**General Information:**

**Name of Course: Foundation of Informatics**

**Course Code: IVB183AN**

**Semester: 1**st

**Number of Credits:** 3

**Allotment of Hours per Week:** 2 lectures, 1 practice per week

**Evaluation:** Term grade

**Prerequisites:** [none]

**Course responsible: Zsolt SCHÄFFER**

**Instructors: Zsolt SCHÄFFER, contracted lecturer**

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**Introduction, Learning Outcomes**

The goal of the course is to provide an introduction in how computer hardware and software works. The students attending the course get an insight into computer history, the logic and physical build of a computer, a preparation for the Computer Architectures and Operating Systems course. In the second part of the course students will gain the necessary skills to use office applications for preparing their project works, reports and presentations, as needed for completing other subjects during their studies.

**The objectives of this course**

This lecture and practice-based course aims to give computer science engineering students a solid basis in information technology terminology and practical knowledge about general computer use through covering the following topics:

* Computer and computer science history
* Logical build of a computer and computer buses
* The structure and operating principles of a CPU
* Physical build of computers, various hardware components
* Operating system principles and the boot process
* Computer viruses and malware
* Windows user interface. File-, service-, program- and disk management basics
* Word or equivalent document processor
* Excel or equivalent spreadsheet editor
* PowerPoint or equivalent slideshow presenter

**Methodology:**

The presentations give an explanation of listed topics with detailed theoretical knowledge. Practices include putting an operational PC together from real components, installing an operating system and gaining experience in office applications by following an instructor lead practice and self-processing practice tasks.

**Schedule:**

Study period in 15 weeks: September - December

1. Lecture: Introduction to the lab environment. Orientation, requirements.  
   Practice: Test for measuring knowledge of entering students.
2. Lecture: Information, IT, computer science. Computer history.  
   Practice: Numeric representation, number systems, Boolean algebra.
3. Lecture: The logic build of a computer, buses, signal. Endianness, bitness. Harvard vs. Neumann architecture.   
   Practice: CPU instruction classes, machine code, assembly examples. Microcode.
4. Lecture: The structure of a CPU, flags, registers. Memory hierarchy. DMA, IRQ.  
   Practice: Pipelining, hyperthreading, comparison of superscalar and SMP computers.
5. Lecture: Hardware components: DRAM and SRAM, classification of memories and storage devices. Classification of computers. CPUs, MCUs, SoCs.  
   Practice: PC build/maintenance practice.
6. Lecture: Hardware components: System boards, CPU sockets, north and south bridge. Matching logical and physical components of a computer.   
   Practice: PC build/maintenance practice.
7. Lecture: Hardware components: Magnetic storage devices, flash and optical storage, principles, formats. Printers, plotters, display devices. Networking hardware. Cases, power supplies, and cooling solutions.  
   Practice: PC build/maintenance practice.
8. Lecture: Operating systems, system calls. Partitions, file systems. BIOS vs UEFI, the boot process. Viruses and malware.  
   Practice: Installation of an operating system
9. Autumn break
10. Lecture: Windows basics, user accounts and profiles, UAC. Windows user interface.  
    Practice: Mid-term test on theoretical knowledge (in writing).
11. Lecture: File-, disk-, service-, software- and device management.  
    Practice: Control Panel, Service manager, Device manager, Task manager. File management on the command line, in Explorer and with Total Commander.
12. Lecture: Office, Word terminology. The ribbon bars. File formats. Paragraph and character formatting, styles. Making selections.  
    Practice: Instructor lead practice about document processing.
13. Lecture: Excel terminology, database vs. spreadsheet. Cell addressing, formatting. Diagram wizard. Mathematical, statistical, string, query functions, date arithmetic.   
    Practice: Instructor lead practice about working and programming spreadsheets.
14. Lecture: Slideshow presentations with PowerPoint. Animations, interactions, timing. Slide templates. Importing objects from Excel and Word.  
    Practice: Instructor lead practice on creating slideshow presentations.
15. End of term office applications skill test (in practice in computer lab). Retake for Mid-term test on theoretical knowledge (if needed).

Correction period: First two weeks of the exam period.

**Attendance:**

Attending at least 70% of all classes is required. Attendance will not impact the grade. Absence from more than 30% of classroom lectures/practices will conclude to failing the subject without any further conditions. Presence is defined as being in the classroom at the beginning of class and staying until the scheduled end of the lesson. Tardiness of more than 10 minutes will be counted as an absence. In case of illness, family emergency or any other valid excuse, the student must present proof, such as a doctor's note.

**Behavior and self-conduct:** Any activity that disturbs the lecturer and/or the other students is prohibited. This includes but is not restricted to the following: producing any kind of noise (talking, whispering, cell phones rings, notification sounds), arriving late to the classroom, walking around or in and out of the classroom for any reason, interrupting the class session for any reason that is not related to educational goals or the course itself (except for emergencies and medical reasons), using the computer lab in a way that is not aligned to the purposes of the education program, etc. Any kind of activity that obstructs or hinders the work of the lecturer and/or other students is a violation against the student’s legal agreement with the Faculty. In order to protect the invested time and money of other students, those who reduce the efficiency of the education effort in any way, are subject to be banned from classroom session. Repeated offenders are subject to being banned from the course completely for the entire remainder of semester, which implies an automatic failure of the subject. Critical cases can also lead to cancelling the student’s legal agreement with the Faculty, therefore possibly resulting in the termination of the student’s scholarship as well. Any kind of physical violence or even threatening with physical violence in the classroom or on the campus will lead to termination as well as involvement of law enforcement and criminal prosecution. The same applies for trying to hack/attack individual computers, user accounts or the computer infrastructure of the University in general.

**Evaluation and grading**

As part of the test during the term, students are required to answer a number of questions in writing with about 2-8 straightforward sentences, and/or by drawing diagrams. The questions measure the theoretical knowledge acquired during the semester. The practice heavy the end-term test involves the reproduction task. (Each student gets a printed copy of a document, slide and/or spreadsheet and has to reproduce the same result/layout/output by applying the required formatting operations and correct spreadsheet functions. Performance in both tests is expected to be higher than 50%. The weight of each part is 50%-50%. Each test can be taken up to 3 times in a semester, once according to the class timetable schedule, and once a week in the correction period. The practice part and theory part can be re-taken independently. Failing to achieve 50% in either part of the test by the end of correction period results in failing the subject.

Using any unauthorized printed material or hand written note, any unauthorized device/method that can lead to misrepresentation of the student actual knowledge at the time of test is prohibited. Using such methods/devices count as cheating at the test, which will result in a warning for first offenders. Committing the second offense triggers failing the subject instantly without any possibility to take further attempts on the tests in the same semester.

Final grading is calculated with equal weights for the test parts, with the following exception: In case of falling short of the 50% requirement for either test part, the grade will be 1, regardless of the weighted sum.

1. Theory tests: 50 % weight (A performance of at least 50% is required to pass)
2. Practice test: 50 % weight (A performance of at least 50% is required to pass)

**Grading scale**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Numeric Grade: | 5 | 4 | 3 | 2 | 1 |
| Evaluation in points: | 90%-100% | 75%-89% | 61%-74% | 50%-60% | below 50% |

**Students with special needs:**

Students with special physical needs and requiring special assistance must first register with the Dean of the Students Office. All reasonable requests to provide an equal learning environment for all students is to be assured.

**Required Reading and other Materials:**

Students will be provided with the PDF version of all slides and classroom presentations of the course on the Neptun Meetstreet learning support system. Students are also required to take notes on their own during the classroom sessions.