

SYLLABUS

Classification	GIST College	Course No.	EC4301-01	Hrs:E:Credits	3/0/3	Instructor	Ham, Byoung Seung	Lecture Language	English
Course Title	Korean	기초전기전자컴퓨터 특론 I							
	English	Special Topics on Basic Electrical Engineering and Computer Science I							
Course Outline	<p>양자정보기술 개론: 양자역학에 기초한 양자정보과학 및 양자정보기술에 대한 개론으로써, 고전역학의 인과론 혹은 국소성과 대비되는 비국소적 양자상관성에 대한 이해와, 그에 기초한 양자기술(양자정보, 양자통신, 양자컴퓨터, 양자센서 등)에 대한 소개이다. 본 과목은 물리학도는 물론 공학도를 대상으로 최신 양자과학기술에 대한 소개는 물론 그 핵심원리(양자중첩, 큐비트, 양자얽힘, 등)를 이해하기 위한 것으로써, 고전적 세계관과 충돌하는 양자적 세계관을 배우고 이해하여 다가올 미래 양자기술세계를 올바르게 수용하는데 그 목적이 있다.</p> <p>Introduction to Quantum Information: As an introductory course to quantum information science and technology based on quantum mechanics, this course gives students a chance to learn general understandings of nonlocal quantum correlation, quantum communications, quantum computing, and quantum sensing. The purpose of this course is to teach basic quantum principles of quantum superposition, Bell inequality violation, quantum entanglement, quantum teleportation, etc. that contradict classical counterparts to adapt coming future quantum technologies.</p>								
Prerequisite	대학물리학								
Textbook & References	Quantum Physics: what everyone needs to know								
Lecture method	<ul style="list-style-type: none"> - 강의방식: - 강의형태: 								
Grading	중간/기말 각 35%, 퀴즈/숙제 각 10%, 출석 10%								
Etcetera									
Weekly Course Schedule									
Week	Description	Remarks	*On-line/Off-line						
1st	Ch. 1. Quantum Physics								
2nd	Ch. 2. Quantum measurem								
3rd	Ch. 3. Applications: quantum data encryption								
4th	Ch. 4. Quantum behavior and its description								
5th	Ch. 5. Applications: Sensing gravity								
6th	Chs. 6 & 7. Probability amplitudes								
7th	Ch. 8. Bell inequality violation								
8th	Midterm exam								
9th	Ch. 9 Quantum entanglement and teleportation								
10th	Ch. 10. Application: quantum computing								
11th	Ch. 10. Application: quantum cryptography								
12th	Ch. 11. Energy quantization and atoms								
13th	Ch. 12. Applications: quantum sensing								
14th	Ch. 13. Quantum fields								
15th	Ch. 14. Remaining questions								
16th	Final exam								

SYLLABUS

Weekly Course Schedule			
Week	Description	Remarks	*On-line/Off-line

*If there will be experiments, mark it in the "Remarks" section.

Instructor

(seal)

Lecture Language