
ENGINEERING PROGRAMME

2022-2023

Year 3

Professional Option Healthcare Engineering

OP IGSANTE

PROGRAMME SUPERVISOR

Thomas LECHEVALLIER



ENGINEERING - OP IGSANTE

Autumn Semester

Course unit	ECTS Credits	Track	Course code	Title
UE 92	4	Core course	INGHOSP SANTE	Engineering in hospitals Basics of Healthcare

Spring Semester

Course unit	ECTS Credits	Track	Course code	Title
UE 102	1	Core course	INGES PROSAN	Engineering in healthcare industry Healthcare projects

ENGINEERING - OP IGSANTE

Year 3 - Autumn Semester - Course Unit 92

Engineering in hospitals [INGHOSP]

LEAD PROFESSOR(S): Thomas LECHEVALLIER

Objectives

Presentation of engineering in hospitals (digital, biomedical, research, logistics, works, quality)

Course contents

Engineering in hospitals (4 p.m. CM / 2 p.m. TD):

- The hospital (General presentation of the hospital's engineering professions and visit of the hospital if possible)
- Biomedical engineering: 4h of CM
 - o Health constraints,
 - o Regulatory constraints,
 - o Imaging,
 - o Biology,
 - o Blocks,
 - o Hospitalization equipment (Ultrasound, Scope, ECG ...)
- Digital engineering
 - DSN organization
 - Service contracts
 - Urbanization of the SIH
 - Project management
 - Role of the Application Manager
 - HIS security
- Research engineering:
 - o Organization of research,
 - o Research professions
- Quality engineering:
 - o Quality organization,
 - o Health constraints
 - o Regulatory constraints,
 - o Certifications

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	2	24 hrs	6 hrs	0 hrs	0 hrs	2 hrs

ENGINEERING - OP IGSANTE

Year 3 - Autumn Semester - Course Unit 92

Basics of Healthcare [SANTE]

LEAD PROFESSOR(S): Thomas LECHEVALLIER

Objectives

Presentation of health (teaching of fundamentals on medicine, population health and its political and societal organization),

Course contents

Health, the fundamentals (24h CM / 6h TD):

- Body and mind
 - o A / physiology:
 - embryology / cell biology / biochemistry,
 - basic anatomy,
 - systems (nervous, digestive, cardiovascular, respiratory, immune, hematology, nephro-urothelial)
 - body adaptability: tolerance
 - senescence
 - o B / pathology, the various attacks:
 - Oncology,
 - Vascular pathology,
 - traumatology,
 - autoimmune disease,
 - infectiology,
 - toxicology,
 - psychiatry,
 - genetics.
 - The actions of medicine on the body and on the mind
 - o A / clinical examination and questioning,
 - o B / diagnostic research
 - Imaging,
 - Biology,
 - invasive gestures
 - o C / therapeutic
 - Medicine and pharmacy,
 - Kinè and rehabilitation,
 - Diet,
 - Surgery or interventional,
 - Dialysis / chemo / transfusion,
 - Resuscitation,
 - Radiotherapy,
 - Pain,
 - The human being (ethical debates and staging of cases)
 - o sick doctor relationship,
 - o medical ethics: 4 principles (autonomy, benevolence, non-maleficence, justice),
 - o psychology versus medicine,
- Large-scale health
 - o population health and public health,
 - o epidemic,
 - o humanitarian medicine
 - Health networks and actors
 - o in town: attending physician and correspondent, HAD, outpatient, networks with paramedics,
 - o shared medical file,

- o hospital: care sector, role of the different actors (medical, support services, administrative)
- o Importance of time: Emergencies, deadlines, citizen actions

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	2	24 hrs	6 hrs	0 hrs	0 hrs	2 hrs

ENGINEERING - OP IGSANTE

Year 3 - Spring Semester - Course Unit 102

Engineering in healthcare industry [INGES]

LEAD PROFESSOR(S): Thomas LECHEVALLIER

Objectives

Presentation of engineering in healthcare companies (drugs, imaging, biomedical devices, information system, construction, consulting, etc.)

Course contents

Engineering in healthcare companies (24h CM / 6h TD):

- Pharmaceutical companies
 - o Market presentation,
 - o Presentation of the industrial sector,
 - o Presentation of engineering professions,
- Biomedical equipment companies:
 - o Market presentation,
 - o Presentation of the industrial sector,
 - o Presentation of engineering professions,
- Digital companies:
 - o Market presentation,
 - o Presentation of the industrial sector,
 - o Presentation of engineering professions,
 - o Use of health data, IA
- Research :
 - o Presentation of the profession with example of nuclear imaging research

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	0.5	24 hrs	6 hrs	0 hrs	0 hrs	2 hrs

ENGINEERING - OP IGSANTE

Year 3 - Spring Semester - Course Unit 102

Healthcare projects [PROSAN]

LEAD PROFESSOR(S): Thomas LECHEVALLIER

Objectives

health, hospital, private, public and industrial projects.

Course contents

Course material

Assessment

Collective assessment: EVC 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	0.5	0 hrs	0 hrs	0 hrs	40 hrs	0 hrs