TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser and Optoelectronics Engineering Dept.
3. Course title/code	Engineering Analysis /LOPE3201
4. Programme(s) to which it contributes	Laser & Optoelectronics Programs
5. Modes of Attendance offered	Complete Hours
6. Semester/Year	1st &2nd Semester / Year
7. Number of hours tuition (total)	Two Hours / Week 2H X30W=60H/Year
8. Date of production/revision of this specification	15/7/2014
9. Aims of the Course	
The aims which can be achieved during teaching this course program are : 1- Giving knowledge about using the advance mathematical theories in their studies.	
2- Provides the advanced mathematical methods which can be used in laser and optoelectronics theory and applications.	
3- Provide students with experiences that will assist them in solving the scientific problems.	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1. Enabling student to get the knowledge and understanding of the theoretical principles of mathematics. A2. Proceeding the understanding to how solve the mathematical problems of the laser or optoelectronic concepts.
B. Subject-specific skills B1.Literatures B2. Tutorials B3. Conversation
Teaching and Learning Methods
1- Tutorials 2- Literatures.
Assessment methods
1- Examinations. 2- Quizzes. 3- Home works.
C. Thinking Skills C1. Ability of understanding mathematics concepts. C2. Certain discussion and conversation. C3. General information collection for different sources relating to the mathematical problems.
Teaching and Learning Methods
1- Literatures. 2- Tutorials.
Assessment methods
1- Test 1 2- Test 2. 3- Quizzes and Assignments. 4- Final Examination

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1. Different group conversations. D2. New learning methods.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Literature	Fourier Analysis Fourier Series	Lecture	Examinations, Quizzes.
2	=	=	Fourier Analysis Odd and Even Functions	=	=
3	=	=	Fourier Analysis Half-Wave Fourier series.	=	=
4	=	=	Fourier Analysis Frequency spectra Transformations.	=	=
5	=	=	Applications	=	=
6	=	=	Laplace Transformation Partial Fractions	=	=
7	=	=	Laplace Transformation Transformations	=	=
8	=	=	Laplace Transformation Solving Differential Equations	=	=
9	=	=	Laplace Transformation Solving Differential Equations	=	=
10	=	=	Applications	=	=
11	=	=	Complex Variables Complex Numbers	=	=
12	=	=	Complex Variables Cauchy-Remann Equations	=	=
13	=	=	Complex Variables Complex Functions	=	=
14	=	=	Complex Variables Integrations	=	=
15	=	=	Applications	=	=
16	=	=	Power series Divergence and Convergence	=	=
17	=	=	Power Series Solving Differential Equations	=	=
18	=	=	Power Series Solving Differential Equations.	=	=
19	=	=	Power series Basic Functions.	=	=
20	=	=	Power Series Legendr'e Polynomials	=	=
21	=	=	Power Series Bessel's Function.	=	=
22	=	=	Applications	=	=
23	=	=	Matrix Theory Basic Properties.	=	=

24	=	=	Matrix Theory Matrix Inverse.	=	=
25	=	=	Matrix Theory Solving Linear Equations.	=	=
26	=	=	Matrix Theory Solving Linear Equations.	=	=
27	=	=	Matrix Theory Eigen Values And Vectors.	=	=
28	=	=	Applications.	=	=
29	=	=	Numerical Analysis The Roots of Equation.	=	=
30	=	=	Numerical Analysis Integration	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Literatures in geometrical analysis for engineering.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet web sites.
Community-based facilities (include for example, guest Lectures , internship , field studies)	N/A

13. Admissions	
Pre-requisites	Pass from last stage.
Minimum number of students	No limit.
Maximum number of students	No limit.

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HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser and Optoelectronics Eng. Dept.
3. Course title/code	Communications & Wave Propagation
4. Programme(s) to which it contributes	Laser & Optoelectronics Programs
5. Modes of Attendance offered	Full-Time Attendance
6. Semester/Year	2014-2015
7. Number of hours tuition (total)	4 hours – 2 per each branch
8. Date of production/revision of this specification	20-10-2014
9. Aims of the Course	
To provide an introduction to, and understanding of, the fundamental principles of communication systems and radio wave propagation; to provide the theoretical analysis and analytical techniques to be used in future advanced modules.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method
B- Knowledge and Understanding A1. Enable students to be familiar with different types of signals and systems. A2. To make students more understandable with the concepts of Linear Modulation techniques. A3. Enable the students to be familiar with the mathematical representation for each modulation type and systems response in both Time and Frequency Domain by using Fourier analysis. A4. Sampling, Quantization and digital transmission of analog signals; for instance Pulse Code Modulation. A5. Studying, analyzing and understanding the term of noise in engineering sight of view and how does it affect the overall performance of the system. A6. Maxwell's equations and different radio wave propagation.
B. Subject-specific skills B1. The benefit behind the modulation process and how to transform time-domain function to frequency domain using Fourier analysis. B2. Understanding the frequency translation and modulation theorem, in addition to Hilbert transfer function of some filter types. B3. How to calculate the overall system performance by the mean of SNR and Noise Figure.
Teaching and Learning Methods
1- Weekly lectures, lecture notes and text book all as references. 2- Power point presentations and monthly tutorials. 3- Simulink modules and simulation codes by using MATLAB.
Assessment methods
1- Direct and indirect question through lecture time. 2- Sudden Exams (Quiz). 3- Mid-year, second semester and final exam.
C. Thinking Skills C1. How to use Fourier analysis properties to think about how time and frequency shifting are valuable in modulation process. C2. Student's ability to re-derive the noisy received waveform and process it using either low pass or band pass filters. C3. The importance of convolution and correlation theorem in signal-systems interaction. C4. Looking to electromagnetic waves from the side of differential equation.
Teaching and Learning Methods
1- Weekly lectures, lecture notes 2- MatLab simulation tutorials and Solving questions. 3- Topics to be looked, analyzed and researched by students
Assessment methods
1- Evaluating marks depending on in-lecture student performance and their response to different types of given assignments.

D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Searching on International Network (Internet). D2. Other resources could also be valuable; such as papers and other text books.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1st	2	Knowledge and Understanding	Introduction to Communication Systems	Weekly lectures, lecture notes and text book all as references	Mid-year, second semester and final exam
2nd-3rd	2	Knowledge and Understanding	Signals and Systems	Weekly lectures, lecture notes and text book all as references	Mid-year, second semester and final exam
4th – 15th	22	Knowledge, Understanding and Thinking	Continuous Wave Modulation, Digital Transmission of Analog signals and Digital Modulation	Weekly lectures, lecture notes, Power point presentations, monthly tutorials and Matlab	Mid-year, second semester and final exam, Sudden Exams, in-Lecture Questions
15th – 27th	24	Understanding and Thinking	Maxwell's Equations and Radio Wave Propagation	Weekly lectures, lecture notes	Mid-year, second semester and final exam, Sudden Exams, in-Lecture Questions
27th – 30th	6	Understanding and Thinking2	Transmission Lines and Waveguides	Weekly lectures, lecture notes	Mid-year, second semester and final exam, Sudden Exams, in-Lecture Questions

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- Communication Systems, Simon Haykin, 4th Edition. 2- Lecture Notes or any others.

Special requirements (include for example workshops, periodicals, IT software, websites)	1- Passing from 2nd year. 2- Very good understanding of different mathematical subjects.
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

13. Admissions	
Pre-requisites	Passing from 2nd year
Minimum number of students	15
Maximum number of students	35

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser & optoelectronics Engineering Department
3. Course title/code	Computer applications
4. Programme(s) to which it contributes	Laser and Optoelectronics Engineering Programme
5. Modes of Attendance offered	Complete Hours
6. Semester/Year	1st &2nd Semester / Year
7. Number of hours tuition (total)	Theoretical : 1hrs/w Practical : 2 hr/w 3H X30W=90H/Year
8. Date of production/revision of this specification	15 / 9 / 2014
9. Aims of the Course	
The aims which can be achieved during teaching this course program are as follows: 1-Ilustration and discussion the fundamental of MATLAB. 2- programming & drawing mathematical equations. 3- programming conditional statements. 4-programming loops. 5-Fourier and Laplace transformation.	

6-modelling using a simulink.

10· Learning Outcomes, Teaching ,Learning and Assessment Method
A- Knowledge and Understanding A1.Enabling student to get the knowledge and understanding the fundamental of MATLAB programming for different equation. A2. Enabling student to draw different equation by matlab programming. A3. Enabling student to get the knowledge and understanding the Simulink blockes.
B. Subject-specific skills B1. Literatures B2. Tutorials B3. Laboratory and performing some programmes
Teaching and Learning Methods
1-Practical experiments. 2- Simulation and Innovation. 3- pdf literatures by Data show Reviews.
Assessment methods
1-Examinations. 2-Quizzes. 3- Home works. 4- Tutorials and discussions.
C. Thinking Skills C1. Reports. C2. Certain MATLAB problem analysis. C3. information collection for MATLAB functions. C4. Research and collection data.
Teaching and Learning Methods
1. Lectures. 2- Tutorials. 3. Experiments.
Assessment methods
1-Test 1 2-Test 2. 3-Quizzes and Assignments. 4- Laboratory. 5-Final Examination

D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Solution of different MATLAB programs. D2.Analaysis of programming & drawing mathematical equations

D3. fourier and laplace transformation.. D4. Simulation modelling a simulink .

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1+2	Practice	MATLAB Desk top	Lecture & Practice	Examinations and practice
2	=	=	MATLAB functions	=	=
3-5	=	=	Plotting	=	=
6-8	=	=	3D-plotting	=	=
8-11	=	=	Plotting multiple graphs	=	=
12-15	=	=	Conditional statement	=	=
16-18	=	=	loops	=	=
17-20	=	=	Integration & differentiations	=	=
21-23	=	=	Fourier & Laplace transformation	=	=
24-28	=	=	simulink	=	=
29-30	=	=	exam	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	

13. Admissions	
Pre-requisites	Pass from last stage (secondary school).
Minimum number of students	No limit.
Maximum number of students	No limit.

FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser and Optoelectronics Engineering Dept./ Optoelectronic Engineering
3. Course title/code	Quantum Mechanics LE3304
4. Programme(s) to which it contributes	Laser Engineering
5. Modes of Attendance offered	2 Complete Hours
6. Semester/Year	1st &2nd Semester / Year
7. Number of hours tuition (total)	Two Hours / Week 2H X30W=60H/Year
8. Date of production/revision of this specification	15/7/2014
9. Aims of the Course	
1. The course provides an introduction to quantum methods including solving Schrodinger equation for many cases.	
2. The course also attempts to describe the behavior of matter and energy at the sub atomic scale.	
3. Giving an idea to compare between classical mechanics and quantum one.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method
A. Knowledge and Understanding A1. Enabling students to get the knowledge and understanding of the theoretical principles of quantum mechanics. A2. Quantum mechanics has explained the structure of the atom and the structure of the nucleus. A3. Describe that among the most important things which quantum mechanics can describe while classical physics cannot are (Discreteness of energy, The wave-particle duality of light and matter, Quantum tunneling, The Heisenberg uncertainty principle, Spin of a particle) A4. Explain the photoelectric , Compton scattering and black body radiation A5. Explain how to solve Schrödinger equation for many cases.
B. Subject-specific skills B1.Literatures B2. Tutorials B3. Conversation
Teaching and Learning Methods
2- Tutorials 2- Literatures. 3- Computer simulation.
Assessment methods
4- Examinations. 5- Quizzes. 6- Home works.
C. Thinking Skills C1. Ability of understanding quantum concepts. C2. Certain discussion and conversation. C3. General information collection for different sources relating to the quantum mechanics.
Teaching and Learning Methods
2- Literatures. 2- Tutorials.
Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Different group conversations. D2. New learning methods.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Literature	Photons, The photoelectric effect Compton Scattering	Lecture	Examinations, Quizzes.
2	=	=	Energy quantization in atoms, Th De Broglie hypothesis	=	=
3	=	=	Electron interference and diffraction.	=	=
4	=	=	State functions, Operators	=	=
5	=	=	Commutation relations, Uncertainty principle	=	=
6	=	=	Eigen values and Eigen function	=	=
7	=	=	Applications	=	=
8	=	=	Schrodinger equation for free particles	=	=
9	=	=	Schrodinger equation for a particle in a field	=	=
10	=	=	Particle in one dimension box	=	=
11	=	=	Applications	=	=
12	=	=	Particle in infinite well	=	=
13	=	=	Particle in finite well	=	=
14	=	=	Tunneling effect	=	=
15	=	=	Applications	=	=
16	=	=	The harmonic Oscillator	=	=
17	=	=	Heisenberg's equation of motion	=	=
18	=	=	The harmonic oscillator based on Heisenberg's formalism.	=	=
19	=	=	Applications	=	=
20	=	=	Quantization of free electromagnetic wave	=	=
21	=	=	Black body radiation	=	=
22	=	=	Quantum theory of coherent optical states	=	=
23	=	=	Applications	=	=
24	=	=	The Hamiltonian of the hydrogen atom	=	=
25	=	=	Angular momentum of the hydrogen atom	=	=
26	=	=	Structure of the hydrogen atom	=	=
27	=	=	Applications	=	=
28	=	=	Electron spin	=	=
29	=	=	Energy states of the hydrogen atom	=	=
30	=	=	Applications	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Literatures in Quantum Mechanics.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet web sites.
Community-based facilities (include for example, guest Lectures , internship , field studies)	N/A

13. Admissions	
Pre-requisites	Pass from last stage.
Minimum number of students	No limit.
Maximum number of students	No limit.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of technology
2. University Department/Centre	Laser &optoelectronics engineering department
3. Course title/code	Semiconductor Devices/LE3206
4. Programme(s) to which it contributes	Laser & optoelectronics programs
5. Modes of Attendance offered	Complete Hours
6. Semester/Year	1st &2nd Semester / Year
7. Number of hours tuition (total)	Two Hours / Week 2H X30W=60H/Year
8. Date of production/revision of this specification	
9. Aims of the Course	
1. Prepare engineers with high efficiency specialists in the field of Laser Engineering and able to develop their skills in the fields of engineering knowledge and well versed in the field of use of different applications specialized in the design and use of services related to jurisdiction	
2. Engineers create a joint organized labor, and enhance communication with institutions and universities scientific and engineering in the responsibility of local and international professional and ethical	

3. The development of the spirit of leadership among students and prepare them for their roles after graduation
4. Supplement the state institutions and private technology specialists, experts, consultants, scientists, and support scientific research centers and engineering projects distinguished scientific cadres
5. Work on developing and improving the efficiency of scientific and administrative faculty members and enable them to use the latest scientific methods, as well as the optimal use of the possibilities of section to keep up with scientific developments and qualitative cooperation with international universities and guidance to serve the community and state institutions

10· Learning Outcomes, Teaching ,Learning and Assessment Method
A. Knowledge and Understanding A1.The ability to apply knowledge in the fields of mathematics, science, engineering specialized in engineering applications of laser A2.Collection of science in various disciplines necessary for Laser Engineering A3Prepare students for continued learning and self-collection techniques and new skills in the field of engineering. A4.Building skills by following the correct procedures
B. Subject-specific skills B1.Literatures B2. Tutorials
Teaching and Learning Methods
Assessment methods
1- Examinations. 2- Quizzes. 3- Home works. 4- Final Examination
Teaching and Learning Methods
1- Literatures. 2- Tutorials.
Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Ability to work with others within the discipline of work per team, teamwork.

D2.Full realization of the moral and practical responsibility for the work that will exercise the student after graduation, the ethics of the profession

D3.The ability to display and discuss ideas and defend them verbally and in writing and electronically

D4.The ability to understanding and understanding of the English language and the technical level within the area of jurisdiction

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-2	2	Literature	Energy bands in typical semiconductor	Lecture & p.p Show.	Examinations ,Quizzes,.
3-7	=	=	Band structure of semiconductor	=	=
8-12	=	=	Elementary transport in semiconductors	=	=
13-20	=	=	Contact phenomena	=	=
21-24	=	=	Semiconductor diode	=	=
25-27	=	=	Zener diode	=	=
28-30	=	=	Transistor	=	=

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet web sites
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	Pass from last stage (secondary school).
Minimum number of students	No limit.
Maximum number of students	No limit.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURES SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification..

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser and Optoelectronics engineering dep.
3. Course Title	Gas Discharge
4. Programme(s) to which it contribute	Laser and optoelectronics engineering Programs
5. Modes of Attendance offered	Full time
6. Semester/ Year	First semester/Year
7. Number of Hours tuition(total)	2/ week(theory) 2H*15w= 30H/semester
8. Date of production/revision of this specification	16-6-2014

9**. Aims of the Course**

1-Define the advance phenomena in Electric Discharge for three stage from department laser branch represent the laser engineering like fundamental processes ,collision types, mobility and diffusion process, these parameters effected for the efficiency part.

2- Explain the D.C ,Arc glow and A.C discharge.

3-prepare the student theoretically and exterminatory in the special fields in all private and former.

4-applied the fundamental principle of breakdown and the self –sustaining discharge

5-Define the Electrode Effect.

10. Learning Outcomes, Teaching, Learning and Assessment Methods
A. Knowledge and Understanding A1.knowledge the Fundamental processes like the kinetic theory of sample gas and the atomic,molecular structure. A2.Helps the student for using the mathematical equations to calculate cross section of a gas partical. A3.Help the students to understand how the absorption and emission of radaition. A4.Help the student to knowledge and understand the fundamental principle of Mobillity , diffusion types and the electrode types effects. A5.Help the student to knowledge and understanding the theoretical principle for the breakdown like townsend discharge. A6. Help the student to knowledge and understands the self-sustaining discharge like the D,C low pressure glow high pressure glow, Arc glow and A.C discharge
B. Subject-specific skills B1.Find the answers of mean free path of electron and particles,mean kinetic energy problems B2.Calcullate the thermonic emission current, saturation current density and the threshold frequency . B3.Explain the phenomena of Townsend discharge,Diffusoin process and Einstein with mathematical equation. B4.Using the mathematical equation to explain the principle of ambipolar difusion in gas discharge.
Assessment methods(References)
1-classroom discussions and to identify the potential of the student to analyze problems. 2- Homework. 3- sudden examination. 4- Quarterly examination. 5- Projects and seminars. 6-Introduction to Gas Dicharges by A.M.Howastson

11. **Course Structure**					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-3	2 hour (weekly) 2 hours theoretical	Define the advance phenomena in Electric Discharge knowledge .the Fundamental processes like the kinetic theory of sample gas and the atomic,molecular structure.	Basic parameters of electric Discharge	Motivate students to develop its capabilities in data analysis.	Discussions. Homework. Sudden exams. Quarterly examinations. Projects and seminars.
4-7	2 hour (weekly) 2 hours theoretical	knowledge and understand the fundamental principle of collision type and the absorption ,emission of radiation and the Mobillity , diffusion types and the Eectrode types effects.	The Mobillity Electrode types and	Motivate students to develop its capabilities in data analysis question and diagnose the problem and describe the solution.	Discussions. Homework. Sudden exams. Quarterly examinations. Projects and seminars. .
8-11	2 hour (weekly) 2 hours theoretical	knowledge and explain the theoretical principle for the breakdown like Townsend discharge. and the self-sustaining discharge	the breakdown	Motivate students to develop its capabilities in data analysis question and diagnose the problem and describe the solution.	Discussions. Homework. Sudden exams. Quarterly examinations. Projects and seminars.
12-15	2 hour (weekly) 2 hours theoretical	Calcullate the thermonic emission current, saturation current density and the threshold frequency Explain the phenomena of Diffusoin process and Einstein with mathematical equation to explain the principle of ambipolar difusion in gas discharge.	Diffusoin process	Motivate students to develop its capabilities in data analysis question and diagnose the problem and describe the solution.	Discussions. Homework. Sudden exams. Quarterly examinations. Projects and seminars. .

PROGRAMME REVIEW	Theory of Control for 3rd year **of laser Eng.**

COURSE SPECIFICATION

This Course Specification provides the main features of the Theory of control for the students of 3rd year in laser Engineering. Learning outcomes which gained by this program will help a typical student to achieve and demonstrate the learning opportunities that are provided during the course study and to comply with the program specification as laser Engineering.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser and Optoelectronics Engineering Dept.
3. Course title/code	Control Eng./LE3307
4. Program (s) to which it contributes	Laser Engineering Program.
5. Modes of Attendance offered	Complete Hours
6. Semester/Year	2nd Semester / Year
7. Number of hours tuition (total)	Two Hours / Week
8. Date of production/revision of this specification	6/7/2014
9. Aims of the Course	
The aims which can be achieved during teaching this course are as follows:	
1- Illustration and discussion the Main Theoretical Principles of control systems	
2- Understanding of using different control systems.	
3- Giving Knowledge about the Systems, Instruments, and Apparatus used in different types of control systems.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A-Knowledge and Understanding

A1-Enabling student to get the knowledge and understanding of the theoretical principles of control for different engineering systems.
A2-Preceding the understanding the Ideological philosophy of open loop and closed loop systems and their applications.
A3-Proceeding knowledge and understanding of the applications, and using Matlab.

B. Subject-specific skills

B1--Literatures
B2-Tutorials

Teaching and Learning Methods

-lectures
-Solving Problems
-Homeworks

Assessment methods

-Examinations
-Quizzes
-Home works
-Tutorials and discussions

C. Thinking Skills

C1-Reports
C2.Technical information collection for system performance.
C3.Research and collection data

Teaching and Learning Methods

-Literatures
-Tutorials

Assessment methods

-Test 1
-Test 2
-Quizzes and Assignments
-Final Examination

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.Solution of different control systems.
D2.Simulation of different control systems.
D3.Training on some software package programs related to the program (Matlab).

11. Course Structure

Week	*Hours*	*ILOs*	*Unit/Module or Topic Title*	*Teaching Method*	*Assessment Method*

1-2	*4*	*Theoretical l*	*Introduction*	*Lectures*	*Examinations, Quizzes, and Reports.*
3-4	=	=	*Mathematical Background*	=	=
5-6	=	=	*Block Diagram*	=	=
7-8	=	=	*Reduction Rules*	=	=
9-10	=	=	*Transfer Function of Physical Systems*	=	=
11-12	=	=	*Root Locus Techniques and Routh Criteria*	=	=
13-14	=	=	*Time Domain Analysis*	=	=
15	=	=	*Nyquist Plot*	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Literatures in different kinds of: Automatic Control systems
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet websites.
Community-based facilities (include for example, guest Lectures , internship , field studies)	N/A

13. Admissions	
Pre-requisites	Pass from last stage (year).
Minimum number of students	No limit.
Maximum number of students	No limit.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Laser & Optoelectronics Engineering Dept.
3. Course title/code	Spectroscopy / LE
4. Programme(s) to which it contributes	Laser Engineering program
5. Modes of Attendance offered	Complete Hours
6. Semester/Year	1st &2nd Semester
7. Number of hours tuition (total)	Two Hours Weekly x 30W=60H/Year
8. Date of production/revision of this specification	July 12/2014
9. Aims of the Course	
- Give an introduction to spectroscopy - Explain some spectroscopic systems and devices - Explain types of spectra - Define some spectroscopic parameters - Discuss interaction between light and matter	

- Differences between line and continuous spectra
- How to calculate energy values.
- Explain theoretical basics of evaluation of energy levels.
- Discuss different models to evaluate energy level values.
- Explain differences between classical and quantum models.
- Explain molecular aspects for spectroscopy.
- Discuss the diatomic molecular approximations.
- Explain different types of electronic, vibrational and rotational energy level calculations.
- Explain types of dispersion devices like prism, diffraction grating and interferometers.

10· Learning Outcomes, Teaching ,Learning and Assessment Methods.

A- Knowledge and understanding

A1. Knowledge of types of spectroscopic devices

A2. Enable the student to know the types of spectroscopic processes like absorption and emission

A3. Enable the student to understand how to calculate the energy level values.

A4. Enable the student to know how to change energy values with various systems.

A5. Knowledge of differences between classical and quantum mechanical treatments of energy values.

A6. Enable the student to know the differences between atomic and molecular systems.

A7. Enable the student to know some spectroscopic resolving devices and how to deal with them.

B. Subject-specific skills

B1. Use different equations to convert energy values.

B2. Use quantum mechanics to deal with energy level values.

B3. Use different approximation methods to deal with molecular electronic, vibrational and rotational energy values

Teaching and Learning Methods

The development of the student's ability to apply the knowledge in order to be able to correct analysis of the question and thus put the appropriate assumptions and interpretation to reach a solution. Through textbook and lectures.

Assessment methods

- Classroom discussions and to identify the potential of the student to analyze issues.
- Homework.

- Quizzes.
- Monthly examinations.

C. Thinking Skills

C1. Describe the methods to join spectroscopic aspects and laser generation.
C2. Description of the spectroscopic complete system.
C3. Describe the molecular system as a group of atomic bonding.
C4. Description of the resolving power of the dispersion systems

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-3	2 hrs /week	Introduction to spectroscopy, line spectra , emission and absorption	Classical spectroscopy	Motivate students to develop their capabilities in the analysis of questions, diagnose the problem and describe the solution.	Discussions. Homework. Quizzes Monthly examinations. Projects and seminars.
4-6	=	Energy levels, line and continuous spectra, atomic spectra,	Atomic spectra	=	=
7-9	=	Structure of matter, Bohr model, Hydrogen atom energy levels, application to other atoms, Q.M treatment	Bohr Model, and Quantum mechanics principles	=	=
10-13	=	Wave function and Schrodinger equation, Exclusion principle and periodic table, electronic structure, quantum numbers	Quantum mechanical treatment and quantum numbers	=	=
14-17	=	Central field model, electrostatic interaction, magnetic interaction, Zeeman effect and stark effect	Central field model and atom-electromagnetic interactions	=	=

18-21	=	Principles of molecular spectroscopy, interatomic potential, Born – Oppenheimer approximation, electronic energy of diatomic molecule	Molecular spectroscopy	=	=
22-25	=	Vibrational energy of a diatomic molecule, Rotational energy of diatomic molecule	Vibrational and Rotational energy	=	=
26-27	=	Ful morse potential, Corrections to simple rigid rotor	Continue to rotational spectra	=	=
27-30	=	Spectroscopic devices and interferometers, dispersion, resolving power, units of resolving power	Spectroscopic devices	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Spectrophysics , By: Anne Thorne Molecular spectroscopy, By: Banwell
Special requirements (include for example workshops, periodicals, IT software, websites)	Lectures are available on the departmental web site: http://www.uotechnology.edu.iq/dep laser and optoelectronics/index.htm
Community-based facilities (include for example, guest Lectures , internship , field studies)	Conducting seminars.

13. Admissions	
Pre-requisites	Passing second year laser engineering
Minimum number of students Max. number of students	Not specified Not specified

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Dep. of laser and optoelectronic Eng.
3. Course title/code	laser physics
4. Programme(s) to which it contributes	B.Sc., In laser Eng.
5. Modes of Attendance offered	Full Time
6. Semester/Year	third year
7. Number of hours tuition (total)	2
8. Date of production/revision of this specification	16-6-2014
9. Aims of the Course	
Definition of the concepts of laser physics for students of different third stage of Laser Engineering Branch and the theoretical basis for the work of lasers	

- Prepare students both theoretical and practical work in the field of competence of the planned public and private sector companies
- Consolidation of the basic principles of laser physics studied by the student in the second year

10· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Knowledge and Understanding

- A 1 - to identify the concepts of gain profile made in the laser device and the basic conditions
A 2 - to enable students to use mathematical equations to find various parameters of laser physics
A 3 - to enable the student to understand the guideline principles theory and practical applications

B. Subject-specific skills

B1 - to explain physics concepts for gain and amplification in different lasers
B 2 - to explain concepts of generation short pulses of laser devices
3 - use mathematical equations to calculate different physical parameters of laser systems

Teaching and Learning Methods

The development of the student's ability to apply the knowledge and the order to be able to correct analysis of the question and thus put the appropriate assumptions and interpretation to reach a solution. Through textbooks and lectures, in addition to the theory of laser physics

Assessment methods

- Classroom discussions and to identify the potential of the student to analyze problems.
- Homework.
- Sudden exams.
- Quarterly examinations.
- Projects and seminars.
- The student's performance in the laboratory.

C. Thinking Skills

C 1 - Description of the origin of the physical processes in laser systems
C 2 - describe the process of investing in the installation of these operations different lasers
C 3 - Description and principles of operation of the pulsed laser systems

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Employing all due respect to the course such as software, tables and diagrams to solve engineering problems.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-4	2 hours per week	Know the gain line shape and its causes and find out broadening taking place and it causes	Gain line shape and broadening processes	Motivate students to develop its capabilities in the analysis of data question and diagnose the problem and describe the solution.	Discussions. Homework. Sudden exams. Quarterly examinations. Projects and seminars. Laboratories.
5-8	2 hours per week	Knowing calculate the profit and amplification in the center of the laser	Gain calculations with and without laser	=	=
9-10	2hours per week	Recognize the effect of the cross-section of the emission of the catalyst on the ability of the laser	Stimulated emission cross-section and laser intensity	=	=
11-12	2hours per week	Description working principle of lasers and their work, installation and wavelengths	Special distribution of the emitted beam	=	=
13-15	2 hours per week	Account breakthrough laser beam focus	Laser beam divergence	=	=
16-21	2 hours per week	Use mathematical equations to calculate the properties and methods of pulsed radiation generated	Short pulses generation techniques	=	=
22-30	2 hours per week	Knowing when a laser beam spread in space and control characteristics	Propagation of Gaussian beam and controlling beam characteristics	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	J.wilson and J.F.B.hawkes, lasers principle and applications. Mark csele ,fundamental of light sources and lasers
Special requirements (include for example workshops, periodicals, IT software, websites)	http://uotechnology.edu.iq/dep-laserandoptoelec-eng/branch/branch2.htm
Community-based facilities (include for example, guest Lectures , internship , field studies)	- Conducting seminars. - Visits to work sites.

13. Admissions	
Pre-requisites	Pass the 2nd year exam. In addition, students have the capacity to communicate in English to read and write
Minimum number of students	No identification.
Maximum number of students	No identification.