Department of Software Engineering

Undergraduate Handbook
2003/2004

September 2003

Content

I. Introduction

This handbook contains important general information for students undertaking Undergraduate Degree program in the Department of Software Engineering. This handbook will be made available on the web.

Your degree program is subject to regulations contained in the **University Students Guide**. This departmental handbook interprets the regulations and your tutors may give advice, but the University Students Guide defines the regulations.

II.   Important Dates

1. Registration:
Admission criteria are issued by the Higher Education Council, which governs all private universities (55% in the Tawjihi exam). First year students must attend the University and they will be given a full timetable for the introductory activities. Departmental and University registration must be completed at the time specified in the introductory timetable (shown below). Returning students must also register in the times specified during introductory week.

(a) The morning study (full-time students)
First year students must attend at 8.30 AM on Sunday 5th October.

(b) The evening study (part-time students)
First year students must attend at 4.00 PM on Sunday 7th September.

2. Session Dates 2003-2004
A. FIRST TERM
- **The morning study**
  Begins: Sunday 5th October 2003
  Ends   : Tuesday 27th January 2004
  The first semester includes
    - Teaching, learning, and assessment activities in Applied Computer Science will run for 1 weeks, from Sunday 5 th October 2003 to Thursday 15th January 2004.
    - Six-day break on 24th September, 25th - 27th November, 25th December, 1st January 2004.

- **The evening study**
  Begins: Sunday 7th September 2003
  Ends   :   Tuseday 27th January 2004
  The first semester includes
    - Teaching, learning, and assessment activities in Applied Computer Science will run for 15 weeks, from Sunday 7 th September 2003 to Monday 19th January 2004.
    - Three-day break on 24th September, 25th December, 1st January 2004, and one month break (Ramadan month) on 26th October – 27th November 2003.

B. SECOND TERM
- **The morning and evening studies**
  Begin: Sunday 22th February 2004
  End   :   Tuseday 15th June 2004
  The second semester includes
    - Teaching, learning, and assessment activities in Applied Computer Science will run for 15 weeks, from Sunday 22th February 2004 to Thursday 3rd June 2004.
    - One -day break on 25th May 2004.

C. SUMMER TERM
- **The morning and evening studies**
  Begin: Sunday 4th July 2004

End: Saterday 28th August 2004

Summer semester includes teaching, learning, and assessment activities, which will run from Sunday 4th July 2004 to Thursday 19th August 2004.

- **Examination Periods**

First Semester (for morning study) - Sunday 18th January 2004 to Tuesday 27th January 2004.
First Semester (for evening study) - Tuesday 20th January 2004 to Tuesday 27th January 2004.
Second Semester (for morning and evening studies) - Sunday 6th June 2004 to Tuesday 15th June 2004.
Summer semester (for morning and evening studies) - Sunday 22nd August 2004 to Saturday 28th August 2004.

3. Timetable

Lectures timetable is published separately from this book. Whilst every attempt is made to timetable reasonable combinations of course units (modules), various constraints make some combinations and outside options impossible. If you have a timetable problem, please consult your personal tutor in the first instance.

III. Scope and Input Resources

1. Aims and Objectives

Aims: The Bachelor of Software Engineering (BSE) aims to
- Go on to work in organisations producing software, by engineering and re-engineering of high quality large software with low cost.
- Use the Object Oriented Technology\
- Have a Life long learning attitude.

Objectives (Learning Outcomes). The program provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas (A, B, C, D). In the individual course unit (module) syllabi, the categories of learning outcomes (A, B, C, D) and the individual learning outcomes appropriate to the module are identified.

A- Knowledge and Understanding of
A1) The essential mathematics relevant to computer science.
A2) A wide range of principles and tools available to the software developer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
A3) The principles of computer systems, including architecture, networks and communication.
A4) The professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.
A5) The principles and techniques of a number of application areas informed by the research directions of the subject, such as artificial intelligence, databases, software engineering, net-centric, and distributed systems.
A6) The application of computing in a business context.

B- Intellectual (thinking) skills - able to
B1) Solve a wide range of problems related to the analysis, design and construction of algorithms, systems, and information systems.
B2) Design and implement a software system of significant size.
B3) Identify a range of solutions and critically evaluate and justify proposed design solutions

C- Practical skills - able to
C1) Plan and undertake a major individual project.
C2) Prepare and deliver coherent and structured verbal and written technical reports.
C3) Give technical presentations suitable for the time, place and audience.
C4) Use the scientific literature effectively and make discriminating use of Web resources.
C5) Design, write and debug computer programs in appropriate languages.
C6) Use appropriate computer-based design support tools.

D- Transferable skills - able to
   D1) Display an integrated approach to the deployment of communication skills.
   D2) Use IT skills and display mature computer literacy.
   D3) Work effectively with and for others.
   D4) Strike the balance between self-reliance and seeking help when necessary in new situations.
   D5) Display personal responsibility by working to multiple deadlines in complex activities.
   D6) Employ discrete and continuous mathematical skills as appropriate.

In order to provide students with the "life long learning" attitude, the teaching method is essentially based on self learning (3 hours in class rooms and 6 hours out of class rooms: coursework, practical works, workshops, seminars, etc.)

2. Staff
A. Academic Staff
- **Qualifications**
   The academic staff members are divided into two categories: full-time and part-time. The number of full-time staff members is 23, while the number of part-time staff depends upon the number of students and the needs of the Department.
   The academic staff members, who are between 26 and 54 years of age, have relatively adequate experience ranging from 1 year to 22 years.
   Six academic staff members at the Basic Sciences Department / Faculty of Science assist in teaching the Mathematics and Discrete Mathematics course units.

- **Specialisations**
   Full-time as well as part-time teaching staff members have various specialisations that can be divided into four categories (Software, Communication and Interaction, Practice, Theory). At present, there are six research teams at the Faculty of IT and young staff members belong to these teams.

B. Non-Academic Staff
   Besides the academic staff, the Department has 4 other full time members, 2 of them hold a B.Sc. degree in Computer Science and 2 holds a B.Sc. in Computer Engineering. Those staff members have 2 to 6 years working experience and some of them have been appointed from Philadelphia University graduates who hold bachelor degrees with Grade "Excellent" or "Very Good".
   All of the non-academic staff members are qualified as laboratory tutors and assist lecturers in the laboratory hours. In addition, some of them are responsible for maintenance of computer hardware and software in the laboratories.

3. Departmental Learning Resources

- **Code of Practice for Student Computer Usage**
   At registration, you will be required to assent to the following departmental code of behavior, which relates to the responsible use of Computer equipment. Misuse of the facilities is regarded as serious disciplinary offences.
   This code of practice is supplementary to University regulations concerning the use of computing equipment to which you are required to assent at Registration.
   1. Every student is allocated one PC in every laboratory session. But for Unix laboratory, you have been allocated one or more usernames for your own personal use: you must not use other usernames or permit other people to use your username. You must not use computers to which you have not been granted access, or attempt to access information to which you have not been granted access.
   2. You must not deliberately hinder or annoy other computer users.
   3. You must not use machines belonging to the Department for commercial purposes without the prior written permission of the Head of Department. You must not sell the results of any work you do using Departmental facilities without the prior written permission of the Head of Department.

4. You must not write or knowingly store, on machines belonging to the Department, software that, if executed, could hinder or annoy other users, except with the prior written permission of the Head of Department.
5. You must not make an unauthorized copy, in any form, of copyright software or data.
6. You must not store personal information, except in a manner permitted by the Data Protection.
7. You must follow all rules, regulations and guidelines imposed by the Faculty of IT and the University in addition to the Department's Code of Practice.

- **Explanatory Notes**
  The following notes indicate ways in which the Code of Practice applies to undergraduates for use of computers. It is not intended to be a complete list of possible abuses of the equipment. Each note refers to the corresponding paragraph above.
  1. Undergraduate students are not normally granted access to the computers in the network, or to other students' files. You should not attempt to use another student's account even if they have not set a password. Of course, it is still important to set a password for your own privacy and security.
  2. This will be interpreted very broadly. It includes

     · Tampering with another user's files.

     · Tampering with another user's screen.

     · Setting up processes which persist after you log out and annoy subsequent users of the machine.

     · Broadcasting of offensive messages.

     · Display or storage of offensive pictures.

     · Abuse of the mail system.

     · Occupying a machine to play games while other students need it to do their laboratory work.

  3. Clearly, the Head of Department would have to be convinced that any such use of the machines would not conflict with their primary purpose.
  4. Note carefully that this means you are not allowed to write or introduce a virus program, even if it is never executed.
  5. Note that this does not prevent your taking copies of your laboratory work home, or making copies of non-copyright material, but does prevent your taking random pieces of software away on a floppy. You should assume that all material is copyright unless it specifically states otherwise. If in doubt, ask.
  6. Personal information includes names, addresses, mailing lists, etc. You should contact the Data Protection Officer, Mr. Tarek Hassan, if you need to store such information.
  7. In fact, you agreed to abide by the University and Faculty rules when you registered.
     Please direct queries concerning the code of practice to Department Chair.

- **Support for Computer Equipment**
  Students are encouraged to own their own machines. Please note, however, that you are NOT REQUIRED to own your own computer. The Department has excellent facilities and undergraduate students are allowed to use the facilities provided in the buildings of the Faculty of Information Technology and the Faculty of Science. Whenever the buildings are open between 08 AM and 07 PM, access is also allowed in this range of time, from Sunday to Thursday during term.

- **Learning Resource Center**
  Photocopy facilities are available in the Learning Resource Center, room 103, Tel. 453. Reference copies of textbooks are available for consultation. Copies of previous weeks' tutorial solutions are also available. The resource center holds non-loan copies of undergraduate textbooks. Lending copies of textbooks are available in the University Library.

- **Photocopying**
  Out of the library, photocopy may be done at different Bookshops, on an affordable cost.

- **Printing**

You can take printout (free of charge) in any lab of the Department. Each lab contains at least two printers for this purpose.

- **Departmental Computer Club**
  This is organized and run by students. It arranges various activities from time to time. See the notice boards in the Faculty.

- **Administrative Infrastructure**
  It is composed of seven offices (Dean, 2 Advisory services, Dean Secretary, and Department's Chair, Department Secretary, and Meeting Room).

- **Academic Infrastructure**
  It is composed of
- 16 Department classrooms plus some other classrooms shared with other faculties and one lecture theatre equipped with support facilities: computer, data show, overhead projector.
- 15 laboratories (each contains 20 to 25 PCs or Monitors and 1 to 2 printers): Windows NT Laboratories, Internet Laboratories, SunRay1 Unix Laboratories, and Sun Sparc Unix Laboratory.
- 1 Learning Resource Center that contains computers, textbooks and related reference books and journals.
- 19 staff offices where each staff member is supplied with a PC.
- 1 room for staff meeting
- 1 office for the student's guidance and examination committee.

  - **Lecture Support Facilities**
    In the Department, there are 4 overhead projectors and 7 data shows used to support modules and seminars presentations.

  - **University Computer Centre**
    This centre provides the Department with training and maintenance facilities.

  - **Networking Facilities**
    Ethernet: The PCs in each laboratory are connected to an Ethernet platform 10/100 Mbps.
    Intranet: All computing facilities of the University are connected to a Gigabit Intranet backbone.
    Internet: The University is connected to the Internet by 2 Mbps lines.

  - **Type and Level of Access**
    For communication, computing, or information searching, the Department provides free access to networking facilities at any time for the staff and the students.

  - **Library Infrastructure**
    This structure includes the University Main Library, which It provides students and staff members with the required recent text and references books, journals, and CD ROMs. According to its collaboration and co-ordination program, it has relations with more than 120 universities and scientific organisations. It opens from 08 AM to 07 PM. It includes:
      - *Conventional Library,* which contains books and journals. The books room contains more than 1860 different English titles in computing, where more than 12% are edited in years 2000 and 2001. The room of journals contains 30 computing journals that are useful for research and teaching.

      - *Electronic Library,* which contains CD ROMs for the taught programming languages and module support tools. It is connected to approximately 800 universities electronic libraries via the World University Library that is endorsed by the United Nation University. The World University Library has four databases that contain more than 3300 periodicals available online. The online resources in the electronic library include sites that list more than 40000 online books and access to online libraries and encyclopaedias and other databases on the Internet.

- *Internet Access Service,* available in a room containing 10 PCs.

• **Bookshops:** contain books, exercises with solutions, solutions to previous examinations and so on.

• **Extracurricular Activities**
The University provides some entertainment for the students to enrich their talents in their free time. This includes
- **A Deanship of Student Affairs** that organises the social, cultural, and sport activities for the students in the University. It has also an alumnae office that keeps track of the graduate's information and news.
- Several spaces for different sports.
- Several spaces for cultural activities.
- Several common rooms for meetings, snacks, and cafeterias.
- Three Internet cafes each one containing 11 PCs.
- One Students Club.

IV. Student Support and Guidance

1. Assistant Dean Office
The Assistant Dean Office (Rooms IT 1013) is mainly for students advisory services. It deals also with all routine undergraduate enquiries. Problems, which cannot be dealt with by the Assistant Dean, will be referred to an appropriate person in the Department or University.

2. Academic Guidance
All new students should have academic (personal) tutors. The new students are grouped into 20 – 30 students groups and each group is assigned to an academic staff member who is their academic tutor. The students remain with the same tutor till their graduation. The tutor deals with all routine undergraduate inquiries, advises for academic registration at the beginning of each semester, and any other raised problems. However, problems, which cannot be dealt with by the tutor, will be referred to the head of the Department, the Dean of the Faculty, or to an appropriate member of academic staff. The academic guidance is available on specified dates in the terms, and any advisory service offered by the Assistant Dean is available daily to all students in the Software Engineering Department (including both Full- and Part-time students).
   Time: 08.00 AM to 04:00 PM Sunday to Thursday during term, Venue: Room IT 1013 (for Full-time students)
   Time: 11:00 AM to 07:00 PM Sunday to Thursday during term, Venue: Room IT 1013 (for all students)
The advisory service offers advice on departmental and University matters and helps with anything that concerns you, whether in your studies, in the Department, in the University or in your life outside the university. Each of the staff in these offices is available with knowledge of the Department and University and who is willing to listen and help with whatever you bring. Note that
- All visits to the advisory service offices are strictly confidential.
- If you have difficulties with material on particular course units you should normally first approach your tutors (or lecturers/project supervisors). You may also consult your tutors on matters that are more general but you can equally well call in at the Assistant Dean Offices.
- If you have health problems, you are welcome to consult an advisor in the Department but may prefer to go directly to your doctor or to the University Clinic.

   Feel free to make use of these services at any time on any matter.

3. Students Affair Deanship
Confidential, individual counseling on any matter affecting personal well-being or effectiveness is available at the Philadelphia University Students Affair Deanship. The Deanship sees well over a hundred students a year and gives expert advice on problems such as low motivation, personal decision making, relationships, and anxiety and family difficulties. People there, are willing to help in finding fresh ways of coping with the emotional and personal aspects of problems and seeks to do so in a collaborative,

straightforward and empowering way with the individual concerned. Advice is available concerning referral to other services, helping others and dealing with common student problems such as exam anxiety.

The Deanship is open from 8.00 AM to 4.00 PM, from Sunday to Thursday throughout the year and appointments can be made by calling into the office of the Dean of Students affairs. All inquiries will be treated confidentially.

4. Tutoring Arrangements

Some of your course units will have tutorials, where you can discuss topics on a course unit and run through exercises. Usually, the lecturer of the course unit runs the tutorial. There will be an opportunity for you to ask questions on matters you do not understand.

As you have a personal tutor from the beginning of your University life, your tutor is here to help you in your way through University life. He/she will watch your progress and offer help and advice wherever necessary. If you get into difficulties, you should contact your personal tutor or visit the Assistant Dean at the earliest possible opportunity. Do not let things slide until it is difficult to retrieve the situation, especially if you are getting behind with your work. Your personal tutor will also advise on your choice of course units, on departmental or University procedures and will provide references for jobs and other purposes.

Course lecturers are always available to discuss questions or problems with the course unit material. Each lecturer fixes at least six office hours on his timetable, which is fixed on his office door. You can call at these hours. For any reason, if these lecturers could not see you at these office hours, they may arrange an appointment at another time. It is important that any matter that affects your ability to work is notified to the Department - through your personal tutor, through the Assistant Dean or otherwise. The following are examples of matters that may affect your work: illness, personal or family difficulties (including illness in the family) or financial problems. In assessing your performance, the Department has a policy of trying to compensate for difficulties you have encountered whilst studying. We can only do this if we are notified of difficulties and have some idea of their extent.

5. Student Progress

Work and Attendance. The University regulations governing the Work and Attendance of students are given in the Student Guide 2001/2002. Full attendance is required at 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 registers kept. Please note that the expectation is that students will be required to undertake approximately thirty six hours per week of study i.e. an average of two hours private study will be required for every scheduled hour of lectures, laboratories etc. and some students may require much more time than this. *Being a student is a full time occupation!* Absence for holidays is not permitted in term-time. The experience of the Department confirms that lack of attendance leads to study problems and any student with problems should consult his/her subject tutors or personal tutor. In addition, failure to attend can result ultimately in refusal by the University to allow a student to sit in the degree examinations. 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 unit, is greater than 15% (or 20% for student representing the University in sportive or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is excluded from that course unit. 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. Direct approaches by lecturer to solve the problem are as follows: He may choose to issue an "informal" warning, which has a precisely defined format and permits recovery of the situation. If this is unsatisfactory, a "formal" warning is issued. This is again of a precisely defined format. Failure to recover the situation at this stage leads to an exclusion from the course. A copy of this correspondence is held in a student's file.

6. Interruption of Degree Program

Any interruption (taking at most 2 years) of your degree program requires special permission from Faculty. Regulations state that a B.Sc. degree is a continuous 4-year period of study. Permission will only be granted if satisfactory reasons are given. A written case with supporting evidence must be presented to Faculty. Reasons might include prolonged illness. Consult your tutor for advice.

7. Transfer between Departments

- If you are contemplating any change of Faculty or Department, consult your primary tutor as soon as possible.
- You can change your Department by filling a special form at the beginning of the semester. It is only required that the Tawjihi average imposed in the new faculty or department must be less than or equal to your Tawjihi average. A specialized committee will decide what courses will be retained from your actual Department.

8. Withdrawal from Modules

If you are contemplating withdrawing from a module, please discuss the situation with your personal tutor at the earliest opportunity.

- You can withdraw a module at most during the thirteenth week of the first or second term, and at most during the seventh week of the summer term.
- The minimal number of modules (which is 9) required in each term should be followed.

V. Organization of Teaching

An individual course of lectures is known as a "**course unit**" or sometimes as a "**module**".
The curriculum contains modules that are from University Requirements (Univ. Reqts.), Faculty Requirements (Fac. Reqts.), and Department Requirements (Dept. Reqts.). Each module has 3 credit hours per week. However, some modules are supported by tutorials and some continuous assessment, such as seminars or laboratory work, usually amounting to 1 hour per week. When you register for course units, you should follow the academic guidance plan that the Department arranges for you. In fact, you can register on any module only if you have taken its prerequisite(s) with the exception that you can register on the module and its prerequisite only if you are in the graduation semester.
In each semester, you can register for at least 12 credit hours and at most 18 credit hours, except for the semester in which you are expected to graduate when you can register for 21 hours. The complete four years academic guidance plan is listed in **Appendix A** of this Handbook. For more information about module numbering and full module descriptions, see **Appendix B** of this Handbook.

In the **First Year**, you are encouraged to take 18 credit hours in each semester (first and second, the summer term is not taken into account). The fourth digit of each course unit code (see **Appendix B**) tells you the year in which the course is offered. During each 15 weeks semester, students will normally attend 6 modules. Thus, each teaching week contains 18 hours or more of scheduled work. In addition, each scheduled hour typically requires two extra hours of unscheduled work (e.g. writing up lecture notes, preparing for a tutorial, finishing off a laboratory exercise etc.). The selection of a University elective module (one module) depends upon your choice. **Five** of the 12 modules of the first year are from the University requirements, **three** from the Faculty requirements, **two** from the support requirements, and **two** from the Department requirements.

In the **Second Year,** the number and size of modules is similar to that of the first year. **One** of the 12 modules of the second year are from the University requirements, **two** from the Faculty requirements, **one** from the support requirements, and **eight** from the Department requirements.

Meanwhile, in the **Third Year,** you should take six modules in the first semster and five modules in the second semester. **Nine** modules are from the compulsory Department Requirements, **one** module from the University requirements and **one** module form the Faculty requirements. One of the compulsory modules is the **Practical Training module**, which consists of realizing a supervised training in an industrial organization, or using distance online training. You should take this module in the first semester.

In the **Fourth Year,** you should take nine modules in this year. In the first semester, you must select one departmental elective module, three compulsory modules that are all from the Department requirements, and one module from the Fcaulty requirements. In the second semester, you must take the Graduation Project module, **one** departmental elective module, **one** University elective module, and **one** free module from any department in the University.

VI. Course Unit Choices

You may choose a course unit (module) if you have already taken all its prerequisite modules and your personal tutor must supervise this choice.

An initial choice is made before or at Departmental Registration. After that, changes can be made as follows:
- The deadline for changing modules in each semester is one week after lectures start (three days for summer semester). Normally, no changes of modules will be permitted after these dates except for the withdrawal mentioned in point (8) of the previous section.

- In the first instance, you should discuss any plan to change modules with your primary tutor. You must check that the new module you wish to take is a valid option for your degree program and find out if there are likely to be any timetable problems. If there are timetable clashes this will probably prevent you from changing module.

VII. Assessment and Examinations

1. Criteria for Assessing Examination Work

First class (90 – 100 marks). First class answers demonstrate depth of knowledge or problem solving skills, which is beyond that expected from a careful and conscientious understanding of the lecture material. Answers will show that the student
1. has a comprehensive knowledge of a topic (often beyond that covered directly in the program) with an absence of misunderstandings;
2. is able to apply critical analysis and evaluation;
3. can solve unfamiliar problems not drawn directly from lecture material and can adjust problem solving procedures as appropriate to the problem;
4. can set out reasoning and explanation in a logical, incisive and literate style.

Upper Second class (80 – 89 marks). Upper second class answers provide a clear impression of competence and show that the student
1. has a good knowledge base and understanding of all the principal subject matter in the program;
2. can solve familiar problems with ease and can make progress towards the solution of unfamiliar problems;
3. can set out reasoning and explanation in a clear and coherent manner.

Lower Second class (70 – 79 marks). Lower second class answers will address a reasonable part of the question with reasonable competence but may be partially incomplete or incorrect. The answer will provide evidence that the student:
- has a satisfactory knowledge and understanding of the principal subject matter of the program but limited to lecture material and with some errors and omissions;
- can solve familiar problems through application of standard procedures;
- can set out reasoning and explanation which, whilst lacking in directness and clarity of presentation can nevertheless be followed and readily understood.

Third Class (60 – 69 marks). Third class answers will demonstrate some relevant knowledge but may fail to answer the question directly and/or contain significant omissions or incorrect material. Nevertheless, the answer will provide evidence that the student
- has some basic knowledge and a limited understanding of the key aspects of the lecture material;
- can attempt to solve familiar problems albeit inefficiently and with limited success.

Pass (50 – 59 marks). Answers in this category represent the very minimum acceptable standard. Such answers will contain very little appropriate material, major omissions and will be poorly presented lacking in any coherent argument or understanding. However the answer will suggest that the student

- has some familiarity with the general subject area;
- whilst unable to solve problems can at least formulate a problem from information given in a sensible manner.

2. Assessment Regulations

In general, every module is assessed as follows: 50% is given for two 1-hour midterm exams, coursework and/or seminars, projects, or essays, and 50% for the final exam that may be a written exam only or a written exam plus final laboratory exam (if applicable), final small project, or seminar presentation. The 50% of the final exam is from the University regulations. The minimum pass mark is 50% for any module, whereas the minimum passing accumulated average in each semester is 60%. Students will be warned if they could not obtain average of at least 60%. In this case, students are encouraged to repeat studying those modules 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.

For the practical training module, each student should submit a technical report of his/her training, and a team of academic staff members makes several observations on the trainers' work in their place of training. Then according to the observations and the report, they assess the students.

On the other hand, a committee of three staff members, including the supervisor of the project, assesses the graduation project module. The project's assessment includes the supervisor mark (35%) and the discussion committee mark (65% given as follows: 20% for project presentation, 25% for report writing, and 20% for defendant discussion).

3. Role of Internal and External Examiners

For each module, the Department assigns a module coordinator and an internal examiner who is one of the senior staff members. If many lecturers teach the same module concurrently, they should suggest exam questions (for the first, second and final exams) and run the same exam for all sections. The main coordinator of the module will collect these questions from lecturers and select some of them to be in the exam paper.

On the other hand, external examiners validate the standard of degree program. The external examiners are expected to look at the question papers, inspect a selection of scripts and project reports (particularly those on borderlines). They supply an assessment report to the Department.

4. Appeal Procedures

If you have good reason to question a mark you have been given (in midterm exams or in coursework), you should in the first instance approach the module lecturer. If the problem is not solved, you must submit it to your primary tutor. He will find the appropriate solution with administrative structures.

Problems with final examinations are resolved by submitting complaints or appeals in writing (within three days of the announcement of examination results) to the Examination Committee of the Faculty. The examination committee will consider these cases and checks if there is any mistake in the summation of the marks and so on.

5. Unfair Practices

The University treats attempting to cheat in examinations severely. The penalty is usually more severe than a zero in the paper concerned. More than one student of this Department were dismissed from the University because of this. Plagiarism, or copying of course or lab work, is also a serious academic offense as explained in the University guidelines. In Software Engineering Department these guidelines apply also to laboratory exercises.

6. Department Guidelines on Plagiarism

1. Coursework, laboratory exercises reports and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
2. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
3. Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation

marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.

4. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.

5. Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.

6. Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

7. Plagiarism is a serious offence and will always result in imposition of a penalty. In deciding upon the penalty the Department will take into account factors such as the year of study, the extend and proportion of the work that has been plagiarized and the apparent intent of the student. The penalties that can be imposed range from a minimum of a zero mark for the work (without allowing resubmission) through caution to disciplinary measures (such as suspension or expulsion).

VIII. Teaching Quality Assurance Committee

The Departmental Teaching Quality Assurance and Enhancement Committee is responsible for the quality of teaching in the Department, including the analysis of Course Evaluation Questionnaire responses.

IX. Student Feedback and Representation

1. Staff Student Consultative Committees

Student representatives are elected onto the departmental staff student committees at the start of each term. All simultaneous sections of a module have a staff student committee. Each committee meets at least three times each semester and may discuss any matter of concern with the module. The staff members of each committee are the lecturers of the concerned sections.

2. Departmental and Deanship Meetings

The meetings, held by the head of Department and the Dean of the Faculty during term time, has mainly an advisory role, where students may raise their problems that need some concern from these authorized persons. These meeting are held separately for each year students.

3. Module Evaluation Questionnaires

The Department attaches great importance to the opinion of students on the quality of the teaching provided, and every student is asked to complete a Module Evaluation Questionnaire for each module. The questionnaires are anonymous.

X. Communications

1. Official Notices

Official notices are posted on the notice boards at the Department and at the Faculty. Electronic mail is also used extensively for communication with the Department and University. Each lecturer provides the students with his/her e-mail at the beginning of the term. Most official information including copies of this handbook, the undergraduate syllabus and timetables are available on the University Web pages www.philad.edu.jo. This includes directories of staff and students for internal use, completed with photographs.

2. Electronic Mail

Electronic mail is used widely for administrative purposes within the Department. It is frequently useful for communicating between individuals and small groups (e.g. between a tutor and his/her tutorial group), and occasionally for broadcasting important messages to wider groups. It is important that you know how to use email. It will be covered in the introductory laboratory sessions. The code of practice for computer usage covers electronic mail, please note the points below.

3. **Obscene or Offensive Mail**
   DO NOT SEND OBSCENE OR OFFENSIVE MAIL. If you receive mail, which you regard as offensive or obscene, you may wish to complain to a member of staff so that appropriate disciplinary action can be taken against the offender.

4. **Group Mailing**
   You are strongly discouraged from sending email to groups of people. The newsgroups should be used for this purpose.

5. **Miscellaneous Hints**
   - Be brief in your communications.
   - Compose your message as if ALL of your recipients were physically present.
   - Limit the distribution of messages to the people who are likely to be interested.
   - Keep a copy of the mail you send out, for future reference. Learn to use folders to keep useful messages.
   - Read all your incoming mail before replying to any of it. There may be other relevant messages for you to read.
   - Be careful when replying to messages. You probably want your reply to go only to original message sender - not to the whole of the distribution list.
   - When you reply to a message, it is frequently helpful to include some of the original message to help your recipients to remember and understand the context of the reply.

XI. Curriculum Design, Content and Organization

1. *Curriculum Design and Content*.
Students should complete 44 modules (132 credit hours) summarised as follows:

- 8 modules (University requirements)	(24 credit hours)	(18.18 %)
- 7 modules (Faculty requirements)	(21 credit hours)	(15.91 %)
- 23 modules (Departmental Compulsories)	(72 credit hours)	(52.27 %)
- 2 modules (Departmental Electives)	(12 credit hours)	(4.55 %)
- 3 modules (Supportive modules)	(9 credit hours)	(6.82 %)
- 1 module (Free unit)	(3 credit hours)	(2.27 %)

2. *Curriculum Organization.*
The curriculum is organised as it is shown in the study plan in **Appendix D**.

3. *Curriculum Characteristics*
- *Objectives of the Main University-Requirement Modules.* These requirements are to broaden the student's base for different topics such as culture, languages, and computer skills.

- *Objectives of the Main Faculty-Requirement Modules.* These requirements are to consolidate mainly the student's background in Mathematics and some other common topics. They constitute the common knowledge required for all students in the Faculty of Science.

- *Objectives of the Main Computing Modules in the Curriculum.* The modules in the curriculum are organized into three types: **introductory, intermediate**, and **advanced** modules. The curriculum is designed according to the **Imperative First Strategy** for the introductory modules. This model also focuses on programming, but emphasises the principles of object-oriented programming and Design

from the second semester of the first year. The curriculum of Intermediate modules is designed according to the **Topics-based approach**, which is the most common approach for the intermediate modules. Students take separate modules in each of the core areas enumerated below (programming fundamentals with object-oriented paradigm, Net-Centric Computing, Multimedia, Professional Practices, etc.). For the advanced modules, the Department wishes to orient such modules to its own areas of expertise*.* The advanced and elective modules contain more advanced topics in the areas of Net-Centring Computing, Multimedia, and Project and Training.

Recent methodology in programming such as object-oriented programming, software tools, and current technologies in multimedia systems and network systems are included in the curriculum.

- *Objectives of the Training and Graduation Project Modules.* The objectives of these modules are to allow students to gain practice in problem analysis, design, implementation, report writing, and presentation.

- *Elaboration on Content and Emphasis of Practical Components of Modules.* Most of the modules contain practical work that make students involved in using current software tools and computing technologies. Thus, the practical part of modules accounts for at least 25% of the total number of hours. Many laboratory assignments are given during the semester through which the students can practice what they have learned from the theoretical part of the module, or develop their skills in using most recent software tools and programming languages. For example, the practical work in "Programming Fundamentals" and "Object-Oriented Paradigm" modules emphasize on problem solving and structured and object-oriented programming via C++ language and Java language. However, the practical work in Operating System module is concerned with inter-process communication, while in Net-Centric computing it is concerned with client server applications and simulation of OSI protocols.

4. *Innovation of Curriculum.* The curriculum is constantly evolving to cope-up with new technologies and rapidly developing software. The first curriculum was designed in 1994 and updated in 1999, 2000, and 2001. This development is through regular internal monitoring and reviews, and to recent local developments in teaching and learning. For example, the Curriculum 2001/2002 is a clear specialisation in development of software and information systems that are supported by the object-oriented technology. Proceeding in this way provides a curriculum that matches the aims and objectives of the Department and the University. The Scientific Committee with the Syllabus setup committee of the Department usually recommend development and modification of curriculum.

XII. Health and Safety in the University

The University has a Health and Safety Committee, which comprises representatives of all services within the University. It is the responsibility of this committee to investigate complaints and potential hazards, to examine the cause of all accidents and to carry out periodic inspections of all areas of the Department. At registration, you will be required to assent to the departmental code of behavior, which relates to health and safety.

1. **Buildings**
   The Department comprises two kinds of buildings: the Rooms Building and the IT Laboratories.The buildings are generally open between 08.00 and 19.30 (Sunday – Thursday). In accordance with University policy, smoking is prohibited throughout all buildings.

2. **Emergency Evacuation**
   It is the responsibility of every individual to familiarize themselves with the Department's buildings and be aware of the fire exits.
   - After evacuation of any building, please assemble well away from the building, and do not block any exits.
   - Do not return to any building until authorized to do so.

3. **Fire Action**

   Fire Action notices are located at, or adjacent to, fire alarm actuation points, and all staff and students should make them acquainted with this routine.

4. **Operating the Fire Alarm**

   The manual fire alarm system can be activated by breaking the glass in the red contact boxes sited at strategic points throughout the premises.

5. **Use of Fire Appliances**

   Fire appliances are sited at strategic points throughout the Department to deal with fires. Fires should only be tackled provided there is no personal danger and after the alarm has been set off.

6. **Action when the Alarm Rings**

   On hearing the intermittent alarm, you should prepare yourself to leave the building.
   On hearing the continuous alarm, you should evacuate the building immediately by the nearest exit.

7. **Personal Difficulties**

   Please inform the Department's counselors or your tutor of any difficulties with which the Department can be of assistance.

Appendix A

The Academic Guidance Plan

in

Department of Software Engineering

2003 / 2004

Guidance Plan for the SE Curriculum
2003 / 2004

Year	Semester	Module Number	Module Title	Prerequisite	Types of Requirements
First	First (18 Credit Hours)	110101	Arabic Skills (1)	---	(UR)
		120101	English Skills (1)	---	(UR)
		710101	Computer Skills (1)	---	(UR)
		210101	Mathematics (1)	---	(FR)
		711111	Programming Fundamentals	---	(FR)
		210104	Discrete Structures	---	(SR)
	Second (18 Credit Hours)	120102	English Skills (2)	120101	(UR)
		710102	Computer Skills (2)	710101	(UR)
		760161	Fundamentals of Information Technology	710101	(FR)
		210103	Mathematics for Computing	210101	(SR)
		721112	Object-Oriented Paradigm	711111	(DR)
		721281	Introduction to Software Engineering	711111	(DR)
Second	First (18 Credit Hours)	210231	Introduction to Probability and Statistics	---	(FR)
		731151	Introduction to Information Systems	710101	(SR)
		721283	Software Requirement	721281+760261	(DR)
		760261	Database Fundamentals	(711211 or co-requisite)+210104	(DR)
		721211	Object-Oriented Data Structures	721112	(DR)
		711231	Computer Organization and Architecture	210103+760161	(DR)
	Second (18 Credit Hours)	111133	Culture and Civilization (1)	---	(UR)
		711271	Multimedia Systems	760161	(FR)
		721284	Software Design 1	721283	(DR)
		721285	Software Process and Quality	721283	(DR)
		721232	Principles of Operating Systems	711231+721211	(DR)
		750322	Design and Analysis of Algorithms	210103+721211	(DR)
Third	First (15 Credit Hours)	111100	Military Sciences	---------	(UR)
		721282	Professional Issues in Computing and Information Technology	721281 or 731151	(FR)
		721341	Fundamentals of Computer and Telecommunication Networks	760161	(DR)
		721384	Software Design 2	721284	(DR)
		721385	Software Construction and Evolution	721284	(DR)
		750351	Fundamentals of Artificial Intelligence	210104+750322	(DR)
	Second (15 Credit Hours)	711343	Concurrent and Distributed Programming	??711232??	(DR)
		721386	Software Verification and Validation	721385	(DR)
		721398	Practical Training	721384+Dept. Agmt.	(DR)
		750321	Concepts of Programming Languages	210104+721211	(DR)
		750472	Computer Modelling and Simulation	210231+721211	(DR)
Fourth	First (15 Credit Hours)	711272	WWW: Concepts and Programming	721112 or 731211	(FR)
		721471	Multimedia Software Engineering	721384+711271+711272	(DR)
		721487	Formal Methods in Software Engineering	210104+721386	(DR)
		721488	Software Management	721386	(DR)
		----------	Department Elective 1	---------	(DR)
	Second (15 Credit Hours)	-------	Free Module	---------	---
		-------	Department Elective 2	--------	(DR)
		721499	Graduation Project	721398 +Dept. Agmt.	(DR)
		---------	University Elective	--------	(UR)

(UR) University Req.   (FR) Faculty Req.   (DR) Dept. Req.   (SR) Supporting Req.

Appendix B

Outlines of Module Descriptions

2003 / 2004

I- The University Requirements and Faculty Requirements for All IT Departments

The study plans of all Departments at Faculty of Information Technology include the same University and Faculty requirements. In the University requirements, only the computer-based modules are considered here.

(A) University Requirements

710101, Computer Skills (1)

3 hours per week, 3 credit hours, prerequisite: **none**

Aims: Introduction to computer systems and practical use of software packages.

Textbook:
1- Joseph S. Akasheh et al, Introduction to Computer Science and Programming in Basic; chapter 1, chapter 10, Second Edition, 1993.
2- Robert T. Grauer et al, Exploring Microsoft Windows 98 and Essential Computing Concepts, Prentice Hall, 1998
3- Robert T. Grauer et al, Exploring Microsoft Office 97 Professional, Volume 1, Prentice Hall, 1998.

Teaching Method: 32 hours Lectures and Laboratory (2 per week) + 16 hours Example sessions (1 per week).

Synopsis: Introduction to computer systems and practical use of software packages. Introduction, MS-DOS, MS-Windows, WinWord, Excel, PowerPoint, Internet.

Assessment: Two 1-hour midterm exams (15% each); Assignments (20%); 2-hours Final Exam (50%)
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710102, Computer Skills 2

3 hours per week, 3 credit hours, prerequisite: **710101**

Aims: Introduction to visual and object-based programming, with information storing and retrieving facilities.

Textbook: Deitel and Deitel, Visual Basic, How to Program, Prentice Hall, 1999.

Teaching Method: 32 hours lectures (2 hours per week) + 16 hours laboratory (1 per week).

Synopsis: Introduction to programming, algorithms, and flow chart; introduction to visual object-based programming; data types; input/output expression; mathematical and logical functions; srings; controls structures: If, for, Do while; arrays; advanced programming applications; Introduction to Microsoft Access: files accessing, data storing in files and processing, Input Output windows and reports designing.

Assessment: Two 1-hour midterm exams (15% each); Assignments (20%); 2-hours Final Exam (50%).
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(B) Faculty Requirements

210101, Mathematics I

3 hours per week, 3 credit hours, prerequisite: **none**

Teaching Method: 32 hours Lectures (2 per week) + 16 hours Tutorials (1 per week).

Textbooks:

Synopsis:

Assessment: Two 1-hour midterm exams (15% each);   Assignments (10%);   Tutorial Contribution (10%); 2-hours Final Exam (50%).
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210231, Introduction to Probability and Statistics

3 hours per week, 3 credit hours, prerequisite: **none**

Teaching Method: 32 hours Lectures (2 per week) + 16 hours Tutorials (1 per week).

Aims:

Textbooks:

Synopsis:

Assessment: Two 1-hour midterm exams (15% each);   Assignments/Quizzes (10%);   Tutorial Contribution (10%); 2-hours Final Exam (50%).
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711111 Programming Fundamentals

4 hours per week, 3 credit hours, prerequisite: **none**

Teaching Method: 32 hours Lectures (2 per week) + 16 hours Tutorials (1 per week) + 16 hours Laboratory (1 per week).

Aims: To introduce the principles of design and imperative programming. Topics include data types, control structures, and fundamental data structures, functions. Topics also include problem-solving strategies, the concept of an algorithm. Case studies will be used to illustrate the use of language features in solving complete problems. C++ programming language is adopted as a vehicle language for implementations.

Textbooks:
1- Thomas H. Cormen, Charles E. Leiserso, Introduction to Algorithms, MIT Press and McGraw-Hill
2- Deitel & Deitel, C++ How to Program, Prentice-Hall, 2000

Synopsis: Fundamental programming constructs: Syntax and semantics of a higher-level language, variables, types, expressions, assignment, simple I/O, conditional and iterative control structures, function and parameters passing, structured decomposition. *Algorithms and problem solving:* the concept of an algorithm, properties of algorithms, implementation strategies, sequential and binary search algorithms, quadratic sorting algorithms (selection, insertion). Machine level representation of data. *Basic computability theory:* Tractable and intractable problems, the existence of non-computable functions. *Graphics:* using a graphics API. *Principles of encapsulation:* Encapsulation and information hiding, separation of behaviour and implementation (Abstract: interface, and concrete implementation).

Assessment: Two 1-hour midterm exams (15% each); Assignments (20%); 2-hours Final Exam (50%).
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711271, Multimedia Systems

3 hours per week, 3 credit hours, prerequisite: **760161**

Teaching Method: 40 hours Lectures (2-3 hours per week) + 8 hours Tutorials (1 per 2 weeks).

Aims: From this module, students will learn the art of multimedia systems concepts. The module introduces the aspects of sound, images and video with their applications in IT. Project design and assignments will be given to students to get familiar with some Macromedia applications like flash.

Textbooks:
 1- Multimedia: Ralf Steinmetz Klara Nahrsedt, Computing Communications and Applications, Prentice Hall, Third Edition, 1999.
 2- Macromedia Flash 5, Training from the source, 2001

Synopsis: Introduction to Multimedia. Media and Data Stream: Perception medium, Representation medium, Presentation medium, Storage medium, Information and exchange medium. Multimedia Application, Properties of Multimedia System, Data Stream characteristics: Traditional asynchronous and synchronous transmission, Continuous. Sound/Audio: Audio Format, Music format Using MIDI(basic, devices, messages, software), Speech format using wave (basic, devices, generation….). Image and Graphics: Digital image, Image format, Graphics format, Image processing(synthesis, analysis, Transmission). Video and Animation: Video signal representation, Computer video format, Computer based animation, Animation language, Controlling animation, Display of animation, Transmission of animation. Multimedia text, Data compression: JPEG, MPEG, DVI.

Assessment: Two 1-hour midterm exams (15% each); Project work (15%); Assignments (5%); 2-hours Final Exam (50%).
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711272, World Wide Web: Concepts and Programming

3 hours per week, 3 credit hours, prerequisite: **721112 or 731211**

Teaching Method: 18 hours Lectures (1-2 hours per week) + 8 hours Tutorials (1 per 2 week2) + 22 hours Laboratory (1-2 hours per week).

Aims: This module aims to give students, an introduction and general concepts of the Internet technology, the World Wide Web, TCP/IP and web design languages (HTML, DHTML, JavaScript, and ASP). It also involves the necessary background that student needs to develop different tasks of programming aspects concerning the foregoing objectives. Sufficient study levels are supposed to be studied and learned by the students within the course for the sake of applying the different fields of education, learning, economical, E-Business and other approaches.

Textbooks:
1- Deitel & Deitel, "Internet & World Wide Web How to Program", Prentice Hall, 2000.
2- Comer, "Computer Networks", Prentice Hall, 1999.
3- HTML for fun and profits. Prentice Hall, 1999.

Synopsis: Internet Technology: Concepts, protocols, Services, and architecture. Introduction to the Internet Technology: Internet & Intranet. TCP/IP: Architecture & Protocols (Client & Server), DNS, Internet Service Providers (ISP), Internet Services: USENET News, E-Mail, and Telnet. The Web: Basic Concepts, WWW and Web Servers, Links: Hyperlinks and Hypermedia, Web pages and home pages, Browsers and Search Engines. HTML: Basics and Programming, Introduction To markup languages, Editing HTML, HTML tags: Headers, Text Styling and Formatting, linking, and Images, Basic HTML Tables and Formatting, Basic HTML Forms, Dynamic HTML: Cascading Style Sheets. Script Languages: Introduction to Scripting, Simple JavaScript Programs. J-Script: Control Structures, if, if/else, while, for, switch, break and continue

Statements, J-Script: Functions, J-Script: Arrays. Web Servers: Basics and Programming, Introduction to Web Servers, Active Server Pages (ASP), ASP Examples. Overview of Web and Internet Tools.

Assessment: Two 1-hour midterm exams (15% each); Course work (15%); Tutorial contribution (5%); 2-hours Final Exam (50%).
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721282, Professional Issues in Computing and Information Technology

3 hours per week, 3 credit hours, prerequisite: **721281 or 731181**

Teaching Method: 32 hours Lectures (2 hours per week) + 10 hours Seminars (average 1 per week) + 4-6 hours presentations at the end of the semester (depending on the number of students in the class) where students present their work in the essays.

Aims: This module aims to give students an informed awareness of the principal issues of professional ethics and responsibility in the design, implementation and use of computer and information systems. In addition, the module aims to help in recognition of ethical problems when they occur, and to enable students to deal effectively with ethical and professional issues now and in their future careers. The module does not require a laboratory, but one group and one individual essay are required. Students are expected to spend 10 - 20 hours preparing for these essays at outside lecturer times. Students are asked at the end of the semester to present their essays.

Textbooks:
1- Ayres R., The Essence of Professional Issues in Computing. ISBN 0-13-908740-0, Prentice Hall Europe 1999.
2- Dejoie, R. et al., Ethical Issues in Information Systems. (ISBN 0-878-355-626), Boyd & Fraser 1991.
3- Bott F et al, Professional Issues in Software Engineering, 3rd Edition (ISBN 0748409513), Pitman 2000, UCL 1995 .

Synopsis: Introduction to the module, Problems of ethical decision-making, Professional Societies and their codes of conduct and practice, Professionals and Professional Behavior, Discussion of Case Studies: Describing Steps to Resolve the Current Situation, Preparing Policies and Strategies to Prevent Recurrence. Introduction to the Crawling Eye case study, Formal laws do not make for ethics, Graduate careers in the 21st century, Building the foundations to future career success, Concurrent engineering, group working and distributed enterprises, The law and contracts, Safety critical systems and legal liability, Introduction to the Killer Robot case study, A business view of contracts, IPR and copyright, IPR and patents, Computer misuse and the law, Data Protection, the Act and its implications.

Assessment: Two (1 hour) midterm exams (15% each); Assessment by individual essay (10%); Assessment by group essay (10%); 2-hours Final Exam (50%).
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760161, Fundamentals of Information Technology

3 hours per week, 3 credit hours, prerequisite: **710101**

Teaching Method: 40 hours Lectures (2-3 hours per week) + 8 hours Tutorials (1 per 2 weeks).

Aims: This module aims to introduce the fundamental and powerful roles that information technologies play in the modern global business environment, valuable insight into the strategic role of information systems in modern organizations, and insight into computing technologies such as telecommunications and computer networks, overview of the internet and intranets.

Textbook: Turban, R. K. Rainer and R. E. Potter, Introduction To Information Technology, John Wiley, 2001.

Synopsis: Business and IT: Pressure and responses, The importance of IT, What is an Information Systems. Organisations and IT support: Structure and IT support, IT support at different organization levels. Computer Hardware: The significance of hardware, CPU, Memory, Input and Output technologies. Computer Software: Software history and significance, System software, Application software. Managing Organisations Data and Information: Basics of data arrangement and access, Data bases, Logical data models. Telecommunications and Networks: Telecommunication systems, Networks, Telecommunication applications. The Internet and Intranet: The evolution and operation of the internet, Services provided by the internet, Intranet. Electronic Commerce: Foundation of electronic commerce, Consumers, Market research and customer support.

Assessment: Two 1-hour midterm exams (20% each); Assignments (5%); Tutorial contribution (5%); 2-hours Final Exam (50%).
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II- The Core Modules for All Departments in IT Faculty Except Management Information Systems Department

The four Departments: Applied Computer Science, Software Engineering, Computer Science, and Computer Information Systems have common six core modules. These are presented in this section.

711231, Computer Organization and Architecture

3 hours per week, 3 credit hours, prerequisite: **210103 + 760161**

Teaching Method: 32 hours lectures (2 hours per week) + 16 hours Tutorials (1 per week).

Aims: This module aims to introduce students with the structure of modern computer systems and emphasising on the organization of memory and control unit.

Textbook: Computer Organization and Architecture, Fifth Edition, Stallings, Prentice-Hall, 2000.

Synobsis: A hardware-oriented introduction to the structure of modern computer systems, emphasizing the role of, and interrelationships between the various components. The evolution of modern computer systems. Memory organization, peripheral devices, and their connectivity. Instruction sets, arithmetic, and central processing unit structure. Control unit organization and operation. Alternative computer architectures.

Assessment: Two midterm exams (15% each); Asignments (15%); Tutorial contribution (5%); 2-hours Final Exam (50%).
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711232, Principles of Operating Systems

3 hours per week, 3 credit hours, prerequisite: **711231 + 721211**

Teaching Method: 40 hours Lectures (2 hours per week) + 8 hours Tutorials (1 per 2 weeks).

Aims: The aim of this module is to introduce the basic principles of computer systems organization and operation; to show how hardware is controlled by program at the hardware/software interface; to outline the basic OS resource management functions: memory, file, device (I/O), process management, and OS security/protection. Two concrete examples of operating systems are used to illustrate how principles and techniques are deployed in practice.

Textbooks:
1- J. Bacon, Concurrent Systems: Database and Distributed Systems, 2nd Edition, (ISBN 0-201-177-676), Addison Wesley, 1998.
2- A. S. Tanenbaum, Modern Operating Systems, Prentice Hall, 1992.
3- Abraham Sillberschatz and Peter B. Gavlin, Operating Systems Concepts, Addison Wesley, 1994

Synopsis: Processes: Purpose of the Operating System. OS entities and functions (processes and memory), Process and Threads Management Creation / Scheduling / Termination Communication/Synchronization. The OS Kernel. Memory Systems: Hierarchical Organization. Contiguous storage allocation, Single- and multi- programming, Static and Dynamic partitioning, Segmentation, Paging. File Systems: Directory organization. File types and file organization,. File systems implementation. I/O Devices: I/O devices and interfaces; polling and interrupts. The general exception mechanism for interrupts, errors, system calls, memory management. Character and DMA interfaces. Protection and Security: Security (Threats, Authentication), Protection mechanisms (access control lists, capabilities). Case Studies: Unix, Linux and Windows 2000 Overviews.

Assessment: Two 1-hour midterm exams (15% each); Course work (15%); Tutorial contribution (5%); 2-hours Final Exam (50%).
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721112, Object-Oriented Paradigm

4 hours per week, 3 credit hours, prerequisite: **711111**

Teaching Method: 32 hours lectures (2 hours per week) + 16 hours Tutorials (1 per week) + 16 hours Laboratory (1 per week).

Aims: This module introduces the concepts of object-oriented programming for students after having a background in the procedural paradigm. It also introduces the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design by considering JAVA language. The core features of Java language will be covered and some library packages will be introduced. Design principles for human-computer interfaces will also be taught and the AWT and swing packages will be used to implement practical examples. Some advanced features of Java will be covered, such as networking and multithreading. Program design will be addressed by the use of a number of case studies in which complete programs will be developed from informal requirements expressed in English and this development will include the process of identifying objects, classes and methods. Such designs will make informal use of diagrammatic notations as required.

Textbooks:
1- Dietel and Dietel, Java How to Program, 3rd ed., Prentice Hall, 2000 (or later)
2- C. Thomas Wu: "An Introduction to Object-Oriented Programming with Java", 2nd edition, published by McGraw-Hill, 2001, ISBN 0-07-118195-4.
3- Ben Shneiderman, Designing the User Interface: Strategies for Effective Human-Computer Interaction, (3rd edition) Addison-Wesley, 1998.

Synobsis: A brief survey of programming paradigms. Object-oriented programming: Object-oriented design; encapsulation and information-hiding; separation of behaviour and implementation; classes, subclasses, and inheritance; polymorphism; class hierarchies, Fundamentals of event-driven programming. Application and applet programs. Building GUIs. Advanced case stuies: Multithreading and networking.

Assessment: Two midterm exams (15% each), Laboratory (15%), Tutorial contribution (5%), Final exam (50%).

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721211, Object-Oriented Data structures

3 hours per week, 3 credit hours, prerequisite: **721112**

Teaching Method: 32 hours lectures (2 per week) + 16 hours Tutorials (1 per week).

Aims: The choice of appropriate data structures is the key in the development of efficient algorithms. In fact, it is virtually impossible to create efficient algorithms without a good understanding of a number of fundamental data structures. In this module, each data structure (such as linked lists, stacks, queues, hash tables, binary trees, binary search trees, and graphs) is introduced with a corresponding collection classes. Excellent case studies are also included. Thus, the aims of this modules are to teach how the choice of data structures and algorithm design methods impact the performance of programs; to study specific algorithm design method: divide and conquer; and to gain experience in writing programs in any object-oriented programming language.

Textbook:
1- M. A. Wess, Data Structures and Algorithm Analysis in C++, Addison-Wesley, 1999.
2- Robert L. Kruse and Alexander J. Ryba, "Data Structure and Programming Design in C++", Prentice Hall, 1999.
3- A. Michael Berman, "Data Structure via C++", Oxford University Press, 1997.

Synopsis: Introduction to data structure: What is the data structures? data structures and algorithms,and algorithms complexity. The phases of software development: specification of the task, design of the solution, imlpementation of the solution (coding), analysis of the solution, testing and debugging, and maintenance evolution of the system. Absrtract Data type (ADT): ADT concepts, specification , implementation, application and practical works. Vector and string ADT: implementation of the vector and string ADTs. Lists. Stacks. Qeues. Trees. Hashing. Sorting (Insertion Sort, Shellsort, Heapsort, Quicksort). Graphs

Assessment: Two 1-hour midterm exams (15% each) + Assignments (20%) + 2-hours final exam (50%).

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721281, Introduction to Software Engineering

3 hours per week, 3 credit hours, Second year, First semester, prerequisite: **711111**

Teaching Method: 32 hours Lectures (2 hours per week) + 16 hours Tutorials (1 per week).

Aims: This module aims to provide students with a comprehensive introduction to software engineering (development, management, and evolution), especially with regard to system requirements engineering and critical systems, and shows how they can be applied in practical software projects. It covers the software process and software process technology, system integration, and requirement management, as well as pattern-based reuse, and legacy systems**.**

Textbooks:
1- Ian Sommerville, Software Engineering, 6th edition, Addison-Wesley, 2000
2- Pressman, Software Engineering and Practice, 1998
3- J. Poul Micheal, Software Engineering with C++ and Case Tools, Addison-Wesley, 1996

Synopsis: Software engineering principles: tool, technique, method, methodology, process. Lifecycle models; sizing, estimation, planning and control; Support techniques: object-oriented paradigm, software database, parallel and distributed programming, Requirements specification; design; implementation,

Integration and testing strategies; quality assurance; configuration management; Software maintenance; Reuse and reengineering.

Assessment: Two 1-hour midterm exams (15% each) + Assignments (15%) + Tutorial contributions (5%) + 2-hours final exam (50%).

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760261, Database Fundamentals

3 hours per week, 3 credit hours, prerequisite: **(721211 or Concurrently) + 210104**

Teaching Method: 32 hours lectures (2 hours per week) + 16 hours Laboratory (1 per week).

Aims: This module aims to provide students with an overview of database management system architectures and environments, an understanding of basic database design and implementation techniques, and practical experience of designing and building a relational database. The other aim of this module is to make students able to discuss/explain the importance of data, the difference between file management and databases. In addition, it enables students to apply conceptual design methodologies for a database and learn about architectures and environment of database management system (in particular the Ansi-Sparc model). This module requires a practical work, which is assessed by producing individual and group small projects.

Textbooks:
1- Elmasri R. and Navanthe S. B., Fundamentals of Database Systems, 3rd edition, (ISBN 0-201542633), Addison Wesley, 1999.
2- C. J. Date, An Introduction to Database Systems,

Synopsis: General introduction and database systems. Architectures: Ansi-Sparc model of databases, components of a database management system, DBMS functions schemas, levels of abstraction and mappings, role of the data dictionary, client-server systems, PC based systems, database servers, distributed systems. General database design: Design framework, mappings between abstractions, integrity, compromises, data vs functional design, non-functional considerations e.g. performance, volumes, user interface etc, security. Conceptual design: Requirement for conceptual design, Extended Entity Relationship model, object-oriented design. Logical design: The relational model, normalization, relational algebra, SQL, mapping conceptual design to relational, integrity, views, embedded SQL, PL/SQL, triggers. Relational databases: Mapping conceptual schema to a relational schema; entity and referential integrity; relational algebra and relational calculus. Database query languages: Overview of database languages; SQL; query optimization. Relational database design: Database design; functional dependency; normal forms; multivalued dependency; join dependency; representation theory. Physical design: Clustering, indexes, performance considerations. Transaction processing: Transactions, Concurrency techniques (locking, 2-phase locking, serialisability), recovery (rollback and commit, 2-phase commit), Transaction Processing Management Systems. Introduction to distributed databases: Distributed data storage; distributed query processing; distributed transaction model; concurrency control; homogeneous and heterogeneous solutions; client-server. Physical database design: Storage and file structure; indexed files; hashed files; signature files; b-trees; files with dense index; files with variable length records; database efficiency and tuning.

Assessment: Two 1-hour midterm exams (15% each) + Labwork and Assignments (20%) + 2-hours Final Exam (50%).

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III- The Department's Major and Supplementary Requirements

(a) Supplementary Requirements

210103, Mathematics for Computing

3 hours per week, 3 credit hours, prerequisite: **210101**

Teaching Method: 32 hours Lectures (2 hours per week) + 16 hours Tutorials (1 per week).

Aims:

Textbook:

Synopsis:

Assessment: Two 1-hour midterm exams (15% each); Assignments (10%); Tutorial Contribution (10%); 2-hours Final Exam (50%).
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210104, Discrete Mathematics

3 hours per week, 3 credit hours, prerequisite: **none**

Teaching Method: 32 hours Lectures (2 hours per week) + 16 hours Tutorials (1 per week).

Aims: This module aims to present the computer mathematics and its application in different computing areas.

Textbook: J.K. Trust, Discrete Mathematics for Computer Scientists, Addison Wesley, latest Edition.

Synopsis: Number Systems, Logic, Sets and Relations, Counting techniques, Recurrence relations, Introduction to graph, Mathematical induction and Modular arithmetic

Assessment: Two 1-hour midterm exams (15% each); Assignments (10%); Tutorial Contribution (10%); 2-hours Final Exam (50%).
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(b) Department Requirements

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721398, Practical Training

3 hours per week, 3 credit hours, prerequisite: 721281 + Department Agreement (student can take this module on completing 75 credit hours at least).

Aims: The main aim of this module is that students will have practice in different industrial, commercial, administrative enterprises or companies. By this module, students may apply, in the real world, what they have learned during the first three years of their study in the University. The module also aims to teach students how to be self-confident when they face problems in their practical life.

Duration: At least 9 weeks (18 training hours per week at least). This may be distributed onto two semesters at most.

Regulations for Training: Students who register on practical training module should not register on modules with total credit hours more than 15 hours per week including the training module itself. Students must, therefore, be full-time trainees for at least 2 days per week. Students should arrange their timetable for other modules in a way that enables them to enrol in the pre-specified enterprise or company at least two days per week during the semester period.

Assessment: A committee from the Department supervises the students along their training period, where one supervisor is assigned on one group of students. The student should submit a technical report to this committee in 2 weeks time after completing the training session. In addition, the trainer body presents a report to the committee. The grade "pass" is given to students who complete the training requirements successfully and discuss their reports with the supervision committee.

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721499, Graduation Project

3 credit hours, prerequisite: **711398 + Department Agreement**

General Descriptions:
The graduation project consists of a single project on which the student works over a period of 16 weeks that can be extended to 32 weeks (2 semesters). It is assumed that the student spends a nominal 192 hours (or 384 hours), the equivalent of 12 hours per week, working on this. There are three deliverables: demonstration, discussion, and a written report.
A student works under the supervision of a member of staff, the Supervisor. Most of the projects involve three students working together on the same project; apart from these, all students do different projects.

Aims: The aims for the project work done in the fourth year are:
1- To manage and execute a substantial project in a limited time.
2- To identify and learn whatever new skills are needed to complete the project.
3- To apply design and engineering skills in the accomplishment of a single task. In this context the skills mentioned may be in the general area of design and engineering in its broadest sense, or may be very specifically related to particular tools.

Textbook: C. W. Dawson, The Essence of Computing Projects, A Student's Guide. ISBN 0-13-021972-X. Prentice Hall 2000.
The projects list and notes for guidance in carrying out a project are available in the Graduation Project Committee.

Assessment: Supervisor mark: 35%; Project Examination Committee mark: 65% (demonstration 20%, Report 25%, discussion 20%).

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(c) Elective Modules

721491, Special Topics

3 hours per week, 3 credit hours, prerequisite: **Department Agreement**

Teaching Method: 48 hours Lectures (2 hours per week) OR depending on the topic to be taught.

Aims: This module provides students with new trends in Information Technology.

Textbook: Depends on the topic

Assessment: Two 1-hour midterm exams (15% each); Assignments (20%); 2-hours Final Exam (50%).

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Appendix C

Study Plan

of

Software Engineering Curriculum

2003 / 2004

PHILADELPHIA UNIVERSITY
(Private Accredited University)

Study Plan for Bachelor Degree
(Software Engineering)
(132) Credit Hours

Faculty of Information Technology
Software Engineering Department
2003-2004

First: University Requirements: 24 Credit Hours
1. University Compulsory
- 21 credit hours for Jordanians
- 18 credit hours for Non-Jordanians

Course No.	Course Name	Cr.	Pre-req.
111100	Military Science **	3	-
110101	Arabic Skills (1)	3	-
120101	English (1)	3	-
120102	English (2)	3	120101
111133	Culture and Civilization (1)	3	-
710101	Computer Skills (1) *	3	-
710102	Computer Skills (2) *	3	710101

2. University Electives
- 3 credit hours for Jordanians
- 6 credit hours for Non-Jordanians

110102	Arabic Skills (2)	3	-
111111	Introduction to Sociology	3	-
111112	Introduction to Psychology	3	-
111113	Principles of Logic	3	-
111121	Issues in Contemporary Thoughts	3	-
111135	Culture and Civilization (2)	3	-
111141	History of Science	3	-
111142	Communication & Society	3	-
111153	Science and Society	3	-
111195	Physical Education	3	-
120103	Foreign Language	3	-
130110	Quranic Studies	3	-
180473	History of World Art	3	-
210152	Nutrition	3	-
240151	Man and Environment	3	-
330101	Introduction to Management	3	-
330102	Administration in Islam	3	-
340101	Principles of Macroeconomics	3	-
340104	Fundamentals of Islamic Economics	3	-
420150	Human Rights	3	-
620105	Automobile Essentials	3	-

Second: Faculty Requirements: 21 Credit Hours

210101	Mathematics (1)	3	--
210231	Introduction to Probability and Statistics	3	-
711111	Programming Fundamentals *	3	-
711271	Multimedia Systems *	3	760161
711272	World Wide Web: Concepts and Programming *	3	721112 or 731211
721282	Professional Issues in Computing and Information Technology	3	721281 or 731151
760161	Fundamentals of Information Technology	3	710101

Third: Supplementary Requirements: 9 Credit Hours

210103	Mathematics for Computing	3	210101
210104	Discrete Structures	3	--
731151	Introduction to Information Systems	3	710101

Fourth: Major Requirements: 75 Credit Hours
1. Compulsory Modules: 69 Credit Hours

721231	Computer Organization and Architecture *	3	210103+760161
721232	Principles of Operating Systems *	3	711231+721211
711343	Concurrent and Distributed Programming *	3	711232
721112	Object Oriented Paradigm *	3	711111
721211	Object Oriented Data Structures *	3	721112
721281	Introduction to Software Engineering *	3	711111
721283	Software Requirement *	3	721281+760261
721284	Software Design I *	3	721283
721285	Software Process and Quality	3	721283
721341	Fundamentals of Computer and Telecommunication Networks	3	760161
721384	Software Design II *	3	721284
721385	Software Construction and Evolution *	3	721284
721386	Software Verification and Validation *	3	721385
721398	Practical Training	3	721384+ Dept. Agrmt.
721471	Multimedia Software Engineering *	3	721384+711271 +711272
721487	Formal Methods in Software Engineering *	3	210104+721386
721488	Software Management *	3	721386
721499	Graduation Project	3	721398+ Dept. Agmt.
750321	Concepts of Programming Languages *	3	210104+721211
750322	Design and Analysis of Algorithms	3	210103+721211
750351	Fundamentals of Artificial Intelligence	3	210104+750322
750472	Computer Modeling and Simulation *	3	210231+721211
760261	Database Fundamentals *	3	(721211 or co-requisite) + 210104

2. Elective Modules: 6 Credit Hours

711471	Graphical User Interface *	3	721211+721281
721472	Financial and E-Commerce Systems Development *	3	721384+760161
721473	Embedded and Real Time Systems Design *	3	721384+711343
721475	Telecommunication Software Design *	3	721341+721384
721476	Information Systems Analysis and Design *	3	731151+721384
721477	Intelligent Systems Design *	3	750351+721384
721478	CASE Tools Development *	3	721384
721479	Software Reengineering Techniques *		721384

Fifth: Free Modules: 3 Credit Hours   Department Agreement

*   Modules include practical work of at least 25% of their total weight.

** Military Sciences is compulsory module for Jordanian students and