MATERIALS ENGINEERING AND NANOTECHNOLOGY (LM56)

(Lecce - Università degli Studi)

Teaching SEMICONDUCTOR PHYSICS AND TECHNOLOGY

GenCod A003116

Owner professor Nicola LOVERGINE

Teaching in italian SEMICONDUCTOR PHYSICS AND TECHNOLOGY

Teaching SEMICONDUCTOR PHYSICS AND TECHNOLOGY

SSD code FIS/03

Reference course MATERIALS ENGINEERING AND

Course type Laurea Magistrale

Credits 9.0

Teaching hours Front activity hours: 81.0

For enrolled in 2019/2020

Taught in 2020/2021

Course year 2

Language ENGLISH

Curriculum MATERIALS FOR ELECTRONIC APPLICATIONS

Location Lecce

Semester Second Semester

Exam type Oral

Assessment Final grade

Course timetable https://easyroom.unisalento.it/Orario

REQUIREMENTS	Knowledge and understanding of the concepts tought in PHYSICS OF MATTER MOD. I & MOD. II (LM56)
TEACHING METHODOLOGY	The Course is carried on through classroom theoretical lectures (about 90% of the total teaching hours) and practical Laboratory sessions (about 10% of the teaching hours) , the latter focussing on the applications of MOVPE and MBE technology to the synthesis of compound semiconductor hetero- and nano-structures.
ASSESSMENT TYPE	The exam consists of an oral examination/colloquium aimed at determining to what extent the student has gained an overall knowledge of the topics treated within the course, and its ability to discriminate between different semiconductor technologies, their most relevant areas of applications and understand the fundamental physical-chemical principles behind these technologies.
FULL SYLLABUS	Introduction to Semiconductors and their Applications, Crystallography of elemental and compound semiconductors, Electrons band structure of semiconductors, Point defects in semiconductors, Line and plane defects in semiconductors, Phase diagrams of semiconductor compounds, Production of Electronic Grade poly-Silicon, Bulk crystal growth technologies of c-Silicon, Bulk crystal growth technologies of III-V compound semiconductors, Fabrication of Semiconductor Wafers, Epitaxy and epitaxial heterostructures, Liquid Phase Epitaxy, Principles of VPE technology, VPE-chlorides and VPE-hydrides of Si and III-V compounds, VPE-hydrides of II-VI compounds, MOVPE technology of compound semiconductors, Laboratory I: VPE/MOVPE, MBE technology of compound semiconductors, Laboratory II: MBE.

REFERENCE TEXT BOOKS

Fundamental University Physics Vol. 3 – Quantum and Statistical Physics (M. Alonso & E.J. Finn), Addison Wesley (1968).

Introduction to Solid State Physics(C. Kittel), Wiley (Chichester, 1991).

Handbook of Crystal Growth, Edited by D.T.J. Hurle (North-Holland, Amsterdam-NL, 1993).

Vol. 2: "*Bulk Crystal Growth*".

Vol. 3: "*Thin Films and Epitaxy*"