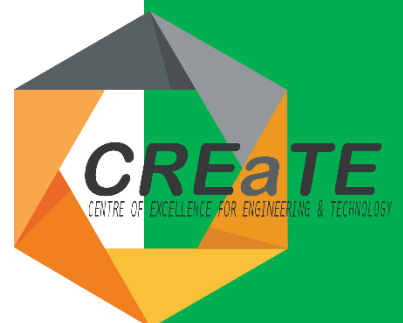


RESEARCH INTEGRITY AND GOVERNANCE CODE OF PRACTICE



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**PUSAT KECEMERLANGAN KEJURUTERAAN DAN
TEKNOLOGI JKR
(CREaTE)**

Research Integrity and Governance Code of Practice

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Abbreviations

BIPPK	Innovation, Engineering Research and Development Division or <i>Bahagian Inovasi, Penyelidikan dan Pembangunan Kejuruteraan</i>
CREaTE	Centre of Excellence for Engineering and Technology
JKPP	Research Project Approval Committee or <i>Jawatankuasa Kelulusan Projek Penyelidikan</i>
JKR	Public Works Department or <i>Jabatan Kerja Raya</i>

1. Statement of Principle

1.1 Introduction

This document applies to all subject areas and to all staffs at the Innovation, Engineering Research and Development Division (BIPPK); and researchers involved in research works at the Public Works Department (JKR), whether funded by JKR or other parties (hereinafter referred to as Researchers). It is the responsibility of all Researchers to be fully aware of and familiar with the good practice and abide by the statutory requirements of this Code of Practice. This Code of Practice has been developed to promote good conduct in research in all stages of a research project, assist Researchers to meet legal and ethical requirements, and help prevent misconduct, in order to assist Researchers to conduct research of the highest quality. Any breach of this Code of Practice may be grounds for disciplinary action.

All Researchers have a responsibility and a duty of accountability to their profession, to JKR, and to the funders of the research, to accept full responsibility for the professionalism and integrity of all aspects of conduct and publication of their research, and for the activities of any staff or Research Assistant under their direction. This extends to reporting conflicts of interest or suspected misconduct, in the appropriate manner. Researchers must also accept the responsibility for taking steps to ensure the safety of all parties involved with the research, the probity of the integrity of the financial management of the research project, and for ensuring that the outcome of the research will give optimum value for the public or private funds invested in the research project. All legal and ethical requirements laid down by JKR or any other authorised bodies must be adhered to.

1.2 The Objectives of Research

The primary objective of research is the quest for, the deepening and broadening of knowledge, including the dissemination of results through publication, teaching, applied research and consultancy.

Research should also seek to meet the following additional objectives:

- i. the training of new Researchers in appropriate methods and professional standards of research;
- ii. the promotion of the interests and benefits of research; and
- iii. the securing of the exploitation of results for the public good and the benefit of JKR and its staffs; and Researchers.

2. Principles of Research

2.1 Excellence

Researchers should strive for excellence when conducting research and aim to produce and disseminate work of the highest quality. This Code of Practice is intended to support this goal.

2.2 Honesty and Integrity

Researchers must be honest in respect of their own actions and in their responses to the actions of other Researchers. This includes honesty in the presentation of research goals, intentions

and findings; in reporting on research methods and procedures; in gathering data; in using and acknowledging the work of others; in conveying valid interpretations, and making justifiable claims based on research findings. Researchers must not engage in nor conceal misconduct and have a responsibility to report potential incidences of misconduct in an appropriate manner. The consequences of failing to behave honestly in any of these, or other actions may be regarded as a disciplinary offence. Procedures for dealing with allegations of misconduct in research can be found in Appendix 1 of the “ Standard Procedure for Dealing with Allegations of Misconduct in Research” (document number: JKR 29201-0007-18).

Maintaining professional standards is fundamental to research. A culture of honesty and integrity should be fostered in all areas of research activities.

2.3 Openness

Subject to legal, and ethical constraints, all research outputs and data from research funded by JKR or the government should be made openly available in a responsible manner and appropriate format. Research data (metadata) and outputs should be deposited in the CREaTE repository once the output has been accepted for publication, with the full text of the final author’s refereed version deposited within six (6) months after completion of the research project.

Research methods and results should be open for scrutiny, discussion and debate. Subject to considerations of confidentiality and protection of intellectual property rights, Researchers should be open with other Researchers and the public regarding their work and promote the exchange of ideas and information. There should be transparent and open communication in declaring conflicts of interest; in the reporting of the research data collection methods; in the analysis and interpretation of data; in making research findings widely available, which includes sharing negative results as appropriate; and in presenting work to other researchers and the public.

2.4 Accountability and Responsibility

The primary responsibility for safeguarding the integrity of any research undertaken lies with the individual Researcher. It is his responsibility to ensure that the work meets all professional standards and the principles outlined in the Code of Practice.

Researchers should recognise that in and through their work they are ultimately accountable to the general public and must act accordingly. All Researchers should be aware of and must comply with JKR and CREaTE policies and guidelines, especially the basic principles relating to ethics, information, finance, and health and safety.

All Researchers must ensure the work undertaken is consistent with any agreements and terms and conditions related to the project. This includes ensuring the programme is carried out as defined in the original proposal, the finance is used solely for the purpose it was intended for, reports are accurate and produced on schedule, and that there is adherence to the conditions regarding publication, data management and intellectual property ownership. Any failures in any of these aspects or instances of misconduct (refer to section 5) should be reported in line with the requirements of the project and of JKR or CREaTE.

Researchers should follow the requirements and guidance of any professional bodies in their field of research. Researchers who are members of a regulated profession should follow the requirements and guidance of their profession.

2.5 Rigour

CREaTE promotes good research practice, emphasizing integrity and rigour. A rigorous approach to research is part of the professional integrity to which all Researchers must adhere.

Researchers should conduct research according to the highest standards of rigour in line with prevailing disciplinary norms and standards. Rigour should be applied when performing research and using appropriate methods; in drawing interpretations and conclusions from the research; in the verification of the results before publication; and in communicating the results.

2.6 Care and Respect

Care and respect must be extended to all participants in and subjects of research, including humans, animals, the environment and cultural objects. Researchers should address any concerns relating to the dignity, rights, safety and well-being of all involved in research. Those engaged with research must also show care and respect for the stewardship of research and scholarship for future generations.

Due care and attention must also be paid to issues of equality and diversity throughout the research process.

3. Commitments for Research

3.1 Leadership and Supervision

The Group Leader/Lead Researcher of a research project is responsible for ensuring that all researchers under his supervision/management have been suitably apprised of their responsibilities under this Code of Practice and that they undertake all aspects of research in line with its provisions. This includes ensuring:

- i. the dignity, rights, welfare and safety of any research participants;
- ii. research is conducted in accordance with guidelines (including best practice, and health and safety procedures), and the approval obtained from the Research Project Approval Committee (JKPP) before research commences;
- iii. that a risk assessment of the planned study is undertaken to determine the potential risks to the organisation, the research, the safety and well-being of the participants and researchers, and identify the legal and ethical requirements governing the research;
- iv. the study complies with all relevant legal and ethical requirements;
- v. each research team member is qualified and experienced to fulfil their role including ensuring that students and Researchers have adequate supervision and support;
- vi. that all procedures are in place to collect, store, manage and keep secure high quality data and, subject to legal and ethical constraints, to make such data available upon completion of the research project. That these procedures are documented in a data management plan where required;
- vii. reports on research progress and outcomes are produced on time and to an acceptable standard;
- viii. research results are disseminated promptly and fed back as appropriate to participants;

- ix. findings are open to review through accepted scientific and professional channels and research data is appropriately registered to facilitate access;
- x. arrangements are in place to manage financial and other resources provided for the study, and any intellectual property arising;
- xi. he accepts the key role of detecting and preventing misconduct by taking responsibility for all aspects of research integrity which relate to a particular publication;
- xii. that provision is made for the continued management of research data if a Researcher in the project team leaves the Research team; and
- xiii. that where collaborations with external organisations are entered into, there is formal agreement regarding data ownership prior to project commencement.

A research Group Leader/Lead Researcher is expected to establish an atmosphere of organisation and co-operation in his team, fostering the open exchange of ideas and ensuring that robust management practices exist to safeguard the honesty and integrity of the research conducted. New Researchers must be given access to this Code of Practice, and any other appropriate guidelines on best practice.

Research Group Leader/Lead Researcher must ensure that Researchers are not placed under commercial or other pressures that prevent the normal pursuit of thorough and honest investigation.

3.2 Research Data and Records

3.2.1 Research Data and Records Management

A primary principle of good research practice is the effective management of research data and records. CREaTE will provide guidance, training, technical support and infrastructure to assist Researchers to manage their research data and records effectively and in line with this Code of Practice. Researchers must ensure that they fully understand, and comply with, any funder policies, relevant legislation, CREaTE policies and guidelines concerning research data and records management.

Researchers are responsible for the meticulous recording, quality assurance and management of their research data. At the proposal stage Researchers must consider how they will actively manage their research data and records in whatever format throughout the project lifecycle, to ensure they remain secure, retain integrity and authenticity and remain available throughout the designated period of retention. Due regard must also be given to the provision of access to the research data. As good practice, all research projects that are creating or capturing data should include these considerations in a formally documented data management plan (DMP). The DMP should be implemented, and updated where required throughout the project lifecycle. As part of their DMP Researchers should ensure that they have assessed the risks relating to confidentiality, integrity, availability and compliance with respect to their data and have employed appropriate security controls.

3.2.2 Metadata and Documentation

Researchers must ensure that research data and records are created with sufficiently high quality metadata and documentation to explain their origin, content and context, and where being made accessible externally, discoverable to others for future re-use.

Researchers will be expected to register details of their research data, and the provisions for accessing it in line with funder requirements and in accordance with CREaTE designated method. Where funders do not have requirements concerning the registration of data, Researchers are expected to log details with CREaTE.

3.2.3 Retention

Research data must be retained in line with the CREaTE's retention requirements and any retention periods specified by the funding organisation.

3.2.4 Access to Data and Data Preservation

At the end of the research project, subject to any legal, contractual and ethical considerations, data shall be made openly available in a timely and responsible manner. Researchers are entitled to a limited period of privileged access to work on their data and to prepare publications but it is expected that data will be made available no later than publication of research outputs.

Research data that substantiates research findings or is likely to be of interest for future research shall be deposited for preservation to CREaTE's data service or repository, where legal, contractual and ethical considerations allow. Research data shall be deposited with the appropriate metadata and documentation.

Where data is deposited externally care must be taken to ensure that rights are not assigned without retaining the right to make the data openly available for re-use, unless this was an original condition of the research project funding award. Where data cannot be made widely available, Researchers should provide access to third parties under appropriate legally enforceable confidentiality agreements to enable them to verify results.

3.2.5 Leaving the Research Team

Researchers leaving the research team must ensure that appropriate arrangements are made for the continued retention, storage and where applicable, provision of access to their research data and records. The Research and Technical Management Section, CREaTE shall take on the responsibility for assisting in the management of the research data and records.

3.3 Publications and Authorship

Researchers have a responsibility to publish and disseminate research in a manner that reports the research and all the findings of the research accurately and without selection that could be misleading. Research results should be disseminated widely in an appropriate form, thereby allowing the community at large to view, challenge and develop research results. All publications should contain enough information to allow other Researchers to accurately repeat the procedures originally used.

Research should be published wherever possible, taking into account conditions specified by the funding body and protection of any intellectual property or confidential information (refer to section 4). It is important that research output is peer reviewed through accepted scientific and professional channels.

Published research should always include 'Public Works Department' in the author address field. In the majority of cases supporting data should be made available and published research should include a short statement outlining how and on what terms the data may be accessed.

Authors should not publish more than one paper based on the same set of data, except where there are full and thorough references and acknowledgements made to the earlier paper(s). A publication must contain appropriate references if it is substantially similar to another/other article(s) on the same research. Any author who submits similar work to more than one publisher must ensure each publisher is aware of this at the time of submission.

Authors are required to deposit the full text of the final, peer-reviewed, author's version ("post-print") of their journal articles and published conference proceedings in CREaTE's repository no later than six (6) months after acceptance. Where publishers' copyright permissions allow and there are no confidentiality or commercial constraints, these versions will be made Open Access. Outputs subject to an embargo will not be released publicly until the embargo period has expired.

Authorship is the foremost method of allocating credit for intellectual advances. An author can be defined as someone who has had a major input into a publication's creation. This can be by:

- i. helping conceive the research project and its procedural framework;
- ii. being involved in the study and the interpretation of research data;
- iii. drafting the publication, or revising its content in a critical matter to perceive its actual worth; and
- iv. giving approval for the final version of article which is to be published.

Assisting in acquiring funding or data is not sufficient to earn the title of author. Neither is general supervision of a research team. Contributions of this kind should be acknowledged in the text, but not as authors. The practice of honorary authorship is not acceptable.

An author is responsible for reviewing and taking responsibility for his contribution to the output prior to the publication and thereby ensuring that he is familiar with its contents and his contribution to it. Once published, the authors should collectively support the findings of the research: any person listed as a co-author on a publication is deemed to endorse every part of that output.

In every aspect of research, the roles and contributions of collaborators and other supporters of the work must be acknowledged. This extends to attributing thanks to the body funding the project, if it is appropriate to do so. This should apply when publishing research findings, and whenever making a statement regarding the research. Where data from third parties has been used the source of the data shall be acknowledged.

Failure to properly acknowledge all direct or indirect contributions made by other persons is unprofessional conduct and could amount to academic research misconduct.

3.4 Training

It is the personal responsibility of Researchers to participate in training in current good practice and statutory requirements relevant to their research area. It is the responsibility of CREaTE to ensure that there are adequate provisions for training and development of Researchers and management staffs to conduct and manage research programme in JKR and CREaTE.

It is CREaTE's policy that Researchers receive adequate supervision from their Lead Researcher, along with regular reviews of their progress. It is the responsibility of the Lead Researcher to work with researcher(s) under him to identify their training needs and lay down efforts on how these needs will be met.

It is also vital that the Lead Researcher develop the appropriate skills in respect of their researcher(s)/staff's development and managerial responsibilities. Training in research related skills will generally be provided at CREaTE or other training institutions, as appropriate. Particular attention should be paid to providing inexperienced Researchers with training in all the necessary skills to undertake their research works.

This training shall aim at providing and preparing Researchers with generic research skills, professional and transferable skills and career development opportunities, which are organised around these four areas: knowledge and intellectual abilities; personal effectiveness; research governance and organisation; and engagement, influence and impact.

3.5 Ethical Requirements

Research ethics is a set of principles governing the way any research involving interaction between a Researcher and other humans or human tissue or data relating to humans, is designed, managed and conducted. The dignity, rights, safety and well-being of human participants must be considered at all times, respected and safeguarded.

3.5.1 Research Involving Human Participants or Human Data

The responsibility for ensuring the ethical conduct of research resides with the Researcher. The following guidance sets out the principles that should be adhered to for all research involving human participants, human material or human data.

Research must adhere to all legal requirements and guidelines produced by appropriate bodies, including but not limited to, this Code of Practice, Copyright (Amendment 2012) Act 1987 [Act 332], Defamation Act 1957 [Act 286], Official Secrets (Amendment 2006) Act 1972 [Act 88], Patents (Amendment 2006) Act 1983 [Act 291], Sedition (Amendment 2006) Act 1948 [Act 15], Computer Crimes (Amendment 2006) Act 1997 [Act 563], Security Offences (Special Measures) Act 2012 [Act 747], Printing Presses and Publications (Amendment 2006) Act 1984 [Act 301], Films Censorship Act 2002 [Act 620], and guidelines from relevant professional bodies or relevant research ethics committees. It is legally and ethically paramount that all information gained from research regarding individuals must be kept strictly confidential and securely stored.

3.5.2 Research Involving Human Participants: Basic Principles

In any research involving human participants, the safety, rights and dignity of the participant must be of primary concern.

The Innovation, Engineering Research and Development Division (BIPPK) recognises the breadth of research methodologies in use across the academic disciplines and that ethical issues and practices may vary within the context of the methodologies as well as within the context of a discipline. Valid and informed consent is normally necessary where sensitive personal data is collected. For the consent of the research subjects to be valid it must be fully informed and freely given.

If researchers consider that human participants in research are subject to unreasonable risk or harm, or the improper use or storage of personal data, they must report their concerns to their supervisor or other appropriate person in BIPPK and where required, to the appropriate regulatory authority.

4. Intellectual Property

4.1 Definition and Importance

Intellectual property (IP) is the product of thought, creativity and intellectual effort. In the course of their research, consultancy and teaching Researchers often generate IP (e.g. technical discoveries and methods, drawings, designs, experimental outcomes, pieces of prose and music). Funding bodies generally expect Research Institutions/Research Bodies to commercialise IP arising from research they have funded.

It is important therefore that IP generated by BIPPK is commercially exploited, where appropriate, in order to:

- i. propagate research findings and help realise their fullest value;
- ii. aid local and national economic prosperity;
- iii. generate additional income for JKR and its staff; and
- iv. gain prestige for JKR.

although there is no guarantee of a financial return from the commercialisation of IP, where such return is realised. Other advantages include:

- i. more opportunities for collaborative research;
- ii. entrepreneurial status and recognition; and
- iii. satisfaction of making a positive contribution to the society.

At the earliest opportunity Researchers should bring to the attention of the Engineering Innovation Unit, BIPPK of any IP that may have commercial value.

4.2 Ownership

Intellectual Property (IP) generated through research funded by JKR or Ministry of Works (MoW); belongs to JKR, and the Researcher must notify JKR of any invention or other intellectual property with potential commercial value.

CREaTE will normally allow the author to own the copyright on any work to be published, and waive any claim it may have to benefits arising from publication. There are exceptions to this:

- i. copyright in course materials for the purpose of a course being run or to be run by CREaTE;
- ii. copyright in any software program generated during the normal course of employment;
- iii. copyright in any works which may be necessary to protect rights in commercially exploitable IP; and
- iv. copyright in any works commissioned by an external organisation where the terms and conditions of the commission require copyright to be transferred to that organisation.

The Engineering Innovation Unit will work with Researcher in developing business proposals and obtaining the necessary approvals from JKR.

4.3 Protection

Researchers should safeguard their own interests, those of JKR, and those of any funder or collaborating body in relation to IP. In most countries of the world, prior disclosure will invalidate any patent application and harm potential commercial benefits. Researchers should not, therefore, disclose an idea to any party not employed by JKR or the government, either verbally or in writing, until steps have been taken to protect the IP. After obtaining the appropriate protection, the idea or results may then be published in the normal way.

When a piece of research is believed to have commercial potential, immediate steps can be taken to protect the idea through filing a patent application. To be patentable, an invention must be novel, include an inventive step not immediately obvious and be capable of industrial application. The Engineering Innovation Unit is responsible for managing JKR's patent budget and it will discuss and agree with the inventor(s) the best means of protecting and exploiting the IP.

5. Conflicts of Interest

Researchers should recognise that conflicts of interest (i.e. personal, or institutional in nature, including but not limited to financial matters) may have a negative impact on research. Thus, conflicts of interest must be identified, declared, and addressed in order to avoid poor performance in research. The initial responsibility for managing conflicts of interest rests with the individual Researcher. When addressing a conflict of interest, one has to decide whether it is the type and severity that poses a risk which may compromise the validity and integrity of the research whereby the research should not be allowed to proceed further, or whether the conflict can be adequately addressed.

The responsibility for identifying and declaring conflicts of interest lies with all individuals involved in research. Researchers should refer to JKR for addressing conflicts of interest, as well as any external requirements relating to conflicts of interest (such as those of funding bodies). This disclosure will usually be made to the Lead Researcher and the individual concerned will then comply with their direction. If in doubt, it should be considered best practice in the first instance to disclose any potential conflicts of interest and seek advice from BIPPK.

6. Concluding Statement

This Research Integrity and Governance Code of Practice aims to enhance the professional, open and honest research culture whilst not infringing upon the fundamental pursuit of greater knowledge and understanding.

All external standards applicable to the research and any relevant stakeholder requirements must be complied with as well as JKR's common law and statutory obligations.

Acknowledgements

JKR gratefully acknowledges the following organisations in producing some aspects of this Code of Practice:

Cardiff University	Code of Research Practice
Research Councils UK (RCUK)	RCUK Policy and Code of Conduct on the Governance of Good Research Conduct
UK Research Integrity Office	Code of Practice for Research: Promoting good practice and preventing misconduct Procedure for the Investigation of Misconduct in Research
Universities UK	The Concordat to Support Research Integrity



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