

Semi-conductor materials and devices

Lab work : semiconductor materials and devices

IDENTIFICATION

CODE : SGM-4-S1-TPMASC
ECTS : 4.0

HOURS

Lectures : 0.0 h
Seminars : 0.0 h
Laboratory : 52.0 h
Project : 0.0 h
Teacher-student
contact : 52.0 h
Personal work : 26.0 h
Total : 78.0 h

ASSESSMENT METHOD

Lab report + oral defense

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

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AIMS

Acquisition of working methods and of knowledge to analyze and interpret the properties of semiconductor materials and components
To familiarize the students with techniques for the engineer on fields of the development and characterization of semiconductor materials. Study of the technological processes and the electric behaviour of semiconductor devices.

CONTENT

- Semiconductor light emitters (LED, laser diodes) and optical fibers
- Atomic Force Microscopy (AFM)- analysis
- Photovoltaic Solar cells
- Doping of semiconductors : thermal diffusion
- Ellipsometry
- Characterization of MOS-FET transistor
- Characterization of MOS-bipolar transistor
- Electric simulation of MOS and bipolar transistors
- Process simulation of bipolar transistor
- Process simulation of MOS transistor
- Project of simulation
- photolithographie processes.

BIBLIOGRAPHY

- [1] H. MATHIEU - Physique des semiconducteurs et des composants électroniques, Ed. Masson 1990
- [2] A.VAPAILLE, R. CASTAGNE - Dispositifs et circuits intégrés semiconducteurs - Physique et Technologie, Ed Dunod [1990]
- [3] S. M. SZE - Semiconductor devices : Physics and Technology, Ed. J.Wiley [1985]