Name of Module: Study and research in business in Data Science	Credit Points (ECTS): 12	**Module-ID:** SMZ2ID4 in semester 2
Person Responsible for Module (Name, Mail address): Cédric Ulmer, cedric.ulmer@francelabs.com, I&E UNS coordinator		
University: UNS	**Department: Computer science, Faculty of Science**	

1. Prerequisites for Participation

According to general prerequisites for EIT Digital Master School programs; attendance to the Communication and management of I&E and I&E Principles modules.

2.a. Applicable EIT Overarching Learning Outcomes

- **Ability to think beyond boundaries and systematically explore and generate new ideas ([C]reativity)**
- **Ability to use knowledge, ideas or technologies to create new or significantly improved products, services, processes, policies, new business models or jobs ([I]nnovation)**
- **Ability to transform innovations into feasible business solutions ([E]ntrepreneurship)**
- **Leadership and decision-making, based on a holistic understanding of the contribution of higher education, research and business to value-creation, in limited sized teams and contexts ([L]eadership)**
- **Ability to identify short and long term future consequences of plans and decisions from an integrated scientific, ethical and intergenerational perspective and to merge this into a solution-focused approach, moving towards a sustainable society (Making [V]alue Judgements)**

2.b. Intended Learning Outcomes

- **[C] The ability to explore and create ideas or modify existing ideas for business solutions**
- **[I] The ability to apply the learned knowledge for development of a new product or business concept**
- **[I] The ability to recognize and address diverse obstacles in transforming a technology into a business**
- **[E] Understanding of the different phases of a business development process**
- **[L] The ability to use decision-making and leadership competencies while transforming new ideas into business solutions**
- **[L] The ability to reflect upon team processes**
- **[L] The ability to work in multi-disciplinary teams**
- **[V] The ability to realize ethical and sustainability considerations when developing new products/technologies**
- **The ability to transforming new ideas into business solutions on the commercial market, combined with decision-making and leadership competencies**

3. Content

Business plan development in phases – (a) idea recognition – (b) concept design – (c) Business Plan conceptualization – (d) Business Plan presentation.

Application of subjects from the other I&E modules or introduced in this module:

- Business Model Canvas (9 boxes)
- Methods and tools for customer discovery, customer validation, evidence-based decision making, market analysis
- Business ethics, sustainability
- Entrepreneurial finance concepts, methods and tools (cash flow management, financial scenarios)
- Other business planning concepts methods and tools (strategy, marketing, market entry)
- Financing, fund raising
- IP and intellectual assets Management
- Pitching and oral communication

These contents are normally introduced and applied through the Bus Dev Lab project (learning by doing). Additional know how are provided through the associated "Business course" (see details below), and are also intensively applied in the Bus Dev Lab project.

4. Teaching and Learning Methods

Course 1: BDL (7 ECTS starts in 2nd semester)

The Business Development Lab lets students work in teams on a business plan development project. The teams are multidisciplinary in nature also containing students from other disciplines (according to availability). It is split in two phases: a short one, focused on applied lectures, and a longer one, focused on learning by doing through a project.
Students start by choosing an entrepreneurial idea/challenge/problem either brought in from the students themselves or inspired/indicated by business partners or academics. Toy projects are avoided. Ability to do actual customer/hypothesis is considered. The subject relates to ICT and must involve technology to some extent.

The BDL team schedules specific lab sessions with students on campus: the overall goal is for students to select a business idea, and this has to be in connection with technical program (in our case Data Science). Either a preset theme or simply a set of ideas will be served by EIT Digital partners, startups partners of the CLC, business incubators/TTO or association/competiveness clusters in the Nice Sophia-Antipolis ecosys-tem. Again, small teams of students are set up, through a team building process mixing personal competen-cies, and a competition about business ideas.
Additional classes cover Intellectual Property in particular, and marketing.

Students work on a business plan that covers the customer discovery, market analysis, as well as a business model.
To execute the BDL in concrete terms, teams are requested to work on an alpha-stage prototype of their product. For this reason, IT (app development) will be the preferred product. We believe this prototyping (or at least simulation driven) step is important for students to get a realistic idea about the needed efforts for developing and launching the target product (including associated IPR related actions) and consequently for building a realistic business plan.
One inspirational mentor preferably not an academic will be assigned to each team and regularly meet. The overall goal of the BDL course is to end up with a detailed business plan. BMC is used. To this aim, BMC is introduced during traditional classes.
The BDL is assessed by the final pitch in front of a jury, composed of academics and industrials.

Course 2: Business course for data science (5 ECTS starts last quarter in 2nd semester)

This part is itself decomposed into traditional classes with data science business development as a target, These classes encompasses interventions of business developers or partners involved at government levels, concerned with the privacy, use of private or open data, protection of personal data:

- Business and marketing, in particular of data
- Ethical aspects of data usage, intellectual property of data management products, data privacy
- Search and indexing of data
- Living labs, innovation 2.0, co-creation, etc

5.a. Assessment and Grading Procedures

Below the repartition for the **BDL grade**:

A. Technical POC: 25% of the grade
B. BDL report and presentation: 75% of the grade

Technical POC grade is decomposed as follows:

1. Written report: 70%. Evaluation: The written report is evaluated based on the quality of its content, the writing, and the explanation of your decisions. In particular, it should contain:
   a. The algorithms, techniques you have decided to use, be they off the shelf or home-made. Also motivate why you decided to use them
   b. Present the work breakdown of the POC
   c. Present and motivate the technologies that you have used
   d. Present the pros and cons of the technologies/algorithms used, and what you would recommend to use if a hypothetical « second phase » with more time and money was given to your project

2. Oral presentation: 30%. Evaluation: Quality of the presentation, presentation skills. Basically, can we understand what you did by looking at your presentation without looking at your written report. The assumption is that the persons evaluating are knowledgeable in Data Science technologies.

BDL report and presentation grade is decomposed as follows:

1. Oral presentation: 25%. The oral presentation is twofold:
   a. The investors pitch: 2-5 min. Evaluation: Quality of the investors pitch, time respected. Can we understand what you sell. Are you giving the feeling that you understand the market that you're going into. Presentation skills matter as well. Quality of the project presentation.
   b. The project presentation: 10-15 min. In this part, in particular, you present the GANTT chart, with whom you have been discussing, the challenges encountered, the pivots you made (if any), who did what, and some drill downs you consider as relevant and want to highlight. Evaluation: do we understand what you did in the project. Do we have the feeling you worked hard on it, without having read the written report.
2. BDL report: 65%. Evaluation: The written report is evaluated based on the quality of its content and the writing.
3. Leadership: 10%. Evaluation: Throughout the module, students are evaluated for their leadership skills, through oral presentations of their ongoing work.

Below the respective repartition for the **business in data science** grade:

- 2.5 on ethical aspects and data usage
- 0.5 on living labs and co-innovation
- 2 on data search and indexing techniques

5.b. Grading Criteria

Grading criteria include:

- **[C] Invents or finds solutions to address and solve his/her project main challenges (customer problem, functionality, business model, development,…)**
- **[I] Drives his project according to the dimensions of (1) customer problem/solution discovery (including in relation to the product technical development) and (2) market discovery (related to strategic thinking) in ways that are relevant for the situation.**
- **[E] Alternative 1: Addresses key steps in a BM/BP/BD project/activity. Plans / diagnoses / recommendations or actions are well supported and appropriate. Identifies appropriate strategies for risk reduction.**
- **[E] Alternative 2: Systematically uses analytical business skills to recognize, assess and/or develop business opportunities in relation to all dimensions covered in his project/study/activity: market, customers, competition, environment, human, and material and technical resources.**
- **[L] Is able to initiate and carry out design projects, achieve milestones, do problem solving, understand team roles, handle conflicts, negotiate, have good verbal, written and visual communication skills, ability to interact with stakeholders.**
- **[V] Alternative 1: Apply ethical perspectives and theoretical concepts in relation to the topic of the work or its results. Consider and discuss future consequences of these in different situations and/or for different societal groups from a sustainability perspective. Show a solution focused approach.**
- **[V] Alternative 2: Relate the value proposed in his project/study/activity to all relevant stakeholders including producers, customers, shareholders, communities, ecological systems and policies as appropriate**

6. Workload calculation (contact hours, homework, exam preparation,..)

For the BDL (7 ECTS):
Since this module is heavily oriented towards in class preparation work, the amount of expected homework is about 120h
The workload per group distribution is:

- Coached group work: 22h onsite (C.U) TDs
- Individual and group work: 14h onsite TPs, (Assistance CU on demand)
- Pitching sessions: 2x3h pitching sessions, TDs

And for the whole cohort:

- In depth BDL applied lectures (Marketing, IP, BMC, …): 12h C

For the Business course (5 ECTS):

- In depth applied lectures (Data protection and privacy, Living labs, Co-innovation, Data search, …): 21h C plus business presentations from partners of the eco system for an amount of 25 h approximatively.

7. Frequency and dates

Once a year

8. Max. Number of Participants

All DSC entry point students must be able to participate

9. Enrolment Procedure

None

10. Recommended Reading, Course Material

Books:

- Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers Wiley Desktop Editions. Authors Alexander Osterwalder, Yves Pigneur. John Wiley & Sons, 2010
- The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company, Volume 1. Authors Steven G. Blank, Bob Dorf. K&S Ranch Publishing LLC, 2012
- Technology Ventures: From Idea to Enterprise; Authors Richard C. Dorf, Thomas H. Byers. Edition 2; McGraw-Hill Higher Education, 2008
- Strategor. Authors Laurence Lehmann- Ortega, Frédéric Leroy, Bernard Garrette, Pierre Dussauge, Rodolphe Durand ; Collection: Livres en Or, Dunod 2013 - 6ème édition - 704 pages - 190x240 mm

Online I&E content for use in blended / flipped class:

- As available from EIT Digital

11. Other Information (e.g. home page of module)

http://www.i3s.unice.fr/csmaster/mods/IandE.html

Comments:

Basic data (header)	Module ID	Module-ID is the local module or course number that uniquely identifies this module in the university.
	Person responsible	This is usually the professor teaching this course.
1	Prerequisites	Knowledge and skills the participants are expected to have when enrolling.
2	Intended Learning Outcomes	3-5 statements of what the students should know or be able to do after successful completion. Statements should be characterised by (a) knowledge, (b) skills, or (c) competences. (This relates to the European Qualification Framework.)
3	Content	Short list of key words
4	Teaching and learning Methods	Short characterisation whether it is a lecture, lab course, project, seminar or a combination including number of weekly hours, if possible.
5	Assessment	Description of how the assessment takes place and how the grades are calculated. It may be a simple written exam with one grade, or e.g. in case of a seminar a combination of assessment of an oral presentation (1/3) and written seminar paper (2/3).
6	Workload calculation	You should indicate, how the credit points are calculated, e.g.: 4 weekly hours contact time x 15 weeks = 60 hours Assignments: 90 hours Exam preparation: 30 hours Total: 180 hours = 6 ECTS
7	Frequency and dates	Indication, if the course is offered each semester or once a year, and if it is in spring/summer or in fall/winter semester. It should also be indicated, what date the classes usually start and what date the course is finished (including exam).
8	Max. number of participants	In lab courses, projects or seminars, there might be some limitation.
9	Enrolment procedure	Indicate when and how students can register for that module.
10	Recommended reading	If the course is based on some text book, it should be indicated here.
11	Other information	All other information you consider useful, especially the URL of the home page of the course can be put here.