

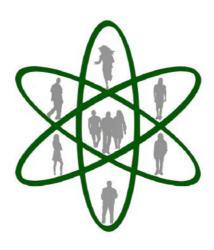


RRIL - Presentation of the Course:

Ethics in Responsible & Sustainable Innovation

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RRIL – Presentation of the course: Ethics in Responsible & Sustainable Innovation

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Presentation of RRIL - Responsible Research and Innovation Learning

Responsible Research & Innovation is a genius concept developed by the European Commission for the governance of research and innovation processes with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products. It aims to shape, maintain, develop, coordinate and align existing and novel research and innovation-related processes, actors and responsibilities with a view to ensuring desirable and acceptable research outcomes.

In the Horizon 2020 programmes, there were and are some projects focusing on related training needs. But there is no substantial attempt observable to develop continuous higher education programmes supporting the implementation of this concept and the respective reorganisation processes in universities, research centres, research and innovation oriented enterprises and public authorities like cities or regional governments. This project pretends to fulfil this gap through the co-creation of higher education modules between different research and innovation actors.

RRIL especially focus on public engagement, gender equality and ethics (in the knowledge fields Energy and Economy) testing the learning modules in innovative environments based on interactive real-problem approaches. The modules developed are offered to research and innovation actors supporting the implementation of RRI principles in the organisations capacitating the learners to develop jointly innovative solution for societal problems.

RRIL is based on co-creation and open innovation processes giving a prominent role to the learners. The co-creation is conceived as multidisciplinary and transversal among different kinds of actors as HEI, research centres, NGO's and cities paving the way for knowledge exchange between them. It consists in informed learning among practitioners considering learners as a knowledgeable and critical partners in designing and implementation of the learning means. Under this perspective, the potential learners – programme coordinators and tutors - are considered peers working collaboratively on the project outputs

RRIL - consortium

Universitat Rovira i Virgili (Coordinator).

Tampere University

Kozminski University

NOTUS applied social research.

Fundació Tarragona Smart Mediterranean City.

INGOS - Institute of Innovative Economy.

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Preface

Responsible research and innovation (RRI), as an integrated concept, is being promoted by the European Union since 2010 and forms part of the Horizon 2020 in the area of science with and for society. Although the issue of responsibility in research and innovation has been discussed for some time before especially in North America, Great Britain, and the Netherlands, it is a concept genuinely developed by the European Commission at the end of the 2000's for the governance of the science and technology complex from the political level. So far it forms part of the answer of the European Commission to the changes in the configuration of the democratic processes to steer societal processes, in which the private actors gained relevance. However, recently the RRI as guiding vision lost relevance in favour to other concepts as the Sustainability Goals of the UN, which, however, covers the core principles of RRI. For this reason, we decided to anchor RRI in sustainability and enrich it towards Responsible & Sustainable Innovation (ReSI).

RRI is formed by five strategic dimension: public engagement, gender equality, science education, open science and ethics, to which the transversal dimension of governance is added to develop harmonious governance models and institutional strategies. The project developed learning courses for three of these dimensions: public engagement, gender equality and ethics, to which we add an introductory course to ReSI.

The goal of the learning programme is to support the integration of these core aspects of RRI and sustainability in science-based innovation processes. The main target groups are academics involved in science-based innovation processes or students as future academics or agents of innovation e.g. in business, NGOs, local and regional authorities.

The integration of the programme in the learning offers of higher education will support the promotion of responsibility in innovation processes in universities. The participating Higher education institutes will do so in the next academic years. The use of the creative Commons licences Attribution-NonCommercial-ShareAlike allows other higher education institutions to integrate the whole programme (or parts of them) in their learning offers. Although the courses are designed as a holistic programme, they can be used separately.

In this document, we present briefly the programme and then in some more detail the course Ethics in Responsible & Sustainable Innovation.

The learning program

| | | Fiche | | |
|-------------------------------|---|---------|--------|------|
| Title | Responsible and Sustainable Innovation: Learning Programme | | | |
| Leading Organisations | University Rovira i Virgili, Kozminski University; Tampere | | | |
| | University | | | |
| Target group | Master Students, PhD students, others as agents of change o | | | |
| | municipalities, NGOs, Business etc. | | | |
| N° of students | 20 | | | |
| Language | English, also accessible in Spanish | | | |
| Requirements of participation | Medium Level of English/ Medium Level of Spanish | | | |
| Credits points | 9 ECTS | | | |
| N° of lecturing hours | 60 hours | | | |
| Mode | F2F | blended | Online | MOOC |
| | | X | X | X |
| Learning Methods | Lecture, group work, workshop or others | | | |
| Evaluation Quizzes | | | | |
| | Open questions | | | |
| | Group discussions | | | |
| | Case studies as group work suing problem based approaches | | | |
| | Design and realisation of interviews with experts | | | |

Objective

The program aims at helping practitioners to understand and analyse the dynamics of science-based innovation processes and the integration of principles of responsible and sustainable innovation focusing on public engagement, gender equality and innovation ethics. The practitioner will learn the reasons of the development of Responsible Research & Innovation (RRI) and it further development to Responsible & Sustainable Innovation (ReSI). The program aims at helping the students to understand the dynamics of public engagement, the relevance of gender equality for the research processes and the tools for apply innovation ethics in science based innovation processes. It provides the students with insight so that they can (a) reflect on their research and innovation already in early career stage; (b) anticipate intended and unintended consequences of their activities; (c) apply criteria of open science making transparent the intention of the research and innovation, the actors involved and their particular interest; and (d) involve the main stakeholders including the citizens in the deliberation processes from the beginning to the end of the science-based innovation process.

Structure

Course: Introduction to Responsible & Sustainable Innovation (ReSI)

Introduction.

Lecture1: Changes in Innovation Systems.

Lecture 2: Multi-actor configuration and open innovation.

Lecture 3: Answer to innovation dilemmas: Responsible Research & Innovation.

Lecture 4: Responsible Research and Innovation.

Lecture 5: Towards Responsible & Sustainable Innovation.

Lecture 6: ReSI in practice.

Course: Public Engagement in Responsible Research and Innovation

Introduction.

Lecture 7: Public Engagement in Responsible Research and Innovation.

Lecture 8: Innovation and Innovation Models.

Lecture 9: Conceptualising Dimensions of Public Engagement.

Lecture 10: Commercialisation of Research and Innovation and Public Engagement.

Group Exercise and Learning Diary: Developing sustainable public engagement strategy.

Course: Gendered Responsible & Sustainable Innovation (ReSI)

Introduction.

Lecture 11: Gender Bias in Economic Research.

Lecture 12: Gender Economics and Sustainability.

Lecture 13: Gendered ReSI (including gender bias in energy and technology innovation).

Lecture 14: Gender ReSi in Cities (with reference to energy use and mobility).

Lecture 15: Gender Mainstreaming and Doughnut strategy.

Group Exercise and Learning Diary: Gendered Responsible & Sustainable Innovation.

Course: Ethics in Responsible and Sustainable Innovation

Introduction.

Lecture 16: Tools to ensure societal relevance and ethical acceptability of RRI outcomes.

Lecture 17: Corporate Social Responsibility.

Lecture 18: Smart City & Responsible Technology.

Lecture 19: Just Energy Transition.

Group Exercise and Learning Diary: Ethics and General programme

Content

The first course **introduces in Responsible & Sustainable Innovation**, which anchored the concept of Responsible Research and Innovation (RRI) in Sustainability and the Sustainable Development Goals. The students will learn about

- the transformations of the innovation system towards quadruple helix configuration.
- the dilemmas, which academics must face, and how the concept of Responsible Research and Innovation have academics orientations to face these dilemmas.
- the need to anchored RRI in Sustainability and the Sustainable Development Goals. proposing the concept of Responsible & Sustainable Innovation (ReSI).

Based on this concept, the courses of public engagement, gender equality and innovation ethics has been developed. All three modules take as thematic reference points: economy, energy (including mobility) and urban development. The last topic indicates that the program insists in the cooperation with municipal public administrations and policy makers considering cities as crucial to achieve the Sustainable Development Goals.

https://lor.instructure.com/resources/0c1fa583b6cb443e9b37d75403e56fbc

The course of *public engagement* aims at helping students to understand and analyse the dynamics of public engagement in the context of responsible research and innovation and its central elements. The students will be able to critically assess the strengths and weaknesses or advantage and disadvantages of public engagement in enhancing responsible research and innovation. The course insists in the relevance of public engagement for the implementation of the gender perspective and principles of innovation ethics already at the beginning of the innovation process. Students will work on a particular country/region innovation process case and analyse the major challenges and opportunities of public engagement of universities in transforming an innovation process to meaningfully respond to social, economic and political problems and come up with strategic and feasible solutions.

https://lor.instructure.com/resources/f17d06173ec14c61bccf80117e771fd8

The course of *gender equality* aims to enable participants to integrate the dimension of gender equality and social vulnerability in science based innovation projects based on quadruple helix configuration, especially with the participation of municipal public administration and policy makers. Through the example of economy and technology (energy and artificial intelligence), it will arise the awareness of gender bias in science and innovation processes. The module insists in the interrelation with public engagement and innovation ethics to achieve the implementation of the gender perspective in science based innovation processes. It will reinforce the competences of the participants (defined in terms of knowledge, capacities, responsibility and autonomy) to integrate the gender and social vulnerability perspective in innovation projects and to evaluate and monitor their impact on gender equality and social vulnerability.

https://lor.instructure.com/resources/0aa23b741bac4f6a855057d12c8e17c1

The course of *innovation ethics* aims to enable students to introduce the ethical perspective in science based innovation processes, particularly in the fields of economy and energy with the focus on sustainability. It provides an overview of various tools, approaches, and methodologies such as the precautionary principle, International Standard ISO 26000, Value Sensitive Design, and participative technology assessment. It will arise the capability of the students to use in their projects, campaigns, or any other endeavours these and other tools reinforcing the ethic dimension of the innovation activities in close relation to public engagement and gender equality. It is based on the premise that to ensure social relevance and acceptability of any innovation, its impact should be evaluated at the early stages of the research process, including its possible unintended and unexpected consequences. Monitoring the innovation process could be enabled by sharing authorship and responsibility of the results with relevant social groups (citizens, policymakers, entrepreneurs, educators, etc.) who should be involved in all stages of the process while respecting the principles of gender balance.

https://lor.instructure.com/resources/eec37eb0a22d49a1bd5139b105f4194b

The programme and its four courses used video presentation to introduce to the topic and subtopics, web texts, video with experts (generally from external sources), individual exercises (e.g., quizzes and open questions), participants' learning journals, and group works (e.g., simulation of project development, interviews with experts among others) using holistic approaches combining public engagement, gender and ethic. Each course includes group exercises for its specific topic, so that they can be used separately, but maintaining the holistic approach.

For more details of the content of the program, please consult the RRIL learning programme presentation at <u>RRIL project website</u> or the <u>project lab at research gate</u> or the <u>online learning programme</u>.

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Ethics in Responsible and Sustainable Innovation

| Outline of the course | | | | |
|-------------------------------|--|---------|--------|------|
| Title | Understanding societal relevance and ethical acceptability of R&I outcomes in responsible and sustainable innovation | | | |
| Leading Organisation | Kozminski University (Warsaw) | | | |
| Target group | Bachelor Students, Master Students, PhD students, representatives of business (esp. start-ups community) and local communities engaged in innovation process | | | |
| N° of students | 20 | | | |
| Language | English with some additional material in Polish | | | |
| Requirements of participation | Medium Level of English | | | |
| Credits points | 3 ECTS (as standalone course) | | | |
| N° of lecturing hours | 20 hours as standalone course/ 19 hours integrated part of the program | | | |
| Mode | F2F | blended | Online | MOOC |
| | | X | X | X |
| Learning Methods | Lecture, reading, group work. | | | |
| Learning products | Group presentation; Videos; Case studies | | | |
| Evaluation | Group presentation, Videos; Case studies, Quizzes, Open questions | | | |

Objectives

The main objective of the course is raising awareness on ethical dimension of conducting research and innovation development, as well as providing inspiration, knowledge and learning tools related to ethical considerations in research and innovation processes.

The course introduces the students to various approached applied to ensure societal relevance and ethical acceptability of R&D+I outcomes in the context of business activity, energy research, and urban development. In this understanding, an ethical reflection is closely related to other concepts, such as sustainability, transparency, the precautionary principle, social responsibility of science, impact assessment, or design for values.

The course is based on the premise that to ensure social relevance and acceptability of any innovation, its impact should be evaluated at the early stages of the research process, including its possible unintended and unexpected consequences. Monitoring the innovation process could be enabled by sharing authorship and responsibility for the results with relevant social groups (citizens, policymakers, entrepreneurs, educators, etc.) who should be involved in all stages of the process while respecting the principles of gender balance. Therefore, the course stresses the

connections between ethical dimension of R&D+I with public engagement and gender perspective, and present them as complementary concepts.

Such an approach to ethics is the least known among researchers and innovators in Spain, Finland and Poland, and rarely implemented in a systematic way in the processes of innovation development¹. These issues have become even more important and troublesome in light of emerging new ethical challenges related to new technologies, such as cutting-edge applications of AI and increasingly complex global problems, such as climate crisis, or raising social inequalities. Therefore, this course aims at contributing to answer the following question: How to introduce the ethical perspective in research and innovation development processes on these cutting edge domains?

Structure

The course is divided in 4 Lectures.

Introduction.

Lecture 16: Tools to ensure societal relevance and ethical acceptability of RRI outcomes.

Lecture 17: Corporate Social Responsibility.

Lecture 18: Smart City & Responsible Technology.

Lecture 19: Just Energy Transition.

Group Exercise and Learning Diary: Ethics and General programme

Content

Ethical reflection is one of the guiding principles of the Responsible Research and Innovation framework. Ethics in research and innovation development can be understood as an umbrella concept that encompasses various ideas and can be divided into three broad categories:

- 1. Research integrity and good research practice;
- 2. Research ethics for the protection of the objects of research;
- 3. Societal relevance and ethical acceptability of R&I outcomes.

While the first two categories apply first of all to the process of research, the third one considers its outcomes. The course focuses on the third category, that "(...) aims to ensure increased societal relevance and acceptability of research and innovation outcomes. Ethics should not be perceived as a constraint to research and innovation, but rather as a way of ensuring high quality results" (European Commission, 2012). In this understanding, an ethical reflection is closely related to other concepts, such as sustainability, transparency, the precautionary principle, social responsibility of science, Corporate Social Responsibility, or designing for values, among others. The course invites its participants to reflect to what extent these concepts, which are commonly associated with responsible innovation, actually respond to current social, economic, and environmental problems. It also invites participants to reflect on how to make innovations developed within the Corporate Social Responsibility (CSR), Smart City, or just energy transition more socially relevant and ethically acceptable.

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¹ Krüger, K. (Coord.), Molas, A.; Jiménez, L.; Hjelt, J.; Pekkola, E.; Stenvall, J.; Stasik, A.; Dańkowska, A. & Kobza, N. (2020) Responsible Research & Innovation in three countries: Finland, Poland and Spain-Catalonia. dia-e-logos Discussion Paper 02/2020. Oldenburg/ Barcelona. dia-e-logos.

After presenting the introduction to the course, its content is divided into 4 lectures:

1. Tools to ensure societal relevance and ethical acceptability of R&D+I outcomes.

This lecture presents different disciplined approaches which serve to ensure societal relevance and ethical acceptability of R&I outcomes: the precautionary principle, International Standard ISO 26000, Value Sensitive Design, and participative technology assessment. The lecture includes discussions on the assumptions on which these approaches are based, and reflects on their strengths and weaknesses. It shows how these tools may be used by participants in innovation development processes, in campaigns, or other endeavours, ensuring that they meet the criteria for responsibility.

2. Corporate Social Responsibility

This lecture explores how the concept and various practices related to Corporate Social Responsibility (CSR) may ensure societal relevance and ethical acceptability of R&D+I outcomes. For that purpose, it starts with the introduction of the CSR concept and how it evolved over time. Next, it presents the discussion on the need, limitations, and ethical dilemma of CSR. It pays especially close attention to the CSR in the world of technological corporations, where the role of societal relevance and ethical acceptability of R&D+I outcomes is highly relevant. It also explores the role of CSR during the COVID-19 pandemics.

3. Smart City and Responsible Technologies.

This lecture allows to understand the ethical dimension and challenges of the innovations developed for the smart cities. It explores the idea of the Smart City in connection with the ethical and societal challenges of the urbanization and digitalization. It presents the example of Smart City projects from all over the world and from Poland and shows how they relate to the problem of ethical acceptability of innovations.

4. Just energy transition.

This lecture explores the challenge of developing responsible and sustainable innovations necessary to avoid the catastrophic climate change. For that reasons, it introduces the concept of the climate change and explains why the political actions are essential to tackle it. Then, it presents the role of innovations in searching for solutions for just energy transition and discusses ethical aspects of the process of creating these solutions.

5. Group Exercise and Learning Diary: Developing sustainable public engagement strategy

The section provides the opportunity for the students to analyse various strategies of to apply principles of ethics of innovations. First, a brief presentation about sustainable ethic strategies is presented. Second, selected cases are explored in a bid to integrate ethic strategies in urban innovation project in conjunction with public engagement and gender. It is based on the cases selected in the previous course about public engagement

The aim is to support the comprehensive understanding of students about ethic strategies in ReSI and to design holistic strategies integrating public engagement, gender and ethic principles in one

strategy. The section includes workshops and seminars prepared by students. Finally, this section briefly summarised the contents of the previous ethic lectures and of the whole programme based on the learning dairies of the students.

The students are called to drawn out a simulation of an urban project to integrate gender topics based on public engagement procedures and having in mind the future integration of ethical principles of innovation.

Finally, this section briefly summarised the contents of the previous lectures based on the learning journals of the learners.

Competencies

Knowledge

EQF – Learning outcomes linked to knowledge

<u>Level 5:</u> Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge.

Level 6: Advanced knowledge of the field of work or study, involving a critical understanding of theories and principles.

<u>Level 7:</u> Highly specialised knowledge, some of which is at the forefront of knowledge in the field of work or study, as the basis for original thinking and/or research. Critical awareness of knowledge issues in a field and at the interface between different fields.

The objectives are to:

- understand the concept of ethics and its relationship with RRI.
- understand the importance of implementing ethical considerations in research and innovation processes.
- recognize and understand different dimensions of ethics in research and innovation processes.
- understand the risks related to negligence of ethical reflection in research and innovation processes.
- learn about different approaches and strategies of implementing ethics in research and innovation processes.
- learn about different approaches and methodologies to evaluate the ethical dimension of research and innovation processes.
- learn about the relationships between ethics, gender mainstreaming and public engagement in research and innovation processes.

Skills

EQF – Learning outcomes linked to skills

<u>Level 5:</u> A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems.

Level 6: Advanced skills, demonstrating innovation, required to solve complex and unpredictable problems in a specialised field of work or study.

<u>Level 7:</u> Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields.

The objectives are to:

- critically assess the challenges and opportunities of ethics in enhancing research and innovation processes.
- implement various ethical dimensions in a particular innovation process.
- analyse and evaluate a particular innovation process from the ethical perspective.

Responsibility & autonomy

EQF – Learning outcomes linked to Responsibility & autonomy

<u>Level 5:</u> Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others.

<u>Level 6:</u> Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts. Take responsibility for managing professional development of individuals and groups.

<u>Level 7:</u> Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches. Take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams.

The objective is to strengthen responsibility and autonomy to:

- adopt and develop innovative mind-set.
- commit to understand the concept of ethics in making research and innovation responsive to societal problems.
- appreciate the concept of responsible research and innovation and the role of ethics in achieving its objectives.

Assessment and Learning Products

Assessment

Quizzes (30% of course grade)

At the end of each of the four lectures, the participants can take part in the quiz that allows him/her to check it he/she understood the most important concepts introduced in the given lecture. This assessment method may serve as the main method if the course is used as MOOC.

Open questions (40% of course grade)

Each lectures have a number of open questions, which serves two main goals. First, it allows participants to check if they remember the most important facts presented during the lecture and in learning materials. Second, they allow the participants to apply the concepts to explore different real-life challenges and develop intended skills.

Group work and presentations (30% of course grade)

Groups of 3–4 students will be formed before the first lecture. Group division and two assignments will be presented to the students on the first lecture. The groups are supposed to work on a chosen case during the whole course and develop a strategy for a case institution or project. The idea is that student groups apply concepts and theories from the lectures, course literature and material from the other modules on Responsible Research and Innovation.

The groups present the solutions of their group work (case study) on the workshop sessions. All students are expected to participate actively in class discussions and other course activities. It is also expected that students have critically read the assigned pre-lecture readings and they should be prepared to discuss, critique and raise questions regarding the materials when necessary. Moreover, students are expected to write a learning journal at the end of the course. In the learning journal, students will reflect on their overall experience on participating in the course.

Learning products

- Presentation with case studies prepared for workshop sessions, which will be critically analysed, with feedback provided by other groups and the teacher (unless conducted in MOOC mode).
- Written individual reflection guided by the open questions, with the feedback from the teacher (unless conducted in MOOC mode).
- Learning journal (self-assessment) as a reflection on the overall experience of participating in the course and feedback to the teacher.





Responsible Research & Innovation (RRI) is a genius concept developed by the European Commission for the governance of research and innovation processes with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products. It aims to shape, maintain, develop, coordinate an align existing and novel research and innovation-related processes, actors and responsibilities with a view to ensuring desirable and acceptable research outcomes.

RRIL – Responsible Research and Innovation Learning has developed and tested a learning programme on RRI anchoring it in Sustainability and Sustainable Development Goals. talking about Responsible & Sustainable Innovation. Fior the development of the learning programme, RRIL focus on three core dimension of RRI: public engagement, gender equality and ethics based on interactive real-problem approaches.

It is based on a previous analysis of the degree of the implementation of RRI in the R&I systems of Finland, Poland and Spain (Catalonia) and of the close cooperation with innovation stakeholders, especially from local authorities

Thie learning programme is composed by fours course: (a) Introduction to Responsible & Sustainable Innovation (ReSI); (b) Public engagement; (c) Gender equality; and (d) Ethics. We present here the second course Ethics. It can be online consulted, download and imported to other learning platforms at:

https://lor.instructure.com/resources/eec37eb0a22d49a1bd5139b105f4194b
The whole learning programmne is accesible at

https://lor.instructure.com/resources/3d459de396ba4ad59e5f6b87a306d5e6