offer the students several opportunities to have an initiation in scientific research and pursue an academic career in the future. At the last year of the Course, most of the students join the internship period at different industries, sharing their time between the campus and the industrial environment, what help the students to get ready for a successful career at the work market.

The objective of the Chemical Engineering Undergraduate Program is to provide students with scientific-technical and professional knowledge.
Chemical Engineering undergraduates are expected to be able to:

• Develop, improve and spread:
- basic knowledge of chemical engineering, including the production and the use of advanced applied computational methods;
- services, products and processes related to chemical industry, petrochemical, food, pharmaceutical and so on;
- new technologies in areas as biotechnology, composite materials as well as in areas related to the human life and environmental protection.

• Judge and make decisions, evaluating the potential or real impact of their actions, based on scientific-technical and humanitarian criteria, supported by social and ethical principles.

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- Participate, coordinate or leader in team-oriented activities;

- Communicate effectively in oral, written and graphical forms;

- Understand the progress of science in the field of Chemical Engineering and be prepared to develop actions to improve the Chemical Engineer attributions.

The educational background of Chemical Engineering Undergraduation students is distributed in 3 main clusters: I) Fundamentals – topics in Chemistry; Mathematics; Physics, Human and Social Sciences, Management and Economics, and Environmental Sciences; II) General Professional Formation – Topics in Computer Sciences; Technology and Sciences of Materials, Biochemistry and Microbiology, Electronics, Numerical Methods, Instrumentation and Control of Batch and Continuous Processes, Modelling and Simulation of Chemical/Biochemical Processes, Unit Operations, Chemical/Biochemical Industrial Processes, Chemical/Biochemical Reactors, Thermodynamics; III) Specific Professional Formation – Contents in Mass and Energy Balances; Chemical Processes Development; Analysis and Synthesis of Chemical Industrial Processes and Products; Processes and Chemical Installations Design; Environmental Analysis and Management. Most of lectures and practical classes from cluster "I" is concentrated in the 1st and 2nd years. Second, third and fourth years concentrate activities from cluster "II" and the fourth and fifth years contain the activities of cluster "III". In addition, three days per week in the 5th year are reserved for the training period at industries and consulting companies.

Table A1: Interactions with external stakeholders – pag. 1/1

Academic body or person representing the institution	External stakeholders	Type and frequency of interactions	Documents on record
Rectorate of UFSCar	Ministry of Education Association of Higher Education Federal Institution Rectors (ANDIFES)	Six meetings every year of National Education Council or monthly meetings of Higher Education Chamber (CNE/CES)	Directives, laws and decrees aiming at the improvement of Brazilian Education
ABEQ, ABENGE UFSCar representative	Federal Council of Engineering, Architecture and Agronomy (CONFEA) São Paulo Region Council of Engineering, Architecture and Agronomy (CREA)	Three regular meetings every year of Colégio de Entidades Nacionais (CDEN) Monthly Plenary Sessions	Minutes of meetings Minutes of meetings
CCET	Brazilian Association for Engineering Education (ABENGE)	Brazilian Congress of Engineering Education (COBENGE), once a year.	Congress documents
Associates from Chemical Engineering Department	Brazilian Association of Chemical Engineers (ABEQ)	Regular meetings of the São Paulo Region Office	Contact Dr. Pedro de Alcantara Pessoa Fo. at abeq@abeq.org.br
Ch. Eng. Undergraduate Program Coordination	Brazilian Meeting about Chemical Engineering Education (ENBEQ)	Every two years meetings	Meetings documents
Ch, Eng. Undergraduate Program Coordination	UFSCar Chemical Engineering Graduates Forum (DEQ-Ex)	Informal and not precisely scheduled at present, but being implemented.	Contacts: Head of Department:deqchefe@ufscar.br Course Coordination: coordeq@ufscar.br

Table A2: External requirements – pag. 1/2

Design, calculation and construction of machinery and equipment, testing and monitoring of operation in multi-body mechanical systems, robotic mechanics and mechatronics. Machines and their capacity for energy transformation and development of production processes.

Main *reference* professional roles or further study for which the graduate will be prepared	Competencies required to fill role / functions exercised in role
Chemical/Biochemical Plant Process Engineer	**Functions:** Provides technical support to staff and troubleshoots processes in a production facility to keep a plant running efficiently. Plant process engineers work closely with equipment operators to get feedback on the operations of each process and determine how to avoid shut-downs. They may also be involved with design work for improving methods of production and on workers safety and product quality issues. **Competencies:** In addition to transversal competencies (see below), practical experience with chemical process equipments, chemical handling, chemical analysis, and process instrumentation.
Chemical/Biochemical Process Design Engineer	**Functions:** Design of equipment, piping, instrumentation and facilities, including materials used inside, for pharmaceutical, food, biofuel, petrochemical, cosmetics etc new plants or new process unities, with minimum cost, minimum wastewater production/gases emissions and maximum energy savings. Process design engineers work with teams of engineers to develop new or improved processes to meet company´s production needs. **Competencies:** In addition to transversal competencies (see below), ability to apply and integrate the major elements in chemical engineering fundamentals to design/modify process units and systems of process unities.
Technical Manager	**Functions:** Responsible for the engineering staff and programs at a facility. Manages people, research programs, and daily operations of the engineering functions. Technical managers may oversee R&D. With plant managers, they may plan and implement the funding and expansion programs necessary to develop a new product, Coordinate and integrate a team of professionals with different educational formation. Report to the company's direction/presidency/owners. **Competencies:** In addition to transversal competencies (see below), practical and long experience with chemical process and equipments and on coaching company collaborators; knowledge of Economics and Management Principles and leadership.

Table A2: External requirements – pag. 2/2

Main *reference* professional roles or further study for which the graduate will be prepared	Competencies required to fill role / functions exercised in role
Researcher	**Function:** Work on process research and development at industrial companies, research institutions or universities. **Competencies:** In addition to transversal competencies (see below), solid basis in the fundamentals of his/her expertise, in Chemical Engineering as well as in any other required knowledge field. Aptitude for innovation and maintaining professional competence through life-long learning. Capacity to analyze the technical details and methodologies concerning his/her expertise. Ability to address innovative problems and complex design activities
Teaching Activities	**Function:** Chemical engineers can pursue an academic career, instructing students, besides conducting research. As lecturers, they may teach classes in chemical or other engineering fields, be members of university committees and conduct research using government, corporate or private funding. **Competencies:** In addition to transversal competencies (see below), all above mentioned competencies for a Researcher plus specific training on Didactics.
Transversal Competencies (in accordance with the documents "Profile of the Professional Educated at UFSCar" and "Chemical Engineering Undergraduate Pedagogical Project")	Self-learning Solid basis in the core subjects in chemical engineering: material and energy balances; heat, mass and momentum transfer; thermodynamics; chemical reaction kinetics; process control; and properties of materials. Ability to use modern engineering tools, specially the advanced computer tools, necessary for engineering practice. Ability to define and solve engineering problems. Ability to communicate ideas in oral, written and graphical forms. Ability to work effectively in teams in order to accomplish common goals. Act with integrity, consideration for the welfare of community and society, Exhibit appropriate professional behavior when interacting with others professionals.

ADDITIONAL COMMENTS: The contents of the table comprise only some of the main functions that a chemical engineering can perform as a professional. The names given to the functions may change according to the source. Our source was the AIChE web page (http://www.careercornerstone.org/chemeng/chemengdaylife.htm). At this link, one can find a complete description for all functions usually performed by chemical engineers. It is also worthy to consult the reported profiles, with rich descriptions of daily routine and competencies, for several chemical engineer functions available at http://www.careercornerstone.org/chemeng/profiles/chemengprofiles.htm.

Table A3: Intended learning outcomes and associated course work – pag. 1/7

GENERAL INFORMATION

At UFSCar, the workload of a student is measured in "credits". One credit corresponds to 15 hours of classroom lectures or workshop activities. A student concludes the Chemical Engineering Program when he/she amounts 264 credits (3960 hours), distributed as 252 credits (3780 hours) for obligatory subjects and 12 credits (180 hours) for optional subjects. Among the obligatory subjects, the credits are distributed as follows: 24 credits (360 hours) for practical work, 208 credits (3120 hours) for theoretical lectures, 12 credits (180 hours) for the internship period (at private companies, research institutes or UFSCar research laboratories) and 8 credits (120 hours) for the final project. As optional subjects, the student has to choose one (4 credits) in the Human Science area and two (8 credits) in the technical area. Moodle Environment for Distance Education can also be used for lectures up to 30 % of the total subject credits. Students passing requirements: at least 75 % frequency; final average grade ≥ 6.0 (grade scale: 0 to 10). For students with final average grade higher than 5.0, a recuperation procedure is available. Every course is described by a "Teaching Plan" which is prepared by the lecturer at the beginning of the academic semester. The "Teaching Plan" contains, besides the syllabus, the course objective, the learning outcomes, the teaching strategies proposed by the lecturer, the evaluation procedures and the recommended textbooks. All courses offered to the Chemical Engineering Program are linked to their respective "Teaching Plans" (see column "Course work and other educational activities"). For an example of the information provided by a Teaching Plan.

Obligatory subjects

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Mathematics and Statistics (32 credits or 480 hours of lectures)	Basic conceptual understanding and working practice of university level calculus, linear algebra and analytical geometry. Apply numerical techniques to solve problems in the engineering field. Solve Ordinary Differential Equations using analytical and numerical techniques. Use computational algorithm in order to solve common problems in the field of sciences and engineering. Introduce basic statistical methods useful for experimental planning as well as for data analysis.	Calculus 1 (4 credits) Calculus 2 (4 credits) Calculus 3 (4 credits) Analytical Geometry (4 credits) Numerical Calculus (4 credits) Methods of Applied Mathematics (4 credits) Series and Differential Equations (4 credits) Introduction to Planning and Statistical Analysis of Experiments (4 credits)

Table A3: Intended learning outcomes and associated course work – pag. 2/7

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Physics (20 credits or 300 hours of lectures or workshop activities)	Basic concepts of classical physics (classical mechanics). Be able to analyze qualitative and quantitative physical phenomena. Basic conceptual understanding of the fundamentals of electricity and magnetism. Conduct experiments, as well as analyze and interpret data. Use measurement instruments (length, time and temperature). Estimate the true value of the measurement and the uncertainty of this estimation. Basic theoretical understanding and practical handling of electricity, magnetism and geometrical optics. Use equipment as oscilloscope, voltmeter and ohmmeter. Analyze and design simple electrical circuits. Fundamentals of reflection and refraction laws. Skills in technical writing, report preparation and oral communication.	Physics 1 (4 credits) Physics 3 (4 credits) Experimental Physics A (4 credits) Experimental Physics B (4 credits) Electrotechnique (4 credits)
Chemistry (36 credits or 540 hours of lectures or workshop activities)	Basic principles and important theoretical concepts of chemistry (atomic structure, electronic configuration, the atom wave model, chemical bonding, states of matter, chemical equilibria, systems of acids and bases and electrochemistry). Basic conceptual quantitative and qualitative understanding and laboratory practice. Use classical and modern analytical methods. Chemistry of the main groups of organic and inorganic compounds. Fundamental laws governing matter in the gaseous state, and the laws of thermodynamics and their applications to chemistry. Fundamental concepts of solid, liquid and gaseous states, solutions, phase equilibria, chemical kinetics, and electrochemistry. Error analysis and statistical analysis of experimental data. Skills in technical writing, report preparation, oral communication and laboratory safety.	General Chemistry 1 (4 credits) General Chemistry 2 (4 credits) General Chemistry Lab (4 credits) Inorganic Chemistry (4 credits) Organic Chemistry (4 credits) General Analytical Chemistry (4 credits) General Analytical Chemistry Lab B (4 credits) Physical and Chemical Lab (4 credits) Fundamental Electrochemistry (4 credits)
Computation Science (4 credits or 60 hours of lectures)	Use available computational programs to solve problems in the Chemical Engineering courses. Develop skills in use computer packages and algorithm implementation.	Algorithm Project and Computational Program for Chemical Engineering (4 credits)

Table A3: Intended learning outcomes and associated course work – pag. 3/7

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Materials Science (6 credits or 90 hours of lectures)	Describe the properties of different materials and their applications to various areas of science and engineering. Know the relationship between the structure of materials and their properties. Understand the behavior and stability of deformable bodies under external loads. Use the principles of equilibrium to calculate deformations, stresses and strains in a body due to applied loads.	Materials for Chemical Industry (4 credits) Strength of Materials (2 credits)
Civil Engineering (6 credits or 90 hours of lectures)	Basic concepts of technical drawing in engineering applications using manual and computer aided tools. Apply algebra concepts to solve problems related to rigid bodies, structural analysis, inertia and dynamics of rigid bodies.	Technical Drawing (4 credits) Applied Mechanics 1 (2 credits)
Chemical Engineering Basics (14 credits or 210 hours of lectures)	Fundamental concepts related to Chemical Engineering core subjects: mass and energy balances, kinetics and biological sciences. – practices of global mass and energy balances techniques and its application in industrial chemical processes; – basic concepts in chemical kinetics of homogeneous and heterogeneous reactions, design of isothermical chemical reactors; – basic concepts in biochemistry, microbiology, cell metabolism, enzyme kinetics and design of enzymatic reactors.	Introduction to Chemical Engineering (2 credits) Mass and Energy Balances (4 credits) Kinetics and Chemical Reactor (6 credits) Biochemical Engineering 1 (2 credits)
Chemical Engineering Thermodynamics (8 credits or 120 hours of lectures)	Concepts related to thermodynamics: classical thermodynamics, state equations and fluid properties, phase equilibrium, typical applications in Chemical Engineering;	Thermodynamics for Chemical Engineering 1 (4 credits) Thermodynamics for Chemical Engineering 2 (4 credits

Table A3: Intended learning outcomes and associated course work – pag. 4/7

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Transport Phenomena (12 credits or 180 hours of lectures)	Application of basic concepts in fluids mechanics, heat and mass transfer to solve Chem. Eng. problems involving flow of fluids, energy and mass transfer as well as their associations;	Transport Phenomena 1 (4 credits) Transport Phenomena 2 (4 credits) Transport Phenomena 3 (4 credits)
Unit Operations (12 credits or 180 hours of lectures)	Application of transport phenomena theory to the design of Chemical Engineering equipment used for flow of fluids, heat exchange and separation processes;	Industrial Chemical Unit Operation 1 (4 credits) Industrial Chemical Unit Operation 2 (4 credits) Industrial Chemical Unit Operation 3 (4 credits)
Lab scale Chemical Processes (16 credits or 200 hours of workshop activities and 40 hours of lectures)	Error analysis and statistical analysis of experimental data. Skills in technical writing, report preparation, oral expression, team work and laboratory safety. Knowledge integration with theoretical concepts learned in Transport Phenomena, Unit Operation, Chemical and Biochemical Kinetics/ Isothermal Reactors.	Transport Phenomena Lab (4 credits) Industrial Chemical Operations Lab (4 credits) Chemical Processes Development 1 (4 credits) Chemical Processes Development 2 (4 credits) Chemical Reaction Engineering Lab (4 credits)
Process Modeling (Analytical and Numerical) (4 credits or 60 hours of lectures)	Introduce methodologies for chemical processes analysis; develop skills for model building, computer aided model simulation and simulated data interpretation.	Chemical Processes Analysis and Simulation (4 credits)
Advanced Topics in Chemical Engineering (12 credits or 180 hours of lectures)	Complement, deepen and integrate the knowledge in chemical and biochemical reactors design, unit operations and industrial chemical/biochemical processes. Design of non-isothermal and heterogeneous reactors.	Biochemical Engineering 2 (4 credits) Design of Reactors (4 credits) Engineering of Industrial Chemical Processes (4 credits)

Table A3: Intended learning outcomes and associated course work – pag. 5/7

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Chemical Engineering Design (12 credits or 180 hours of lectures)	Practical knowledge of design, integration, and economical analysis of complex chemical processes and plants, design and extrapolation of chemical process equipment. Effective analysis and resolution capability of incompletely formulated problems with multiple possible solutions, for obtaining an acceptable or the optimum solution, under some technical and/or economical objective(s). Develop skills in self learning, information research, technical writing, oral expression, and team work.	Design of Chemical Processes (4 credits) Design of Chemical Installations (4 credits) Synthesis and Optimization of Chemical Processes (4 credits)
Process Dynamics and Control (8 credits or 120 hours of lectures)	Basic and advanced understanding of the dynamics of systems of varying nature (namely of chemical systems and processes) ability to formulate and implement control structures for their automatic control, including the techniques commonly used in the modern industries.	Process Control 1 (4 credits) Process Control 2 (4 credits)
Administration, Management and Economics (16 credits or 240 hours of lectures)	Basic financial concepts and techniques of Economics and Management Engineering. Make decisions on investments. Understanding the strategic behavior of firms, the structure of markets and their interactions.	Engineering Economics (4 credits) Production and Quality Management (4 credits) Industrial Organization (4 credits) General Economy (4 credits)
Human and Social Sciences (6 credits or 180 hours of lectures)	Improvement of writing and reading abilities as well as practice of text interpretation. Technical skills and competencies which enable to develop professional basic understanding within the field of industrial and labor relations (history of labor and labor-union organization and management, business organization and management, and corporate finance).	Portuguese Language (2 credits) Industrial and Labor Sociology (4 credits)
Environmental Sciences (4 credits or 60 hours of lectures)	Known the main pollutants, theirs causes and effects and the legislation. Know the effluent treatment technologies and strategies for the environmental management of chemical plants.	Environmental Control (4 credits)
Professional Experience and Final Project (20 credits or 300 hours of supervised self work)	Internship period developed by the student at chemical/biochemical industries, consulting companies, engineering project companies; develop skills of human relation at work environment. Integrate the tasks and activities developed during industrial training with Chem. Eng. Concepts. Consolidate the knowledge in Chem. Eng. through complete project elaboration; develop skills in self learning, information research, technical writing, oral expression	Supervised Industrial Internship (12 credits) Final Project (8 credits)

Table A3: Intended learning outcomes and associated course work – pag. 6/7

Optional subjects – Technical Areas (Choose 2 subjects among the following options)

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Particle Systems Engineering and Advanced Unit Operations	Fluid flow in porous beds, hydrodynamics of fluidization, spotted bed and particle transportation, mass and heat transfer in porous beds. Emphasize the Transport Phenomena concepts and apply them to particle systems. Advanced topics in unit operations involving heat and mass transfer. Application, analysis and design (ASPEN aided) of equipments .Gravitational and centrifugal separators, filters, electrostatic settlers, washers. Complement the Chemical Engineer formation, enabling the student to design gas filters.	Particle-Systems Engineering (4 credits) Special Topics in Particle-Systems Engineering (4 credits) Separation Processes in Porous Systems (4 credits) Unit Operations of Chemical Industry 4 (4 credits) Gases Filtration (4 credits)
Biochemical Engineering, Agroindustry Processes and Waste Water Treatment	Introduce advances in biotechnological applications (enzyme and cell immobilization, separation and purification of biotechnological products, safety in bioprocesses). Deepen the understanding about agroindustrial processes, their unit operations and markets. Introduce concepts related to primary, secondary and tertiary treatments, UASB reactors, design of equipments and their applications in chemical industries.	Topics in Biotechnology (4 credits) Technological Applications of Microbiology (4 credits) Introduction to Sugar Production Technology (4 credits) Introduction to Ethanol Production Technology (4 credits) Introduction to Biological Treatment of Industrial Wastewater (4 credits) Introduction to Anaerobic Treatment of Wastewater (4 credits)
Process Dynamics and Control	Chemical Engineering applications of multivariable optimization, linear, non-linear and dynamic programming. Chemical Engineering application of parametric and non-parametric models, model validation, state inference. Strengthen the skills of students on handling biological systems and its variables, bioreactor instrumentation, control and optimization.	Optimization Methods Applied to Chemical Engineering (4 credits) Chemical Processes Identification (4 credits) Bioprocess Control (4 credits)
Quality control	Improve students knowledge on quality control and improvement (quality inspection, statistical control of quality, ISO 9000, Total Quality Management).	Quality Assurance and Control (4 credits)

Table A3: Intended learning outcomes and associated course work – pag. 7/7

Optional subjects – Human Science Areas (Choose 2 subjects among the following options)

Subject areas	Knowledge, understanding and skills expected of the student in order to demonstrate achievement	Course work and other educational activities
Human and Social Sciences	Greek model of the Theory, Galileu and Descartes: Physics and Universal Mathematics, Philosophy of Science nowadays. Introduce the history of Science Philosophy and its present problems to the student.	Philosophy of Science (4 credits)
	Socio-economical analysis of the environment, the ecological question, the green markets and ISO 14000, globalization and environmental problems. Introduce the theoretical-historical backgrounds of the contemporary environmental problems.	Society and the Environment (4 credits)
	Modern Racionalism, Philosophy of the Lights, Dialectics and Positivism. Introduce the Philosophy principles to the students.	Introduction to Philosophy (optional)
	Pronouns, Numerals, Verbs, Adverbs, Articles, Substantives, Adjectives Grammar and Vocabulary. Develop skills of oral and written expression in English.	English Language 1 and 2 (optional)
	History and fundamentals of Psychology, Scientific problems studied in Psychology, Contributions of Psychology. Identify and describe the main Psychology systems and their applications in the human behavior.	Introduction to Psychology (optional)

Table B1a: Entry qualifications *(selective admissions)* – pag. 1/2

Mandatory entry qualifications (prior knowledge, understanding and skills)
The students need to have completed his/her fundamental (8/9 years) and Upper Secondary School (3 years). To be eligible for admission at the São Carlos Federal University (UFSCar), students must have completed Upper Secondary School and hold a certificate of its conclusion. The selective process of entrance examination for undergraduate students at UFSCar takes place annually between the months of December and February. This process is coordinated by the Pro-Rectory for Undergraduate Studies (www.prograd.ufscar.br) by means of the Admission Exam Coordination (CoVest), which is planned and applied by the Vunesp Foundation (www.vunesp.com.br). Candidates must pass an exam which requires knowledge and skill relative to the subjects taken during his/hers fundamental and upper secondary school. For the 2008 exam there were approximately 1600 candidates for the 60 places in chemical engineering course. Applications to the entrance examination (Vestibular) generally take place from September to November. Information is found in the Candidate's Manual, which can be purchased in accredited banking institutions. The candidates can also apply and obtain information through the Internet. The Exam calendar is generally published in April. At the website of the entrance examination (www.vestibular.ufscar.br/), the candidates can find more information about the university, as well as about the exam, including dates and places and also links to previous tests. **Description of the selective process for entrance at UFSCar Undergraduate Courses** The exam is carried out in three days. It consists of tests composed by objective questions and discursive questions focusing on the knowledge of high school level. The tests cover the following subject areas: First day: Portuguese (18 questions) and English (10 questions) languages and a composition. Second day: Chemistry (15), Mathematics (15) and History (15). Third day: Biology (15), Physics (15) and Geography (15). With the purpose of facilitating access to the selective process for socio-economical underprivileged candidates, UFSCar exempts registration fees for the entrance examination to candidates who fits the profile. This system is in compliance with the norms established by the University Council (CU) and also counts on a cooperation agreement with the Franciscan Division of the Immaculate Conception of Brazil – EDUCAFRO (Education and Citizenship of Afro Descendents), an organization which acts as a centralizing coordination that provides support to candidates who finds difficulties in requiring exemption of the registration fees through Internet or in going directly to the campuses of UFSCar in order to accomplish the required procedures. During 2007, UFSCar began its Affirmative Actions Program. The Program includes reservation 20% of the places in Undergraduate Courses by using a socio-economical criteria. Besides, from this percentage, 35% of the places are reserved by an ethnic criteria. More information is available in the official site of the Program (http://www.acoesafirmativas.ufscar.br). **Additional Selective Process for entrance at UFSCar Undergraduate Courses (exclusive for students coming from Higher Education Institutions)** Another possibility for admission in undergraduate courses of UFSCar is through a Transfer process, which can be inter-courses (internal- for students of other UFSCar courses) or inter-institutional (external – for students of other Higher Education institutions). This procedure aims at to fulfill idle places in the undergraduate courses resulting from students who dropped out, transferred to another institution or were expelled. In the transfer process for UFSCar´s Engineering Undergraduate Courses, only students coming from engineering undergraduate courses are accepted.

Table B1b: Entry qualifications *(for orientation)* – pag. 2/2

Recommended entry qualifications (prior knowledge, understanding and skills)
Basic requirements for candidates to Brazilian engineering schools include a background in mathematics (algebra, geometry, trigonometry, calculus) and science (biology, chemistry, physics) as well as Portuguese. A good knowledge of English is also important, since several books and web information are available in this language. Handling informatics is another key aspect in the formation of a chemical engineer. Therefore, besides enjoying to study chemistry, physics and mathematics, good skills on computers are extremely helpful for chemical engineering students. A deep look at the AIChE (American Institute of Chemical Engineers) web site (overview, preparation and day in the life) is strongly recommended to any student who wants to pursue a career as a Chem. Eng. It is also important to remember that most chemical engineers are in close contact with industrial plants or even work inside them. Therefore, feeling comfortable at the industrial environment and wearing individual safety equipments are issues to be considered. To get some examples of what real chemical engineers do, access profiles of chemical engineers. As in many other careers, chemical engineers work in teams and their work is strongly influenced by world economy and market. Focus on becoming as well-tuned as possible and joining activities that improve communication and dealing with people skills are also recommended.

Table B2: Curricular content – pag 1/8

For teaching/learning activities, L means Lecture, E means Exercise class, A means practical activities at Workshops/Laboratories
For position, TP means temporary professor, PA means Associate Professor, PAd means Adjunct Professor, PTit means Full Professor, PAs means Assistant Professor.

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
1	General Chemistry 1	07013-0	Ch	4	60	0	0	60	Neila Maria Cassiano	TP	PhD	< 2
1	General Chemistry Lab	07018-1	Ch	4	0	0	60	60	Neila Maria Cassiano	TP	PhD	< 2
1	Analytic Geometry	08111-6	M&S	4	45	0	15	60	Edivaldo Lopes dos Santos	Pad	PhD	< 3
1	Calculus 1	08910-9	M&S	4	60	0	0	60	Marcello Fidelis	TP	PhD	< 2
1	Experimental Physics A	09110-3	Ph	4	0	0	60	60	Maristela Olzon Monteiro Dionysio de Souza	PA	PhD	> 3
1	Physics 1	09901-5	Ph	4	60	0	0	60	Caio Eduardo de Campos Tanbelli	TP	PhD	< 2
1	Introduction to Chemical Engineering	10004-8	ChE	2	30	0	0	30	Zangirolami, Teresa Cristina	PA	PhD	> 3
1	Portuguese	06203-0	H&SS	2	30	0	0	30	Roberto Leiser Baronas	Pad	PhD	> 3
1	Inorganic Chemistry	07103-0	Ch	4	60	0	0	60	Julio Zukerman Schpector	PA	PhD	> 3
1	General Chemistry 2	07014-9	Ch	4	60	0	0	60	Emerson Rodrigues de Camargo	Pad	PhD	> 3
1	Calculus 2	08920-6	M&S	4	45	0	15	60	Sadao Massago	Pad	PhD	> 3
1	Series and Differential Equations	08940-0	M&S	4	45	0	15	60	Maria Basilio de Matos	TP	PhD	< 2
1	Experimental Physics B	09111-1	Ph	4	0	0	60	60	Sergio de Aguiar Monsanto	Pas	MSc	> 3
1	Applied Mechanical	12003-0	CE	2	30	0	0	30	Salvador Homce de Cresce	Pad	PhD	> 3
1	Technical Drawing	12005-7	CE	4	15	0	45	60	Carolina Maria Pozzi de Castro	PA	PhD	> 3

Table B2: Curricular content – pag 2/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
2	Eletrotechnical	03080-5	ME	4	30	0	30	60	Alberto Moreira Jorge Junior	PA	PhD	> 3
2	General Analytical Chemistry	07406-3	Ch	4	60	0	0	60	Orlando Fatibello Filho	PTit	PhD	> 3
2	Methods of Applied Mathematics	08311-9	M&S	4	60	0	0	60	Rafael Augusto dos Santos Kapp	PAd	PhD	> 3
2	Calculus 3	08930-3	M&S	4	45	0	15	60	Vera Lucia Carbone	PAd	PhD	> 3
2	Physics 3	09903-1	Ph	4	60	0	0	60	Heurison Souza e Silva	TP	PhD	< 2
2	Mass and Energy Balances	10511-2	ChE	4	60	0	0	60	Cruz, Antonio Jose Gonçalves Badino Jr., Alberto Colli	PA PA	PhD PhD	> 3 > 3
2	Industrial and Labor Sociology	16157-8	H&SS	4	30	0	30	60	Maria Ines Rauter Mancuso	PA	PhD	> 3
2	Strength of Materials	03086-4	MS	2	30	0	0	30	Walter Libardi	PA	PhD	> 3
2	Organic Chemistry	07208-7	Ch	4	60	0	0	60	João Batista Fernandes	PTit	PhD	> 3
2	Analytical Chemistry Lab B	07403-9	Ch	4	0		60	60	Neila Maria Cassiano	TP	PhD	< 2
2	Thermodynamics for Chemical Engineering 1	10104-4	ChET	4	60	0	0	60	Sartori, Dermeval Moura, Luiz Fernando	PA PA	PhD PhD	> 3 2
2	Transport Phenomena 1	10208-3	TP	4	60	0	0	60	Assaf, José Mansur Aguiar, Monica Lopes	PA	PhD	> 3

Table B2: Curricular content – pag 3/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
2	Algorithm Project and Computational Program for Chemical Engineering	10518-0	CS	4	60	0	0	60	Moura, Luiz Fernando Gonçalves, José Antonio Silveira	PA PA	PhD PhD	2 2
2	General Economy	16400-3	AM&E	4	60	0	0	60	Vera Alves Cepeda	PAd	PhD	> 3
2	Elective from Human Sciences			4	60	0	0	60	Designated by Social Sciences Dpt			
3	Numerical Calculus	08302-0	M&S	4	45	0	15	60	Andrea Ribari Yoshizawa	TP	PhD	< 2
3	Thermodynamics for Chemical Engineering 2	10105-2	ChET	4	60	0	0	60	Sartori, Dermeval Moura, Luiz Fernando	PA PA	PhD PhD	> 3 1
3	Transport Phenomena 2	10209-1	TP	4	60	0	0	60	Assaf, Jose Mansur	PA	PhD	> 3
3	Industrial Chemical Unit Operations 1	10312-8	UO	4	60	0	0	60	Barboza, Marlei P. Silva, Edson Luiz	PA PA	PhD PhD	> 3 > 3
3	Kinetics and Chemical Reactors	10410-8	ChE	6	90	0	0	90	Cardoso, Dilson Zangirolami, Teresa Cristina	PTit PA	PhD PhD	1 1
3	Introduction to Statistical Design and Analysis of Experiments	15006-1	M&S	4	30	0	30	60	Pedro Ferreira Filho	Pas	MSc	1
3	Fundamental Electrochemistry	07638-4	Ch	4	60	0	0	60	Ione Iga	PA	PhD	> 3

Table B2: Curricular content – pag 4/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
3	Transport Phenomena 3	10210-5	TP	4	60	0	0	60	Ferreira, Maria do Carmo	PA	PhD	> 3
3	Transport Phenomena Lab	10211-3	LSChP	4	15	0	45	60	Ferreira, Maria do Carmo Assaf, Jose Mansur Aguiar, Monica Lopes	PA	PhD	> 3
3	Industrial Chemical Unit Operations 2	10313-6	UO	4	60	0	0	60	Araujo, Everaldo C C Barboza, Marlei P.	PA PA	PhD PhD	> 3 2
3	Design of Reactor	10408-6	ATChE	4	60	0	0	60	Bueno, Jose Maria C.	PA	PhD	> 3
3	Chemical Processes Analysis and Simulation	10512-0	PM	4	45	0	15	60	Giordano, Roberto de Campos Cruz, Antonio J G	PTit PA	PhD PhD	> 3 > 3
3	Biochemical Engineering 1	10706-9	ATChE	2	30	0	0	30	Suazo, Claudio Alberto Giordano, Raquel de L. C.	PA PTit	PhD PhD	> 3 1
4	Physicochemical Lab	07618-0	Ch	4	0	0	60	60	Ione Iga	PA	PhD	> 3
4	Industrial Chemical Unit Operations 3	10314-4	UO	4	60	0	0	60	Moura, L. Fernando Gonçalves, Jose Antonio Silveira	PA PA	PhD PhD	> 3 2
4	Industrial Chemical Operations Lab	10315-2	LSChP	4	15	0	45	60	Moura, L. F. Gonçalves, J. A. S. Araujo, Everaldo C. Barboza, Marlei P Silva, Edson Luiz	PA PA PA PA PA	PhD PhD PhD PhD PhD	> 3 > 3 > 3 > 3 > 3

Table B2: Curricular content – pag 5/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
4	Chemical Processes Development 1	10605-4	LSChP	4	30	0	30	60	*			
4	Biochemical Engineering 2	10707-7	ChE	4	60	0	0	60	Suazo, Claudio Alberto	PA	PhD	> 3
4	Industrial Organization	11204-6	AM&E	4	60	0	0	60	Roberto Grun	PA	PhD	> 3
4	Engineering Economics	11302-6	AM&E	4	60	0	0	60	Mario Otavio Batalha	PA	PhD	> 3
4	Materials for Chemical Industry	03502-5	MS	4	60	0	0	60	Sebastião Elias Kuri	PA	PhD	> 3
4	Process Control1	10513-9	PD&C	4	60	0	0	60	Kwong, Wu Hong Correa, Ronaldo G	PA	PhD	> 3
4	Chemical Processes Development 2	10606-2	LSChP	4	15	0	45	60	*			
4	Synthesis and Optimization of Chemical Processes	10607-0	ChED	4	60	0	0	60	Urquieta-Gonzáles, Ernesto A Kwong, Wu Hong	PA	PhD	> 3
4	Chemical Reaction Engineering Lab	10708-5	LSChP	4	15	0	45	60	Cardoso, D. Badino Jr., A. Colli Zangirolami, Teresa Cristina Giordano, Raquel L. C. Bueno, Jose Maria C.	PTit PA PA PTit PA	PhD PhD PhD PhD PhD	> 3 > 3 > 3 > 3 > 3

Table B2: Curricular content – pag 6/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
5	Supervised IndustrialTraining	10005-6	PE&FP	12	60	0	60	90	Araujo, Everaldo C C Badino Jr., Alberto Colli	PA	PhD	> 3
5	Environmental Control	10316-0	ES	4	60	0	0	60	Coury, José Renato	PA	PhD	> 3
5	Process Control 2	10514-7	PD&C	4	60	0	0	60	Kwong, Wu Hong Correa, Ronaldo G	PA	PhD	> 3
5	Design of Chemical Processes	10608-9	ChED	4	60	0	0	60	Giulietti, Marco Ruotolo, Luis A. M.	PA PAd	PhD PhD	> 3 2
5	Engineering of Industrial Chemical Processes	10910-0	ATChE	4	60	0	0	60	Giordano, Raquel de L.C. Giordano, Roberto C.	PTit PTit	PhD PhD	> 3 > 3
5	Final Project	10006-4	PE&FP	8	90	0	30	120	Silveira, Ana Maria Zangirolami Teresa Cristina Freire, Jose Teixeira	PA PA PTit	PhD PhD PhD	> 3 > 3 > 3
5	Design of Chemical Installations	10609-7	ChED	4	60	0	0	60	Giulietti, Marco Ruotolo, Luis A. M.	PA PAd	PhD PhD	> 3 2
5	Production and Quality Management	11130-9	AM&E	4	60	0	0	60	Tatiane Fernandes Zambrano	TP	PhD	< 2
5	Electrochemical Engineering	076236	OS-TA ATChE	4	60	0	0	60	D Alkaine, Carlos Ventura	PTit	PhD	> 3

Table B2: Curricular content – pag 7/8

Year	Course	Course Code	Subject area (optional)	Credits*	Total hours of the course				Instructor	Position	Qual.	Years held
				National	L	E	A	Self study				
5	Special Topics in Particulate Systems	102075	OS-TA ATChE	4	45	15		60	Freire, Jose Teixeira	Ptit	PhD	> 3
5	Introduction to Computational Fluid Dynamics	102148	OS-TA ATChE	4	45	0	15	60	Gonçalves, Jose Antonio Silveira	PA	PhD	> 3
5	Chemical Industry Unit Operations 4	103071	OS-TA ATChE	4	45	0	15	60	Araujo, Everaldo C.	PA	PhD	> 3
5	Gas Filtration	103098	OS-TA ATChE	4	45	15	0	60	Coury, José Renato	PTit	PhD	> 3
5	Optimization Methods Applied to Chemical Engineering	105163	OS-TA ATChE	4	60	0	0	60	Kwong, Wu Hong	PA	PhD	> 3
5	Introduction to Anaerobic Wastesater Treatment	107115	OS-TA ATChE	4	60	0	0	60	Silva, Edson Luiz	PA	PhD	> 3
5	Quality Warranty and Control	111090	OS-TA AM&E	4	60	0	0	60	Lizarelli, Fabiane Letícia	TP	PhD	< 2
5	Society and Environment	161306	OS-HS	4	60	0	0	60	Valencio, Norma Felicidade Lopes	PA	PhD	> 3
5	Philosofy of Science	180025	OS-HS	4	60	0	0	60	Cass, Mark Julian Richter	PA	PhD	> 3
5	Introduction to Philosofy	180041	OS-HS	4	60	0	0	60	Maar, Wolfgang Leo	PTit	PhD	> 3
5	Introduction to Psychology	200077	OS-HS	4	60	0	0	60	Carmo, João dos Santos	PAd	PhD	> 3
5	Sugar-cane Industrial Processing	106020	OS-TA ATChE	4	60	0	0	60	Poiani, Luiz Marcio	PA	PhD	> 3
5	Microbiology Applied to Technological Area	330175	OS-TA ATChE	4	30	30	0	60	Souza, Clovis Wesley Oliveira	PA	PhD	> 3

Table B2: Curricular content – pag 8/8

* Badino Jr Alberto Colli; Cruz, Antonio José G;, ; Aguiar, Monica Lopes; Moura, Luiz Fernando; Barboza, Marlei Pasotto; Silva, Edson Luiz; Poiani, Luiz Marcio; Zangirolami, Teresa Cristina

Observations:

1) Credit: One credit is equivalent to 15 hours in classroom (Please see Table A3 for more information).

2) Subject Areas:

AM&E – Administration, Management and Economics
ATChE – Advanced Topics in Chemical Engineering
CE – Civil Engineering;
Ch – Chemistry
ChED – Chemical Engineering Design
ChE –Chemical Engineering
ChET – Chemical Engineering Thermodynamics
CS – Computation Science
ES – Environment Sciences
H&SS – Human and Social Sciences
LSChP – Lab Scale Chemical Processes
M&S – Mathematics and Statistics
MS – Material Science
OS–TA – Optional Subjects – Technical Area (Choose two among the options)
OS – HS – Optional Subjects – Human Sciences (Choose one among the options)
PD&C – Process Dynamics and Control
PE&FP – Professional Experience and Final Project
PM – Process Modeling
Ph – Physics
TP – Transport Phenomena
UO – Unit Operations

3) During the fifth year (9th and 10th semesters), students have three days free (Wednesday, Thursday and Friday) for conducting professional internships in local and regional companies and industries.

4) The course code is followed by a letter that indicates the class (some course have many classes).

5) The complete schedule of contact hours and locations of the course is available for every semester at ProgGradWeb website: https://prograd web.ufscar.br/prograd web/

For further information, please contact: Course secretariat: coordeq@ufscar.br

Table B3: Contact hours – pag 1/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
1	General Chemistry 1	25 feb 08	05 Jul 08	4:00 PM – 6:00 PM		4:00 PM 6.00 PM			
1	General Chemistry Lab	25 feb 08	05 Jul 08	8:00 AM –12:00 AM Chemical Building	8:00 AM 12:00 AM Or 2:00 PM 6:00 PM Chemical Building		2:00 PM 6:00 PM Chemical Building		
1	Analytical Geometry	25 feb 08	05 Jul 08			2:00 PM 4:00 PM		2:00 PM 4:00 PM	
1	Calculus 1	25 feb 08	05 Jul 08			8:00 AM 10:00 AM		8:00 AM 10:00 AM	
1	Physics Lab A	25 feb 08	05 Jul 08	8:00 AM –12:00 AM Physics Building			2:00 PM 6:00 PM Physics Building		
1	Physics 1	25 feb 08	05 Jul 08			10:00 AM 12:00 AM		10:00 AM 12:00 AM	
1	Introduction to Chemical Engineering	25 feb 08	05 Jul 08		2:00 PM 4:00 PM or 4:00 PM 6:00 PM				
1	Portuguese	04 aug 08	13 dec 08				2:00 PM 4:00 PM		
1	Inorganic Chemistry	04 aug 08	13 dec 08			8:00 AM 10:00 AM	10:00 AM 12:00 AM		
1	General Chemistry 2	04 aug 08	13 dec 08	4:00 PM – 6:00 PM		4:00 PM 6:00 PM			

Table B3: Contact hours – pag 2/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
1	Calculus 2	04 aug 08	13 dec 08		8:00 AM 10:00 AM	10:00 AM 12:00 AM			
1	Differential Equations and Series	04 aug 08	13 dec 08	2:00 PM – 4:00 PM		2:00 PM 4:00 PM			
1	Experimental Physics B	04 aug 08	13 dec 08	8:00 AM – 12:00 AM Physics Building				8:00 AM – 12:00 AM Physics Building	
1	Applied Mechanical	04 aug 08	13 dec 08		10:00 AM 12:00 AM				
1	Technical Drawn	04 aug 08	13 dec 08		2:00 PM 6:00 PM				

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
2	Eletrotechnical	25 feb 08	05 Jul 08	2:00 PM 6:00 PM Material Engin. Building			2:00 PM 6:00 PM Material Engin.Building		
2	General Analytical Chemistry	25 feb 08	05 Jul 08		10:00 AM 12:00 AM	8:00 AM 10:00 AM			
2	Methods of Applied Mathematics	25 feb 08	05 Jul 08			2:00 PM 4:00 PM		2:00 PM 4:00 PM	
2	Calculus 3	25 feb 08	05 Jul 08			10:00 AM 12:00 AM		10:00 AM 12:00 AM	
2	Physics 3	25 feb 08	05 Jul 08		8:00 AM 10:00 AM			8:00 AM 10:00 AM	

Table B3: Contact hours – pag 3/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
2	Mass and Energy Balances	25 feb 08	05 Jul 08		2:00 PM 6:00 PM		8:00 AM 12:00 AM		
2	Industrial and Labor Sociology	25 feb 08	05 Jul 08	8:00 AM 12:00 AM					
2	Strength of Materials	04 aug 08	13 dec 08			10:00 AM 12:00 AM			
2	Organic Chemistry	04 aug 08	13 dec 08			8:00 AM 10:00 AM		8:00 AM 10:00 AM	
2	Analytical Chemistry Lab B	04 aug 08	13 dec 08		8:00 AM 12:00 AM Chem. Build.		2:00 PM 6:00 PM Chem. Build.		8:00 AM 12:00 AM Chem.Buil .
2	Thermodynamic for Chemical Engineering 1	04 aug 08	13 dec 08	8:00 AM 12:00 AM	2:00 PM 6:00 PM				
2	Transport Phenomena 1	04 aug 08	13 dec 08	8:00 AM 12:00 AM	2:00 PM 6:00 PM				
2	Algorithm Project and Computational Program for Chemical Engineering	04 aug 08	13 dec 08			2:00 PM 6:00 PM	8:00 AM 12:00 AM		
2	General Economy	04 aug 08	13 dec 08	2:00 PM 6:00 PM					
2	Elective from Human Sciences	04 aug 08	13 dec 08						

Table B3: Contact hours – pag 4/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
3	Numerical Calculus	25, feb, 08	05, Jul, 08				10:00 AM 12:00 AM	2:00 PM 4:00 PM	
3	Thermodynamic for Chemical Engineering 2	25, feb, 08	05, Jul, 08	8:00 AM 12:00 AM		2:00 PM 6:00 PM			
3	Transport Phenomena 2	25, feb, 08	05, Jul, 08	2:00 PM 6:00 PM	8:00 AM 12:00 AM				
3	Industrial Chemical Unit Operations 1	25, feb, 08	05, Jul, 08		2:00 PM 6:00 PM	8:00 AM 12:00 AM			
3	Kinetics and Chemical Reactors	25, feb, 08	05, Jul, 08		2:00 PM 6:00 PM	8:00 AM 12:00 AM	2:00 PM 4:00 PM 4:00 PM 6:00 PM		
3	Introduction to Statistical Design and Analysis of Experiments	25, feb, 08	05, Jul, 08				8:00 AM 10:00 AM	10:00 AM 12:00 AM	
3	Fundamental Electrochemistry	04, aug, 08	13, dec, 08		10:00 AM 12:00 AM		10:00 AM 12:00 AM		
3	Transport Phenomena 3	04, aug, 08	13, dec, 08		2:00 PM 6:00 PM	8:00 AM 12:00 AM			
3	Transport Phenomena Lab	04, aug, 08	13, dec, 08	2:00 PM 6:00 PM Chemical Engineering Building		2:00 PM 6:00 PM Chemical Engineering Building		2:00 PM 6:00 PM Chemical Engineering Building	
3	Industrial Chemical Unit Operations 2	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM			2:00 PM 6:00 PM		
3	Design of Reactor	04, aug, 08	13, dec, 08		2:00 PM 6:00 PM	8:00 AM 12:00 AM			
3	Chemical Processes Analysis and Simulation	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM			2:00 PM 6:00 PM		
3	Biochemical Engineering 1	04, aug, 08	13, dec, 08		8:00 AM 10:00 AM		8:00 AM 10:00 AM		

Table B3: Contact hours – pag 5/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
4	Physicochemical Lab	25, feb, 08	05, Jul, 08	8:00 AM 12:00 AM Chemical Building			8:00 AM 12:00 AM Chemical Building	8:00 AM 12:00 AM Chemical Building	
4	Industrial Chemical Unit Operations 3	25, feb, 08	05, Jul, 08	2:00 PM 6:00 PM		2:00 PM 6:00 PM			
4	Industrial Chemical Operations Lab	25, feb, 08	05, Jul, 08				2:00 PM 6:00 PM Chemical Engineering Building	2:00 PM 6:00 PM Chemical Engineering Building	
4	Chemical Processes Development 1	25, feb, 08	05, Jul, 08			8:00 AM 12:00 AM	8:00 AM 12:00 AM		
4	Biochemical Engineering 2	25, feb, 08	05, Jul, 08	2:00 PM 6:00 PM					
4	Industrial Organization	25, feb, 08	05, Jul, 08		8:00 AM 12:00 AM				
4	Engineering Economics	25, feb, 08	05, Jul, 08		2:00 PM 6:00 PM				
4	Materials for Chemical Industry	04, aug, 08	13, dec, 08		8:00 AM 12:00 AM		2:00 PM 6:00 PM		
4	Process Control1	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM		8:00 AM 12:00 AM			
4	Chemical Processes Development 2	04, aug, 08	13, dec, 08		2:00 PM 6:00 PM			8:00 AM 12:00 AM	
4	Synthesis and Optimization of Chemical Processes	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM			2:00 PM 6:00 PM		
4	Chemical Reaction Engineering Lab	04, aug, 08	13, dec, 08	2:00 PM 6:00 PM Chemical Engineering Building		2:00 PM 6:00 PM Chemical Engineering Building	8:00 AM 12:00 AM Chemical Engineering Building		

Table B3: Contact hours – pag 6/6

Year	Course / Activity	Start date	End date	Monday Time slot Location	Tuesday Time slot Location	Wednesday Time slot Location	Thursday Time slot Location	Friday Time slot Location	Saturday Time slot Location
5	Supervised IndustrialTraining	25, feb, 08	05, Jul, 08			Students have these three days free for developing professional internships in local and regional business and industries.			
5	Environmental Control	25, feb, 08	05, Jul, 08	8:00 AM 12:00 AM	8:00 AM 12:00 AM				
5	Process Control 2	25, feb, 08	05, Jul, 08	8:00 AM 12:00 AM	8:00 AM 12:00 AM				
5	Design of Chemical Processes	25, feb, 08	05, Jul, 08	2:00 PM 6:00 PM					
5	Engineering of Industrial Chemical Processes	25, feb, 08	05, Jul, 08		2:00 PM 6:00 PM				
5	Final Project	04, aug, 08	13, dec, 08						
5	Design of Chemical Installations	04, aug, 08	13, dec, 08	2:00 PM 6:00 PM					
5	Production and Quality Management	04, aug, 08	13, dec, 08		2:00 PM 6:00 PM				
5	Elective – Technical	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM	8:00 AM 12:00 AM				
5	Elective – Technical	04, aug, 08	13, dec, 08	8:00 AM 12:00 AM	8:00 AM 12:00 AM				

Check the update class schedule for each semester here.

Theoretical classes take place in classrooms located inside UFSCar campus (buildings named "Theoretical Classes Building": AT-1, AT-2, AT-3, AT-4, AT-5 or AT-6); please see the map of the campus. The coursers are set up in the beginning of each semester by the Academic Control Division (DICA), E-mail: dica@ufscar.br).

For further information, please contact the Course Coordination (coordeq@ufscar.br)

Table C1: Premises and equipment pag. 1/5

Rooms:

Room	Room type	Capacity	Characteristics and Equipment	Address / Location at the UFSCar Campus
# 03 to 06 # 08 # 09	Classroom	40	Available overhead projector.	AT1 (Theoretical Classes Building 1) South area, UFSCar campus Link to the map: http://www2.ufscar.br/aufscar/mapa.php
# 07 # 17	Classroom	160	Available overhead projector and PC projector (multimedia projector).	
# 11 to 14	Classroom	20	Available overhead projector	
# 16	Classroom	60	Available overhead projector.	
# 26 # 29 # 41 to 44	Classroom	40	Available overhead projector.	AT2 (Theoretical Classes Building 2) South area, UFSCar campus Link to the map: http://www2.ufscar.br/aufscar/mapa.php
# 27 # 28 # 30 # 31 # 37 to 39	Classroom	60	Available overhead projector.	
# 32	Classroom	20	Available overhead projector.	
# 40 # 45, # 46	Informatics room	30	PC computers connected to the Internet; air conditioned.	
# 51 # 52	Classroom	60	Available overhead projector and PC projector.	AT3 (Theoretical Classes Building 3) North area, UFSCar campus Link to the map: http://www2.ufscar.br/aufscar/mapa.php
# 53	Classroom	50	Available overhead projector.	
# 54 # 58	Informatics room	30	PC computers connected to the Internet; air conditioned.	
# 55 # 56 # 57	Classroom	50	Available overhead projector.	
# 59 # 60 # 61	Classroom	30	Available drawing tables (drafting tables or architect's tables)	

Table C1: Premises and equipment pag. 2/5

Room	Room type	Capacity	Characteristics and Equipment	Address / Location at the UFSCar Campus
# 66 # 69 to 71	Classroom	20	Available overhead projector and PC projector.	AT4 (Theoretical Classes Building 4) North area, UFSCar campus Link to the map: http://www2.ufscar.br/aufscar/mapa.php
# 67 # 68 # 72	Classroom	60	Available overhead projector and PC projector.	
# 73 # 91	Classroom	80	Available overhead projector.	
# 74	Classroom	40	Available overhead projector.	
# 75 # 76	Classroom	40	Available overhead projector.	
# 81 to 84	Classroom	20	Available overhead projector.	
# 85 to 89	Classroom	30	Available overhead projector.	
# 92	Informatics room	30	PC connected to the Internet; air cond.	
# 96 # 101 to 103	Classroom	60	Available overhead projector and PC projector.	AT5 (Theoretical Classes Building 5) North area, UFSCar campus Link to the map: http://www2.ufscar.br/aufscar/mapa.php
# 97 to 100	Classroom	50	Available overhead projector and PC projector.	
# 108	Classroom	30	Available drawing tables (drafting tables or architect's tables)	
# 109 # 114 to 116	Classroom	60	Available overhead projector.	
# 110 to 113	Classroom	50	Available overhead projector.	
# 134	Informatics room	30	PC computers connected to the Internet; air conditioned.	AT6 (Theoretical Classes Building 6) North area, UFSCar campus Link to the map: http://maps.google.com.br/maps?f=q&source=s_q&hl=pt-BR&geocode=&q=ufscar+&sll=-58.813742,-84.375&sspn=168.304442,360&ie=UTF8&ll=-21.988457,-47.881851&spn=0.011739,0.027595&t=p&z=15
# 138 to 140	Classroom	60	Available overhead projector and PC projector.	
# 133	Classroom	100	Available overhead projector and PC projector.	
# 129 to 131	Classroom	60	Available overhead projector.	

Table C1: Premises and equipment pag. 3/5

Room	Room type	Capacity	Characteristics and Equipment	Address / Location at the UFSCar Campus
# 162 and 163	Classroom	97	Available overhead projector and PC projector.	AT7 (Theoretical Classes Building 7) North area, UFSCar campus Link to the map: http://maps.google.com.br/maps?f=q&source=s_q&hl=pt-BR&geocode=&q=ufscar+&sll=-58.813742,-84.375&sspn=168.304442,360&ie=UTF8&ll=-21.988457,-47.881851&spn=0.011739,0.027595&t=p&z=15
# 164 to 169 # 171	Classroom	63	Available overhead projector and PC projector.	
# 160 and 161	Classroom	52	Available drawing tables (drafting tables or architect's tables)	
# 170 # 173 to 176	Classroom	45	Available overhead projector and PC projector	
# 172	Classroom	81	Available overhead projector and PC projector	

Labs:

Room	Room type	Capacity	Characteristics and Equipment *	Address / Location at the UFSCar Campus
Chemical Building Room # 501	Laboratory of Analytical Chemistry	30	120 m²; Air conditioning and exhaust hoods are provided. Bench-scale experiments (please click for laboratory detailed syllabus in Table A3)	Building of Chemical Department at UFSCar campus (São Carlos) Link to the map: http://www2.ufscar.br/aufscar/mapa.php
Chemical Building Room # 507	Laboratory of General Chemistry	30	200 m²; Air conditioning and exhaust hoods are provided. Bench-scale experiments (please click for laboratory detailed syllabus in Table A3)	
Chemical Building Room # 505	Laboratory of Physical and Chemical	20	100 m²; Air conditioning and exhaust hoods are provided. Bench-scale experiments (please click for laboratory detailed syllabus in Table A3)	

Table C1: Premises and equipment pag. 4/5

Room	Room type	Capacity	Characteristics and Equipment	Address / Location at the UFSCar Campus
Physics Building Room # 301	Laboratory of Experimental Physics A	30	66 m²; Air conditioning and exhaust hoods are provided. Bench-scale experiments (please click for laboratory detailed syllabus in Table A3)	Building of Physics Department at UFSCar campus (São Carlos) Link to the map: http://www2.ufscar.br/aufscar/mapa.php
Physics Building Room # 302	Laboratory of Experimental Physics B	30	66 m²; Air conditioning and exhaust hoods are provided. Bench-scale experiments (please click for laboratory detailed syllabus in Table A3)	
	Laboratory of Chemical Process Development ("open" lab)	30	220 m²; Air conditioning and exhaust hoods are provided in the analytical lab. Please click for laboratory detailed syllabus in Table A3: *Chemical Processes Development 1* *Chemical Processes Development 2*	
	Laboratory of Chemical Processes Automation and Control	15	30 m²; Air conditioning is provided in the room. Process control equipments (PLC, computers). Experiments of level control, mass transfer in bioreactor; reaction.	
	Informatics Undergrad. Laboratory	20	30 m²; Air conditioning is provided in the room. Software available: Aspen Plus, Matlab, Simulink, Scilab, Octave, Fluent, Fortran, etc.	
	Amphitheater	40	60 m²; Available overhead projector and PC projector; Air conditioning is provided in the room.	

Table C1: Premises and equipment pag. 5/5

Library

Community Library	Library		9000 m² Information related with services, titles, volumes and any other resources available are available in the following website: http://www.bco.ufscar.br/bco/index.html	Link to the map: http://www2.ufscar.br/aufscar/mapa.php

E-learning

e-Learning Platform Website: http://www.moodle.ufscar.br/	Learning management system

Other on-campus (645 hectares) facilities

Name / Identification	Type	Capacity	Characteristics and Equipment *	Address / Location
Students residencies	Dormitories	383	Students´ Assistance Office: http://www2.ufscar.br/servicos/assistencia.php More information available on the following web site: http://www.sac.ufscar.br/	Campus of São Carlos
Health-School Unit (Unidade Saúde Escola, USE)	Health Assistance	NA	A unit that comprises activities developed by the Health area of UFSCar, which involves the departments of Physical Education, Nursing, Physiotherapy, Psychology and Occupational Therapy. Assistance to the community is available in partnership with the Government Funded Program for Health.	
Sport facilities	Communitarian and selective		Play yard, field court (football), gymnasium, swimming pool, among others.	
The University restaurant	Dinning place	Please click here	The University restaurant: http://www2.ufscar.br/servicos/restaurantes.php	
6 Cafeterias	Snack-bar	NA	Fast food, snacks and drinks.	

* Some buildings of the campus are covered by wireless network (Theoretical Buildings, Library, and most of the Departments).

Table D1: Student enrollment and progression data pag. 1/2

Year	1st year students enrolled at entrance examination (Nº/%)								Graduates (Nº/%)						
	Total	From			Second. Grade*		From out of the		Total	Within 1 year of legal end			Within 2 years of legal end		Within 3 or more years of legal end	
		Academic Second. Schools	Technical Second. Schools	Other Second. Instit.	Other Univers. Programs	□ 9/10	□ 7/10	Province[1]	Region[2]		Grade □□□□□□	7 > Grade > 9	Grade □□□□□□	Grade □□□□□□	Grade □□□□□□	Grade □□□□□□	Grade □□□□□□
2008	60	55/91.7	2/3.3	1/1.7	2/3.3	10/16.7	0/0	11/18.3	5/8.3	32	7/21.9	14/43.8	2/6.3	0/0	5/15.6	0/0	1/3.1
2007	60	53/88.3	1/1.7	4/6.7	2/3.3	7/11.7	0/0	8/13.3	3/5.0	58	0/0	36/62.1	2/3.4	0/0	3/5.2	0/0	5/8.6
2006	60	54/90.0	3/5.0	1/1.7	2/3.3	4/6.7	0/0	11/18.3	3/5.0	41	6/14.6	23/56.1	1/2.0	1/2.4	1/2.4	0/0	5/12.2
2005	60	56/93.3	2/3.3	0/0	2/3.3	8/13.3	0/0	6/10.0	1/1.7	53	3/5.7	36/67.9	0/0	0/0	7/13.2	0/0	2/3.8
2004	60	57/95.0	2/3.3	0/0	1/1.7	not available		4/6.7	3/5.0	49	4/8.2	36/73.5	2/4.1	0/0	1/2.0	0/0	3/6.1

Outside São Paulo State
Outside southeastern region states (São Paulo, Rio de Janeiro, Minas Gerais e Espírito Santo)
* Performance at the entrance examination used for classification.

Additional information:
Students passing requirements at UFSCar: for each course, at least 75 % frequency and final average grade ≥ 6.0, for a grade scale from 0 to 10. For students with final average grade higher than 5.0, a recuperation procedure is available.
Rules to remain enrolled at UFSCar: the student has to pass at least 8 credits per year and renew her/his enrollment every semester by accessing the ProGradWeb system at the enrollment period (see Academic Calendar). The student has to finish the Chemical Engineering Program at no more than 9 years.
Comments on the students classification according their grades. At UFSCar, the students are classified according to the "Index of Academic Yield" (IRA). This index is available for every student and it takes into account all grades in all subjects, ranging from 0 to 18000. The average performance criteria used at the table above was defined by multiplying the students IRA by the factor (10/18000).

Table D1: Student enrollment and progression data pag. 2/2

Credits earned		Progression data for 1st year students registered in (N/%)				
		2008	2007	2006	2005	2004
0*	0	5/ 7.2 %				
≤ 18	Less th. 33%	2/ 2.9 %				
≤ 36	bet. 33 % & 67 %	3/ 4.3 %				
< 54	More th. 67 %	27/ 39.1 %				
54	100%	32/ 46.4 %				
0*	0		1/ 1.5 %			
≤ 38	Less th. 33%		2/ 3.1 %			
≤ 75	bet. 33 % & 67 %		7/ 10.8 %			
< 112	More th. 67 %		26/ 40.0 %			
112	100%		29/ 44.6 %			
0*	0			3/ 5.0 %		
≤ 55	Less th. 33%			1/ 1,7 %		
≤ 110	bet. 33 % & 67 %			7/ 11.7 %		
< 164	More th. 67 %			37/ 61.7 %		
164	100%			12/ 20.0 %		
0*	0				9/ 16.1 %	
≤ 70	Less th. 33%				0/ 0.0 %	
≤ 140	bet. 33 % & 67 %				2/ 3.6 %	
< 212	More th. 67 %				23/ 4.1 %	
212	100%				22/ 39.3 %	
0*	0					4/ 6.7 %
≤ 90	Less th. 33%					0/ 0.0 %
≤ 180	bet. 33 % & 67 %					5/ 8.3 %
< 264	More th. 67 %					30/ 50.0 %
264	100%					21/ 35.0 %
TOTAL		**69*[2]**	**65*[1]**	**60**	**56**	**60**

* Students who dropped out or were expelled at the first year are considered as earned "0 credits"

*1 – Four students admitted in the Program by Transfer Process and 1 by International Exchange Program (PEC-G)

*2 – Eight students admitted in the Program by Transfer Process and 1 by International Exchange Program (PEC-G)

No part-time students enrolled at the Chemical Engineering Program – UFSCar

Table D2: Further information pag. 1/2

Grants and Scholarships
By the action of the Students Assistance Office, UFSCar offers over 1000 scholarships for those students coming from underprivileged socio-economical conditions, such as Bolsa Moradia, Bolsa Alimentação and Bolsa Atividade, which help them on covering their basic expenses with accommodation and food. Other scholarships are available for those students who join research activities or teaching assistance. UFSCar has several internationally recognized Research Groups, which welcome undergraduate students in their labs. More than 190 grants per year, with one year duration, are available under the Unified Program for Research Initiation (PUIC). Another modality of financial support is provided by Bolsa-Treinamento (Training Scholarship), which offers to the students an opportunity of professional training in activities related to the undergraduate courses. Every semester 55 Training Scholarships are offered, with 6 months duration.
Students can also develop activities as teaching assistants or as Computer Room assistants (Monitoria). The Center for Exact Sciences and Technology distributes about 30 grants, of 6 months duration, per year (8 for teaching assistance on the subjects offered by the Chemical Engineering Department).

Tutorial Education Program of the Chemical Engineering Undergraduate Course (PET-EQ)
The Tutorial Education Program (PET) aims at supporting academic activities that integrate teaching, research and extension. Formed as tutorial learning groups of students, supervised by a professor (the tutor), the main feature of the PET Program is to complement the academic formation of the students by stimulating their involvement in extra-curricula activities. The Program is supported by the Higher Education Secretary (SESu), comprising yearly tuition fees and monthly grants for students and the tutor.

Affirmative Actions Program
Established in December 2006, the Affirmative Action Program (PAA) aims to promote the higher education access for the underprivileged socio-economical youngsters coming from the public secondary schools and among these, for black, mulatto and native Brazilians. The PAA also offers Students Aid and Research Incentive Grants (BAIP), directly targeted to the underprivileged socio-economical students, partially afforded by Ford Foundation.

Students Exchange Programs
UFSCar's main international exchange programs for undergraduate students are:

Exchange Program and Academic Mobility (PIMA) – aims at consolidating inter-university cooperation and broadening the partnership of Ibero-American countries in the scope of higher education by means of multilateral undergraduate student exchange projects in the region. INSIDE is part of the university cooperation projects (INSIDE + Synergy = Development). More information is available at www.oei.es/pima

Escala Program – aims at promoting cultural, educational and scientific exchange and a more intense students participation in matters related to the process of regional integration and social issues concerning South America, by means of undergraduate students´ mobility for study activities, with subsequent awarding of credits at the home university. For more information visit: www.grupomontevideo.edu.uy/escala/
For information about specific exchange programs available at the Chemical Engineering Undergraduate Program, please contact coordeq@ufscar.br.

Table D2: Further information pag. 2/2

Undergraduate Student International Exchange Program (PEC-G) from the Ministry of Foreign Affairs
The PEC-G aims at the bilateral cooperation in the educational area by forming professionals with high education level and contributing to formation of qualified human resources in developing countries from Latin America, Caribe and Africa. The exchange student joining this Program is specially selected according diplomatic criteria in his/her home country.

Extra-Class Activities
The main students organizations available are: the Chemical Engineering Academic Center (CAEQ), the Chemical Engineering Junior Enterprise (ENETEQ), the Athletics Academic Association (Associação Atlética Acadêmica) and the Central Directory of Students (DCE).

Table D3: Programme analysis, monitoring and review – pag 1/2

Action	Responsibility	Timeline	Documents on record
Elaborate a Teaching Plan	Instructor	Beginning of each semester	**Teaching Plan** in the Nexos system Example of a Teaching Plan
Analyses of the Teaching Plan	Teaching Council (from each course) and Department Council (responsible for offering the discipline)	Mid-semester	
Approval of the Teaching Plan or recommendation for modification	Teaching Council (from each course) Department Council (responsible for offering the course)	Mid-semester	
Final version of Teaching Plan on-line divulgation	Secretary of Informatics Teaching Council (from each course) Department Council (responsible for offering the course)	Mid-semester	
Systematic surveys of participating students opinion (questionnaire about teaching quality, facilities and equipment, evaluation procedures, respect to the subject syllabus, filled by the students)	Secretary of Informatics	End of semester	Questionnaire template
Systematic surveys of instructors opinion (questionnaire about quality of facilities, equipment, technical support and services, students behavior, students learning, filled by the instructors).	Instructors	End of semester	Professor form template

Table D3: Programme analysis, monitoring and review – pag. 2/2

Action	Responsibility	Timeline	Documents on record
Release of the systematic surveys results and initial discussions concerning the evaluation (Reflection).	Secretary of Informatics Teaching Council Department Council	After the end of the semester	Results of surveys
Release of summary report about the surveys results, containing situation analysis and proposals	Teaching Council Department Council	Beginning of the next semester	Summary report
Seminar about Pedagogical Innovation	Undergraduation Courses and Pro-Rectory	Before the beginning of the first semester or each academic year	Seminário de Inovações Pedagógicas