ASIIN Seal & EUR-ACE

Accreditation Report

National Diploma
Industrial Engineering
Civil Engineering

Provided by
Polytechnic Institute of Advanced Sciences of Sfax (IPSAS), Tunisia

Version: 07.12.2021

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Génie Industriel	Industrial Engineering	ASIIN, EUR-ACE® Label	-	06
Génie Civil	Civil Engineering	ASIIN, EUR-ACE® Label	-	03
Date of the contract: 22.12.2020 **Submission of the final version of the self-assessment report:** 01.07.2021 **Date of the onsite visit:** 26./27.07.2021 **Virtual audit**				
Peer panel: Prof. Dr. Joaquin Diaz, TH Mittelhessen University of Applied Sciences Prof. Dr. Ralf Elbert, Technical University of Darmstadt SiZhong Hu, Student at Technical University of Berlin Dr. Olaf Neitzsch, Dr. Olaf Neitzsch Consulting Prof. Dr. Andreas Zilian, University of Luxembourg				
Representative of the ASIIN headquarter: Christin Habermann				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of May 15, 2015				

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes
[2] TC: TC 03 - Civil Engineering, Geodesy and Architecture; TC 06 - Industrial Engineering

ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 03 – Civil Engineering, Geodesy and Architecture as of September 28, 2012 Subject-Specific Criteria of Technical Committee 06 – Engineering and Management, Economics as of September 20, 2019	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Industrial Engineering	National Diploma	/	7	Full time	/	6 Semester	180 ECTS	Since 2013
Civil Engineering	National Diploma	/	7	Full time	/	6 Semester	180 ECTS	Since 2013

For the National Diploma in Industrial Engineering the institution has presented the following profile in the self-assessment report:

"Initially, industrial engineering is an expanding profession. Presently, industrial engineering at IPSAS institute is a branch of engineering dealing with the optimization of complex processes or systems. As has been noted, it is mainly concerned with the development, improvement, implementation and evaluation of integrated systems of employees, knowledge, information, equipment, energy, materials, analysis and synthesis. At this instance, future industrial engineers would determine the most effective ways to use the basic factors of production people, machines, materials, information, and energy to make a product or provide a service after receiving well- detailed courses.

The ultimate objective of the Industrial Engineer at IPSAS is to acquire a good training in the various disciplines of Industrial Engineering, namely engineering sciences and industrial engineering techniques.

Studies are done over 3 years, the equivalent of 6 semesters of theoretical and practical studies. The last semester is dedicated to the realization of the end-of-study project which is a synthesis work during which the student implements all the knowledge and skills acquired during these engineering studies.

Thus, this training is focused on two major parts:

[3] EQF = The European Qualifications Framework for lifelong learning

- The first part is notably: technical training allowing students to know the basic physical sciences and the technical characteristics of materials and equipment used in manufacturing production. Simlarly, acquisition of a technical vocabulary, awareness of the importance of technology in the development of means of production as well as concepts related to health, safety at work and protection of the environment.
- The second major component: training in maintenance, production and quality management. Equally important, students learn to perceive the business in the economic system and to understand the particular roles and interactions of different business departments. By all means, the potential candidate of industrial engineer would be able for practical use of analysis techniques, concepts and management tools related to the different stages of production are an integral part of the training.

To summarize, to wrap this training, the student will be able to find his place in any sector interested in industrial development and in various functions: from the physical system of the company (engineering, industrialization, production), by opening up to more transversal functions (quality, information systems, logistics) and evolving to a global vision of the process."

For the National Diploma in Civil Engineering the institution has presented the following profile in the self-assessment report.

"To begin with, in the Civil Engineering department of IPSAS, the main objective is to train engineers to be become capable of designing, analysing, calculating, carrying out, appraising and managing works in the construction sectors. Studies are done over 3 years, the equivalent of 6 semesters of theoretical and practical studies. The last semester is dedcated to the realization of the end-of-study project, which is a synthesis work during which the student implements all the knowledge and skills acquired during these engineering studies.

The civil engineer is a candidate specializing in the design and implementation of means, the management of men in the act of building. Add to this, it engages its responsibility towards the community and the company in a construction work especially for the concerns of the human being: important to realize that

- Construction of buildings for residential use, shops, industrial buildings, offices or entertainment spaces.

- Building communication and land-use planning infrastructure (roads, bridges, tunnels, logistics centers, dams, power plants) or back up the environment (water management, waste storage)

Another key point, the engineer can intervene in any stage of the construction operation, from the soil study until the accomplishment of the project: to point out those factors: Soil study, calculation of foundations; Design of the structure (calculation, methods, price study); Work management; Technical control.

In brief, the training offered by IPSAS is constantly adapted to the needs of companies by integrating the evolution of techniques and methods in the civil engineering sector. In the final analysis, one of the biggest benefits of studying civil engineering at IPSAS is that the field is so broad, encompassing a diverse collection of specializations and projects.

Consequently, Civil engineers graduated from IPSAS Sfax are even responsible for maintaining, repairing and upgrading infrastructure, so they are involved with engineering projects in a unique and ongoing way even after construction is complete."

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Student guide and IPSAS presentation
- Student handbook Industrial Engineering
- Student handbook Civil Engineering
- Objective-Module-Matrices for both degree programmes
- Self-Assessment report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The auditors refer to the Subject-Specific-Criteria (SSC) of the Technical Committees Civil Engineering, Geodesy and Architecture (03) and Engineering and Management, Economics (06) respectively as a basis for judging whether the intended learning outcomes of the Industrial Engineering programme and the Civil Engineering programme, as defined by Polytechnic Institute of Advanced Sciences of Sfax (IPSAS), corresponds with the competences as outlined by the SSC. They come to the following conclusion:

The auditors note that updating the qualification objectives and learning outcomes is a crucial element of IPSAS' quality management system (cf. criterion 6), which should guarantee that students are trained in conjunction with the demand of the employment market as well as adapt to technological changes. This commitment is also set in IPSAS' vision, which is stated to be "closely linked to the creation of programs that respect industrial [and] technological developments and the demand imposed by the labour market." Thus, the learning objectives are regularly evaluated by participants of IPSAS scientific committee, the

[4] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

teaching staff, students, alumni and related institutional stakeholders. The latter include a number of partner companies that work closely with IPSAS, e.g. by teaching courses, planning industrial visits or supervising end of studies projects. For the Industrial Engineering program, for example, IPSAS holds relations with IWC (International Welding Group), STEG (The Tunisian Company of Electricity and Gas) or SONOTRAK (a large logistics company). For the Civil Engineering program, IPSAS communicates frequently with the Regional Directorate of the Ministry of Equipment, Chaabene Frères (a large construction company) or SOMATRA-GET (Central Equipment and Works Company, field of infrastructure). The auditors laude the very strong connection to the industrial sector (e.g. external lecturers from the industry, industrial members as part of the advisory board) and believes it to be one of the strong points of the university and the two degree programmes.

The qualification objectives of the Industrial Engineering programme aim to produce graduates that have acquired the technical training to know the basic physical sciences and technical characteristics of materials and equipment used in manufacturing processes as well as a vocabulary, an awareness of the importance of technology in the development of means of productions. Graduates have gathered training in maintenance, production and quality management and have understood the particular roles and interactions of different business partners within the economic system. They are capable of using analysis techniques, concepts and management tools related to the different stages of production.

Graduates of the Civil Engineering programme are engineers, capable of leading projects and construction sites. They manage teams and operations in compliance with the law and with safety standards on a local, national and international scale. Graduates of this programme understand, through methodical reflection, complex problems and act responsibly. They work in construction companies, in design offices or in control offices within the construction sector as well as in project management and research development.

The qualification objectives for both degree programmes are anchored in detail in the student handbook (cf. annex to this report). Here, IPSAS provides an extensive list of the graduates' competencies and skills and – for the Civil Engineering Programme – also a list of potential employment opportunities for the graduates. The auditors miss a precise career profile for the Industrial Engineering programme.

The auditors generally recognise that the qualification objectives have been selected in accordance with the title of the degree programmes and thus train both civil engineers and industrial engineers. In particular, the learning outcomes defined in the Student Handbook in the individual areas of civil engineering appear sensible to the auditors. However, they notice here that the degree programme covers a very wide range of civil engineering fields

– building sites, functional work, road work, draining sites, earthworks, contracting, calculating, project management - without students being able to specialise in one of these directions. For them, this means that students receive a generalist rather than an in-depth education. They are therefore wondering what the exact subject-specific profile of this degree programme covers, as it does not seem possible for them to cover all the specialisations of civil engineering in the three years of the programme.

This is similar to the qualification objectives of industrial engineering. The auditors deem these to be quite general as well as they do not allow any impression of the subject-specific profile of this degree programme. According to the student handbook, graduates should be able to "analyse and synthesise complex electromechanical systems, mobilise scientific and technical resources, [...] have mastery of computer methods and tools and modelling [and] have the capacity for research or R&D activities". Although further skills are mentioned (divided into "specific skills", "common skills" and "behavioural skills"), these are also formulated rather vaguely and not subject-specifically. The auditors are therefore also confronted with the question of what exactly the special profile of this degree programme is. In addition, according to the qualification objectives, the focus in the technical area is on electro-mechanics, but this is not addressed otherwise. In both degree programmes, the auditors therefore ask the higher education institution to formulate the qualification profiles subject-specifically or to highlight the special features of the respective degree programme (e.g. specialisations).

The auditors also inquire into the employment opportunities for students. According to the student handbook, graduates of the Civil Engineering programme can find employment in companies, design offices or control office in the building and public works sector, in engineering, architecture project management as well as research and development in the construction field. For the Industrial Engineering programme no specific employment opportunities are listed. Here, IPSAS presents statistical analyses from the Tunisian National Statistics Institute, which showcase that the manufacturing sector of the Tunisian economy holds by far the most career opportunities. In 2018, for example, nearly 17.000 new recruits were employed in this sector. This is followed by over 5.500 new recruits in the service industry and over 2.000 in the commerce sector, both highly sought after by Industrial Engineering graduates. For the graduates of the Civil Engineering programme, IPSAS presents statistical data that look equally promising. Currently, there are an estimated 42.000 jobs in the building sector and over 140.000 in the service sector, which also employs many of IPSAS Civil Engineering programme. In 2018, 1.800 new recruits found employment in the building sector and 5.202 in the service sector.

The auditors are thus surprised to find out that employment rates have been decreasing for alumni of both programmes. For the Industrial Engineering graduates, employment

sank from 80% in 2018 to 70% in 2019 and finally to 50% in 2020. Similarly, employment for Civil Engineering graduates decreased from 85% in 2018 to 75% in 2019 and 60% in 2020. During the audit, the university states that these numbers are wrong and that in reality, 80-90% of Industrial Engineering graduates got a job and nearly 100% of Civil Engineering graduates. With regard to the various data, the auditors are unsure to what extent the study programmes are actually adapted to the labour market and help students to find a job. They therefore ask IPSAS, on the one hand, to check the statistics and adjust them if necessary and, on the other hand, to include or specify the professional profile of graduates in the qualification objectives.

Furthermore, the qualification objectives of both degree programmes lack the aspect of scientificity, which is defined in the SSCs of both disciplines. While the Industrial Engineering Programme mentions that graduates “have the capacity for research or R&D activities”, the qualification objectives of Civil Engineering lack any mentioning of scientific competencies of the students. For the auditors, the qualification objectives indicate a very high level of applied relevance; nevertheless, students, especially at EQF level 7, must also be trained to do scientifically sound work.

Given the very broad orientation of the degree programmes, which miss specification in the sense of deepening or broadening knowledge, as well as the lack of information on career opportunities as well as the scientific nature of the degree programme, the auditors finally question whether the qualification objectives relate to EQF Level 7 at all. For example, the civil engineering degree programme states that "he/she knows the scientific bases of modelling and the modern tools of scientific language, mathematics, statistics, numerical methods" and "he/she has the scientific bases of mechanics for civil engineering". This shows that the students do not acquire the necessary specialisation, which is decisive for a study programme at EQF level 7. The same applies to the qualification objectives of the Industrial Engineering Programme, which are not always based on in-depth knowledge of the graduates, but also list objectives such as “mobilise scientific and technical resources”, “have mastery of computer methods and tools and modelling” or “have the capacity for research”. As these goals are not very specific, the auditors cannot with certainty state whether the study programmes train students on a level necessary for EQF 7.

In summary, the auditors are of the opinion that although IPSAS has defined qualification objectives for both degree programmes, these must be rewritten as they currently do not match EQF Level 7 and lack certain aspects, such as the scientificity of the educational programmes and the precise employment opportunities of the graduates.

Criterion 1.2 Name of the degree programme

Evidence:

- Student handbook on Industrial Engineering
- Student handbook on Civil Engineering
- Self-Assessment report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The auditors confirm that the names of the Industrial Engineering as well as the name of the Civil Engineering programme correspond with the intended aims and learning outcomes as well as (in their original French title) the main course language.

Criterion 1.3 Curriculum

Evidence:

- Study plans for both degree programmes
- Student handbooks for both degree programmes
- Module descriptions for both degree programmes
- Objective-Module-Matrices for both degree programmes
- Flowchart
- Self-Assessment report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The curriculum of both programmes consists of three types of modules: elementary modules (Level 1), intermediate modules (Level 2) and advanced modules (Level 3). The modules of the Industrial Engineering programme cover the following areas of expertise: engineering sciences, industrial sciences, IT, production, quality, energetic, materials, logistics, mathematics, transversal skills and research. The modules of the Civil Engineering programme cover skills related to the following areas: mathematics, mechanics, geologies, building and works, transversal skills, synthesis project, construction, design and calculation of structures, architecture, design offices, special construction and research.

In their self-assessment report, IPSAS states that it considers practical training a fundamental basis for engineering students to constitute the strength of the qualification granted by the diploma. As such, both study programmes currently entail four different kinds of practical trainings. First, practical work is carried out in the laboratories. Here, students put into practice the theoretical knowledge they have received during their course. Second, students undertake so-called mini-projects. Here, students develop and research a theme relating to a subject of his or her field of study and capture the findings in a report and/or a presentation. Third, students have to participate in mandatory worker and technician internships in order to gain an understanding of the nature of working in company of their chosen area. Finally, the end of study project enables students to carry out practical work associated with this project at the industrial level. Here, they must apply all the theoretical and practical knowledge they have received during their years of study. IPSAS presents a list that details, which form of practical training the students receives in which module. The peers are generally satisfied with the practical aspects of the programme, although they share some concerns given the equipment used in the laboratories (cf. criterion 4.3).

As already discussed in criterion 1.1, the auditors are not convinced, however, that the study programmes are at a level that is appropriate for a Master's programme (EQF Level 7). When reviewing the study plans as well as the module descriptions, they are missing both a deepening and a broadening of the knowledge acquired during the students previous studies. Unfortunately, the module descriptions are not very informative and hardly address the qualification goals and the contents of the individual modules, so that the auditors cannot be completely sure what exactly is taught in the degree programmes. The objectives-module matrices submitted by the university is also not very informative in this respect. Nevertheless, the auditors find that many of the modules cover basic competencies rather than broadening or deepening them, which does not do justice to a level EQF 7. In particular, the Civil Engineering programme lacks topics of building constructions, which the auditors deem a fundamental part of any civil engineering programme. For the Industrial Engineering programme, the students voiced their wish to include topics related to entrepreneurship and quality management as these are skills they particularly need for their future employment. The auditors agree that introducing these topics would be reasonable.

The auditors also criticise that the curricula seem outdated in many places and do not contain new methods or topics that are, however, crucial for the current training of qualified civil and industrial engineers. For example, topics such as Smart Factory, Product Life Cycle Engineering or Industry 4.0 could be included in the curriculum of the industrial engineering

programme; for the curriculum of the civil engineering programme, the experts recommend topics such as Building Formation, Modelling, Common Data Environment (CDE) or Virtual Design and Construction.

The auditors are therefore of the opinion that the curricula of both study programmes need to be redesigned in order to meet the requirements of a Master's programme (EQF 7). This should be done in accordance with the revision of the qualification objectives, as all shortcomings identified there are also reflected in the curricula. This applies not only to the deepening or broadening of subject-specific knowledge, but also to the scientific aspects of the training, because in both study programmes students do not learn how to work scientifically or how to use scientific methods.

Finally, the auditors recommend that the soft skills of the students be further developed or promoted. On the one hand, the students in particular expressed the desire to invest more in English-language education and to offer modules in English in addition to language courses. On the other hand, the auditors recommend teaching skills in negotiation and general management in addition to the teamwork and communication skills anchored in the curriculum.

Criterion 1.4 Admission requirements

Evidence:

- Study handbooks for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The admission requirements and conditions are defined for both study programmes in the study guide as well as the respective student handbook. In accordance with the provision of Law No. 2000-73, regulating private higher education in Tunisia, two types of admissions are possible: Admission through the preparatory cycle and direct admission to the study programmes (engineering cycles).

The preparatory cycle is open for all students holding a technical baccalaureate. Students that have completed this two-year preparatory cycle have a right to choose any of the offered engineering programmes at IPSAS.

It is also possible to apply directly to the engineering programmes. Any student, whether Tunisian or international, is eligible for the study programmes if he or she holds a BTS (two-year vocational training), a technology license (EQF 6) matching the chosen engineering

course, a Master's degree or has completed a preparatory cycle at a different university. Master's degree students may directly advance to the second year of the programme if they have already achieved the necessary skills and knowledge in their previous degree.

After reviewing the documents, the auditors notice that the admission requirements are not very specific. For example, there do not seem to be any subject-specific prerequisites for admission to the degree programmes. So if students apply from outside and have not already taken the preparatory course at IPSAS, it is not defined what prerequisites these students must bring with them, i.e. theoretically a student with previous knowledge in a completely different field could apply for the programme and not be rejected.

It is also not regulated how applicants are selected if the capacity is exceeded. The evaluators learn during the audit that about 80 people apply for Civil Engineering each year, of whom 60 are admitted. In Industrial Engineering, this ratio is 30-20, but it is not clear to the auditors how a selection is made here or whether students who have already completed their preparatory course at IPSAS are given preference.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion not fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Student handbooks for both degree programmes
- Study calendar
- Training plan and practical training descriptions
- Module descriptions for both degree programmes
- Study plans for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
IPSAS is a polytechnic school accredited by the Tunisian Ministry of Higher Education and Scientific Research. Its mission is to train engineers and to provide applied research and technology transfer.

At IPSAS, each student has to undertake a two-year long preparatory cycle before beginning studying his speciality, in this case industrial engineering and civil engineering. A student is admitted to the preparatory cycle according to the nature of his or her baccalaureate: the technical baccalaureate is oriented towards the Technology preparatory cycle, the baccalaureate in experimental sciences or mathematics is directed either to the preparatory cycle in physics and chemistry or to the preparatory cycle in mathematics and physics. Any student of the preparatory cycle, who has passed his second-year exam, has the right to choose the engineering cycle he prefers (cf. criterion 1.4).

After the preparatory cycle, each study programme is spread over five face-to-face semesters during which the engineering students receive the necessary theoretical fundamental knowledge. In addition, the student reinforces and improves his knowledge through practical work, mini-projects, excursions and compulsory internships (s. below). The sixth semesters is mainly devoted to the development of the end of study project that is generally carried out at a company.

So far, the programmes offered at IPSAS are designed based on a set of modules that are entirely mandatory. Thus, the programmes do not offer any elective modules. IPSAS states that this topic, which hinders the individual specification of a student based on his future career plans or simply his interests, is currently discussed by the teachers and IPSAS managements and measures will be taken in the near future to introduce elective modules. The peers believe this to be a very promising undertaking and support IPSAS in this endeavour.

The auditors further notice that the modules are generally very small, encompassing mostly 2 or 3 ECTS-points. As such, some of these modules could be integrated to form one larger, thematically coherent module. They also regard the structure of the modules to be in need of improvement. Currently, not all modules are structured in a manner that allows a smooth transition from fundamental to basic modules to more advanced ones. For example, in the Industrial Engineering programme, the rather subject-specific module “Management Cost Accounting” is taught during the first semester, while more general modules, such as “Business Management” or “Project Management” are taught in semesters two and five respectively. As already stated in detail in criterion 1.3, the auditors believe it to be necessary that IPSAS re-designs the curriculum for both study programmes. In this undertaking, it would also be possible to re-organize the modules so that they appear more cohesive.

Mobility

Both study programmes attract a large share of students from sub-Saharan Africa (around 40%), who move to Tunisia for their studies. Thus, many students are already international students and are not interested in further international experiences. Nonetheless, IPSAS offers all their students a continuation of their studies at any institution that presents a curriculum identical or similar to the student's study profile at IPSAS. The students have the opportunity to spend a study semester abroad through ERASMUS mobility agreements and through partnerships with foreign institutes. In addition, students can also spend time at other universities or colleges that they choose on their own and will receive support from IPSAS in planning the semester abroad. Currently though, very few students decide to spend a semester abroad. The auditors ask IPSAS to specify or provide them with the co-operation agreements (ERASMUS) and they strongly recommend to improve the opportunities for students to complete a theoretical semester or the internship abroad without any prolongation of their studies. They also urge IPSAS to establish more support for the students planning to conduct a semester abroad.

Criterion 2.2 Work load and credits

Evidence:

- Study plans for both degree programmes
- Student handbooks for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
Within the framework of Tunisian regulations, training in engineering cycles is governed by a system based on coefficients and not credits; thus, coefficients are allocated for each module, according to the following regulations:

- A module consisting of 30 working hours, including tutorials will have a coefficient of 2, at most.
- A module consisting of 30 hours of lessons, including tutorials and practical work will have a coefficient of Coef ≥ 2.5.
- For a transverse module, the coefficient is: 1≤ Coef <2

The first year worker internship and the second-year technical internship of engineering studies, although compulsory, are not taken into account by the coefficient. Similarly, personal working time is not taking into consideration. To comply with the international system and accreditation requirements, IPSAS has introduced ECTS credit points, which considers both personal work and the various internships. Here, both internships are given 2 ECTS points. However, this rule applies not only to the conversion into the ECTS system but also to the national credit point system. Accordingly, the workload here must also include both the students' presence and self-learning time, as well as all compulsory parts of the study programme.

Generally, both study programmes consist of 180 ECTS with each semester covering 30 ECTS. One credit point is equivalent to 25-30 hours of work. Without probation periods or delays, students will thus complete the degree programs in six semesters. Students, who have previously received a License (equivalent to a Bachelor's degree) can shorten their study to four semesters. During the audit discussion, the auditors learn that around 85% of all students finish their studies on time, while 5% drop out entirely and 10% take one or two semesters longer. The students confirm that the workload is feasible and that there are no structural problems that would hinder finishing on time.

Nonetheless, the auditors urge IPSAS to establish a credit point system based on the amount of work the students spend on each module, thus including self-study time as well as all mandatory parts of the curriculum. In addition, a process should be established to systematically monitor the student workload to ensure a just credit point allocation.

Criterion 2.3 Teaching methodology

Evidence:

- Module descriptions for both degree programmes
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the self-assessment report, the teaching methodology includes lectures, practical work, tutorials, field studies, excursions and seminars. They are aimed at achieving the learning outcomes and follow certain models of learning:

- Learning that is centred on the compulsory presence of students during the classes to ensure continuous improvement of the students' achievements

- Cooperative learning, a method of working in small groups that is based upon the heterogeneity of the group, the positive interdependence of the participants as well as their individual responsibilities.
- Problem-based learning, a learning strategy that focuses on problem-solving, aims at encouraging critical thinking and cooperative learning
- Competency-based learning is reflected in tutorials performed at the laboratories where independence, collaboration and active learning is developed while knowledge is acquired
- Project-based learning, a pedagogical approach that involves the interests and motivations of the students, connects theoretical concepts learned in class and their application during mini-projects or graduation projects and offers opportunities for direct interaction between the students.

IPSAS ensures that the staff members are equipped with specific teaching aids they need to conduct their lectures, such as software, educational mini-models, visits to external sites or further education (cf. criterion 4.2).

The auditors discuss with the programme coordinators and lecturers, which software the students are able to utilize. They learn that each student has access to Python and MATLAB. While these programs are very useful, they nonetheless expect IPSAS to employ more advanced and current software to prepare the students for the demands of the labour market.

Criterion 2.4 Support and assistance

Evidence:

- Student guide and IPSAS presentation
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The aim of IPSAS is to ensure the provision of a good educational service for all its students. According to the program coordinators, there are some general support services offered to students. For example, international students are assisted in addressing administrative issues and with finding housing. In terms of academic support, IPSAS teachers offer additional upgrading courses to allow the students to better succeed in their university course as quickly as possible and with good results. The students report that they rely on direct contact with their teachers. In this regard, the small class sizes and many group works are

advantageous, allowing students and staff to form stronger relationships. It appears that the relationship between teachers and students is respectful, helpful and esteeming, and that sufficient resources are available to provide students with individual assistance, advice and support. The students confirm that the IPSAS teachers are available for them at any time and for any advice and support, even on a personal level.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion not fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Student guide and IPSAS presentation
- Student handbook for both degree programmes
- Study calendar
- Exam regulations
- Module descriptions for both degree programmes
- Example of exam schedules

Preliminary assessment and analysis of the peers:

At IPSAS, assessment is conducted according to the regulations defined in the exams regulation book. The assessment system at IPSAS has two purposes: a formative and a summative purpose. The formative assessments are used by the lecturer to continuously monitor the progress of achieving the course objectives and usually take place in the middle of the semester. A typical form of continuous monitoring is reporting on a specific topic, an oral presentation or a combination thereof. Laboratory work is assessed through reports and practical work exams. The summative assessments are used to display whether the course objectives have been met at the end of each semester. The panel as well as the students welcome the continuous learning assessment as it not only allows a close monitoring of the students' learning progress but also encourages students' motivation throughout the semester. By way of helping students to consciously assess their actual state of knowledge, the assessment procedure at the same time contributes to an adequate exam preparation.

The organization of the exams guarantees examinations that avoid delay to students' progressions. The relevant rules for examination and evaluation criteria are transparently put into a legal framework, as both students and lecturers confirm in the audit discussions. All final exams take place within a certain timeframe at the end of each semester. This timeframe (exam weeks) is communicated at the beginning of each academic year. Before each exam week, IPSAS carries out a revision period of 10 to 15 days for students to prepare intensively for their final exams. At least seven days prior to the exam weeks, a detailed schedule is published that informs about the exact time and date when each exam takes place. The peers confirm that rules have been defined for disability compensation measures, illness and other mitigating circumstances. However, the peers emphasize that the examination regulations do not specify what happens if an exam is not passed, i.e. when and how often it can be retaken, and therefore urge IPSAS to define rules for re-sit examinations in a binding fashion.

Shortly before the online visit, the peers were provided with a selection of exams and final projects to check. The peers note that the only form of examination is the traditional written exam, which is very unusual in a master's program and, more importantly, limits competence-oriented testing. At the same time, and as a consequence of the fact that large parts of the curriculum do not correspond to EQF level 7, the requirements and standards of most of the exams presented do not reach master's level either. Although the peers generally get a better impression of the final theses presented, as most of them cover demanding topics, they lack a scientific and research-oriented approach and instead focus almost entirely on practical application.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion partially fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Staff handbook
- Self-Assessment Report

- Discussions during the audit

Preliminary assessment and analysis of the peers:

IPSAS has 150 lecturers, 30 of whom are permanent, and 120 of whom are temporary staff. The temporary staff members are either university teachers, who also work at a different university in Tunisia, or industrialists with several years of both industrial and educational experience. IPSAS' teachers include university professors, lecturers, assistant professors and assistants or engineers. Assistants must hold a Master's degree, while assistant professors and professors must hold a PhD.

IPSAS provides a list of all staff involved in the two study programmes as well as their respective CVs. In the Industrial Engineering programme, there are 10 permanent and 22 temporary teachers. All permanent and the majority of the temporary teachers hold PhDs. In the Civil Engineering programme, there are 11 permanent teachers and 14 temporary teachers. Of the 11 permanent ones, 8 hold a PhD and two are currently in the process of obtaining a PhD. Most of the temporary staff members, besides from the professional engineers, also hold PhDs.

Teachers, whether permanent or temporary, are recruited based on professional and educational experience, scientific knowledge, reputation and the correspondence to the profile of the module that needs to be taught. IPSAS has recently established a monitoring process that allows students to evaluate the lecturers at the end of each class (cf. criterion 6)

The auditors learn that temporary teachers are bound by contract to finish the module they have started in order to ensure that students can finish the course (and the exam) without disruptions. However, most temporary teachers, despite their title, tend to stay at IPSAS for a very long time, mostly for eight to nine years, thus guaranteeing a consistent teaching of the modules and the curriculum. The auditors thus can confirm that, despite the unusual low number of permanent staff members, all lecturers are taking their profession serious, tend to spend a long time at IPSAS and are highly qualified given their previous backgrounds in teaching or in the industry.

Overall, the auditors confirm that the staff has the right skill set in order to meet the teaching demands requested to ensure high quality teaching and training for the students. During the audit they acknowledge that the work load is evenly distributed and that, for example, temporary teachers are only allowed to teach up to six hours a week at IPSAS given their professorship at another university as well. As such, the auditors do not identify major risks potentially impeding a responsible execution of the services offered to students. They are, however, concerned, that the programme coordinators of both degree programmes

are also temporary teachers. They are of the opinion that the important position of a programme coordinator must be carried out by a person employed full-time at IPSAS.

Criterion 4.2 Staff development

Evidence:

- Training plan
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the programme coordinators, in Tunisia in the private sector, it is not authorized to create research units, to provide training in research or to supervise theses. In response to this situation, all private schools in Tunisia, including IPSAS, have implemented cooperation and exchange programs in the field of research with some public and foreign laboratories, mostly at other universities or in some industries. Given this limitation, only 10 out of all 150 teachers at IPSAS are currently conducting research and develop recognized research activities through publications. However, with regard to the practical orientation of the university and the degree programmes and the fact that the majority of the teaching staff have a PhD, the evaluators do not see this as a problem. In addition, IPSAS lists all institutes with which there is cooperation in terms of laboratories, which convinces the auditors.

With regard to didactical training, the auditors gather the impression that there are no opportunities offered for the teaching staff. Neither the documents nor the discussions during the audit gave any indication that IPSAS has established further training offers for its staff members, something the auditors deem to be absolutely necessary, especially since IPSAS also recruits a large share of staff members from the industry who have little prior experience in teaching.

Criterion 4.3 Funds and equipment

Evidence:

- IPSAS practical center descriptions and costs
- Videos and images presenting the equipment of IPSAS

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:
As a private institution, IPSAS depends fully on its own resources, as it does not receive financial support from the Tunisian government. IPSAS is therefore funded mostly through tuition fees and projects with industry partners.

In the self-assessment report, IPSAS gives an overview of its four different buildings and the available learning spaces. Moreover, they list information on the center of practical work, which accommodates the institution's laboratories where the students carry out the practical assignments. The peers learn that IPSAS is constantly striving to improve its laboratory equipment, although the different stakeholders emphasize that the current equipment is sufficient in order to carry out the programs adequately. Any lack of material is compensated by agreements with other public or private institutions. The students consider the labs to be satisfactory and confirm that they get access to some laboratories with the help of their teachers also beyond the regular classes.

Due to the ongoing Covid-19 pandemic, it is not possible for the peer panel to travel to Tunisia and visit IPSAS in person. During the online audit, IPSAS therefore conducts a live tour through the most important facilities. Unfortunately, the peers get only limited insight into the university's premises and equipment due to communication issues and technical difficulties. Yet, what they can see from laboratories is that, while the equipment might be up to date and adequate for teaching purposes, it is not sufficient for research activities, especially with regard to software utilized. Moreover, the peers get the impression that international safety standards are neglected. As such, the auditors request that an additional audit on-site it to take place.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion not fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions for both degree programmes

Preliminary assessment and analysis of the peers:
IPSAS presents module descriptions for nearly all modules offered in both study programmes, except the practical courses/internships. The auditors notice that while all necessary categories are included, the module descriptions nonetheless are very unspecific and do not offer an overview of the qualification goals, the taught contents nor the teaching methods. As a teaching method, for example, the Industrial Engineering module descriptions nearly always list "attendance" and the Civil Engineering module descriptions "classroom", which does not refer to the actual teaching methodology used. As for the learning outcomes, some are kept very short and unspecific while others are so detailed that the auditors find it hard to believe that all the mentioned objectives can really be taught, especially given the low ECTS (and thus workload) of most modules. Similarly, the module contents are also very unspecific by either being too short or too detailed.

The auditors ask IPSAS to standardise the module descriptions and to describe all essential categories precisely so that students as well as external stakeholders can get an overview of the study programmes. In addition, the module descriptions should also indicate, which modules adhere to a EQF Level 7. In line with the suggested re-design of the curriculum, the module descriptions must obviously also be re-written.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Copy of diploma for each degree programme
- Copy of transcript of record for each degree programme
- Copy of diploma supplements for each degree programme.

Preliminary assessment and analysis of the peers:
Upon graduation, students of both degree programme are handed a diploma, a transcript of records as well as a diploma supplement, which entail all necessary information. IPSAS provides examples of all these documents.

Criterion 5.3 Relevant rules

Evidence:

- Ministry autorization of both degree programmes
- Exam regulation

- IPSAS quality policy
- IPSAS quality assurance plan
- Student guide
- Student handbooks for both degree programmes

Preliminary assessment and analysis of the peers:
The auditors confirm that most rights and duties of both the university and the students are defined and binding, for example in the student guide, the quality policy, or the student handbooks. In addition, many regulations stem directly from the ministry and are thus authorized accordingly. However, as has been mentioned in various chapters throughout this report, some relevant rules are missing, regarding for example re-sit examinations or admission requirements. In addition, not all information available to the auditors are also available to the students, such as the module descriptions. Thus, the auditors urge IPSAS to ensure that all relevant rules, regulation and information are available to the students.

An English version of the website of both study programmes exists in theory, yet when opening it, no content is available. Given that IPSAS plans on extending their international visibility, the auditors recommend to publish English versions of all relevant regulations and information on the website as well.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion partially fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- IPSAS quality policy
- IPSAS quality assurance plan
- IPSAS process mapping

Preliminary assessment and analysis of the peers:

According to the self-assessment report and its supporting documents, IPSAS' quality management was newly implemented just prior to the certification of the organization as complying with the requirements of ISO 21001 (International Standard of Quality Management System Requirements for Training and Education Organisation). The role of the quality management process is to establish and implement methods for monitoring the satisfaction of relevant stakeholder (students, teachers, industry, parents), analyse the data resulting from the assessment carried out, report to the management on the condition of the system and the results of the analysis, and finally to suggest actions to correct non-conformities and opportunities for improvement.

Regarding the two study programmes at hand, the advisory committee and the evaluations undertaken are of particular importance. The advisory committee holds a scientific advisory role for the program and guides the continuous improvement of the program. Industrial representatives are part of this committee and have the opportunity to bring in their expertise as well as the current demands of the labour market.

IPSAS has decided that all study programmes be revised every three years, beginning in the 2020/2021 academic year. Future programme reviews should take into account several key points, among them the proposals made by students and alumni. The census of student opinions through questionnaires is a recently installed tool as in the past, student notifications and claims were made verbally. The auditors thus understand that the culture of student involvement is not yet fully established in all degree programmes.

During the discussion with the students as well as the teachers, the auditors learn that currently, not all modules are surveyed and even if they take place, they are rarely analysed and never discussed with the students. While they acknowledge that the current quality system at IPSAs has only been recently establish, they nonetheless notice that this system is as of now mainly theoretical and not yet set out in practice. The auditors thus urge IPSAS to implement their quality management. In particular, the evaluation results must be analysed and concrete measures must be derived from them.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

After assessing the statement of SUAI (attached in annex E of this report) as well as the additional documents, the auditors deem this criterion partially fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

D 1. Evaluation form (questionnaires) as templates
D 2. Filled-out exams for both study programmes
D 3. Final projects for both study programmes
D 4. Cooperation agreements with international universities
D 5. Revised and completed staff handbooks

E Comment of the Higher Education Institution (01.11.2021)

The institution provided an extensive/ statement as well as the following additional documents:

D 1. Evaluation form (questionnaires) as templates
D 2. Filled-out exams for both study programmes
D 3. Final projects for both study programmes
D 4. Cooperation agreements with international universities
D 5. Revised and completed staff handbooks

The following quotes the comment of the institution:

CRITERION 1.1 OBJECTIVES AND LEARNING OUTCOMES OF A DEGREE PROGRAMMES

"The IPSAS team thanks the peers for their profound comment. The program specific learning objectives and qualification profiles were revised and reformulated. In the new updated version, they highlight the special features of the 4 engineering degrees delivered by IPSAS. Furthermore, we want to notice that the generic impression given by the previous formulation if the programs objectives were eliminated. This was mainly done by adding, for the 4 engineering degrees delivered by IPSAS, new elective specialization modules in the fourth and fifth semesters. Moreover, a mini-project module was added, for the 4 engineering degrees delivered by IPSAS, in semester 4 in order to give the engineering student the opportunity to develop his/her career plan and take the chance to enlarge his research skills and specialize in specific engineering topics.

The IPSAS team totally agrees that the initially submitted document doesn't reflect well the research skills and methodological/scientific knowledge/competencies. This was mainly due to the French engineering culture that makes research in opposition with engineering fields. However, the 4 IPSAS engineering curricula are full of engineering modules with deep and advanced scientific topics permitting to IPSAS graduates to continue in research career (more than 4 alumni are finishing their PhD thesis soon). Moreover, in the new revised version, the 4 IPSAS engineering curricula were reformulated toclearly show the specialisation aspects. This was also enhanced by the added elective courses and mini projects that offer to the IPSAS engineering students deepening and broadening scientific knowledge. The freedom of choice of the topics will offer to IPSAS graduates a real opportunity to forge their professional/research career project.

The IPSAS team recognizes that the given statistics are somewhat confusing.

In fact, these employment indicators were calculated in December 2020 and, unfortunately, didn't reflect the time to first recruitment: therefore 90% of 2018 batch graduates were hired during the two years 2018-2020, which was not the case of 2020 batch. The employment indicators were recalculated by considering the time of the first recruitment after 6 months of their graduation. This gives the bellow statistics:

	2018	2019	2020
Computer engineering	76%	79%	80%
Electromechanical engineering	76%	74%	77%
Industrial engineering	77%	77%	79%
Civil engineering	70%	74%	75%

CRITERION 1.3 – CURRICULUM

The IPSAS team thanks the peers for their valuable comments concerning the curriculum. The study programs of the 4 engineering degrees delivered by IPSAS were redesigned. This was done in accordance with the revision ofthe qualification objectives. By adding, for the 4 engineering degrees delivered by IPSAS, new elective specialization modules in the 4th and 5th semesters as well as a mini-project modulein semester 4, the IPSAS engineering student will have the opportunity to develop his/her career plan and take the chance to enlarge his research skills and specialize in specific engineering topics. The freedom of choice of the topics will offer to IPSAS graduates a real opportunity to forge their professional/research career project. The 4 IPSAS engineering curricula are now full of engineering modules with deep and advanced scientific topics permitting to IPSAS graduates to continue in research career (more than 4 alumni are finishing their PhD thesis soon). Finally, the IPSAS team notices that considering the professional/technical skills required by the industry representativesis not in contradiction with the high and deep scientific/research dimension offered by IPSAS curricula. In fact, most stakeholders' requirements are about soft skills (communication, entrepreneurship, innovation, project management, etc.) which concerns mainly some specific modules offered in each semester.

A new module of English certification is now offered for all IPSAS engineer for preparation for TOEIC, TOEFL, and BEC certification. BEC Exams are produced by Cambridge English. The purpose of this test is to assess English in a business context. This test includes 3 levels which are BEC preliminary, BEC Vantage and BEC higher. It is designed for those individuals who are willing to prepare for business course. The BEC exam may take place in the premises of the IPSAS but totally controlled by the examiners of the British Council: preparing exams, supervising, collecting copies for grading. Finally, IPSAS teaching staff is encouraged to pass these certifications.

CRITERION 1.4 – ADMISSION REQUIREMENTS

The IPSAS team recognizes that the selection procedures were not detailed in the previous submitted documents.

The applied selection procedures are as follows:

- For engineering preparatory cycle, coming from IPSAS or from other preparatory institutions: the admission is conditioned by the examination of the applicant submission. This is achieved, depending on the applicant specialty, by the corresponding department committee. The acceptance criteria are mainly based on the overall applicant grades in mathematics and physics, as well as in language modules (English + French).
- In specific cases, the department committee may require a face-to-face interview with the applicant. In the last 2 years and during the COVID-19 pandemic, the face-to-face interviews were replaced by Visio-conference sessions. This is always the case for international students.
- For bachelor level, coming from IPSAS or from other higher education institutions: the admission is conditioned by the examination of the applicant submission. This is achieved, depending on the applicant specialty, by the corresponding department committee. The acceptance criteria are mainly based on the overall applicant grades in mathematics and specialty modules, as well as in language modules (English + French).

The IPSAS team recognizes that some courses may be considered as repetitive or as of bachelor's level. This was mainly due to the following causes:

- The Tunisian legislation obliges engineering institutions to accept in the first year of their engineering programs students coming from engineering preparatory cycle(2 years after baccalaureate) and also coming from bachelor level (3 years after baccalaureate).
- The engineering preparatory cycle is more concentrated on deep scientific knowledge of physical phenomena as well as fundamental advanced mathematical topics.
- The technological bachelor level is, as in all international programs, more concentrated on basic and professional courses.

For this reason, semester 1 of the 4 IPSAS engineering curricula is dedicated to the knowledge homogenisation of the different IPSAS new students. This, naturally, gives the impression that several 1st year courses are on the bachelor level. The IPSAS team wants

also to gently recall that masters curricula take only 2 years; so dedicating the 1st engineering year to put all IPSAS new students at the same level of scientific knowledge independently of their previous different background. The IPSAS team hopes that, as previously detailed in the given responses to peers'comments inCriterion 1.1, it is clear that the programs of the 2nd and the 3rd engineering years are with no bachelor level redundancy, and that they are of international master level.

The IPSAS team has detailed in the previous responses the admission requirements and clearly discussed the issue of bachelor/master levels by showing that the engineering curricula is of 3 years duration, and so constituted by a 1st homogenisation year + 2 specialisation years with deep scientific/research knowledge. The IPSAS team notices that considering the professional/technical skills required by the different stakeholders is not in contradiction with the high and deep scientific/research dimension offered by IPSAS curricula. In fact, moststakeholders' requirements are about soft skills (communication, entrepreneurship, innovation, project management, etc.) which concerns mainly some specific modules offered in each semester. The IPSAS team hopes that the new redesigned curriculahighlight better the correspondence between EQF level 7 requirements and IPSAS engineering offer.

CRITERION 2.1 – STRUCTURE AND MODULES

The IPSAS team has redesigned tall he modules structure in order to meet with the peers suggestions and recommendations (see annexed documents):

- elective courses were added,
- modules were grouped on larger thematically coherent ones of 6 ECTS,
- the module structures were improved.

CRITERION 2.2 – WORK LOAD AND CREDITS

The IPSAS team revised the credit points system in order to better reflect the actual workload of the individual courses (see new redesigned curricula). Moreover, the ISO 21001 QMS contains a process for monitoring the student workload to ensure a just credit point allocation.

CRITERION 2.3 – TEACHING METHODOLOGY

The IPSAS team wants to clarify that IPSAS engineering students have access to several software facilities through the IPSAS Digital Center. Matlab and Python are only examples of the software available for students. One can list several others such as CAO software, AutoCad, Programming Tools, Web and mobile programming tools, etc.

CRITERION 3 – EXAMS

The IPSAS team wants to clarify the following examination regulations procedures:

- Monitoring attendance is the responsibility of teachers and the Student Affairs Office. When the percentage of absence of the student in a course exceeds 20% of the hourly volume allotted in the study plan, the student is barred from writing the course's semester exam.
- Any absence from a test or supervised duty is sanctioned by a grade of "zero" regardless of the reason for the absence. Nevertheless, the relevant teacher may, if deemed appropriate, give the student a chance to repeat the test or the assignment.
- As for the end-of-semester exams, any absence is sanctioned by the grade "zero" in a systematic way without any possibility to retake the exam.
- It should be noted in this regard that the Student Affairs Office accepts no justification of absence (medical certificates, etc.)
- The student has the right to take the examination of the non-passed exams in a catch-up session, organized 1 week after the principal examination session deliberation.

The IPSAS team wants to clarify that learning assessments take the form of continuous reviews for each subject encompassing the different grades obtained (supervised tests, practical work, mini-projects, projects, end-of-semester exams, and, possibly, an oral presentation mark). This permits competence-oriented testing of IPSAS engineering students' skills. It is important to notice that, contrary to what was understood by the peers, several courses provide research-oriented assignments for engineering students.

CRITERION 4.1 – STAFF

IPSAS team thanks the peers for their valuable comments concerning staff issues. IPSAS team has rewritten and completed the staff handbook (annexed to this report) taking into account on the peers suggestions and recommendations.

CRITERION 4.2 – STAFF DEVELOPMENT

IPSAS team precises that only 10 out of 150 IPSASfaculty members provided their publications records in the previous staff handbook. By conducting an exhaustive verification, it was noticed that only 80 from the 150 IPSAS staff are teaching at the engineering cycles. Moreover, 32 IPSAS faculty members have publications in international indexed conferences and journals as detailed in the new version of the staff handbook (annexed to this report).

Concerning staff members coming from industry, IPSAS team recognises that some of them may have little prior experience in teaching. However, these professionals have a wide technological knowledge and experience that IPSAS team judges to be very useful to share

with IPSAS graduates. Finally, even if the number of these professional is somewhat high, their intervention is very limited in terms of number of hours taught by each professional.

CRITERION 4.3 – FUNDING AND EQUIPMENT

IPSAS team agrees with the peers that the previous report missed to show the importance of IPSAS technological/research platform (IPSAS-TRP and spontaneously called IPSAS center) for research activities. IPSAS team notices that several graduation projects (constituted mainly by research activities) are using IPSAS-TRP facilities. Furthermore, several agreements were signed with Sfax University laboratories offering to their masters and PhD students access to the research facilities of IPSAS-TRP.

CRITERION 5.1 – MODULE DESCRIPTION

The IPSAS team recognises that the previous submitted module descriptions luck specificity and do not offer an overview of qualification goals as well as specific details about teaching contents and methods.

The new redesigned and rewritten curricula take into account all peers concerns.

The module descriptions were standardised, and all essential categories were described (ECTS, teaching methods, learning outcomes, etc.) This will offer to students as well as external stakeholders a detailed overview of the study programs.

The IPSAS team insists that all the modules of the 2 last years of the 4 IPSAS engineering programs (2nd and 3rd engineering years) adhere to a EQF level 7.

As an example that justifies this adhesion, an agreement was signed since 2012 with the University Jean Monnet, Saint-Etienne, France, to offer an equivalence of their master in industrial engineering with IPSAS industrial engineering diploma. This is a clear proof that IPSAS engineering curricula adhere to EQF level 7 master's degree.

CRITERION 5.3 – RELEVANT RULES

The IPAS team agrees with the peers that some relevant information is missing on the website. Now that the new rewritten and redesigned curricula are ready, the IPSAS team commits to update soon IPSAS website, in French and English versions; and so, ensuring that all relevant rules, regulation and information are publicly available.

CRITERION 6 – QUALITY MANAGEMENT

IPSAS team notices that mostly all the modules of the last university year 2020-2021 were evaluated. The luck of the evaluation analysis was corrected, and the analysis results will be annexed to this report. The evaluation analysis was furthermore discussed in the different department committees as well as at the scientific council of IPSAS. Several concrete measures were derived from the evaluation results; this was documented in IPSAS scientific council minutes.

Concerning the results of the surveys, weremindyouthatwe have sent a 36-page report whichwas about an evaluation of the institution by teachers and students and whichincludes the results of the global satisfaction study about the courses concerned in the accreditation we tried to summarize the results of the questionnaires , so that it would be easier and clearer for auditors to read it. IPSAS presents the result of the survey in an annex.

F Summary: Peer recommendations (17.11.2021)

Taking into account the additional information and the comments given by IPSAS the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma Industrial Engineering	Suspension	/	EUR-ACE®	/
National Diploma Civil Engineering	Suspension	/	EUR-ACE®	/

Prerequisites

For all degree programmes

V 1. (ASIIN 1.1.) Define the educational objectives so that they describe the academic, subject-specific and professional classification of the qualifications gained in this programme while adhering to EQF 7.

V 2. (ASIIN 1.3, 2.1, 5.1) Re-design the programme, especially its scientific focus, to ensure that it adheres to EQF 7. Include new methods and topics, such as Smart Factory, Product Life Cycle, Industry 4.0 (for Industrial Engineering) or Building Formation, Modelling, CDE, Virtual Design and Construction (for Civil Engineering). Consequently, completely revised module descriptions must be provided.

V 3. (ASIIN 1.4) Define technical admission requirements that reflect the subject-specific focus of the different study programmes and that state how students are selected if the number of applicants exceeds capacity.

V 4. An on-site assessment must be carried out in order to have renewed discussions and to inspect the equipment.

Requirements

For all degree programmes

A 1. (ASIIN 1.3) Ensure that students learn methods of scientific work.

A 2. (ASIIN 2.2) All compulsory parts of the curriculum must be credited.

A 3. (ASIIN 2.2) A credit point system based on the amount of work the students spend on each module (workload) must be implemented. In addition, a process must be established to systematically monitor the student workload to ensure a just credit point allocation.

A 4. (ASIIN 3, ASIIN 5.3) It must be guaranteed that exams can be retaken, especially in case of illness or mitigating circumstances.

A 5. (ASIIN 3) In addition to written examinations, alternative forms of examinations must also be offered in order to ensure competence orientation and alignment to EQF Level 7.

A 6. (ASIIN 4.1) Programme coordinators must be full-time staff members at IPSAS.

A 7. (ASIIN 4.2) Offer opportunities for didactical training of teachers.

A 8. (ASIIN 2.3, 4.3) Provide modern software.

A 9. (ASIIN 4.3) The laboratories must adhere to international safety standards.

A 10. (ASIIN 5.1) The module descriptions must be expanded according to the aspects listed in the report and indicate a level EQF 7.

A 11. (ASIIN 5.3) Make all information concerning the degree available to the students.

A 12. (ASIIN 6) The quality management system outlined must also be actively implemented. In particular, the evaluation results must be analysed and concrete measures must be derived.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to enhance the English language skills of both students and teachers.

E 2. (ASIIN 1.3) It is recommended that students be taught more soft skills, especially in the areas of negotiation and general management.

E 3. (ASIIN 1.3) It is recommended to include topics such as entrepreneurship and quality management.

E 4. (ASIIN 2.1) It is recommended to improve the opportunities for students to complete a period of vocational practice or a stay at a different higher education institution.

E 5. (ASIIN 2.1) It is recommended to integrate elective modules into the curricula of all study programmes.

E 6. (ASIIN 5.3) It is recommended to publish English versions of all relevant regulations and information on the website.

G Comment of the Technical Committees

Technical Committee 03 – Civil Engineering, Geodesy and Architecture (15.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the auditors.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme does not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 03 – Civil Engineering, Geodesy and Architecture

The Technical Committee 03 – Civil Engineering, Geodesy and Architecture recommends the award of the seals as follows:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
National Diploma Civil Engineering	Suspension	/	EUR-ACE®	/

Technical Committee 06 – Engineering and Management, Economics (26.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The expert committee recognizes that the study programme to be accredited has a number of structural deficiencies for which the higher education institution itself is only partially responsible, but which are specified by the Tunisian Ministry. Nevertheless, the majority of the expert committee members are in favor of giving the higher education institution the opportunity to make improvements and fulfil the requirements with the suspension for a maximum of 18 months.

In order to address the two structural deficiencies - few full-time staff and hardly any laboratory equipment - the expert committee is in favor of two further prerequisites (V5 and V6).

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme does not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 06 – Engineering and Management, Economics

The Technical Committee 06 – Engineering and Management, Economics recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma Industrial Engineering	Suspension	/	EUR-ACE®	/

Prerequisites

For all degree programmes

V 1. (ASIIN 1.1.) Define the educational objectives so that they describe the academic, subject-specific and professional classification of the qualifications gained in this programme while adhering to EQF 7.

V 2. (ASIIN 1.3, 2.1, 5.1) Re-design the programme, especially its scientific focus, to ensure that it adheres to EQF 7. Include new methods and topics, such as Smart Factory, Product Life Cycle, Industry 4.0 (for Industrial Engineering) or Building Formation,

Modelling, CDE, Virtual Design and Construction (for Civil Engineering). Consequently, completely revised module descriptions must be provided.

V 3. (ASIIN 1.4) Define technical admission requirements that reflect the subject-specific focus of the different study programmes and that state how students are selected if the number of applicants exceeds capacity.

V 4. An on-site assessment must be carried out in order to have renewed discussions and to inspect the equipment.

V 5. (ASIIN 4.1) It must be ensured that the majority of lecturers - especially those responsible for programmes - are employed full-time at the university.

V 6. (ASIIN 4.3) The university must provide the necessary technical equipment on site for the implementation of the study programmes as well as the research of the teachers.

Requirements

For all degree programmes

A 1. (ASIIN 1.3) Ensure that students learn methods of scientific work.

A 2. (ASIIN 2.2) All compulsory parts of the curriculum must be credited.

A 3. (ASIIN 2.2) A credit point system based on the amount of work the students spend on each module (workload) must be implemented. In addition, a process must be established to systematically monitor the student workload to ensure a just credit point allocation.

A 4. (ASIIN 3, ASIIN 5.3) It must be guaranteed that exams can be retaken, especially in case of illness or mitigating circumstances.

A 5. (ASIIN 3) In addition to written examinations, alternative forms of examinations must also be offered in order to ensure competence orientation and alignment to EQF Level 7.

A 6. (ASIIN 4.1) Programme coordinators must be full-time staff members at IPSAS.

A 7. (ASIIN 4.2) Offer opportunities for didactical training of teachers.

A 8. (ASIIN 2.3, 4.3) Provide modern software.

A 9. (ASIIN 4.3) The laboratories must adhere to international safety standards.

A 10. (ASIIN 5.1) The module descriptions must be expanded according to the aspects listed in the report and indicate a level EQF 7.

A 11. (ASIIN 5.3) Make all information concerning the degree available to the students.

A 12. (ASIIN 6) The quality management system outlined must also be actively implemented. In particular, the evaluation results must be analysed and concrete measures must be derived.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to enhance the English language skills of both students and teachers.

E 2. (ASIIN 1.3) It is recommended that students be taught more soft skills, especially in the areas of negotiation and general management.

E 3. (ASIIN 1.3) It is recommended to include topics such as entrepreneurship and quality management.

E 4. (ASIIN 2.1) It is recommended to improve the opportunities for students to complete a period of vocational practice or a stay at a different higher education institution.

E 5. (ASIIN 2.1) It is recommended to integrate elective modules into the curricula of all study programmes.

E 6. (ASIIN 5.3) It is recommended to publish English versions of all relevant regulations and information on the website.

H Decision of the Accreditation Commission (07.12.2021)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the procedure intensively, especially with regard to the many serious deficiencies. They find that many of these deficiencies are due to structural framework conditions of the type of higher education institution, for example the low proportion of permanent teaching staff, the lack of laboratory equipment especially for research, as well as the lack of EQF 7 level. The Accreditation Commission does not see how the higher education institution can remedy these deficiencies in 18 months (the period of suspension of the procedure) and therefore votes to refuse accreditation for both study programmes.

Assessment and analysis for the award of the EUR-ACE® Label:

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 03 – Civil Engineering, Geodesy and Architecture and the Technical Committee 06 – Engineering and Management, Economics.

The Accreditation Commission decides to award the following seals:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
National Diploma Industrial Engineering	Refusal	/	EUR-ACE®	Refusal
National Diploma Civil Engineering	Refusal	/	EUR-ACE®	Refusal

Appendix: Programme Learning Outcomes and Curricula

According to the student handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Industrial Engineering degree programme:

“The IPSAS Industrial Engineering Department trains multidisciplinary engineers. Theoretical and practical knowledge is diverse and diversified and at the same time coherent.

The training is spread over five face-to-face semesters during which the student engineer receives the necessary theoretical foundations. Being aware of the necessity of the practical side and the importance of the gradual knowledge of the business world, the student reinforces and improves his knowledge through practical work, mini-projects, study visits, and compulsory internships.

Synthesis of the competences attested at the end of the training:

- Analyse and synthesise complex electromechanical systems,
- Mobilise scientific and technical resources,
- To have mastery of computer methods and tools and modelling,
- Have the capacity for research or R&D activities and be open to collaborative work

Specific skills: Other skills are more specific to the electromechanical field. Engineers must be able to:

- Design, implement, test and validate innovative solutions, methods, products, systems and services,
- Have the ability to find relevant information, evaluate and exploit it,
- Have the ability to take into account the economic dimension, respect for quality, competitiveness and productivity, commercial requirements, economic intelligence.

Common skills: Certain skills are common to the engineering professions and are particularly applicable to "electromechanical" engineers who must be able to have

- The ability to work in an international context: mastery of one or more foreign languages (French and English) and associated cultural openness,

- The ability to take into account environmental issues, particularly by applying the principles of sustainable development,
- The ability to fit into professional life, to integrate into an organisation, to lead it and to make it evolve: exercise of responsibility, team spirit, commitment and leadership, project management, communication with specialists as well as with non-specialists.

Behavioural skills are also necessary for these very complex jobs:

- Ability to take into account the issues of workplace relations, ethics, responsibility, safety and health at work,
- Ability to take into account the challenges and needs of society,
- Autonomy, decision-making ability, organisational skills.

The following **curriculum** is presented:

Première Année — **First Year**

Semestre I — **Semester I**

Génie Industriel — **Industrial Engineering**

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	Tper	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
■ **Modules obligatoires**											**Compulsory courses**	
MathI	MGIND11.01	Mathématique I	30	00	30	25	55	2	2	CC+E	Mathematics I	GM1-1
CompAG	MGIND11.02	Comptabilité Analytique de gestion	30	00	30	20	50	2	2	CC+E	Management AnalyticalAccounting	GM1-2
ConcpMec	MGIND11.03	Conception mécanique	30	15	45	50	95	3.5	3	CC+E	Mechanical concept	GM1-3
ElecqI	MGIND11.04	Electronique I	30	15	45	40	85	3	2.5	CC+E	Electronics I	GM1-4
SystCL	MGIND11.05	Systèmes et circuits logiques	30	15	45	40	85	3	2.5	CC+E	Logicsystems and circuits	GM1-4
TherdApp	MGIND11.06	Thermodynamique appliquée	24	0	24	40	64	2.5	2	CC+E	Appliedthermodynamics	GM1-5
ChoixMat	MGIND11.07	Choix des matériaux	24	0	24	20	44	1.5	2	CC+E	Materialschoice	GM1-6
RDM	MGIND11.08	Résistance des matériaux (RDM)	30	15	45	50	95	3.5	3	CC+E	Materialresistance (RDM)	GM1-6
MecFlud	MGIND11.09	Mécanique des fluides	30	15	45	40	85	3	2.5	CC+E	Fluidmechanics	GM1-5
AgInd I	MGIND11.10	Anglais industriel I	24	0	24	20	44	2	1	CC+E	Industrial English I	GM1-7
TechCom	MGIND11.11	Techniques de communication	24	0	24	20	44	2	1	CC+E	Communication techniques	GM1-7
DrtTra	MGIND11.12	Droit du travail	24	0	24	20	44	2	1	CC+E	Labor law	GM1-7
		Total:	330	75	405	385	790	30	24.5			

Première Année — **First Year**

Semestre II — **Semester II**

Génie Industriel — **Industrial Engineering**

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	T.per	T		Coeff	E		GM
Course Id	Code		L	PW	L+Pw	Self pr.	T	ECTS		E	Subject	
■ **Modules obligatoires**											**Compulsory courses**	
RechOp	MGIND12.13	Recherche opérationnelle	24	0	24	25	49	2	2	CC+E	Operationalresearch	GM1-1
StatProb	MGIND12.14	Statistique et probabilités	24	0	24	25	49	2	2	CC+E	Statistics and probabilities	GM1-1
GestEnt	MGIND12.15	Gestion des entreprises	24	0	24	15	39	1.5	2.5	CC+E	Business Management	GM1-2
FinEnt	MGIND12.16	Finance des entreprises	30	0	30	20	50	2	2	CC+E	Corporate finance	GM1-2
TechFab	MGIND12.17	Technologie de fabrication	30	15	45	30	75	3	2.5	CC+E	Manufacturingtechnology	GM1-3
CAO	MGIND12.18	Conception assisté par ordinateur	0	30	30	25	55	2	2.5	CC+E	Computer aided design	GM1-3
TranPMI	MGIND12.19	Transmission de puissance et de mouvement I	30	15	45	30	75	3	2.5	CC+E	Power and motion transmission I	GM1-3
Aut I	MGIND12.20	Automatique I	30	15	45	15	60	2	2	CC+E	Automatic I	GM1-4
Electq	MGIND12.21	Électrotechnique	30	15	45	30	75	3	2.5	CC+E	Electrical engineering	GM1-4
TranTher	MGIND12.22	Transfert de chaleur	24	15	39	21	60	2	2	CC+E	Thermal transfer	GM1-5
MP	MGIND12.23	Mini-projet	0	30	30	25	55	2	1	R	Mini-project	GM1-6
MecMC	MGIND12.24	Mécanique des milieux continus (MMC)	30	0	30	30	60	2	2	CC+E	Continuous media mechanics (CMM)	GM1-6
AgInd II	MGIND12.25	Anglais industriel II	24	0	24	20	44	1.5	1	CC+E	Industrial English II	GM1-7
		Total:	300	135	435	311	746	28	26.5			

■ **Stage ouvrier** — **Practical work**

	MGIND12.25	Stage ouvrier	0	60	60		60	2	0		Worker internship	
		Total (Semestre/Semester) :	300	195	495	311	806	30	26.5			
		Total (Année/Year) :	630	270	900	696	1596	60	51			

Deuxième Année — **Second Year**

Semestre I — **Semester I**

Génie Industriel — **Industrial Engineering**

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	Pw	L+Pw	Self pr.	T	ECTS		E	Subject	
■ Modules obligatoires											**Compulsory courses**	
MathII	MGIND21.26	Mathématique II	24	0	24	24	48	2	2	CC+E	Mathematics II	GM2-1
AnlyNum	MGIND21.27	Analyse numérique	24	0	24	40	64	2	2	CC+E	Digital analyze	GM2-1
SchEle	MGIND21.28	Schéma électrique	24	15	39	40	79	3	2.5	CC+E	Electricaldiagram	GM2-3
MachEle	MGIND21.29	Machines électriques II	36	15	51	40	91	3	2.5	CC+E	Electrical machines II	GM2-3
ElecInd	MGIND21.30	Électronique industrielle	30	15	45	40	85	2.5	2.5	CC+E	Industrialelectronics	GM2-3
MMV	MGIND21.31	Mécaniques et machines vibratoires	24	15	39	40	79	2.5	2.5	CC+E	Mechanical and vibratory machines	GM2-4
MSI	MGIND21.32	Management des Systèmes d'informations	45	0	45	20	65	2	2.5	CC+E	Information System Management	GM2-5
ContND	MGIND21.33	Contrôle Destructif et Non destructif	24	15	39	20	59	2	2.5	CC+E	Non-destructive testing	GM2-6
FrdClim	MGIND21.34	Froid et climatisation	24	0	24	25	49	2	2.5	CC+E	Cold and air conditioning	GM2-7
EchgChal	MGIND21.35	Échangeur de chaleur	21	15	36	24	60	2	2.5	CC+E	Heatexchanger	GM2-7
AlgoST	MGIND21.36	Algorithme et structure de données	21	0	21	30	51	2	1.5	CC+E	Algorithm and data structure	GM2-8
LangPC	MGIND21.37	Langage de programmation C	21	0	21	30	51	2	1.5	CC+E	C programminglanguage	GM2-8
AngIndIII	MGIND21.38	Anglais industriel I	24	0	24	15	39	1.5	1	CC+E	Industrial English I	GM2-8
TechCom	MGIND21.39	Technique de communication	24	0	24	20	44	1.5	1	CC+E	Communication technique	GM2-8
		Total:	366	90	456	408	864	30	29			

DeuxièmeAnnée **Second Year**

Semestre II **Semester II**

Génie Industriel **Industrial Engineering**

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	T.per	T		Coeff	E	Subject	GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E		
■ Modules obligatoires											**Compulsory courses**	
Ecot	MGIND22.40	Econométrie	21	15	36	15	51	1.5	2	CC+E	Econometrics	GM2-1
OutAD	MGIND22.41	Outils d'aide à la décision	21	0	21	25	46	1.5	2	CC+E	Decision-makingtools	GM2-1
InfInd	MGIND22.42	Informatique industrielle	12	15	27	15	42	1.5	2	CC+E	Industrial data	GM2-2
MII	MGIND22.43	Mesure et instrumentation industrielle	24	15	39	35	74	2	2	CC+E	Industrialmeasurement and instrumentation	GM2-2
AutoqII	MGIND22.44	Automatique II	30	15	45	20	65	2	2	CC+E	Automatic II	GM2-2
CAOII	MGIND22.45	Conception assisté par ordinateur II	0	30	30	30	60	2	2	CC+E	Computer aided design II	GM2-4
GestM	MGIND22.46	Gestion de la maintenance	21	15	36	40	76	2.5	2	CC+E	Maintenance management	GM2-4
GOP	MGIND22.47	Gestion et ordonnancement de la production	51	0	51	40	91	3	2.5	CC+E	Production management and scheduling	GM2-5
GQ	MGIND22.48	Gestion de la qualité	24	0	24	24	48	1.5	2	CC+E	Quality management	GM2-5
PFab	MGIND22.49	Processus de fabrication	30	0	30	40	70	2.5	2.5	CC+E	Manufacturingprocess	GM2-6
MOCN	MGIND22.50	Machines-Outils à commande numérique	30	24	54	40	94	2.5	2	CC+E	Numericallycontrolled machine tools	GM2-6
MOSEM	MGIND22.51	Mise en œuvre sans enlèvement de matière	27	15	42	40	82	2.5	2	CC+E	Implementationwithoutremovingmaterial	GM2-6
AgInd	MGIND22.52	Anglais industriel IV	24	0	24	15	39	1.5	1	CC+E	Industrial English IV	GM2-8
MP	MGIND22.53	Mini-projet	0	15	15	30	45	1.5	1	R	Mini-project	GM2-9
		Total :	315	159	474	409	883	28	27			
■ Stage Technicien											**Practical work**	
	MGIND22.54	Stage technician	0	60	60	0	60	2	-		Technician internship	
		Total (Semestre/Semester) :	315	219	534	409	943	30	27			
		Total (Année/Year) :	681	309	990	817	1807	60	56			

TroisièmeAnnée
Semestre I

GénieIndustriel

Third Year
Semester I

Industrial Engineering

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
■ **Modules obligatoires**											**Compulsory courses**	
LogisDis	MGIND31.55	Logistique de distribution	24	0	24	25	49	2	2	CC+E	Distribution logistics	GM3-1
CPSP	MGIND31.56	Conception et performance des systèmes de production	24	0	24	30	54	2	2	CC+E	Design and performance of production systems	GM3-1
GestProjt	MGIND31.57	Gestion de projet	24	0	24	30	54	2	2	CC+E	Project management	GM3-1
GestTranp	MGIND31.58	Gestion de transport	21	0	21	25	46	2	2	CC+E	Transport management	GM3-2
SCM	MGIND31.59	Supplychain management	21	0	21	30	51	2	2	CC+E	Supplychain management	GM3-2
GestStcs	MGIND31.60	Gestion des stocks	24	0	24	30	54	2	2	CC+E	Inventory management	GM3-2
TechPrev	MGIND31.61	Techniques de prévision	30	0	30	20	50	2	2	CC+E	Forecasting techniques	GM3-3
EntRP	MGIND31.62	Entreprise ressource planning	0	30	30	20	50	2	1.5	CC+E	Enterprise resource planning	GM3-3
Opt	MGIND31.63	Optimisation	30	0	30	20	50	2	2	CC+E	Optimization	GM3-3
LeanMan	MGIND31.64	Lean manufacturing	24	0	24	30	54	2	2	CC+E	Lean manufacturing	GM3-3
MSSP	MGIND31.65	Modélisation et simulation des systèmes de production	21	15	36	30	66	2.5	2.5	CC+E	Modeling and simulation of production systems	GM3-4
FMS	MGIND31.66	Fiabilité et maintenabilité des systèmes	15	0	15	25	40	1.5	2	CC+E	Reliability and maintainability of systems	GM3-4
TGRH	MGIND31.67	Techniques de gestion des ressources humaines	21	0	21	30	51	2	2	CC+E	Humanresources management techniques	GM3-4
DevlpPer	MGIND31.68	Développement personnel	21	0	21	20	41	1.5	2	CC+E	Development staff	GM3-4
EnergRnw	MGIND31.69	Énergie renouvelable	30	15	45	30	75	2.5	2	CC+E	Renewableenergy	GM3-4
		Total :	330	60	390	395	785	30	30			

TroisièmeAnnée **Third Year**

Semestre II **Semester II**

Génie industriel **Industrial Engineering**

Idnt	CTSE	Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	

■ Modules obligatoires — Compulsory courses

	MGIND32.70	Stage de fin d'études	0	450	450	450	900	30	-	R	End of studiesproject	
		Total (Semestre/Semester) :	0	450	450	450	900	30	-			
		Total (Année/Year) :	330	510	840	845	1685	60	-			

According to the student handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Civil Engineering degree programme:

"The IPSAS Civil Engineering engineer apprehends, through methodical thinking, complex problems and acts as a manager capable of leading projects and sites relating to building and public works, leading teams and managing operations. They work in companies, design offices or control offices in the building and public works sector, engineering, architecture, project management and Research & Development in the construction field.

The IPSAS civil engineer is capable of managing a building site, functional work, engineering work for the structural part or all trades, i.e. he/she is entrusted with the following responsibilities

- Choosing structural or finishing materials;
- Choosing the materials and techniques to be used;
- Organising the teams, planning the work on site;
- Organise teams, plan work on site; Ensure the financial management of the site;
- Manage the interfaces between trades;
- Ensure safety and quality on the site as well as environmental quality.

He/she is capable of managing an earthworks, road, external works or draining site, i.e. of

- Choose the materials and techniques to be used;
- Organise the teams, plan the work on site
- Ensure the financial management of the site;
- Ensure safety and quality on the site as well as environmental quality.

He/she is capable of analysing and calculating a structure in compliance with national or European regulations and sustainable development, i.e. of :

- Choose a soil survey, analyse it and propose a foundation;
- Choose structural materials;
- Model the structure or structural elements;
- Checking that the work complies with the standards and regulations in force.

He/she is capable of carrying out functions related to project management or contracting which include

- Costing,
- Technical programming,
- Setting up operations,
- Drawing up written documents,

- Technical management of the building.

[…]

IPSAS Civil Engineering graduates have a solid scientific and technical background, which enables them to carry out multidisciplinary missions in various sectors of activity.

In engineering sciences:

- He/she knows the scientific bases of modelling and the modern tools of scientific language mathematics, statistics, numerical methods.
- He/she has the scientific bases of mechanics for civil engineering: mechanics of continuous media, resistance of materials, structural mechanics, soil mechanics.
- He/she knows civil engineering materials: building materials, finishing materials, road materials. He/she knows the basics of soil mechanics and infrastructures: soil mechanics, geotechnics, hydraulics, roads and other networks.
- He/she masters the behaviour of new structures or those in service: structures: design and pathology, inspection, maintenance and repair.
- He/she masters the modern methods of structural design: reinforced and prestressed concrete, metal construction, mixed construction.
- He/she has a solid technical culture of civil engineering worksites: technology, general construction processes, organisation and management of worksites.
- He/she knows the main technical equipment of the building: thermal, acoustic, heating, ventilation/air conditioning.
- They know the constraints linked to design: urban planning, architecture and engineering.

In human, economic and social sciences:

- He/she masters the tools of communication: English, French; expression - communication, negotiation, conducting meetings.
- He/she masters the tools of human management: psychology, human resources management.
- He/she has a basic knowledge of economics and management: general and business economics, project management and business management.
- He knows the basics of law: labour law, contract law, construction law."

Première Année **First Year**

Semestre I **Semester I**

Génie Civil **Civil Engineering**

■ **Modules obligatoires** **Compulsory courses**

		Intitulé	CI	TP	CI+TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
INFO I	MGCV11.01	Informatique I : Langage de Programmation	15	30	45	45	90	3	2	CC+E	Computer Science I: Programming Language	1
MPI I	MGCV11.02	Mathématiques pour Ingénieurs I	30	-	30	30	60	2	2	CC+E	Mathematics for Engineers I	1
PS	MGCV11.03	Probabilité et statistiques	30	-	30	30	60	2	2	CC+E	Probability and statistics	1
MMC	MGCV11.04	Mécanique des milieux continus	45	-	45	45	90	3	3	CC+E	Mechanics of continuous media	2
GGI	MGCV11.05	Géologie et géophysique de l'ingénieurs	30	-	30	30	60	2	2	CC+E	Geology and geophysics for Engineers	3
MF	MGCV11.06	Mécanique des fluides	30	15	45	45	90	3	2.5	CC+E	Fluid Mechanics	3
MC	MGCV11.07	Matériaux de construction	45	15	60	60	120	4	3.5	CC+E	Building materials	2
TB	MGCV11.08	Thermique de bâtiment	30	-	30	60	90	3	2	CC+E	Building Thermal	4
DBAO I	MGCV11.09	Dessin de bâtiments assisté par Ordinateur	15	-	15	45	60	2	-	-	Computer Aided Building Design	4
TC	MGCV11.10	Technique de communication	30	-	30	30	60	2	2	CC+E	Communication Practice	5
DU	MGCV11.11	Droit de l'Urbanisme	30	-	30	30	60	2	2	CC+E	Town Planning Law	5
AN	MGCV11.12	Anglais	30	-	30	30	60	2	2	CC+E	English	5
	Total:		360	60	420	480	900	30	25			

Première Année — **First Year**

Semestre II — **Semester II**

Génie Civil — **Civil Engineering**

■ **Modules obligatoires** — **Compulsory courses**

		Intitulé	CI	TP	CI+TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+Pw	Self pr.	T	ECTS		E	Subject	
A.NUM	MGCV12.13	Analyse numérique	30	15	45	45	90	3	2.5	CC+E	Numerical analysis	1
MPI II	MGCV12.14	Mathématiques pour ingénieurs II	30	-	30	30	60	2	2	CC+E	Mathematics for Engineers II	1
INFO II	MGCV12.15	Informatique II	-	30	30	30	60	2	1	E	Computer Science II	1
M. SOL I	MGCV12.16	Mécanique des sols I	45	-	45	45	90	3	3	CC+E	Soil Mechanics I	2
RDM	MGCV12.17	Résistance des matériaux	45	15	60	40	100	4	3.5	CC+E	Strength of materials	2
AB	MGCV12.18	Acoustique de bâtiment	24	-	24	36	60	2	1.5	CC+E	Building acoustics	4
HU	MGCV12.19	Hydraulique urbaine	30	15	45	45	90	3	2.5	CC+E	Urban hydraulics	3
TOPO	MGCV12.20	Topographie	30	15	45	45	90	3	2.5	CC+E	Geodesy	4
SIG	MGCV12.21	Système d'information géographique	-	30	30	30	60	2	1	CC+E	Geographic Information System	4
DBAO II	MGCV12.22	Dessin de bâtiments assisté par Ordinateur	-	30	30	30	60	2	2	R	Computer Aided Building Design	4
ENT	MGCV12.23	Entrepreneuriat	45	-	45	15	60	2	3	CC+E	Entrepreneurship	5
		Total:	279	150	429	391	820	28	24.5			

■ **Stage ouvrier** — **Practical work**

	MGCV12.24	Stage pratique sur chantier	-	45	45	35	80	2	-	R	Practical training on site	
		Total (Semestre/Semester):	279	195	474	426	900	30	24.5			
		Total (Année/Year) :	639	255	894	906	1800	60	49.5			

Deuxième Année — **Second Year**

Semestre I — **Semester I**

Génie Civil — **Civil Engineering**

■ **Modules obligatoires** — **Compulsory courses**

		Intitulé	CI	TP	CI+TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
MS	MGCV21.25	Mécanique des structures	45	15	60	75	135	5.5	3.5	CC+E	Structural mechanics	1
RO	MGCV21.26	Recherche opérationnelle	30	-	30	45	75	2	2	CC+E	Operations Research	2
BA I	MGCV21.27	Béton Armé I	45	-	45	60	105	3.5	3	CC+E	Reinforced Concrete I	2
CCR	MGCV21.29	Conception et calcul des Routes	30	15	45	60	105	4	2.5	CC+E	Design and calculation of Roads	3
HYD	MGCV21.30	Hydrologie	15	15	30	45	75	2	1.5	CC+E	Hydrology	4
EC	MGCV21.31	Electricité de bâtiments	15	15	30	45	75	2	1.5	CC+E	Electricity for buildings	4
AU	MGCV21.32	Architecture et urbanisme	30	-	30	30	60	2	2	CC+E	Architecture and urbanism	4
CAC	MGCV21.33	Conditionnement d'air et chauffage	30	15	45	45	90	3	2.5	CC+E	Air conditioning and heating	4
CGE	MGCV21.34	Création et gestion d'entreprises	30	-	30	30	60	2	2	CC+E	Creation and management of companies	5
TC	MGCV21.35	Technique de communication	30	-	30	30	60	2	2	CC+E	Communication Practice	5
AN	MGCV21.36	Anglais	30	-	30	30	60	2	2	CC+E	English	5
		Total:	330	75	405	495	900	30	24.5			

Deuxième Année — **Second Year**

Semestre II — **Semester II**

Génie Civil — **Civil Engineering**

■ Modules obligatoires — Compulsory courses

		Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
ASEF	MGCV22.37	Analyse des structures par éléments finis	45	-	45	45	90	3	3	CC+E	Analysis of structures by FEM	1
PC	MGCV22.38	Plaques et coques	30	15	45	45	90	3	2.5	CC+E	Plates and shells	1
PS	MGCV22.39	Projet de synthèse	-	45	45	60	105	4	1.5	R+P	Synthesis project	1
OLGC	MGCV21.28	Outils et Logiciels en Génie Civil	15	30	45	45	90	3	2	R	Tools and Software in Civil Engineering	2
BA II	MGCV22.40	Béton Armé II	15	15	30	30	60	2	1.5	CC+E	Reinforced Concrete II	2
CM	MGCV22.41	Construction métalliques	45	-	45	45	90	3	3	CC+E	Steel construction	2
OA	MGCV22.42	Conception et calcul des ouvrages d'art	30	-	30	30	60	2	2	CC+E	Design and calculation of engineering structures	3
CCSBA	MGCV22.43	Conception et calcul des structures de bâtiments	45	-	45	45	90	3	3	CC+E	Design and calculation of RC structures	3
M.SOL II	MGCV22.44	Mécanique des sols II	30	15	45	45	90	3	2.5	CC+E	Soil Mechanics II	3
PGC	MGCV22.45	Procédés généraux de constructions	45	-	45	30	75	2	3	CC+E	Technics of constructions	4
		Total:	300	120	420	420	840	28	24			

■ Stage technicien — Practical work

	MGCV22.46	Stage pratique dans un bureau d'études	-	30	30	30	60	2	-	-	Practical internship in a design office	-
		Total (Semestre/Semester) :	300	150	450	450	900	30	24			
		Total (Année/ Year) :	630	225	855	945	1800	60	48.5			

Troisième Année — **Third Year**

Semestre I — **Semester I**

Génie Civil — **Civil Engineering**

■ **Modules obligatoires** — **Compulsory courses**

		Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
CEP	MGCV31.47	Calcul élasto-plastique des structures	30	-	30	30	60	2	2	CC+E	Elasto-plastic analysis of structures	1
PC	MGCV31.48	Pathologie des constructions	30	-	30	30	60	2	2	CC+E	Construction pathology	1
OM	MGCV31.49	Ouvrages maritimes	30	-	30	30	60	2	2	CC+E	Marine works	1
BECM	MGCV31.50	Bureau d'étude constructions métalliques	15	30	45	45	90	3	2	P+R	Engineering and design office for steel constructions	1
DASS	MGCV31.51	Dynamique et analyse sismique des structures	45	-	45	45	90	3	3	CC+E	Structural dynamics and seismic analysis	2
BP	MGCV31.52	Béton précontraint	30	-	30	30	60	2	2	CC+E	Pre stressed concrete	2
STFC	MGCV31.53	Sécurité et tenue au feu des constructions en BA	30	-	30	30	60	2	1.5	CC+E	Safety and fire resistance of RC constructions	2
BEBA	MGCV31.54	Bureau d'étude bâtiment en béton armé	15	30	45	45	90	3	2	P+R	Engineering and Design office RC building	2
OGPC	MGCV31.55	Organisation et gestion des projets de construction	45	-	45	45	90	3	3	CC+E	projects of construction: Organization and management	3
SR	MGCV31.56	Silos et réservoirs	15	15	30	45	75	2.5	1.5	P+R	Silos and tanks	3
BEFS	MGCV31.57	Bureau d'étude fondations spéciales	15	15	30	45	75	2.5	1.5	R	Design office special foundations	3
BEOA	MGCV31.58	Bureau d'étude ouvrage d'art	15	30	45	45	90	3	2	R+P	Engineering and design office for bridges	2
		Total:	315	120	435	465	900	30	24.5			

		Intitulé	CI	TP	CI+ TP	T.per	T		Coef	E		GM
Course Id	Code		L	PW	L+PW	Self pr.	T	ECTS		E	Subject	
PFE	MGCV31.60	Projet de Fin d'Etudes	-	450	450	450	900	30		R+P	Work on diploma thesis	
		Total (Semestre/Semester) :	-	450	450	450	900	30				
		Total (Année/ Year) :	315	570	885	915	1800	60				