THE EUROPEAN **COMPETENCE FRAMEWORK FOR RESEARCHERS**

MANAGING RESEARCH

1. Mobilise resources

Identify key relevant funding sources and prepare research grant applications in order to obtain funds and grants. Write research proposals and pitch ideas to convince potential investors (internal or external to the organisation) of the need to fund research initiatives.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Is aware of funding sources for research projects and of the related application procedures. • Contributes to drafting research proposals.	• Is familiar with key funding sources and can navigate their application procedures. • Autonomously applies for small research grants and contributes to larger applications. • Recognises the importance of funding of one's own institution and own research.	• Informs others about relevant funding sources and advises them on application procedures. • Leads consortiums in major presenting grant applications. • Actively engages in the funding of one's own institution.	• Influences funding policy within own research area. • Leads large and prestigious applications of international and interdisciplinary character. • Plays a crucial role in the funding of one's own institution.

2. Manage projects

Manage and plan various resources, such as human resources, budget, deadline, results, and quality necessary for a specific project and for a project portfolio, and monitor the progress in order to achieve a specific goal within a set time and budget using project management tools.

• Is familiar with different project management approaches and tools. • Participates in projects and delivers results according to deadlines.	• Effectively uses a broad project management toolkit. • Defines and designs own research projects. • Identifies risks and implements proper mitigation strategies.	• Manages multiple projects and identifies their synergies. • Leverages problems and anticipates and manages conflicts within the project team and with project stakeholders.	• Is known for outstanding project management skills. • Designs the project management and reporting structure for prestigious research projects. • Takes necessary decisions even when unpopular and is able to successfully convey the reason behind these decisions in complex projects.

3. Negotiate

Exchange ideas while analysing issues and interests at stake, enabling opposing sides to resolve disputes and reach an agreement, or making decisions to resolve disputes.

• Knows the fundamentals of negotiation. • Actively seeks to understand the different viewpoints and motivations of the negotiating parties.	• Contributes to negotiation strategies by developing scenarios and a clear vision. • Efficiently defends contested arguments. • Knows how to rebut arguments not supported by evidence.	• Leads the development and implementation of negotiating strategies. • Demonstrates creativity and anticipatory thinking in negotiating processes. • Leverages solutions in creative ways also away from the negotiating table.	• Advises others of the design and implementation of negotiating strategies. • Is known for being an effective negotiator in complex and controversial issues. • Under change, adapts negotiating strategy in a creative way.

MANAGING RESEARCH

4. Evaluate research

Reflect on research activities and learn from successes and failures based on personal experience, feedback from others or monitoring and evaluation. Assess proposals, progress, impact and outcomes of peer researchers.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Evaluates basic research proposals and the quality of primary and secondary research data. • Effectively assesses and reflects over own research process. • Provides constructive criticism.	• Gives specific evaluative feed-back on research proposals. • Assesses peers' research processes • Advises peers in evaluating the quality of primary and secondary research data. • Effectively provides difficult criticism.	• Frequently evaluates important research proposals. • Guides peers in how to evaluate their research processes. • Advises others in how to effectively provide and receive constructive criticism.	• Designs evaluation processes for prestigious research projects. • Develops guides for self-monitoring of research processes and how to use and provide constructive criticism.

5. Promote open access publications

Develop a strategy to publish your research and identify the appropriate publication channel(s) to implement that strategy. Use open publication strategies when possible. Be familiar with the use of information technology to support research, and with the development and management of CRIS (current research information systems) and institutional repositories. Provide licensing and copyright advice, use bibliometric indicators, and measure and report research impact.

• Is familiar with CRIS (current research information systems) and the pros and cons with open and closed access publication channels. • Produces publishable material and actively seeks appropriate outlets for it.	• Disseminates in a range of publication outlets and actively seeks open access alternatives. • Assists peers in their use of information technology supporting research. • Tracks own research impact with appropriate tools.	• Actively encourages peers to select open access alternatives when appropriate. • Advices peers on licensing and copyright issues. • Tracks the institutions research impact with advanced tools.	• Is a role model within the research community regarding open access publishing. • Designs guides for managing licensing and copyright issues, and the tracking of research impact.

MAKING AN IMPACT

1. Participate in the publication process

Submit, revise and publish academic research through the most appropriate dissemination means and participate in peer review processes, including open peer review.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands the processes of publication both in the traditional and in the Open Science paradigm • Understands how academics communicate research results • Is aware of the diverse outlets for publications and publishes research results with supervision	• Produces publishable material of high standard • Collaborates and co-authors with other researchers • Peer reviews publications. • Disseminates in a range of research outlets (research, professional and public).	• Regularly publishes in, and is involved in the editing of, academic journals • Actively seeks co-authors and collaboration • Is lead author on co-authored outputs. • Supports less experienced researchers to publish.	• Is well-known for involvement in editing academic journals • Has multiple high-ranked publications • Serves on influential editorial boards • Has published internationally and publicly renowned articles.

2. Disseminate results to the research community

Publicly disclose research results by any appropriate means, including training, conferences, workshops, colloquia and research publications.

• Engages in knowledge exchange • Understands the different ways that research results can be disclosed • Presents at academic conferences	• Communicates research in an accessible way to a diverse research community • Engages in interdisciplinary knowledge exchange.	• Publishes scientific results of high-quality and promotes them to other researchers. • Educates, advises, and guides others on the process of publishing scientific results. • Is known within the research community for disseminating high quality scientific results.	• Chairs and leads scientific associations and conferences. • Actively promotes the reputation and esteem of the field. • Is a globally renowned authority on own topic and related interdisciplinary areas.

3. Teach in academic or vocational contexts

Instruct students in the theory and practice of academic or vocational subjects, transferring the content of own and others' research activities.

• Contributes to teaching at undergraduate level • Assists in the supervision of undergraduate projects • Is aware of how research interacts with education	• Develops own teaching style • Assists in the development of student research skills • Co-supervises postgraduate research projects • Seeks ways for own research to influence teaching	• Constantly seeks to improve own teaching with different techniques and approaches • Manages educational programmes • Advocates for the teaching-learning-research connection and interaction • Supervises postgraduate researchers	• Pursues opportunities to develop research-informed education • Leads educational programmes and their quality assurance procedures • Is recognized as an inspiring educator and supervisor

MAKING AN IMPACT

4. Communicate to the broad public

Communicate about scientific findings to a non-scientific audience, including the general public. Tailor the communication of scientific concepts, debates, findings to the audience, using a variety of methods to different target groups, including visual presentations and various forms of written, spoken and digital communication.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands and appreciates the value of engaging with the public. • Listens with attention and speaks with intention. • Knows the basics of non-scientific argumentation and the differences between scientific and non-scientific arguments. • Presents own research at small-scale events.	• Recognises the mutual benefit of public engagement in research. • Contributes to promoting the public understanding of own research area. • Knows how to present the value of own research and the evidence it is based on, to a non-scientific audience.	• Creates a climate where public engagement activity is valued. • Leads major public engagement projects. • Contributes to shaping the public's conception of own research area. • Uses different communication forms tailored for different audiences.	• Gives strategic support for the setup of public engagement campaigns • Occupies specific public engagement post(s) or personal chair. • Is renowned for communicating scientific concepts in a clear, charismatic, and attractive manner, using appealing communication tools for the target audience

5. Increase the impact of Science on Policy and Society

Increase the impact and use of research findings in policy making, by providing input to and maintaining professional relationships with policymakers and other stakeholders.

• Understands the policy-making processes relevant for own field of research • Presents findings in a policy friendly format. • Understands the wider contexts in which policies are situated.	• Recognises the mutual importance of policy making and research. • Engages in dialogue with, government institutions, stakeholders, and other key organisations. • Is aware of different approaches to knowledge brokering • Contributes to science-for-policy outputs	• Writes science-for-policy outputs cited or used by policymakers • Advices and supports colleagues in writing science-for-policy outputs • Builds networks to inform policy making by evidence.	• Informs political priorities by presenting compelling evidence of challenges, or reframing of challenges. • Is called upon as knowledge broker in crisis/urgent situations. • Is called upon to work directly with high-level policy makers.

MAKING AN IMPACT

6. Promote open innovation

Apply techniques, models, methods, and strategies that contribute to the promotion of steps towards innovation through collaboration with external people and organizations.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands the role of innovation, creativity, and collaboration with external partners in research. • Can engage in inter-disciplinary research. • Is open to collaboration with external partners.	• Develops new ways of collaborating with external partners on topics related to own research. • Pursues interdisciplinary research. • Identifies promising ideas which stem from external partners.	• Establishes collaboration platforms for research problems and co-creation activities. • Leads innovative collaborations with external stakeholders from industry, public and third sectors.	• Challenges traditional viewpoints for how to practice research by steering it towards innovation generating external collaboration projects. • Has a track-record of successful innovation projects developed in collaboration with external partners.

7. Promote the transfer of knowledge

Deploy broad awareness and knowledge of processes of knowledge valorisation aimed to maximise the two–way flow of tools, content material, technology, intellectual property, expertise and capability between the research base and relevant stakeholders within the research field.

• Understands the process of commercial exploitation of research results. • Recognises the value of embedding academia in innovation communities. • Appreciates the importance of knowledge exchange within society.	• Develops research ideas with the aims to commercialise them. • Contributes to knowledge exchange within society. • Is aware of different methods to commercialise research.	• Turns research into ventures. • Advocates for increased engagement with the innovation community. • Builds networks to influence change through knowledge exchange. • Recognises research projects' potential for new products and novel applications.	• Provides strategic leadership and support to others' commercialisation projects. • Has reputation for successful engagement with innovation stakeholders. • Stimulates, creates and builds extensive relationships in entrepreneurial/business/ commercial context. • Has a track record of successful adoptions of new technologies and/or new ideas.

SELF-MANAGEMENT

1. Manage personal professional development

Take responsibility for lifelong learning and continuous professional development. Engage in learning to support and update professional competence and develop personal skills. Identify priority areas for professional development based on reflection about own practice and through contact with peers and stakeholders. Pursue a cycle of self-improvement and develop credible career plans.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Actively seeks mentoring for career progression and employability development. • Maintains own records of achievements and experiences. • Develops personal skills and skills aligned with employers' requirements.	• Initiates networks and relationships important to career development. • Actively pursues self and career improvement, and seeks others' advice on this. • Strategically develops both personal and career-oriented skills.	• Coaches others in academic career development. • Uses networks to further the career of others. • Purposefully develops professional and personal skills for self and others.	• Networks in support of the professional development of less experienced researchers at the department • Paves the road for successors and the continuation of research in priority areas. • Is known as a reference point in relation to expanding lifelong learning and continuous professional development.

2. Show entrepreneurial spirit

Demonstrate a proactive mindset and determination to achieve success in business or successfully create it.

• Demonstrates initiative and seeks opportunities to create value with own research. • Understands the potential of commercialising academic research.	• Actively and persistently pursues opportunities to create value with own research. • Takes calculated risks and performs iterations and tests to get feedback on new ideas.	• Understands the process behind creating products and services greater than the sum of their parts. • Mobilises and engages others in entrepreneurial projects.	• Enables entrepreneurial vison of others. • Proactively connects the dots between diverse research fields and new societal trends, needs, and challenges, and makes clear judgment calls about how this can be explored through entrepreneurial activities.

3. Plan self-organisation

Identify the necessary tasks and prioritise them in order to develop an individual schedule and perform the work in an autonomous way, ensuring that the requirements are met. Understand how to behave and work in a sustainable way, including from the environmental point of view, and be mindful of impact of own activities on the environment.

• Manages time in own research projects effectively. • Works autonomously, but actively seeks guidance when necessary. • Is aware of how work-related activities affect the environment.	• Establishes own time management systems. • Is forward thinking and adapts to unexpected changes. • Sustains a sustainable work/life balance. • Actively seeks out environmentally friendly alternatives for work-related activities.	• Identifies synergies between projects to use own time efficiently and productively. • Manages several complex projects to time, in a sustainable way for self and others. • Always prioritises sustainable alternatives in projects and work-related activities.	• Functions as a role model and a coach in questions about time management. • Is known for creating work environment with a sustainable work/life balance. • Applies sustainable practices that are considered as exemplary and which are inspirational and imitated by others.

SELF-MANAGEMENT

4. Cope with pressure

Handle challenges, disruption, and change and recover from set-backs and adversity.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Handles unfamiliar and uncomfortable situations with limited support and supervision. • Perseveres and moves forward in stressful and pressed situations with limited assistance. • Adapts to new cultural contexts.	• Manages challenges and makes decisions under uncertainty. - Endures setbacks and failures. - Demonstrates high tolerance for stress and pressure	• Develops strategies for dealing with uncertainty and adversity. • Assists others in challenging and adverse situations. • Comfortably makes decisions based on limited information when necessary.	• Is recognised as confident decision-maker in uncertain and adverse situations. • A well-known manager and advisor for those who are operating in uncertain situations and adverse contexts.

COGNITIVE ABILITIES

1. Abstract thinking

Demonstrate the ability to use concepts in order to make and understand generalisations, and relate or connect them to other items, events, or experiences.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Assimilates concepts from own discipline. • Establishes relationships with own knowledge.	• Elaborates concepts independently. • Identifies and understands complex trends and patterns.	• Uses with confidence concepts from other disciplines. • Provides insights beyond the obvious.	• Connects unrelated ideas and concepts to elaborate theories. • Contributes outstanding insights pushing the frontiers of knowledge.

2. Critical thinking

Exercise critical judgement and thinking, develop own assumptions, and establish a way of working based on critical thinking.

• Understands complex arguments. • Is humble and curious to listen to others' thoughts. • Formulates assumptions based on own knowledge and information acquired.	• Consciously tries to avoid biased thinking and behaviour. • Makes sound and realistic judgements based on evidence.	• Includes approaches to ensure focus on critical thinking in research projects. • Stimulates critical thinking in less experienced researchers and peers.	• Builds research processes and environments where critical thinking is central. • Stimulates critical thinking at discipline/research area and policy levels.

3. Analytical thinking

Using logic and reasoning to develop alternative solutions, conclusions or approaches to problems and identify their strengths and weaknesses.

• Analyses basic information, data, and ideas. • Assesses and evaluates own findings and datasets.	• Critically analyses complex information, data and ideas from diverse sources. • Assesses and evaluates findings and datasets of others.	• Masters a broad range of analytical methods, and actively seeks to learn new ones. • Supports less experienced researchers and staff to develop their critical analytical skills.	• Makes an outstanding use of logic and reasoning to analyse research problems. • Develops new analytical approaches and methods.

4. Strategic thinking

Develop a vision to turn ideas into action. Obtain and synthesize information to identify and explore trends, opportunities, threats (also based on intuition and creativity) to achieve a long-term goal and to thrive in a competitive, changing environment. Identify alternative paths to turn ideas into action, select the most appropriate approach and adjust where necessary.

• Synthesises basic information, data and ideas. • Positions own research in the field's research landscape and connects it with existing knowledge.	• Understands the broader context of research. • Strategically aligns own research with institutional and/or disciplinary focus. • Creates visionary ideas and/or ways of working.	• Critically synthesises complex information, data and ideas from diverse sources. • Establishes new and unexpected connections across research areas and sectors. • Ideates visionary research projects.	• Develops a vision and research strategy beyond institutional and disciplinary focus. • Is recognised as a thought leader and as someone who strategically shapes the broader research agenda.

COGNITIVE ABILITIES

5. Systemic thinking

Understand and take account of the characteristics of (inter)national research systems where researchers interact with all relevant stakeholders and of the position of individual researchers and their organisation within the system. Situate research activities within the wider context to improve the understanding of complex issues and identify linkages with related issues.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Differentiates between complicated and complex research, challenges and knows why this distinction matters. • Understands the national and international research landscape of own discipline.	• Actively engages in collaborative interactions within the research system. • Understands the research landscape, and the complex interaction between its actors, beyond own discipline.	• Enables others to appreciate and engage with complex research challenges. • Masters the main components of a specific research system and identifies properties of components and key interactions.	• Establishes relationships with all relevant stakeholders inside and outside academia to develop own research area. • Changes and improves the complex interconnections between research and other sectors.

6. Problem solving

Develop and implement solutions to practical, operational or conceptual problems which arise in the execution of work in a wide range of contexts.

• Inquires about basic themes of own research. • Elaborates simple research hypotheses.	• Assesses the effectiveness of own and others' solutions to research problems. • Formulates and verifies hypotheses addressing a broad range of research problems.	• Tackles new, complex, and interdisciplinary problems. • Challenges existing hypotheses and proposes new ones based on evidence.	• Ideates projects challenging traditional thinking and brings new knowledge through own research. • Makes major contributions to understanding and solving complex problems.

7. Creativity

Develop several ideas and opportunities to create value, including better solutions to existing and new challenges. Explore and experiment with innovative approaches. Combine knowledge and resources to achieve valuable effects.

• Is inquisitive, curious, and open-minded • Seeks different perspectives	• Generates, expresses, and tests new ideas and solutions • Explores ideas also from different areas	• Creates novel and valuable ideas • Inspires and develops others' inquiry style	• Expands existing solutions, or proposes new ones, for relevant scientific problems • Challenges the status quo in a visionary way

WORK WITH OTHERS

1. Interact professionally

Show consideration to others and professional collegial behaviour. Listen, give and receive feedback and respond perceptively to others. Engage effectively and in a goal-directed manner with other people in a professional setting, also involving staff supervision and leadership.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Listens to other people's ideas with no prejudice. • Understands the value of collegial behaviour and works professionally and collaboratively.	• Asks colleagues for feedback, advice, and critical appraisal of own work. • Embraces behaviours that foster effective and positive interactions with colleagues in a goal-oriented manner.	• Professionally interacts goal-oriented/productively with colleagues both in own and other disciplinary areas. • Supervises and supports the development of less experienced colleagues.	• Communicates as peers with colleagues of any rank. • Is recognised for own effective leadership style.

2. Develop networks

Develop alliances, contacts or partnerships, and exchange information with others. Foster integrated and open collaborations where different stakeholders co-create shared value research and innovations. Develop your personal profile or brand and make yourself visible and accessible in face-to-face and online networking environments.

• Understands the value of collaborative work. • Builds and fosters working relationships with colleagues. • Promotes ownself as collaborative and accessible.	• Contributes to multi- or cross-disciplinary collaborative teams. • Develops collaborative networks, and actively includes colleagues in these. • Makes use of face-to-face and online networking environments for promotion of own profile and research.	• Engages with stakeholders external of own institutions. • Establishes strategic collaborations and partnerships to develop own research area. • Encourages own institution to foster collaborative networks.	• Builds and leads collaboration partnerships within and outside own institution. • Is an influential leader of large international consortia with academic and non-academic partners.

3. Work in teams

Work confidently within a group with each doing their part in the service of the whole.

• Works within teams under supervision to produce research outputs. • Appreciate the impact of own behaviour on teamwork.	• Recognises the importance of team leadership behaviours. • Understands own priorities and those of own coworkers, creates a cooperative work environment, and thus optimizes the output of teamwork.	• Understands team dynamics and how to manage conflict and appraisal of team members. • Leverages the strengths of different team members to achieve outstanding results. • Is able to modulate own leadership for the best interest of the team.	• Enhances the transformative capacity of the organisation by recruiting, training, and building teams. • Is known for building and leading successful teams

WORK WITH OTHERS

4. Ensure wellbeing at work

Understand the links between work, physical and mental health and wellbeing. Be adequately informed about health promotion and disease prevention to take responsibility for the personal work situation considering the impact on others to create a healthy work environment.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands the link between work, physical and mental health, and wellbeing. • Uses support and advisory resources to avoid stress and pressure. • Considers the needs of others.	• Maintains a leveled work-life balance. • Is well informed about health promotion and takes responsibility for own work situation. • Assists colleagues manage pressure and stress and contributes to a healthy work environment.	• Actively pursues and promotes work-life balance and tracks well-being issues at work, for self and team. • Educates and consults other in the management of stress.	• Designs and implements policies on work-life balance and wellbeing in own organization(s). • Influences policies on work-life balance and well-being at national and international level

5. Build mentor-mentee relationships

Mentor individuals by providing emotional support, sharing experiences and giving advice to the individual to help them in their personal development, as well as adapting the support and guidance to the specific needs of the individual and heeding their requests and expectations. Vice versa, as a mentee, seek support and advice provided by the mentor.

• Supports others through teaching and advisory activities. • Acknowledges the importance of receiving mentoring, and actively seeks support and advice.	• Encourages less experienced colleagues to seek guidance and advice. • Acts as a mentor to less experienced colleagues.	• Develops confidence and manages over-confidence in mentees. • Engages with existing national and international mentorship programmes.	• Influences policies on mentor-mentee relationships. • Nurtures talents, identifies hidden potential in mentees, and contributes to the development of outstanding and resilient researchers.

6. Promote inclusion & diversity

Promote and ensure equality and diversity management, in words as well as in actions and conduct. Guide and advise colleagues about how to work in diverse teams and contexts.

• Appreciates the importance of diversity and how it benefits complex research projects. • Is open-minded about diverging perspectives, and sensible and respectful to individual differences. • Understands diversity and equality requirements of institutions.	• Actively works with diversity projects. • Keeps up to date on research and findings about the benefits and challenges of working with diversity. • Works exclusively in teams and collaboration partnerships that respect inclusiveness and diversity	• Advises and mentors less experienced colleagues about working with diversity. • Actively promotes equality and diversity standards at the institution.	• Influences policy on diversity and equality standards. • Is known for managing diversity and equality in an exemplary way in projects and institutions.

MANAGING RESEARCH TOOLS

1. Manage research data

Produce and analyse research data originating from qualitative and quantitative research methods. Store and maintain the data in research databases. Support the re-use of research data and be familiar with data management principles, including FAIR (Findable, Accessible, Interoperable, and Reusable) principles. Make data as open as possible, and as closed as necessary.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Identifies sources of information, and assesses if data is trustworthy, valid, reliable and pertinent. • Knows how to store and organise data in an accessible way digitally. • Uses, transforms, and analyses non-sensitive research data transparently and in accordance with legal and privacy requirements.	• Organises data sets to be find-able, accessible, interoperable, and reusable (FAIR), and to be easily stored and retrieved in a structured environment. • Trains and empowers other team members to work with data in a structured, transparent, and accessible way.	• Applies data analysis tools, understands legal and ethical issues linked to the use of data, and integrates data management plans. • Transforms, organises, and analyses data in a research context, and applies metrics to evaluate the success of data initiatives. • Promotes FAIR principles within own academic community.	• Creates relevant data sets from different sources, and develops effective methods making data more comprehensible for research. • Proposes new processes and practices in managing data, information and digital content in a structured digital environment. • Is known as influential advocate of FAIR principles.

2. Promote citizen science

Engage citizens in scientific and research activities and promote their contribution in terms of knowledge, time or resources invested.

• Understands that citizens are knowledge-holders with the ability to contribute to the research process in some areas of research. • Knows the pros and cons of engaging or not engaging with citizens in research endeavours.	• Is inclusive and transparent in the research process and understands how best to engage with citizens in each specific context.	• Engages all categories of citizens in the research process and integrates them at specific stages of the research cycle.	• Is recognised for engaging with citizens in an inclusive, transparent and effective manner. • Develops novel, reliable, and trustworthy protocols in own research area to include citizens in the research process.

3. Manage intellectual property rights

Deal with the private legal rights that protect the products of the intellect from unlawful infringement.

• Understands basic concepts of data ownership rules as they apply to own research. • Knows what copyright, IPR, and licensing are, and seeks advice from more experienced researchers.	• Is familiar with the protection of research outputs, open and wider access, and the different licenses related to own research activity. • Advises peers and less experienced researchers and is the reference person about intellectual property.	• Values the relevance of closed and open access of research outputs to researchers and the wider society. • Engages with the local technology transfer office to facilitate the commercialisation of intellectual property where appropriate.	• Leads the development of new procedures for IP protection within the HE sector and professional associations/ bodies. • Successfully protects and commercializes own research outputs.

MANAGING RESEARCH TOOLS

4. Operate open-source software

Operate Open-Source software, beyond licensed software, knowing the main Open-Source models, licensing schemes, and the coding practices commonly adopted in the production of Open-Source software.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands the value of open-source software. • Is aware of pros and cons of operating open-source software • Writes open-source codes under supervision.	• Understands and makes use of relevant open-source licenses. • Knows and uses the most relevant open-source repositories in own research area. • Writes open-source codes using common open-source coding practices.	• Trains students and staff in developing open-source software. • Promotes the use of open-source software in own academic community • Participates as a developer in open-source projects.	• Shapes national and international open-source policies. • Leads open-source projects of large scope.

DOING RESEARCH

1. Have disciplinary expertise

Demonstrate deep knowledge and complex understanding of a specific research area, including responsible research, research ethics and integrity principles, privacy and GDPR requirements, related to research activities within a specific discipline.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands key concepts and relevant knowledge of own research area. • Keeps track of the latest advances within related fields. • Is familiar with RRI (Responsible Research and Innovation) and ethical requisites to develop research in own discipline. • Need guidance to implement GDPR and privacy requirements.	• Makes original contributions to own research area. • Supports awareness of societal, political, ethical, and integrity related aspects of knowledge creation in own research area. • Includes GDPR and privacy requirements in own research activity.	• Brings new knowledge to own and related disciplines and is aware of its impact on society. • Influences national and international policies related to ethics and integrity in own research area.	• Contributes with, and has a deep understanding of, novel developments in own and related research areas, pursuing whenever appropriate an interdisciplinary approach. • Influences national and international policies related to ethics and integrity in research.

2. Perform scientific research

Gain, correct or improve knowledge about phenomena by selecting or developing the appropriate scientific approach and by using scientific methods and research techniques based on empirical or measurable observations.

• Produces and accesses reliable research data. • Learns from senior researchers in own institutions and takes part in collaborative research projects.	• Knows how to create, organise, validate, share, store, and curate information and is aware of the risks therein. • Manages an independent research group. • Engages in research collaborations outside of own institution.	• Introduces the use of new research tools and methods in own area. • Coordinates research collaboration networks. • Advises less experienced colleagues on research approaches in own discipline.	• Sets the research agenda in own research area. • Leads a large research organisations. • Designs guidelines and educational material for performing research.

3. Conduct interdisciplinary research

Work and use research findings and data across disciplinary/functional boundaries, including in collaborative settings.

• Values the benefits of knowledge from disciplines and domains different from own. • Engages with and learns from researchers from other disciplines.	• Fosters creativity and critical thinking in inter-disciplinary meetings. • Leads an inter-disciplinary research group and/or collaborates with colleagues from other disciplines at national and international institutions.	• Develops new approaches to perform research across disciplines. • Leads inter-disciplinary research collaboration networks.	• Develops a visionary approach and challenges traditional viewpoints. • Sets the policy agenda to develop research across disciplinary and functional boundaries.

DOING RESEARCH

4. Write research documents

Draft and edit research, academic or technical texts on different subjects.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Contributes, under supervision, content for research, academic, and technical texts in a style appropriate for readership in own research area. • Becomes confident with scholarly publishing tools.	• Communicates in a written style appropriate for specialist and non-specialist audiences. • Supervises and mentors less experienced researchers in academic literacy and writing skills. • Reviews and edits academic and technical texts.	• Develops advanced academic writing competences and leads the production of research literature, presenting complex ideas in a clear way. • Masters the use of scholarly publishing tools and has a deep understanding of the publication processes.	• Writes academic and technical texts also in research areas contiguous to own discipline. • Innovates scholarly publishing by introducing new tools or business models in the industry.

5. Apply research ethics and integrity principles

Apply fundamental ethical principles and legislation to research and innovation, including issues of research integrity. Perform, review, or report research avoiding misconducts such as fabrication, falsification, and plagiarism.

• Has a basic understanding of ethical conduct of research and of integrity principles. • Asks for expert advice when in doubt about ethical decisions.	• Is well versed in the ethical conduct of research. • Provides advices about ethical issues of research to peers. • Is alert and attentive to falsification and plagiarism	• Engages actively in the works of various ethical committees. • Promotes public understanding of the ethical issues raised by research. • Helps less experienced researchers in the ethical conduct of research	• Actively contributes to develop ethical guidelines and systems to ensure ethical conduct of research in academia. • Advises policy makers on policies and procedures of own research/academic/professional sector.

6. Leverage Artificial Intelligence

Use, integrate and develop AI technologies and algorithms to optimise research processes, analyse complex datasets, and derive meaningful insights for informed decision-making.

FOUNDATIONAL	INTERMEDIATE	ADVANCED	EXPERT
• Understands what AI is (e.g. machine learning, neural networks, natural language processing) and its basic applications in research. • Knows about basic AI tools and the benefits, risks and limitations of their use in research. • Recognises ethical concerns and research integrity challenges related to AI use in research. • Demonstrates a willingness to learn about AI and its integration into research workflows.	• Can assess different AI. • technologies for research tasks. • Applies basic AI tools (e.g., data visualisation, predictive analytics, literature reviews) to facilitate own research. • Data Interpretation: Understands how to interpret AI-generated insights for decisionmaking. • Can identify where AI can be helpful in research tasks.	• Can create or apply customised AI solutions for complex research challenges (e.g. advanced simulations, automated experimentation and data collection). • Critically evaluates AI solutions and providers, making informed decisions about which tools and technologies to adopt. • Establishes rules for responsible AI use in research. • Works with AI experts and teams to integrate AI effectively. Is aware of the legal framework applicable to AI solutions in research.	• Develops and enforces comprehensive policies, practical guidance and ethical guidelines for AI use, ensuring responsible and fair AI practices. • Identifies and facilitates innovative AI solutions that can transform research practices and drive significant advancements. • Guides others in using AI effectively for research. • Shows how AI can make a real difference in research. (Acts as a leader in the integration of AI in research, sharing knowledge through industry forums, publications, and workshops).