Advanced Programming: (Credits: 3, Type: Theoretical, Prerequisite: Fundamentals of Computer & Programming)
Aim of Course: Students learn advanced concepts and techniques such as OO in programming using C ++ & C# language
Text Book: Pohl, Object Oriented Programming in C++, 2nd edition, Addison Wesley, 1997

Artificial Intelligence: (Credits: 3, Type: Theoretical, Prerequisite: Introduction to Algorithms)
Aim of Course: This course is related to Artificial Intelligence subjects in computer science such as Chess Game, Pattern Recognition, Speaking Understanding, and problem solving.
Text Book:

1.Russell, P. Norving, Artificial Intelligence: A Modern Approach, 1st Edition, Prentice Hall,1994

Compiler Design Fundamentals: (Credits: 3, Type: Theoretical, Prerequisite: Language and Machine Theory, Design & Implementing Programming Languages)
Aim of Course: Subjects related to developing languages compilers.
Text Book:
Aho, Sethi, Ullman, Compilers Principles, Techinques, And Tools, Addison Wesley, 2002

Computer Architecture: (Credits: 3, Type: Theoretical, Prerequisite: Logical Circuits Theory, Machine Language and Programming system.)
Aim of Course: In this course, students learn how computers work and become familiar with their organization. Practical experiences to design, use and develop computer parts and joining them to microprocessors are also gained.
Text Books:

1. V.C. Hamacher, Z.G. Zaky, and S.G. Vranesic, Computer Organization, Mc Graw-Hill, 1996
2. D.A. Peterson, N. Indurkhya, Computer Architecture, Hardware/Software Design, Morgan Kaufmann, 2nd edition, 1997
3. Patterson D.A., Hennessey, Computer Organization and Design, The Hardware Interface, 2nd edition, Morgan Kaufmann Pub., 1997
4. A. Clements, Principles of Computer Hardware, 3rd edition, Oxford, 2000

Computer Architecture Lab: (Credits: 1, Type: Practical, Prerequisite: Computer Architecture, Logical Circuits Lab)
Aim of Course: Testing Computer Architecture subjects practically.

Computer Networks: (Credits: 3, Type: Theoretical, Prerequisite: Operating Systems)
Aim of Course: Basics and Principles of Computer Networks and data transition systems are introduced in this course. Also practical principles of developing local networks are presented.
Text Books:

1. J.F. Kurose, Computer Networking, a Top Down Approach Featuring the Internet, Addison Wesley, 2001
2. A.S. Tanenbaum, Computer Networks, 3rd Edition, Prentice Hall, 2002
3. A. Leon Garcia, Communication Networks, Mc Graw-Hill, 2000

Computer Networks lab.: (Credits: 1, Type: Practical, Prerequisite: Computer Networks)
Aim of Course: In this course students have an opportunity to Implement computer network scenarios and work with network protocols and network devices such as routers and hubs.

Computer Lab: (Credits: 1, Type: Practical, Prerequisite: None)
Aim of Course: In this course students have an opportunity to learn using computers and operating systems as an operator. They also learn about different hardware sections of a regular PC such as CPU, VGA, RAM and so on. The students have this opportunity to program via C and C++.

Information Storage & Retrieval: (Credits: 3, Type: Theoretical, Prerequisite: Data Structure) Aim of Course: file systems working logic, how to store data in data storage devices such as H.D.D or tape or flash memory, how to recover stored data from these devices, different algorithms for accessing desired sector and block in a disk, and so on.

Text Book : Taylor, Arlene (2003), 2nd Edition. The Organization of Information. Englewood,Colorado: Libraries Unlimited.

Data Structure: (Credits: 3, Type: Theoretical, Prerequisite: Advanced Programming, Discrete Structures)
Aim of Course: Familiarity with Information Structures, Affects of structures in produced applications, Selecting optimized inside-memory structures, Organizing memory based on need.

Text Books:

1. A.V. Aho, J.E. Hopcraft, J.D. Ullman, Data Structures and Algorithms, Addison Wesley, 1983
2. D.E. Knuth, The Art Of Computer Programming, Volume I: Fundamental Algorithms, 3rd edition, Addison Wesley, 1997

Design & Implementing Programming Languages: (Credits: 3, Type: Theoretical, Prerequisite: Data Structure, Machine Language and Programming system.)
Aim of Course: Basic concepts about program executions and programming languages internal architectures.
Text Books:

1. T. W. Pratt, Programming languages and Implementation, 4th Edition, Prentice Hall, 2001
2. E. Horowitz، Fundamentals of Programming Languages, Computer Science Press

Differential Equations: (Credits: 3, Type: Theoretical, Prerequisite: Math. 2)
Aim of Course: In this course, first and second level liner differential equations and some non liner differential equations are introduced, in addition to some numerical and analytical ways to solve them.
Text Books:

1. E. Kreyszig, Advanced Engineering Mathematics, 1999
2. P. Blanchard, R.L. Devaney, and Co. Hall, Differential Equations, 1st edition, Brooks/Cole Pub, 1998

Discrete Structures: (Credits: 3, Type: Theoretical, Prerequisite: Math. 1, Fundamentals of Computer & Programming)
Aim of Course: Today, many information processing systems are founded on Discrete Structures, and so this course tries to teach the concepts of this field to students.
Text Books:

1. R. Johnson Baugh, Discrete Structures, Mac Millan Pub. Company, 1997
2. K. H. Rosen, Discrete Structures and Its Applications, 4th edition, Mc Graw Hill, 1999

Electric Circuits I: (Credits: 3, Type: Theoretical, Prerequisite: Physics 1, Differential Equations) Aim of Course: This course presents the fundamentals of circuit analysis. It begins with basic concepts such as voltage, current, sources and Ohm's law; then it proceeds to develop general and powerful procedures (nodal and mesh analyses) used in analyzing electric circuits. These methods are first applied to resistive circuits and later to circuits with more complex elements such as capacitors and inductors. Circuits with DC sources as well as those with sinusoidal sources are analyzed. The subjects of steady-state power and three-phase balanced systems are also covered.

Electric Circuits Lab I: (Credits: 1, Type: Practical, Prerequisite: Electric Circuits I, Physics Lab II)
Aim of Course: Testing Electric Circuits subjects practically

Electronic Circuits: (Credits: 3, Type: Theoretical, Prerequisite: Electric Circuits I)
Aim of Course:Principles, analysis and applications of diodes, bipolar junction transistors and field-effect transistors. Amplifier concepts (types, equivalent circuit, gain, frequency response etc). Review of op-amps and discussion of non-idealities. Introduction to active filters and resonant circuits. Introduction to soldering.

Electronic Circuits Lab: (Credits: 1, Type: Practical, Prerequisite: Electric Circuits Lab I, Electronic Circuits)
Aim of Course: Testing Electronic Circuits subjects practically

Engineering Mathematics: (Credits: 3, Type: Theoretical, Prerequisite: Math. 2, Differential Equations)
Aim of Course: Mathematical models are used to understand, predict and optimise engineering systems. Many of these systems are deterministic and are modelled using differential equations. Others are random in nature and are analysed using probability theory and statistics

Family and Population Knowledge: (Credits: 1, Type: Theoretical, Prerequisite: None)
Aim of Course: The aim of this course is discussing about correct sexual relations and related topics.

Project: (Credits: 3, Type: Practical, Prerequisite: Computer Architecture , Method of presenting scientific and technical texts)
Aim of Course: Developing a system using all or part of the materials that was gained through bachelor program based on personal interests.

Foreign Language (Credits: 3, Type: Theoretical, Prerequisite: None)
Aim of Course: The aim of this course is teaching general English language to the students.

Fundamentals of Computer & Programming: (Credits: 4, Type: Theoretical, Prerequisite: Nothing)

Aim of Course: This course teaches students main concepts of programming and program making using a high level programming language such as pascal. Techniques of developing and implementing algorithms in a high level language are thought in this course.
Text Books:

1. T.C. Bartee, Digital Computer Fundamentals, McGrawHill, 1981
2. J.G. Brookshear, Computer Science, and Overview, 6th edition, Addison Welsey, 1999

Math. 1: (Credits: 3, Type: Theoretical, Prerequisite: None)
Aim of Course: Basic concepts of calculus and geometry are thought to the students in this course which provide needed background for technical courses.
Text Book: R.L. Finney, G.B. Thomas, Calculus and Analytic Geometry, Geometry, 9th edition, Addison Wesley, 1996

Math. 2: (Credits: 3, Type: Theoretical, Prerequisite: Math .1)
Aim of Course: Basic concepts of calculus and geometry are thought to the students in this course which provide needed background for technical courses, continuing "Math .1" discussions.
Text Book: R.L. Finney, G.B. Thomas, Calculus and Analytic Geometry, Geometry, 9th edition, Addison Wesley, 1996

Persian Literature: (Credits: 3, Type: Theoretical, Prerequisite: None)
Aim of Course: Teaches Persian literature to students and familiars them with Persian poets

General Workshop (Credits: 1, Type: Practical, Prerequisite: None)
Aim of Course: Becoming familiar with security and hygiene concepts of workshops, and the way of using tools and apparatuses in them. In this course, students learn how to use workshop apparatuses in modeling, casting, electric and … sections.

Date of imamate: (Credits: 2, Type: Theoretical, Prerequisite: None)
Aim of Course: Talking about History of Islamic imamate.

Electric circuits 2: (Credits: 3, Type: Theoretical, Prerequisite: Electric circuits 1)
This course details AC circuit analysis. Topics include Phasor representation of sinusoidal voltage, currents, impedance, power solution of RLC circuits, frequency response and series and parallel resonance. Three phase power transformers and Fourier analysis of complex waveforms are introduced. The use of computer solutions in problem solving is included.
Text Books:

1. Introductory Circuit Analysis 12E, R. Boylestad Prentice Hall Publishing Company

Internship: (Credits: 2, Type: Practical, Prerequisite: -)
Aim of Course: Students have to work in a company or manufacture in a field related to their interests or project for 240 hours.

Designing Algorithms: (Credits: 3, Type: Theoretical, Prerequisite: Data Structure) Aim of Course: How do design efficient algorithms for computer programs
Text Books:

1. R.E. Neapolitan and K. Naimipour, Foundations of Algorithms using C++ Pseudo Codes, 2nd Edition, Johns and Bartlett Publishers, 1998
2. Comman, Leisersen, Rivert, Introduction to Algorithms, MIT Press, 1990
3. E. Horowits, and S. Sahni, Foundations of Computer Algorithms, Computer Science Press, 1978
4. Aho, Hopcoft, and Ullman, Data Structures and Algorithms, Addison Welsey, 1987
5. G. Brassard, and P. Bratley, Fundamentals of Algorithms, Prentice Hall, 1996

Rite of Life(Applied ethics): (Credits: 2, Type: Theoretical, Prerequisite: None)
Aim of Course: Teaches Islamic ethics to students

Islamic Thoughts 1(Origin and Resurrection): (Credits: 2, Type: Theoretical, Prerequisite: None) Aim of Course: becoming familiar with instructions in Islam

Islamic Thoughts 2(Prophecy and Imamate): (Credits: 2, Type: Theoretical, Prerequisite: None)
Aim of Course: becoming familiar with instructions in Islam, continuing "Islamic Instructions I" discussions
Islamic Revolution of Iran (Credits: 2, Type: Theoretical, Prerequisite: None) Aim of Course: About Iran's Islamic revolutions, its roots, and why it was happened

Familiarity with reading of holy book "Quran": (Credits: 1, Type: Theoretical, Prerequisite: None)
Aim of Course: The aim of this course is teaching Quran's Arabic language to students, in such a way that they will be able to read Quran's Texts

Thematic Commentary of the Quran: (Credits: 2, Type: Theoretical, Prerequisite: None
Aim of Course: The aim of this course is teaching Quran's Main meaning, in such a way that they will be able to understand Quran's Texts.

Logical Circuits: (Credits: 3, Type: Theoretical, Prerequisite: Electric Circuits I, Discrete Structures)
Aim of Course: This course provides the student with a foundation in the fundamentals of digital logic design and computer logic circuits. Both combinational and sequential logic circuits are covered in this course. The emphasis is on the use of Boolean algebra and basic logic gates to build cost effective complex logic circuits. Topics include: Number systems, Binary arithmetic, Codes, Logic gates, Boolean algebra and simplifications, Half adders, Full adders, Decoders, Encoders, Multiplexers, Latches, Flip-Flops, Counters, Shift Registers, Memory circuits, and ALU (Arithmetic and Logic Unit)

Text Book: Victor P. Nelson, H. Troy Nagle, Bill D. Carroll and David Irwin, Digital Logic Circuit Analysis and Design, Prentice Hall Inc., 1996

Logical Circuits Lab: (Credits: 1, Type: Practical, Prerequisite: Electric Circuits Lab I, Logical Circuits Theory)
Aim of Course: Testing Logical Circuits Theory subjects practically

Machine Language and Programming system.: (Credits: 3, Type: Theoretical, Prerequisite: Advanced Programming)
Aim of Course: The students learn about the organization of X86 machines, their assembly language and how to program by this language for this machine.

Microprocessor I: (Credits: 3, Type: Theoretical, Prerequisite: Computer Architecture)
Aim of Course: This course is related to topics regarding to microprocessors and basic concepts of designing and developing them. The student also learn how to program via AVR microprocessors. I/O programming, I/O interface design, I/O peripheral devices, data communications, and data acquisition systems.
Microprocessor I Lab: (Credits: 1, Type: Practical, Prerequisite: Computer Architecture Lab, Microprocessor I)
Aim of Course: Testing Microprocessor I subjects practically

Digital Electronics : (Credits :3, Type :Theoretical, Prerequisite:Electronic Circuits)
Aim of Course :This course covers the operation , application, and troubleshooting of TTL and CMOS electronic logic devices,
their use in combinatorial and sequential logic circuits, the interface between the logic families, and the interface between digital and analog circuits. The course also provides a study o f Boolean algebra, binary and hexadecimal number systems, binary codes, and the analysis of the basic components and circuits used in semiconductor switching.
Text Book :Kleitz , W . (2012) Digital Electronics: A Practical Approach with VHDL, 9 th Edition. Upper Saddle River, NJ:Pearson Education, Inc.

Digital Electonics Lab. :(Credits :1, Type :Practical, Prerequisite:Digital Electronics)
Aim of Course : Implementing the Digital Electronic concepts in a Lab Atmosphere . Using of HSPICE Simulator to work with CMOS electronic devices.

Operating Systems : (Credits: 3, Type: Theoretical, Prerequisite: Computer Architecture)

Aim of Course: This course is related to different Operating Systems, their parts and usages Text Books:

1. W. Stallings, Operating Systems, 4th Edition, Prentice Hall, 2001
2. A. Silberschatz, J.L. Peterson, Operating Systems Concepts, Addison Wesley, 2000

Physics 1 (Credits: 3, Type: Theoretical, Prerequisite: None)
Aim of Course: This course teaches students fundamentals concepts of Mechanic and Thermodynamics Physics and is one of basic courses in engineering fields.

Physics 2:(Credits: 3, Type: Theoretical, Prerequisite: Physics 1)

Aim of Course : Student can learn about basic concepts of Electricity and Magnetic physics.The subjects that are covered in this course are basic for many electric and hardware courses.
Text Book: D. Holliday, R. Resnick and J. Walker, Fundamentals of Physics, 6th edition, John Wiley, 2000

Physics Lab I: (Credits: 1, Type: Practical, Prerequisite: Physics 1)
Aim of Course: Testing Physics 1 subjects practically

Physics Lab II: (Credits: 1, Type: Practical, Prerequisite: Physics 2)
Aim of Course: Testing Physics 2 subjects practically

Physical Education I: (Credits: 1, Type: Practical, Prerequisite: None)
Aim of Course: Teaching sports

Physical Education II: (Credits: 1, Type: Practical, Prerequisite: Physical Education I)
Aim of Course: Teaching sports

Pre-university Mathematics (Credits: 2, Type: Theoretical, Prerequisite: None)
Aim of Course: Increase math knowledge of students to a level that can be able to attend in main mathematical courses.

Signals and systems: (Credits: 3, Type: Theoretical, Prerequisite: Data Storage & Retrieval) Aim of Course: In this course, theoretical and practical concepts of relational databases are introduced, and concurrency, security, and completeness aspects of database systems are discussed.
Text Books:

1. R.A. Elmarsi, S.B. Navathel, Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 1999
2. C.J. Date, An Introduction to Database Systems, 7th Edition, Addison Wesley, 1999
3. R. Ramakrishnan, Database Management Systems, Mc Graw-Hill, 1997

Numerical calculation Methods: (Credits: 3, Type: Practical, Prerequisite: Math. 2)
Aim of Course: This course will emphasize the development of numerical algorithms to provide solutions to common problems formulated in science and engineering. The primary objective of the course is to develop the basic understanding of the construction of numerical algorithms, and perhaps more importantly, the applicability and limits of their appropriate use. The emphasis of the course will be the thorough study of numerical algorithms to understand (i) the guaranteed accuracy that various methods provide, (2) the efficiency and scalability for large scale systems. and (3) issues of stability. Topics include the standard algorithms for numerical computation.

Text Book : Numerical Mathematics and Computing (5th Edition), by E. Ward Cheney and David R. Kincaid, Brooks/Cole Publishers (2004), 690 pages

Advanced Logic circuits: (Credits: 3, Type: Theoretical, Prerequisite: Logic circuits)
Aim of Course: Familiarity with advanced topics in logic circuits.
Review of Logic Design Fundamentals,Introduction to VHDL,Designing with Programmable Logic Devices,Digital Design with SM Charts,Designing with Programmable Gate Arrays and Complex Logic Devices,Hardware Testing and Design for Testability

Imam's Will: (Credits: 1, Type: Theoretical, Prerequisite: None)
Aim of Course: Familiarity with Imam Khomeini's Opinions

Method of presenting Scientific & Technical texts: (Credits: 2, Type: Theoretical, Prerequisite: Specialized Lang., Machine Language and Programming system.)
Aim of Course: In this course, students learn about systematic research and technical presentations techniques. Students have to select a subject and work on it during the course and then preparing and writing an article for it.
Text Books:

1. S.E. Lucas, The Art Of Public Speaking, Mc Graw Hill, 2000
2. M. H. Markel, Writing in Technical Field: A Step By Step Guide for Engineering Scientists and Technicians, IEEE Press, 1994

Statistics & Engineering Possibilities: (Credits: 3, Type: Theoretical, Prerequisite: Math .1)
Aim of Course: By learning this course, students can use basic rules of probability theory for real modeling of information problems.
Text Book(s):

1. Walpole and Mayers, Probability and Statistics for Engineering and Scientists, 6th edition, Prentice Hall. 1998
2. R.V. Hogg and T. Elliot, Probability and Statistical Inference, 4th edition, Mac Millan, 1993

Specialized Lang.: (Credits: 2, Type: Theoretical, Prerequisite: Advanced Programming, Foreign Language)
Aim of Course: The aim of this course is to teach students how to read the technical texts in their text books which written in English more efficiently.
Text Books:

1. Keith Boeckner, P. Charlers Brown, Computing, Oxford, 2001
2. An English for Academic Purposes Programme, Mac Millan (China) Ltd.

Language and Machine Theory: (Credits: 3, Type: Theoretical, Prerequisite: Data Structure)
Aim of Course: Some subjects of this course are finite automata, pushdown automata, Turing machine, Grammars and Languages, and so on.
Text Book(s):

1. P. Linz, Introduction to Formal Languages and Automata, 2nd edition, D.C. Heath Company, 1996
2. P. Reveseze, Theory of Formal Languages, Mc Graw Hill, 1985
3. D.I.A Cohen, Introduction to Computer Theory, John Wiley & Sons, 1991

VLSI System Design:(Credits:3,Type:Theoretical,Prerequisite :Computer Architecture, Digital Electronics)
Aim of Course :The aim of this course is to provide an introduction to the design and layout of Very Large Scale Integrated (VLSI) circuits for complex digital systems. It covers custom design, cell-based hierarchical design, and algorithmic aspects of VLSI CAD tools. With a focus on CMOS technology, students generate layouts of CMOS chips on engineering workstations in an associated laboratory. By the end of the course, students will have designed, laid out, and verified a 4-bit microprocessor modeled after the Am2901 from Advanced Micro Devices.
Text Book:

1. N. Weste and K. Eshraghian, Principles of CMOS VLSI Design, 2nd ed., Addison Wesley, 1993.
2. Class notes.

Linear Control Systems: (Credits:3, Type :Theoretical,Prerequisite :Electric circuits2 ,Signals and systems)
Aim of Course:This course is to explore the modeling of linear dynamic systems via differential equations and transfer functions utilizing state-space and input-output representations; analysis of control systems in the time and frequency domains and using transfer function and state-space methods; study of the classical stability tests, such as the Routh-Hurwitz and Nyquist criterions, and design methods using root-locus plots and Bode plots; and the development of control techniques based on PID, lead and lag networks, using linear state or output feedback
Text Book : G. F. Franklin, J. D. Powell and A. Emami-Naeini, Feedback Control of Dynamic Systems, 6th ed., Pearson Prentice Hall, Upper Saddle River, NJ, 2009 (ISBN-13: 978-0-13-601969-5)

Data Transmission:(Credits:3,Type:Theoretical,Prerequisite:)
Aim of Course:Model of a digital communication system. Channel capacity and transmission rate. Transmission channel as a linear time-invariant system. Nyquist criterions and intersymbol interference. Optimum transmit and receive filters. Symbol error probability. Baseband signal transmission and channel equalization. Transmission duplexity. Scrambling. Line coding. Modulation techniques for passband data transmission. Coding channel and error correction, ARQ techniques. Data transmission systems.
Text Book:

1) W. Stalling, Data and Computer Communications.
2) F. Halsall, Data Communications, Computer Networks, and Open Systems.
3) A. S. Tanenbaum, Computer networks.