Philadelphia University
Department of Web Engineering

Undergraduate Programme Specification
(Draft Version)

January, 2018

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1. GENERAL INFORMATION

UCAS Code	Degree	Programme Title	Duration	Mode of study
N/A	B.Sc.	Web Engineering	4 years	Day Mode

School	Not Applicable
Faculty	Information Technology
Awarding Institution	Faculty of Information Technology / Department of Web Engineering
Programme Accreditation	The Higher Education Accreditation Council in Jordan (HEAC)
Relevant QAA benchmark(s)	Computing Benchmark, Computing Curricula 2013 (CC2013), Higher Education Specific Accreditation Norms in Jordan (HESAN) for Web Engineering

2. AIMS OF THE PROGRAMME

The programme aims to:

1.	prepare students for careers in modern enterprise computing by equipping them with knowledge and skills in web application programming
2.	enable students to design and implement solutions by providing them with practical experience of a wide range of industry standard, leading-edge web development tools
3.	enable students to adapt to future developments in web-based computing by providing them with a solid grounding in its underlying concepts and principles
4.	enable students to develop particular expertise in a chosen related area of computing
5.	develop the students' ability to undertake research by providing appropriate resources and guidance in their use
6.	develop the students' ability to make an effective contribution to team-based activity
7.	encourage students to adopt an investigative approach and develop autonomous study skills in order to assist their continuing professional development.

3. INTENDED LEARNING OUTCOMES OF THE PROGRAMME

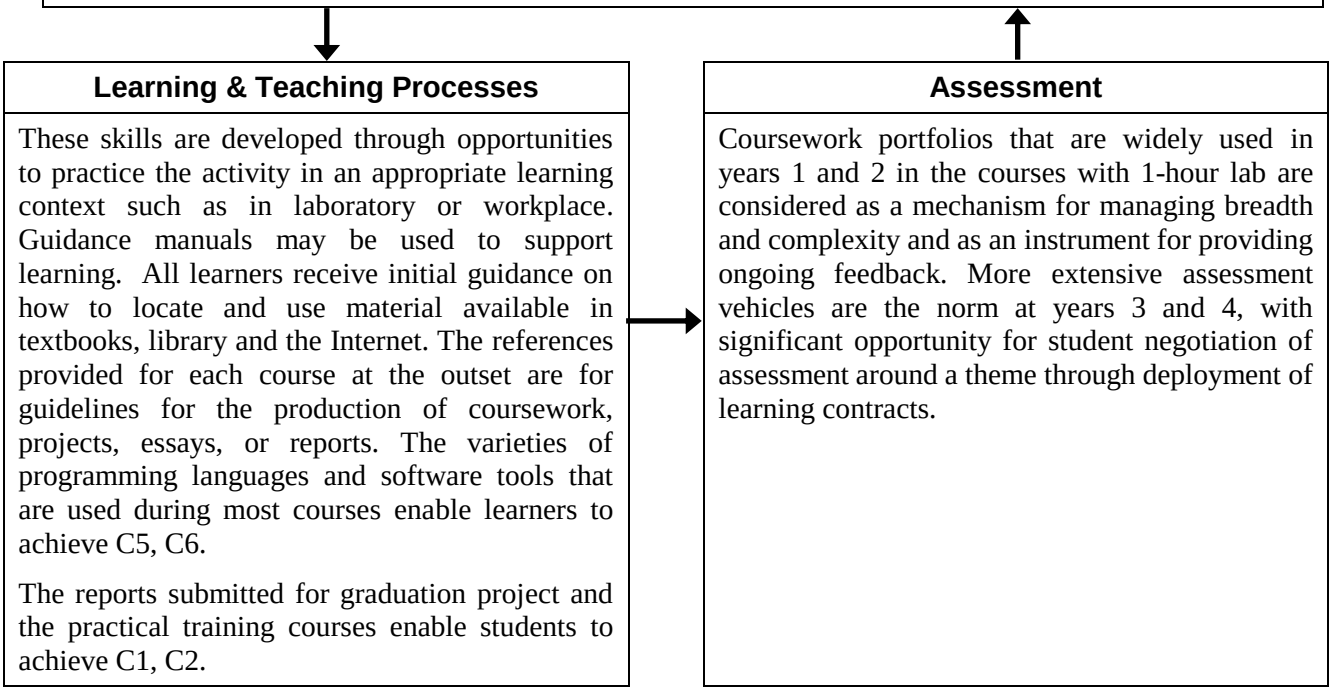
A. Knowledge & Understanding	
Able to:	
A1.	A comprehensive understanding of the relevant topics of Web Engineering including, but not limited to, web project engineering life cycle, risk analysis, web services, cloud computing, eCommerce, eGovernment, and the Semantic Web.
A2.	A critical awareness of current problems and/or new insights most of which is at, or informed by, the forefront of Web Engineering.
A3.	Knowledge and understanding of web technology and systems at an advanced level.

Learning & Teaching Processes (to allow students to achieve intended learning outcomes)	Assessment (of intended learning outcomes)
Acquisition (A1) is developed through lectures and tutorials and supported by regular coursework.	Testing of knowledge base is through a combination of unseen written examinations and assessed coursework. (A1) is assessed in this way.

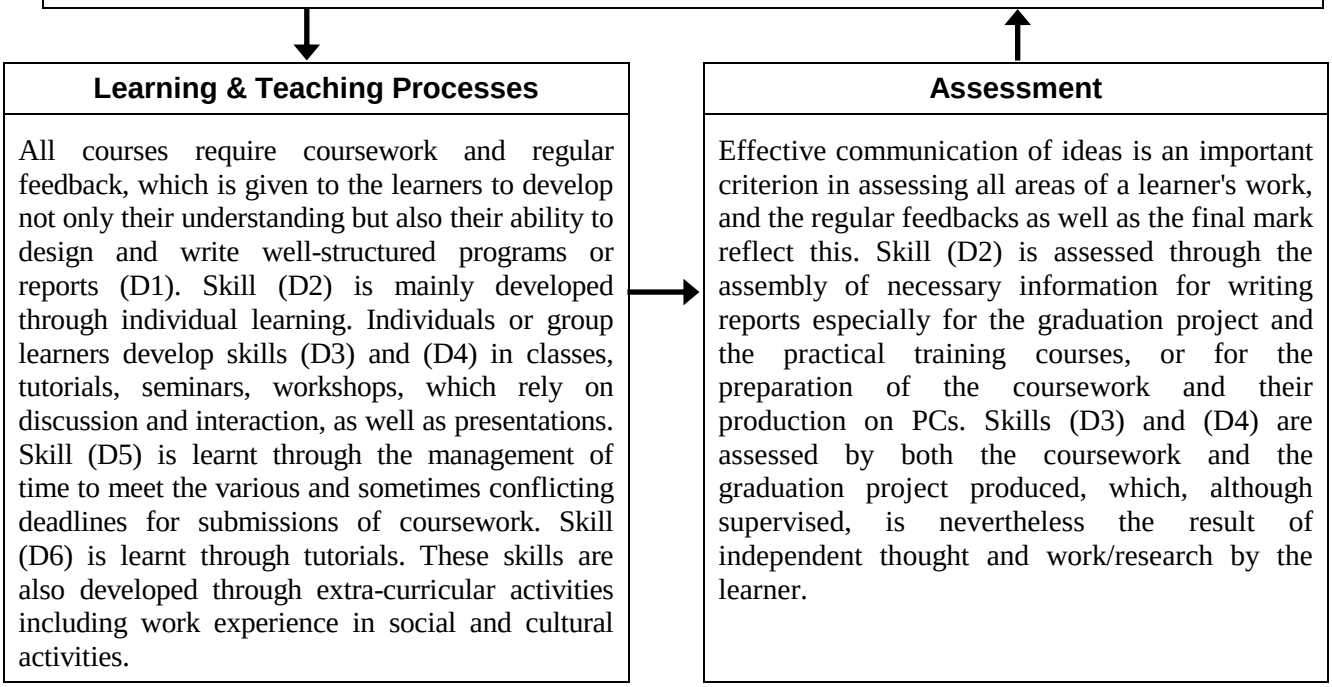
B. Intellectual Skills	
Ability to:	
B1.	apply appropriate engineering analysis methods for solving complex problems in web engineering and to assess their limitations.
B2.	use fundamental knowledge to investigate new and emerging web technologies.
B3.	apply design processes and methodologies and the ability to apply and adapt them in unfamiliar situations.
B4	Apply software engineering principles to the design of secure and reliable web systems.

Learning & Teaching Processes	Assessment
Intellectual skills are developed through the teaching and learning programme. Each course, whatever the format of the teaching, involves practice in applying concepts orally and in writing, analysis and interpretation of materials, and individual feedback sessions for learners on work produced. Workshops and practical exercises more usually support skill development curricula, and open learning materials are used extensively to facilitate individually-paced skill acquisition and development. As the study programme progresses through years 3 and 4, project-based and student-tutor directed approaches are introduced to encourage the notion of learner independence and to promote application of developing competencies	The assessment methods place great emphasis on the learner's ability to demonstrate skills (B1)-(B3) through the unseen exams and the problem-based exercises, the submission of coursework, reports, case studies, and set of assignments. Every student should submit a report for the practical training, and the graduation project, which provide a perfect vehicle to demonstrate capability in a range of intellectual skills linked to specialist knowledge, understanding and practical skills.

C. Practical Skills	
C1.	Use web engineering tools and components to construct and implement web based systems.
C2.	Identify and evaluate a wide range of web engineering tools and components.
C3.	understand current practice and its limitations, and some appreciation of likely new developments.
C4.	apply engineering techniques taking account of a range of commercial and industrial constraints
C5.	generate an innovative design for products, systems, components or processes to fulfil new needs.
C6.	evaluate and use user-oriented Web systems.
C7.	collect and analyse research data and to use appropriate engineering analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods.



D. Transferable Skills and Personal Qualities	
D1.	Awareness of the need for a high level of professional and ethical conduct in engineering.
D2.	Awareness that Web engineers need to take account of the commercial and social contexts in which they operate.
D3.	Knowledge and understanding of management and business practices, their limitations, and how these may be applied in the context of Web Engineering.
D4.	Awareness of relevant regulatory requirements governing engineering activities in the context of Web Engineering.
D5.	Awareness of and ability to make general evaluations of risk issues in the context of Web Engineering, including health and safety, environmental and commercial risk.
D6.	Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.
D7.	Communicate their work to technical and non-technical audiences.



Learning & Teaching Processes

All courses require coursework and regular feedback, which is given to the learners to develop not only their understanding but also their ability to design and write well-structured programs or reports (D1). Skill (D2) is mainly developed through individual learning. Individuals or group learners develop skills (D3) and (D4) in classes, tutorials, seminars, workshops, which rely on discussion and interaction, as well as presentations. Skill (D5) is learnt through the management of time to meet the various and sometimes conflicting deadlines for submissions of coursework. Skill (D6) is learnt through tutorials. These skills are also developed through extra-curricular activities including work experience in social and cultural activities.

Assessment

Effective communication of ideas is an important criterion in assessing all areas of a learner's work, and the regular feedbacks as well as the final mark reflect this. Skill (D2) is assessed through the assembly of necessary information for writing reports especially for the graduation project and the practical training courses, or for the preparation of the coursework and their production on PCs. Skills (D3) and (D4) are assessed by both the coursework and the graduation project produced, which, although supervised, is nevertheless the result of independent thought and work/research by the learner.

4. THE STRUCTURE OF THE PROGRAMME

The University applies the American Course System which is based on the credit units.
Students should complete 44 courses, most with 3 credit hours (Total of 132 credit hours) summarised as follows:

Type	Number of Courses	Credit Hours	Percentage
University Requirements	9	27	%20
Faculty Requirements	8	24	%18
Departmental Compulsory	16	42	%32
Departmental Electives	3	9	%7
Supportive Compulsory	10	30	%23

The Department covers the Web Engineering programme from the areas listed below:

	Name of Knowledge Area
1.	Programming
2.	Computational Science and Algorithms
3.	Information Sciences and Applications
4.	Internet Technology
5.	Statistics, Numerical Analysis, Linear Algebra
6.	Graduation Project / Practical Training

Taught Courses in the Knowledge Areas

A – Compulsory Specialisation Modules		B – Elective Specialisation Modules	
1. Programming			
0721223	Object-Oriented Programming		
0731213	Introduction to Web Programming		
0750113	Programming Fundamentals (1)		
0750114	Programming Fundamentals (2)		
0750215	Visual Programming		
2. Computational Science and Algorithms			
0250104	Discrete Structures		
0721224	Data Structures		
0750323	Algorithms		
3. Information Sciences and Applications			
0731221	Database Fundamentals		
0780320	Web System Analysis and Design		
0780431	Web Security		
0731340	Fundamentals of Computer Networks		
0750464	Information and Data Retrieval		
4. Internet Technology			
0721240	Computing Ethics	0780344	Mobile Web Applications
0731110	Introduction to Information Systems and Technology	0780346	Web Server Administration
0731423	Data Mining	0780430	Semantic Web
0750335	Operating Systems	0780432	Special Topics in Web Engineering
0780110	Introduction to Web and Internet Technology	0780445	Cloud Computing Based Development
0780111	Web Engineering Fundamentals		
0780220	Fundamentals of e-Government		
0780221	Requirements Engineering for Web Applications		
0780230	Web Documents		
0780321	Web Process and Project Management		
0780323	Web Applications Usability		
0780324	Web Services		
0780340	Web Server Side Technologies		

0780341	Web Client side Technologies		
0780420	e-Commerce System Engineering		
0780423	Quality Assurance and Testing of Web Applications		
5. Statistics, Numerical Analysis, Linear Algebra			
0250231	Introduction to Statistics and Probabilities		
0750272	Numerical Analysis		
6. Graduation Project / Practical Training			
0780480	Project (1)		
0780481	Project (2)		
0780470	Practical Training		

Guidance plan

Year	First Semester				Second Semester			
	Module Number	Module Title	Prereq	Type	Module Number	Module Title	Prereq	Type
(1)	0114101	Arabic Language Skills (1)		Uni	0130102	English Language Skills (2)	0130101	Uni
	0130101	English Language Skills (1)		Uni	0111101	National Education		Uni
		University Elective 1		Uni		**University Elective 2**		Uni
	0750113	Programming Fundamentals (1)		Fac	0250104	Discrete Structures		Sup
	0731110	Introduction to Information Systems and Technology		Fac	0750114	Programming Fundamentals (2)	0750113	Fac
	0780110	Introduction to Internet and Web Technology		Fac	0780111	Web Engineering Fundamentals	0731110 0780110	Dept
	Semester Total		*18 Hours*		*Semester Total*		*18 Hours*	
(2)		**University Elective 3**		Uni	0250231	Introduction to Statistics and Probabilities		Sup
	0721223	Object-Oriented Programming	0750114	Fac	0721224	Data Structures	0721223 0250104	Sup
	0750272	Numerical Analysis	0250104 0750114	Sup	0750215	Visual Programming	0721223	Fac
	0731213	Introduction to Web Programming	0750114 0780110	Fac	0731221	Database Fundamentals	0721223	Sup
	0780220	Fundamentals of e-Government	0780111	Dept	0780221	Requirements Engineering for Web Applications	0780111	Dept
	0780230	Web Documents	0780111	Dept	0721240	Computing Ethics	0731110	Fac
	Semester Total		*18 Hours*		*Semester Total*		*18 Hours*	
(3)		**University Elective 4**		Uni		Department Elective 1		Dept
	0750323	Algorithms	0721224 0250231	Sup	0731340	Fundamentals of Computer Networks	0721224	Sup
	0750335	Operating Systems	0721224	Sup	0780323	Web Applications Usability	0780320	Dept
	0780320	Web System Analysis and Design	0780221	Dept	0780324	Web Services	0780340	Dept
	0780321	Web Process and Project Management	0780221	Dept	0780341	Web Client Side Technologies	0780230	Dept
	0780340	Web Server side Technologies	0780230	Dept				
	Semester Total		*18 Hours*		*Semester Total*		*15 Hours*	
(4)		Department Elective 2		Dept		Department Elective 3		Dept
	0780420	e-Commerce System Engineering	0780220 0780323	Dept	0780431	Web Security	0731340	Dept
	0750464	Information and Data Retrieval	0731221	Sup	0780481	Project (2)	0780480	Dept
	0780480	Project (1)		Dept	0780423	Quality Assurance and Testing of Web Applications	0780320	Dept
	0780470	Practical Training		Dept	0731423	Data Mining	0750464	Sup
	0111100	Military Sciences		Uni				
	Semester Total		*13 Hours*		*Semester Total*		*14 Hours*	

5. CURRICULUM PROGRESS: INTENDED LEARNING OUTCOMES FOR EACH YEAR

Year	Intended learning outcomes
Year 1	The curriculum that is based on the CC2013 is designed to have a broad-based structure, which utilizes the knowledge of the new entrants to build a strong foundation through Introductory Level courses (Level 1: 1st and 2nd years). Mathematical and fundamental computer skills are emphasized at the early stage to prepare for more rigors later on. Mathematical courses, computer skills courses, and OOP courses are used to develop the knowledge and understanding and the intellectual skills. In addition, other University based courses help in improving students' communication skills in Arabic and English languages and social/cultural issues.
Year 2	The aim of the core courses taught in this year is to prepare students for more complex and specialist work which could be studied at a later stage. Nevertheless, a wide coverage of the topics is necessary to enable choice and coherence of the curriculum. The core courses that could form the Intermediate Level (Level 2: 2nd and 3rd) courses are designed with this purpose in mind. The intellectual skills may be developed through these courses by solving problems, writing programs, developing small software systems, etc. The Faculty requirements that include essential transferable skills, together with professional, legal and ethical issues contribute both relevance and breadth.
Year 3	As students progress to the third and fourth years they should be well informed about the overall subject area and be mature enough to make informed choices. The curriculum structure has clearly defined prerequisites and displayed pathways providing some specializations, e.g. Artificial Intelligence, Software Engineering, etc. Third year courses help in developing students' cognitive abilities and skills for programming in different paradigms, theoretical aspect, modelling, building computer-based systems, problem solving by analysing criteria and specifications appropriate to certain problems, and finally, report writing. It is however important to realize that theoretical studies have to be supported with practical and real life professional experience. Other generic skills must also be developed. This is achieved by organizing suitable work experience in industry for the students in the practical training course. The elective courses in the 3rd and 4th years allow some flexibility for the student.
Year 4	The final year allows more flexibility for the student by providing the graduation project in addition to other Advanced Level (Level 3) courses. The graduate project is of cardinal importance as it represents an amalgam of various skills and key components of the programme learned so far by the student. It encourages the student to exercise flair and originality and demands strong commitment from him/her. Suitable project supervision ensures that the student is given guidance and support when required. However, the ethos of self-reliance and research has to be paramount. Regular maintenance of documentation and communication develops written and oral skills. With advanced courses, an appropriate depth of knowledge reflects the staff research interest and stimulates students to take the opportunity to develop their intellectual abilities.

6. STUDENT INDUCTION, SUPPORT AND DEVELOPMENT (in order to deliver the year's learning outcomes)

Student induction, support and development are well-developed aspects with a framework, which provides support to the students throughout their programme. The key mechanisms include the following:

- Induction procedures for new students at admission with access to senior members of staff. Induction for returning students is also implemented as it is beneficial in specifying the progressive nature of the learning experience as, for example, higher order skills and independent learning. In both cases, many meetings are held between the Dean and the students and the Head of the Department with the students.
- Provision of an academic tutor for each student
- Provision of good physical and learning resources including Internet, library, and up-to-date electronic educational media, e.g. email and web-based material.
- Provision of good social facilities, e.g. Internet cafes, sport spaces, cafeterias, etc.
- Provision of Self-Study Facilities:
  - The Faculty Learning Resource Centre
  - The Electronic Library
  - The Department's Web page that provides students with all relevant information such as:
    - Undergraduate Handbook
    - Programme Specifications
    - Lectures and course notes.
    - Past Exams, tutorials, and assignments.
  - Distance learning has been implemented through agreement with Phoenix International and through a project financed by UNESCO.
  - Incubator lab.
- The University provides some disabled students' facilities.
- Careers Advisory Service to provide information for students and graduates of the University.
- All simultaneous sections of a course have a staff-student committee. Each committee meets at least twice each semester and discusses any matter of concern with the course. The staff members of each committee are the lecturers of the concerned sections.
- Students' opinion on the quality of the teaching is considered by completing a Course Evaluation Questionnaire for each course in each semester.
- Students' Memberships of various committees can add a voice in resource allocation and other matters.
- Drop-In centre is utilized to enhance students' performance in some courses.
- Student Financial Aid is provided in two mechanisms; the first mechanism is through the Student Fund established by the University in addition to the Orphan Student Fund. The second mechanism is through special Discount Scholarships provided by the University to students based on special criteria.
- Free transportation and medical insurance.

7. CURRICULUM MAP OF COURSE UNITS AGAINST COURSE LEARNING OUTCOMES OF THE PROGRAMME

Code	Course	C/E	Course Learning Outcomes																						
			Knowledge & Understanding				Intellectual Skills				Practical Skills							Transferable Skills & Personal Qualities						
			A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5	D6	D7
780110	Introduction to Internet and Web Technology	C	DA	DA	DA			DA					DA		DA	DA		DA	DA	DA	DA	DA		DA
780111	Web Engineering Fundamentals	C	DA	DA	DA			DA		DA	DA					DA		DA					DA	DA
780220	Fundamentals of e-Government	C																						
780221	Requirements Engineering for Web Applications	C																						
780230	Web Documents	C																						
780320	Web System Analysis and Design	C																						
780321	Web Process and Project Management	C																						
780323	Web Applications Usability	C																						
780324	Web Services	C																						
780340	Web Server Side Technologies	C																						
780341	Web Client side Technologies	C																						
780420	e-Commerce System Engineering	C																						
780423	Quality Assurance and Testing of Web Applications	C																						
780431	Web Security	C																						
780470	Practical Training	C																						
780480	Project (1)	C																						
780481	Project (2)	C																						
780344	Mobile Web Applications	E																						
780346	Web Server Administration	E																						
780430	Semantic Web	E																						
780432	Special Topics in Web Engineering	E																						
780445	Cloud Computing based Development	E																						

Legend for cells

D = skills are taught or developed by students within this course
A = skills are assessed within this course

C = compulsory course
E = elective course

8. CRITERIA FOR ADMISSION

Candidates must satisfy the general admissions criteria of the University and of the School in one of the following ways:

1- They must be from the scientific, Industrial, Agricultural, IT and Health education branches and pass their Tawjihi exam with grade of at least 60%. The programme is offered in full-time (4 years) (morning study mode) and part-time (evening study mode).
2- They can be bridged from the community colleges with a comprehensive exam mark of at least 65%.
3- They can transfer to the Department from other universities.

9. PROGRESS AND ASSESSMENT REGULATIONS

- In order to progress from one year to the next, a student must complete successfully at least 10 courses (30 credit hours). To achieve graduation, the student has to complete successfully 45 courses (132 credit hours) with minimum passing accumulative average of 60%. The minimum pass mark is 50% for any course.
- Undergraduates are assessed for each course independently and there is no carry over of marks from one year to the next.
- If the student fails to get 50%, he/she has to take the course again. This can be repeated three times after which the student is expelled from the programme and is given a chance to transfer to another programme in the University.
- The progress rules provide some flexibility for the student to control his/her own rate of study. The course system with flexible prerequisites enables students to smoothly progress from one level to another. The assessment procedure allows generous opportunity for students to improve their grades to secure progress.
- Students will be warned if they are unable to obtain an average of at least 60%. In this case, students are encouraged to repeat studying those courses with low marks in order to increase their accumulated averages. However, students will be dismissed from the University if this average is not achieved in the third attempt.
- The assessment method deployed within the programme, are of many types:
  - 60% is given for two 1-hour midterm exams, coursework and/or seminars, projects, or essays, and 40% for the final exam that may be a written exam only or a written exam plus final laboratory exam (if applicable), a final small project, or a seminar presentation. The 40% of the final exam is a University regulation.
  - "Pass" is given for the evaluation of the practical training course,
- The University regulations governing the Work and Attendance of students are given in the Student Guide 2016. Full attendance is required in all lectures, laboratories, and any tutorials, which may be scheduled. Completed laboratory work should be handed in on time. Attendance at laboratories and at many lectures is monitored and attendance is registered.
- Absence for holidays is not permitted in term-time. The duty of the lecturer is to keep continuous review of the work and attendance of the students with whom he is concerned.
- If the rate of student absences, in a course, is greater than 15% (or 20% for student representing the University in sports or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is expelled from that course. If the Dean of the Faculty accepts the justifications of absence, then this student is mentioned as ***withdrawn*** without refunding the registration fees.

A formal process is defined to tackle the problem of any student whose work and attendance appear unsatisfactory.

Teaching and Assessment Matrix

Course Number	Course Title	Lectures		Laboratory		Tutorial		Seminars		Assignments, Projects, or other Marks %	Total	
		Hours/ semester	% Exam Marks	Hours/ semester	% Lab work Marks	Hours / semester	% Contribution Marks	Hours/ Semester	% seminar Marks		Hours/ Semester	Assessments Marks
780110	Introduction to Internet and Web Technology	33	80	0	0	12	10	3	5	15	48	100
780111	Web Engineering Fundamentals	33	80	0	0	12	10	3	5	15	48	100
780220	Fundamentals of e-Government											
780221	Requirements Engineering for Web Applications											
780230	Web Documents											
780320	Web System Analysis and Design											
780321	Web Process and Project Management											
780323	Web Applications Usability											
780324	Web Services											
780340	Web Server Side Technologies											
780341	Web Client side Technologies											
780420	e-Commerce System											

	Engineering											
780423	Quality Assurance and Testing of Web Applications											
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