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Index – Modules and Lessons

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Index – Modules and Lessons

NMO Courses & approximate length

- Scientific Writing and Publishing

    - Writing a Research Paper – 4.5 hours
    - Publishing a Research Paper – 5.5 hours
    - Writing and Publishing a Review Paper – 1.5 hours

- Effective Collaboration in Research

    - Introduction to Collaboration – 2.5 hours
    - Participating in a Collaboration – 5 hours
    - Leading a Collaboration – 11.5 hours

- Focus on Peer Review – 3.5 hours
- Managing Research Data to Unlock its Full Potential – 10 hours
- Narrative Tools for Researchers – 8.5 hours
- Persuasive Grant Writing – 7.5 hours
- Networking for Researchers – 8 hours
- Advancing Your Scientific Presentations – 10 hours
- Data Analysis: Planning and Preparing – 4 hours
- Data Analysis: Conducting and Troubleshooting – 5 hours
- Interpreting Scientific Results – 3.5 hours
- Finding Funding Opportunities – 3.5 hours
- Experiments: From Idea to Design – 8.5 hours
- Getting an Academic Research Position – 9 hours
- Effective Science Communication – 6.5 hours
- NEW! Research Integrity: Publication Ethics – 8 hours

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NMO courses by stages of the research cycle

Design Research	Secure Funding	Experiment and Analyse	Write and Publish	Share and Disseminate	Develop Your Career	Work With Others
Experiments: From Idea to Design	Persuasive Grant Writing	Managing Research Data to Unlock its Full Potential	Writing a Research Paper	Narrative Tools for Researchers	Getting an Academic Research Position	Networking for Researchers
	Finding Funding Opportunities	Data Analysis: Planning and Preparing	Publishing a Research Paper	Advancing Your Scientific Presentations		Introduction to Collaboration
		Data Analysis: Conducting and Troubleshooting	Writing and Publishing a Review Paper	Effective Science Communication		Participating in a Collaboration
		Interpreting Scientific Results	Focus on Peer Review			Leading a Collaboration
			Research Integrity: Publication Ethics			

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Research Cycle Stage: **Design Research**

Experiments: From Idea to Design

Course details
8.5 hours
4 modules, 25 lessons
10 – 30-minute lessons

Module 1. Foundations of experimental design – 1h30
Welcome to the course
About this course
The scientific method
Robust experimental design advances your field of research
Thoughtful research motivations for impactful experiments
Module summary

Module 2. Developing your motivation, assumptions, and hypotheses – 2h
Introduction
Explore potential research motivations
Select a research motivation that matches you
Refine your research motivations
Identify assumptions, formulate hypotheses, and make predictions
Module summary

Module 3. Assembling your experimental plan – 3h
Introduction
Set up key variables
Plan your replicates, controls, and validations
Select your methods, tools, and techniques
Choose your protocols
Navigate resources, regulations, and data processing
Module summary

Module 4. Utilising your experimental design – 2h
Introduction

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Seek feedback to refine your experimental design

Check your design through preliminary experiments

Share your experimental design

Module summary

Course summary

Additional resources
- **Blog post:** https://masterclasses.nature.com/mastering-experimental-design/24025492

Research Cycle Stage: **Secure Funding**

Persuasive Grant Writing

Course details

7.5 hours

3 modules, 17 lessons

15-minute lessons

Module 1. Before starting your grant application – 2h

Welcome to the course

Why are many grant applications not funded?

Why use narrative tools when writing a grant application?

The format of grant application and the purpose of its sections

Module summary

Module 2. Targeting your audience – 2h

Introduction

Why should you understand your funder?

How to research your funder?

Create a message that is relevant to your funder

Module summary

Module 3. Creating a narrative – 3h30

Introduction

Support your key message

Select the characters of your grant application

Create a narrative structure within your sections

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Tell your research story throughout the entire application

Module summary

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/persuasive-grant-writing/20003200

Finding Funding Opportunities

Course details

3.5 hours

1 module, 8 lessons

10 – 30-minute lessons

Module 1. Finding Funding Opportunities – 3h30

Welcome to this course

About this course

Understanding the funding landscape

Identify your circumstances and research needs

Search for funding opportunities

Create your shortlist

Choose the best funding for you

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/interpreting-scientific-results/23924010

Research Cycle Stage: **Experiment and Analyse**

Managing Research Data to Unlock its Full Potential

Course details

10 hours

4 modules, 24 lessons

15-minute lessons

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Module 1. Welcome and introduction – 2h

Welcome to the course

Key concepts

Why data management matters

Complying with relevant data policies

Module summary

Module 2. Creating and maintaining your Data Management Plan – 1h30

Introduction

Preparing to create a DMP

Creating a DMP

Module summary

Module 3. Managing data in the short and long term – 3h30

Introduction

Storing data for the short term

Choosing file formats for data storage

Organising and naming your data files

Collecting rich and comprehensible metadata

Checking the quality of your data

Storing data for the long term

Module summary

Module 3. Sharing your data – 3h

Introduction

What to share, when and with whom?

Setting terms for access and use of your data

How to share your data

Sharing your data in a repository

Module summary

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/new-courses-for-researchers-2020/18407574

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Data Analysis: Planning and Preparing

Course details
4 hours
2 modules, 13 lessons
15-minute lessons

Module 1: Introduction to Data Analysis and the importance of planning – 2h
Welcome to the course
Key concepts in data analysis
Why planning data is important
Challenges in data analysis
Challenges in preparing and planning your data analysis
Creating a data analysis plan
Module summary

Module 2: Preparing your data for analysis – 2h
Introduction
Collate your analytic dataset
Quality check your analytic dataset
Preliminary analysis: Explore your data
Module summary
Course summary

Additional resources
Blog post: https://masterclasses.nature.com/data-analysis-planning-and-preparing/20248988

Data Analysis: Conducting and Troubleshooting

Course details
5 hours
3 modules, 16 lessons
15-minute lessons

Module 1. Introduction to Data Analysis – 1h30
Welcome to the course
Key concepts in data analysis

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Why is effective data analysis important?
Challenges in data analysis
Module summary

Module 2. Exploring your data and reviewing your analysis plan – 1h30
Introduction
Explore your data numerically
Explore your data visually
Review your data analysis options and plan
Module summary

Module 3. Analysing your data – 2h
Introduction
Analyse your data and test your hypothesis
Confirm and troubleshoot analyses
Present your findings and express limitations
Module summary
Course summary

Additional resources
Blog post: https://masterclasses.nature.com/data-analysis-conducting-and-troubleshooting/23091744

Interpreting Scientific Results

Course details
3.5 hours
1 module, 12 lessons
10- 20-minute lessons

Module 1. Interpreting Scientific Results – 3h30
Welcome to this course
About this course
Understand your findings
Identify your key message
Address your research aims
Test your hypothesis
Put your findings into context

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Get constructive feedback from others

What to include in your interpretation

Build your interpretation

Adapt your interpretation

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/interpreting-scientific-results/23091746

Research Cycle Stage: **Write and Publish**

Scientific Writing and Publishing

Course details

11.5 hours

3 parts, 15 modules, 149 lessons

10-minute lesson

Writing a Research Paper

Module 1. What makes a great paper? – 0h50

Welcome to the course

Why publish your research?

Starting to write and using storytelling to craft your paper

What do editors look for in a great paper?

There is no magic formula to writing a paper

Editor's favourite papers

Frequently asked questions

Module summary

Module 2. Elements of writing style – 0h25

THE ABC of effective writing

Common issue in writing style

Knowledge check: Effective writing

Building a paragraph

Frequently asked questions

Module summary

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Module 3. Titles and abstracts – 0h40

How to reach your audience

The value in crafting a great title

How to write effective titles

Things to avoid in titles

Knowledge check: Identify an effective title (life sciences example)

Knowledge check: Identify an effective title (physical sciences example)

Choosing keywords for your paper

How to write an abstract

Things to avoid in abstracts

Knowledge check: Improve an abstract

Module summary

Module 4. From introduction to conclusion – 0h40

Writing a paper: The big picture

Writing the introduction

Writing the methods section

Writing the results section

Data deposition

Writing the discussion section

Writing the combined results and discussion section

Writing the conclusion

Things to avoid: Overhyping your work

Knowledge check: Write a paragraph!

Frequently asked questions

Module summary

Module 5. Data management – 0h50

Managing data

Risks of data mismanagement

Creating a data management plan

The importance of sharing data

Meaningful metadata

Sharing data

Poll: How do you access and share data?

The rise of data journals

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Knowledge check: Data ownership

Frequently asked questions

Module summary

Module 6. Data presentation – 0h55

Principles of data presentation

Determine your main message

Find the best format for your data

Knowledge check: Box plot or bar chart?

Organize your data

Choose a representative image

Visual clarity

Use colour wisely

Frequently asked question

Module summary

Course summary

Publishing a Research Paper

Module 1. Authorship and authors' responsibilities – 0h40

Welcome to the course

Principles of authorship

Author contributions

Authorship in collaborative teams and consortia

Knowledge check: Describe authorship

Knowledge check: Who should be an author?

Authorship disputes

Author identity and researcher identifiers

How to start a conversation on authorship

An editor's experience: Honorary authors

Frequently asked questions

Module summary

Module 2. Selecting a journal for publication – 0h35

Poll: Your criteria for selecting a journal

Key considerations for selecting a journal

Why and where to publish?

Publishing in open access journals

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Avoiding predatory journals
Case study: Bohannon's sting
Frequently asked question
Module summary

Module 3. Submitting your paper – 0h30

Submitting your manuscript
Presubmission enquiries at scientific journals
Scientific cover letters
An editor's experience: The submission process
What constitutes a conflict of interest?
Knowledge check: Conflicts of interest
Knowledge check: Competing interests
Frequently asked question
Module summary

Module 4. Understanding peer review – 1h05

A brief history of peer review
Types of peer review
The benefits and limitations of peer review
How editors select referees
When to accept or decline an offer to peer review
An editor's experience: Being a first-time peer reviewer
What makes a great peer review report?
How to think like a peer reviewer when you read a paper
How editors assess referee reports
Rewards for referees
Frequently asked questions
Module summary

Module 5. Journal decisions – 1h

Types of editorial decisions after peer review
Common reasons for rejection at scientific journals
Knowledge check: Editorial decisions
How to respond to peer review comments
Making an appeal
The dos and don'ts of appealing

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What happens after acceptance at Nature Research journals?

Post-publication criticism

Module summary

Module 6. The editorial process – 0h15

Different editorial processes

The editorial process at top-tier journals

Knowledge check: What do editors look for?

Publishing a paper is a team effort

Frequently asked questions

Module summary

Module 7. Measuring impact – 0h40

An introduction to research metrics

Article-level metrics

Researcher-level metrics

Focus on the h-index

Institutional-level metrics

Knowledge check: Metrics

Module summary

Module 8. Plagiarism and other ethical issues – 0h45

Why some researchers behave unethically

Defining plagiarism and tools to detect it

Knowledge check: Using copyright-protected material

Focus on duplicate submissions

Inappropriate citations

A case study of misconduct

Poll: Misconduct - what would you do?

Post-publication corrections

Retractions

Module summary

Course summary

Writing and Publishing a Review Paper

Module 1. Writing and publishing a review paper – 1h30

Welcome to the course

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What is a review paper?

What makes a great review?

Editors' favourite Nature Reviews papers

Dos and don'ts for a good review

Commissioned and unsolicited reviews

How to write the outline of a review paper

The structure of a review paper

Selecting the primary literature for your review paper

Refereeing review papers

The editorial process at Nature Reviews journals

Nature Reviews Disease Primers

An editor's experience: Submitting a review

Reflection: Remember an inspiring review

Frequently asked questions

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/make-the-most-of-the-scientific-writing-and-publishing-course/16568290

NEW! Research Integrity: Publication Ethics

Course details

8 hours of learning

3 modules, 21 lessons

10–40-minute lessons

Module 1. Preparing to publish with integrity – 1h30

Welcome to this course

About this course

Identify a reputable journal

Publish with integrity

Module summary

Module 2. Publication ethics during manuscript preparation – 4h45

Introduction

Publish with transparency

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Uphold image integrity

Ensure data integrity and availability

Reuse materials with relevant permissions

Reuse materials appropriately

Ensure accurate citations and avoid plagiarism

Consider your author list

Confirm your research declarations

Verify your publication declarations

Module summary

Module 3. Publication ethics after submission – 1h45

Introduction

Navigating manuscript revisions

Handle post-publication issues

Module summary

Course summary

Additional resources

Video: coming soon

Focus on Peer Review

Course details

3.5 hours

4 parts, 46 lessons

10-minute lessons

Module 1. Your role as peer reviewer – 0h40

The peer review process

The importance of peer review

The benefits of being a peer reviewer

Peer reviewer's responsibilities

The reasons why I peer review

Deciding whether to peer review a paper

Experiences of peer review

Routes to becoming a peer reviewer

Module summary and next steps

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Useful links and further reading

Module 2. The peer review report – 1h10
What do you think of this report?
Preparing to review
Review strategies
First impressions of the paper
How I approach peer review
The review: Titles, abstracts & introductions
The review: Methods
The review: Results and discussion
The tone of your report
The structure of your report
Major and minor points in a review paper
Writing a summary for a peer review report
Common problems during peer review
Frequently asked questions
Module summary and next steps
Useful links and further reading

Module 3. Ethics in peer review – 0h50
Which of these actions is ethically questionable?
Peer review ethics
Conflicts of interest in peer review
Intellectual theft and plagiarism in peer review
Implicit bias in peer review
Confidentiality in peer review
Why peer review gets a bad press
Knowledge check: Potential issues when peer reviewing
Module summary and next steps
Useful links and further reading

Module 4. Variations and innovations in peer review – 0h50
Types of peer review
Registered reports
Different journals' requirements
Variations in peer review practices

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Knowledge check: Reviewing large data sets

Peer reviewing a review paper

Innovative approaches to peer review

Peer review: Where next?

Module summary and next steps

Useful links and further reading

Research Cycle Stage: **Share and Disseminate**

Effective Science Communication

Course details

6.5 hours

1 module, 13 lessons

10–30-minute lessons

Module 1. Effective Science Communication - 6h30

Welcome to the course

About this course

Set your communication goals

Understand your audience

Reach your audience

Identify your key message

Build on your key message to create a story

Apply strategies to communicate science to non-specialists

Write about your research

Present your research

Communicate your research on social media

Discuss your research in a media interview

Course summary

Additional resources

Videos: Why is science communication important? // Why should you take this course? // Why should researchers take this course?

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Narrative Tools for Researchers

Course details
8.5 hours
3 modules, 21 lessons
15-minute lessons

Module 1. Why use a story? – 2h
Welcome to the course
Why use narrative tools to communicate your research?
How can stories advance your research and career?
Why are stories powerful?
What makes a story?
Module summary

Module 2. Building your story – 4h
Introduction
Identify your key message
Back up your key message
Choose a structure for your story
Build your characters
Help the audience along
Put the pieces together
Module summary

Module 3. Refining your story – 2h30
Introduction
Understand your audience
Adapt to your audience
Plan for constraints
Edit your story
Module summary
Course summary

Additional resources
Blog post: https://masterclasses.nature.com/narrative-tools-for-researchers/18760532

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Advancing Your Scientific Presentations

Course details
10 hours
4 modules, 26 lessons
15-minute lessons

Module 1: Overcoming your research presentation challenges – 2h
Welcome to the course
Identify the benefits of giving effective presentations
Tailoring to your audience can focus your presentation
Use narratives tools to communicate your research story
Module summary

Module 2: Developing the story behind your talk – 2h30
Introduction
Identify your key message
Select the evidence to support your key message
Identify your characters
Choose and use a narrative structure
Bring the elements of your story together
Module summary

Module 3: Building an engaging slide deck – 2h30
Introduction
Create the outline of your slide deck
Set up your slide deck
Craft your components: Pitfalls, principles, and text
Craft your components: Visual and interactive elements
Refine and review your slide deck
Module summary

Module 4: Preparing and navigating your talk – 3h
Introduction
Prepare the practicalities of your talk
Prepare and rehearse your talk
Prepare for Q&A

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Prepare for the unknown

Module summary

Course summary

Additional resources

Blog post: https://masterclasses.nature.com/narrative-tools-for-researchers/20183138

Research Cycle Stage: **Develop Your Career**

Getting an Academic Research Job

Course details

9 hours

4 modules, 32 lessons

10 – 30-minute lessons

Module 1. Exploring your values, interests, skills, and career goals – 2h

Welcome to this course

About this course

The importance of self-reflection

Establish your values

Examine your interests

Identify your skills

Consider your personal and practical priorities

Set your goals

Module summary

Module 2. Finding a research position – 2h

Introduction

Build your professional profile

Find postdoc and faculty opportunities

Understand the role and requirements

Choose which opportunities to apply to

Module summary

Module 3. Applying for a research position – 2h30

Introduction

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Prepare for the application process

Compile your CV

Write and format your CV

Prepare your academic cover letter

Prepare supplementary materials

Apply for the position

After the application

Module summary

Module 4. Excelling at the interview – 2h30

Introduction

Interview preparation: Logistics and questions

Interview preparation: Presentations and meetings

Attending the interview

After the interview

Handling an offer

Module summary

Course summary

Additional resources

Videos: Why should researchers take this course? // Why should you take this course?

Research Cycle Stage: **Work with Others**

Networking for Researchers

Course details

8 hours

4 modules, 23 lessons

15-minute lessons

Module 1. Why Network? – 2h

Welcome to the course

Networking challenges and conversations

Why network

Networking opportunities

Module summary

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Module 2. Getting ready to network – 2h
Introduction
Articulate your professional identity
Build your online presence
Do your research
Prepare your pitch and your questions
Module summary

Module 3. Connect with networking contacts - in person and online – 2h30
Introduction
Reaching out to a new contact
Crafting your communications for maximum effect
Meeting in person
Meeting online
Making the most out of chance encounters
Module summary

Module 4. Nurturing and harnessing the power of your network – 1h30
Introduction
Harness the immediate power of your network
Nurture your network for the future
Module summary
Course summary

Additional resources
Blog post: https://masterclasses.nature.com/networking-for-researchers/20006428

Effective Collaboration in Research

Course details
19 hours
3 parts, 5 modules, 45 lessons
15-minute lessons

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Introducing Collaboration

Module 1. Introducing Collaboration – 1h00

Welcome to the course

About this course

The rise of collaborations

Different types of collaboration

Benefits and challenges of collaboration

Working with industry

Use collaborations to reach your goals

Course summary

Participating in a collaboration

Module 1. Participating in a collaboration – 5h

Welcome to the course

About this course

Keeping the project on track

Working in a new research team

Tools to collaborate

Leveraging your collaborative experience

Troubleshooting tips for new collaborators

Course summary

Leading a collaboration

Module 1. Initiating and leading a collaboration – 5h

Welcome to the course

About this course

Do you need a collaboration?

How to choose your collaborators

How to approach potential collaborators

Effective leadership for collaborations

Setting up a collaboration framework

Establishing a code of conduct

Creating the project schedule

Planning your resources

Legislation, guidelines, and policies

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Funding for collaborations
Module summary

Module 2. Running and troubleshooting a collaboration – 2h30
RUNNING A COLLABORATION:
Maintaining engagement
Keeping the project on track
TROUBLESHOOTING COMMON CHALLENGES:
Interpersonal and personnel issues
Ethical issues
Funding and resources
Module summary

Module 3. Outputs and next steps – 4h
Defining 'outputs', 'value' and 'impact'
Collaborative research outputs
Publishing your results: authorship and writing
Publishing your results: submission and review
The value of research outputs
Assessing and communicating impact
Ending a collaboration
Next steps
Module summary
Course summary

Additional resources
Blog post: https://masterclasses.nature.com/how-good-leaders-manage-collaborations/17650242