NATIONAL AVIATION UNIVERSITY
Computer Technologies Institute
Computer Science Faculty
Software Engineering Department

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"Approved"
Deputy Rector for Academics

_____A.Polukhin
"_____"_____20__

SYLLABUS
of the discipline
"Professional practice of software engineering"
(according to ECTS)

Branch: 6.050103 - "Software Engineering"

Year	– 3	Semester – 5
Lectures	– 34	Differentiated test – 5 semester
Laboratory works	– 17	
Self study	– 39	
Total	– 90	

Kyiv – 2009

Syllabus is based on the Curriculum № РБ – 4 – 103 – а / 08 branch 6.050103 – “Software Engineering”, academic program of the discipline « Professional practice of software engineering » index Н – 4 – 6.050103 – 37 approved of “___”_____ 20__, “Provisional regulations on training according to ECTS (within the pedagogical experiment) and “Provisional Regulations on the assessment grading system” approved by the Rector of the University (order № 122 of 15.06.2004).

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Discussed at the meeting of the Software Engineering Department, Minutes № __ of _____ 20__

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INTRODUCTION

The syllabus on each discipline is a must for successful teaching process organization according to the European Credit Transfer System. Teachers and students are to be familiarized with it. Grading system is an integral part of the syllabus and provides for assessment of student's knowledge and skills during current, module and semester checks.

Grading procedure is performed according to national grading scale and European Credit Transfer System grading scale.

1. REFERENCE NOTES

1.1. Aim of the discipline

The purpose of teaching discipline is to teach students skills relevant fundamental theoretical basis of the professional activities in software development, practical skills of professional activity in conditions close to real.

1.2. Tasks for the discipline study

The main tasks for the discipline study are to provide students with theoretical knowledge of the principles, culture and professional ethics, and standards, environmental protection and relevant legislation relating to the development and maintenance of software, the skills of ethical decision-making on understanding the effect with which the decision cast on society, economy, social environment, customers, management, partners.

1.3. The discipline position in the curriculum system

Academic discipline is arming the software engineer software the theoretical knowledge and practical skills enable professionals to develop software to conduct a comprehensive software development, maintenance and updating it on a professional level.

1.4. Integrated requirements concerning the discipline skills

As the result of mastering the discipline a student should:

Know:

- basis of engineering software history;
- theoretical basis of decision-making in professional activities and accompanied software development;
- role of standards and a set of knowledge that can detect standards;
- ethical principles of professional activity;
- principles of professional group activities.

Be able to:

- make ethical decisions with reference to general ethical principles and code of ethics in software engineering;
- explain and apply laws;
- apply the standards to create and accompanied the software;
- develop and maintain software as part of professional team;
- create a project to test the work items;
- profile the application;
- analyze project status through reports;
- plan deployment of the system;
- assess the quality of software products.

1.5. Integrated requirements concerning the modules skills

The material for the course is structured according to a module principle and consists of one module.

1.5.1. As a result of mastering the material of the module №1 “Professional practice” the student should:

KNOW:

- basis of software engineering history;
- standards of software engineering;
- professional principles of software engineering development.

BE ABLE TO:

- develop software in team;
- build reports in a process of software developing.

1.6. Interdisciplinary connections of the discipline

The discipline is based on the knowledge and practical skills in the disciplines such as: "Fundamentals of Programming", "Object-oriented programming", “Group Dynamics and Communication”, "Introduction to Software Engineering”.

2. THE DISCIPLINE CONTENT

2.1. Topical plan of the discipline

Module № 1 “Professional practice”					
№	Topic	Total	Lectures	Laboratories	Self study
1.1	Software engineering history	6	4	-	2
1.2	Standards and software quality assurance	14	4	4	6
1.3	Professionalism	14	4	4	6
1.4	Professional practice. Processes	24	10	4	10
1.5	Professional practice. Artifacts	27	12	4	11
1.6	Module Test № 1	5	-	1	4
Total for module № 1		**90**	**34**	**17**	**39**
Total for the discipline		**90**	**34**	**17**	**39**

2.2. Development of didactic process for types of classes

2.2.1. Lectures, their subject matters and volume

N	Topics	Volume of training sessions (hours)	
		Lectures	Self study
Module № 1 “Professional practice”			
1.1	Historical aspects of software engineering	2	1
1.2	Development of software engineering in the Soviet Union and Ukraine	2	1
1.3	Standards of software development, maintenance and support	2	1
1.4	Culture of quality in process of software development	2	1
1.5	Accreditation, certification and licensing of software engineers	2	1
1.6	Professional experience in the software industry, the principles of professionalism	2	1
1.7	Choosing a Process Template in software development	2	2
1.8	Processes/ phases of software development	2	1
1.9	Envision. Plan	2	1
1.10	Build. Stabilize. Deploy.	2	1
1.11	Operational Management. Governance.	2	1
1.12	Artifacts	2	1
1.13	Dashboards	2	1
1.14	Workbooks	2	1
1.15	Reports in process of software development	2	2
1.16	Team roles in process of software development	2	1
1.1.7	Meetings in software development process	2	1
Total for module № 1		**34**	**19**
Total for the discipline		**34**	**19**

2.2.2. Laboratories, their subject matters and volume.

№	Topic	Classes volume, hours.	
		Laboratories	Self study
1	щ 2	3	4
Module № 1 “Professional practice”			
1.1	Research of work items, scenarios, tasks and bugs usage in software development	4	4
1.2	Work with queries. Build creation.	4	4
1.3	Discovery of version control in Team Foundation Server	4	4
1.4	The analysis of the project through reports, code analysis, profiling application	4	4
1.5	Module test №1	1	4
	Total for module № 1	**17**	**20**
	Total for the discipline	**17**	**20**

2.2.3. Self studying and testing

№ week	Self study (SS) topical content	SS	Control	№ of the week controlled
1	2	3	4	5
1	To work on the material of lecture № 1.1	1	CC	1
1	Preparation for the laboratory class № 1.1	2	CC	3
2	To work on the material of lecture № 1.2	1	CC	2
3	To work on the material of lecture № 1.3	1	CC	3
3	Preparation for the laboratory class № 1.1	2	CC	3
4	To work on the material of lecture № 1.4	1	CC	4
5	To work on the material of lecture № 1.5	1	CC	5
5	Preparation for the laboratory class №1.2	2	CC	5
6	To work on the material of lecture № 1.6	1	CC	6
7	To work on the material of lecture № 1.7	2	CC	7
7	Preparation for the laboratory class № 1.2	2	CC	7
8	To work on the material of lecture № 1.8	1	CC	8
9	To work on the material of lecture № 1.9	1	CC	9
9	Preparation for the laboratory class № 1.3	2	CC	9
10	To work on the material of lecture № 1.10	1	CC	10
11	To work on the material of lecture № 1.11	1	CC	11
11	Preparation for the laboratory class № 1.3	2	CC	11

1	2	3	4	5
12	To work on the material of lecture № 1.12	1	CC	12
13	To work on the material of lecture № 1.13	1	CC	13
13	Preparation for the laboratory class № 1.4	2	CC	13
14	To work on the material of lecture № 1.14	1	CC	14
15	To work on the material of lecture № 1.15	2	CC	15
15	Preparation for the laboratory class № 1.4	2	CC	15
16	To work on the material of lecture № 1.16	1	CC	16
17	To work on the material of lecture № 1.17	1	CC	17
17	**Preparation for the module test №1**	**4**	**MC**	**17**
Total		**56**	**56**	

3. TEACHING METODICAL MATERIALS FOR DISCIPLINE

3.1. The main and secondary literature

Main literature

3.1.1. M.O. Sidorov. Software engineering: lecture Course.- K. NAU. 2007.- 140 p.
3.1.2. М.О. Сидоров. Вступ до програмної інженерії: конспект лекцій. – К.: НАУ, 2009.- 130с.
3.1.3. K.Wiegers Creating a software engineering culture // Dorset House Publ.- New York, 2003.- 358 p.
3.1.4. И. Саммервил. Инженерия программного обеспечения.- М.: Вильямс, 2002.- 620 с.

Secondary literature

3.1.7. Буч Г. Объектно-ориентированное проектирование с примерами применения. Пер. с англ. – М.: Конкорд, 1992, - 406 с.
3.1.8.MSF for Agile Development 5.0 http://msdn.microsoft.com/en-us/library.aspx
3.1.9. MSDN library http://msdn.microsoft.com/en-us/default.aspx

4. STUDENTS' KNOWLEDGE AND SKILLS GRADING SYSTEM

4.1. Basic Terms, Concepts, Definitions

4.1.1. **Semester Differentiated Test** is a form of final check of how well a student has mastered both theoretical and practical material in a given subject during a semester.

Written examination is held during the examination period in the presence of a board of examiners headed by the chief of the department in accordance with the established time-table.

4.1.2. **ECTS system** is a model of academic process organization based on a combination of two constituents: module technology of training and credits (Test Units) and covers the content, forms and facilities of academic process, forms of checking students' knowledge and skills quality as well as academic activity of students both in class and outside it (i.e. self-study). The ECTS system aims at making students work on a systematic basis during the semester in view of their future professional success.

4.1.3. **A module** is a logically complete, relatively independent integral part of a training course, a set of theoretical and laboratory tasks of relevant content and structure with an elaborated system of methodical, educative, individual and technological support, a necessary component of which is an appropriate form of grading.

4.1.4. **A credit (test unit)** is a single unit of measuring work done by students both in class and outside it (Academic Load) which is equivalent to 36 working hours.

4.1.5. A grade is a quantitative measuring unit of students' learning outcomes assessment, based on a multi-value scale as they perform their pre-assigned set of academic tasks.

4.1.6. **The ECTS grading system** is a system of measuring the quality of all types of classroom and self-study work done by students as well as the level of their knowledge and skills by assessing them in values according to the 100-value scale with further transfer of these values into the national scale and the ECTS scale.

The grading system envisages the use of the following grades: the current module grade, the module test grade, the total module grade, the semester module grade, the examination grade and the total semester grade.

4.1.6.1. **The current module grade** consists of values which a student gets for a certain kind of academic work in mastering a given module, i.e. doing and defending his/her individual tasks at laboratory classes.

4.1.6.2. **The module test grade** is determined in values and in national scale grades as a result of doing the module test.

4.1.6.3. **The total module grade** is determined in values and in national scale grades as the sum of the current module grade and test module grade.

4.1.6.4. **The semester module grade** is determined in values and in national scale grades as the sum of the total module grades obtained after studying the material of all the modules within a semester.

4.1.6.5. **The examination grade** is determined in values and in national scale grades in the result of carrying out the examination tasks.

4.1.6.6. **The total semester grade** is determined as the sum of the semester module grade and the examination/differentiated test grade in values, national scale grades and ECTS scale grades.

The total grade in a discipline taught during a few semesters is determined as the average of the total semester grades in values with its further transfer into the national scale and the ECTS scale. The total grade in a discipline is entered into the Appendix to the Specialist's diploma.

4.2. Grading Scale for Students' Learning Outcomes Assessment

4.2.1. Grading of different kinds of academic work performed by a student is done in accordance with Table 4.1.

Table 4.1

Module №1		Max Grade
Kind of Academic Work	Max Grade	
Performance of lab №1.1	17	
Performance of lab №1.2	17	
Performance of lab №1.3	17	
Performance of lab №1.4	17	
Module Test №1	20	
Total Module Grade №1	**88**	
Semester Differentiated Test		**12**
Total for discipline		**100**

4.2.2. Executed training work is credited to a student if he has received a positive mark for this work in national scale under the table 4.2.

4.2.3. Additional grades (two grades for module №1 for each kind of work) may be awarded to a student for other kinds of academic work he/she has done within the given module.

Table 4.2

Correspondence between Grade Values in different types of work and the National Scale

Grade Value		National Scale
Execution and defence of laboratory work (module №1)	Module Test (module №1)	
15-17	18-20	excellent
13-14	15-17	good
10-12	12-14	satisfactory
under 10	under 12	bad

4.2.4. The grades a student has been given for the different kinds of academic work are summed up and the result constituting a Current Module Grade is entered into the Module Grade Register.

4.2.5. If a student has successfully done all kinds of academic work within the given module and has got a positive Current Module Grade – not less than satisfactory according to the national scale, he/she is allowed to take his/her module test.

4.2.6. Students have their module test in a written form. The procedure, which lasts up to two academic hours, is held by a commission headed by the head of the department responsible for the discipline.

4.2.7. The Current Module Grade and the Module Test Grade together make up a Total Module Grade whose correspondence to the National Scale is shown in Table 4.3.

Table 4.3

Correspondence between Total Module Grade Values and the National Scale

Total Module №1 Grade Values	National Scale
79-88	excellent
66-78	good
53-65	satisfactory
under 53	bad

4.2.8. A student is considered to have passed the module if both his/her Current Module Grade and Module Test Grade are positive, i.e. higher than ‘bad’ according to the national scale (Table 4.2), which yields a positive Total Module Grade (Table 4.3).

4.2.9. If a student has missed the module test due to any reason (being ill, debarred, etc.), the entry ‘absent’ is made against his/her name in the column ‘Module Test Grade’ and the entry ‘unclassified’ – in the column ‘Total Module Grade’.

If the Module Test Grade is “bad”, it shall not to be added to the Current Module Grade, and the student is considered to have failed this module. Otherwise he/she is considered as having an academic incomplete.

Further testing the student in this module is done in accordance with the established procedure.

4.2.10. If the Module Test Grade is “bad”, it shall not to be added to the Current Module Grade, and the student is considered to have failed this module.

4.2.11. A Module Test Grade that a student can be given after the second testing cannot be higher than ‘good’ according to the national scale, i.e. the grade value presented in Table 4.2 is reduced by 3 for the module №1.

4.2.12. A student is not allowed to increase his/her positive Total Module Grade by taking a repetitive test.

4.2.13. The Semester Module Grade is calculated as the sum of the Total Module Grades. The correspondence between Semester Module Grade values and the National Scale is given in Table 4.4.

Table 4.4

Correspondence between Semester Module Grade Values and the National Scale

Semester Grade Values	National Scale
79-88	excellent
66-78	good
53-65	satisfactory
under 53	bad

Table 4.5

Correspondence between Examination Grade Values and the National Scale

Semester Grade Values	National Scale
11-12	excellent
9-10	good
7-8	satisfactory
under 7	bad

4.2.14. The Semester Module Grade and the Examination Grade together make up a Total Semester Grade whose correspondence to the National Scale and the ECTS Scale is shown in Table 4.6.

Table 4.6

Correspondence of Total Semester Grades to the National Scale and the ECTS Scale

Total Semester Grade Values	National Scale	ECTS Scale	
		Grade	Explanation
90-100	Excellent	A	Excellent (excellent performance with insignificant shortcomings)
82 – 89	Good	B	Very Good (performance above the average standard with a few mistakes)
75 – 81		C	Good (good performance altogether with a certain number of significant mistakes)
67 – 74	Satisfactory	D	Satisfactory (performance meets the average standards)
60 – 66		E	Sufficient (performance meets the minimal criteria)
35 – 59	Bad	FX	Bad (bad performance; a second testing is required)
1 – 34		F	Bad (very bad performance; a student shall retake the course)

4.2.15. The Total Semester Grade in a semester with a differentiated test at its end (5 semester in our case) is equal to the sum of the Semester Module Grade and the minimal Examination Grade established for each category of Semester Module Grades (11 for “Excellent”, 9 for “Good, and 7 for “Satisfactory”).

4.2.16. Reexamination of not ‘bad’ Total Semester Grade is not allowed.

4.2.17. The Total Semester Grade is entered into the Examination Register and into a student’s record book in values, National Scale grades, and ECTS Scale grades.

4.2.18. Total Semester Grade is recorded into the student’s record book and student’s card, for example, 92/excellent/A, 87/good/B, 79/good/C, 68/satisfactory/D, 65/satisfactory/E etc.