

# HMRC-CREATE

## Roles, Competencies, and Performance Indicators

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### *Roles<sup>1</sup>*

The HMRC-CREATE training program prepares its trainees to be able to engage in a variety of professional activities or roles upon graduation, namely:

1. Bone and joint health researcher
2. Translational researcher
3. Commercialization partner
4. Leader and Manager
5. Professional

### *Competencies:*

A *competency* is defined here as a set of skills, abilities, and related knowledge needed to perform a specific task or an activity within a specific function or role.

Column 1 of each table identifies the respective *competencies* supporting each role.

### *Performance Indicators*

Performance Indicators define and measure *progress* toward the set competencies. They identify attitudes, behaviours, knowledge, and skills; highlighting the type of evidence that will help to verify the existence of each of the competencies. The performance indicators show professional development as a growth process (along a continuum) in three levels: (1) novice, (2) proficient, and (3) expert as shown under columns 2, 3, and 4 of the tables that follow.

These roles, competencies, and performance indicators are aligned to the goals, mission, and vision of the HMRC-CREATE program. The next section describes these in more detail.

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<sup>1</sup> (HMRC-CREATE, 2010)

## Completing the Competency Assessment Instruments

### *Instructions for Trainees*

Following each role is a competency assessment instrument. Use these worksheets to determine/assess your *current* competencies.

### *Step 1: Assess Your Entry Level Competencies*

Refer to column 2 of each table (competency assessment instrument) in the next section.

Indicate your *current* attitudes, skills, knowledge, and abilities related to each of the following competencies (these are your *entry-level competencies*).

### *Step 2: Determine your Level's Exit Competencies*

Refer to columns 3, 4, 5, 6 of each table. The x on each column indicates whether that particular competency applies to your level and the expected level of performance that you should acquire by completing the HMRC-CREATE program (exit competencies). If a column is left blank that means that that particular competency doesn't apply to your level.

### *Step 3: Identify Learning Activities*

Compare the results from Steps 1 and 2. The difference between the two (gaps) indicate your *learning needs* and *growth opportunities*. Note your areas of *strength* and areas that need *improvement*. This should guide your choice of program activities in the next step – selection of professional development modules.

### *Step 4: Identify Learning Activities*

Refer to column 6 of each table. These show the core courses and complementary activities that relate to each competency. Refer to the program curriculum for descriptions, learning objectives, meeting times, and other details. Your choices will be incorporated in your customized learning plan.

### *Step 5: Submit Documentation*

The trainee submit *signed copies* of the following documents to [create.biomed@queensu.ca](mailto:create.biomed@queensu.ca)

- Completed Competency Needs Assessment (*beginning of program*)
- Professional Development Plan/Learning plan (*beginning of program*)
- Portfolio Review Worksheets (*multiple reviews depending on duration of one's program*)
- Completion and Certification Sign-off sheet (*end of program*)
- Complete exit survey (*end of program*)

# Bone and Joint Health Researcher Role and Competencies

**Role Description:** A Bone and Joint Health Researcher demonstrates knowledge of clinical, scientific, and technical issues and effectively integrates biological, engineering, and information technologies in bone and joint health research.

Competencies	Performance Indicators		
	Novice	Proficient	Expert
<b>Research Technologies</b>	Identifies technologies used in Bone and Joint Health research.	Selects and operates various technologies integrated into one’s research project.	Demonstrates to others how to use various technologies in one’s research specialty.
<b>Multidisciplinary Research</b>	Participates in a research project.	Manages an Integrated Research Team project.	Successfully plans, manages, and completes an Integrated Research Team project.
<b>Research Terminologies</b>	Demonstrates knowledge of clinical, scientific, and technical terminologies.	Mastery of clinical, scientific, and technical terminology is evident in one’s research project.	Mastery of terminology is evident in multiple research presentations and publications.
<b>Research Experimentation</b>	Uses existing experimentation methods to accomplish a research goal.	Participates in determining appropriate experimentation methods.	Leads research team in evaluating the most appropriate experimentation methods.
<b>Research and Evaluation Methods</b>	Understands research and evaluation data using qualitative, quantitative, and mixed approaches.	Designs and implements research and evaluation data using qualitative, quantitative, and mixed approaches.	Evaluates the validity and reliability of research using qualitative, quantitative, and mixed approaches.

# Bone and Joint Health Researcher: Role Competency Assessment Instrument

**Levels of competence:**      Novice (N)                                  Proficient (P)                                  Expert (E)

Bone and Joint Health Researcher Role	Entry Level Competence (Trainee to complete)			Program Completion Performance Indicators (Exit Competencies)				Learning Plan (PDP) Activities (Refer to the curriculum for descriptions of each activity/module)
				Summer Intern	Master's Trainee	Ph.D. Trainee	Post Doctoral Fellow	
<i>Research Technologies</i>	N	P	E					<ul style="list-style-type: none"> <li>• Integrated Research Team</li> <li>• Integrative Technologies</li> <li>• Medical Practice and Research</li> <li>• Internship Research and Seminars</li> <li>• Qualitative Methods</li> <li>• Clinical visits/OR Consultations</li> <li>• Service Learning</li> <li>• Participation in program needs assessment and evaluation</li> <li>• HMRC Seminars</li> </ul>
<i>Multidisciplinary Research</i>	N	P	E					
<i>Research Terminologies</i>	N	P	E					
<i>Research Experimentation</i>	N	P	E					
<i>Research and Evaluation Methods</i>	N	P	E					

# Translational Researcher Role and Competencies

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**Role Description:** A Translational Researcher recognizes key issues in clinical practice and effectively disseminates research into practice.

Competencies	Performance Indicators		
	Novice	Proficient	Expert
<b>Health care delivery</b>	Understand the processes and models of health care delivery.	Identifies the effect of health care delivery processes and models on one's research plan.	Leads research team and other stakeholders in navigating the health care delivery processes.
<b>Clinical Practices</b>	Can identify challenges related to the evaluation, diagnosis and treatment of patients with mobility limitations.	Identifies potential solutions from the literature to address challenges related to the evaluation, diagnosis and treatment of patients with mobility limitations.	One's research provides potential solutions to challenges related to the evaluation, diagnosis, and treatment of patients with mobility limitations.
<b>Clinical Research</b>	Identifies research questions in the literature or in one's project addressing clinical problems in bone and joint health.	Formulates and justifies research questions addressing clinical problems in bone and joint health.	Evaluates research questions addressing clinical problems in bone and joint health.
<b>Research Planning and Execution</b>	Identifies relevant scientific, clinical, and technical literature for a research project.	Plan and execute scientific, clinical, and technical literature review for a research project.	Plans, executes, and effectively communicates scientific, clinical and technical literature review for a research project.
<b>Research Dissemination</b>	Effectively disseminate research to a local audience (class presentation or HMRC or other seminar).	Effectively disseminates research in local and national audiences in multiple formats (class presentation, seminar, conference, journal article).	Effectively disseminate research in local, national, and international audiences (class presentations, seminars, conferences, journal articles).

## Translational Researcher Role: Competency Assessment Instrument

Levels of competence:      Novice (N)                                  Proficient (P)                                  Expert (E)

Translational Researcher Role	Entry Level Competence (Trainee to complete)			Program Completion Performance Indicators (Exit Competencies)				Learning Plan (PDP) Activities  (Refer to the curriculum for more information)
				<i>Summer Intern</i>	<i>Master's Trainee</i>	<i>Ph.D. Trainee</i>	<i>Post Doctoral Fellow (PDF)</i>	
<i>Healthcare Delivery</i>	N	P	E					<ul style="list-style-type: none"> <li>• Knowledge Translation</li> <li>• Medical Practice and Research</li> <li>• Integrated Research Team</li> <li>• Research presentation</li> <li>• Internship Research and Seminars</li> <li>• HMRC Seminars</li> <li>• OR Consultations</li> <li>• Service Learning</li> <li>• Field Travel</li> </ul>
<i>Clinical Practices</i>	N	P	E					
<i>Clinical Research</i>	N	P	E					
<i>Research Planning and Execution</i>	N	P	E					
<i>Research Dissemination</i>	N	P	E					

# Commercialization Partner Role and Competencies

**Role Description:** A Commercialization Partner is knowledgeable in the practices of medical product commercialization associated with research outcomes in bone and joint health technologies.

Competencies	Performance Indicators		
	Novice	Proficient	Expert
<b>Intellectual Property Protection and Management</b>	Demonstrates awareness of how to protect and manage intellectual property.	Protects and manages intellectual property in one’s research project.	Models the use of best practices in protecting and managing intellectual property.
<b>Commercialization Concepts</b>	Uses limited commercialization vocabulary and can explain the concept of commercialization.	Appropriately uses commercialization vocabulary and concepts and can give examples of related research commercialization practices.	Applies commercialization vocabulary and concepts to explain potential uses of one’s research in commercialization.
<b>Pathways for Commercialization</b>	Identifies from the literature pathways for commercialization and business models.	Identifies specific business models and pathways for commercialization used by related researchers (case studies).	Selects a potential commercialization strategy/business model for one’s research and may choose to participate in a commercialization practice.
<b>Medical Device Regulation</b>	Can explain the principles of medical device regulation.	Takes into account the safety, quality, and principles of medical device regulation in one’s research.	Ensures one’s research upholds safety and quality standards of medical devices and applies local and global principles of medical device regulation.
<b>Product Development</b>	Identifies general cultural, safety, performance, and regulatory issues associated with medical product development and availability.	Identifies specific cultural, safety, performance, and regulatory issues associated with medical product development and availability related to one’s research project.	Ensures harmonization of cultural, safety, performance, and regulatory issues associated with medical product development and availability related to one’s research project.

# Commercialization Partner: Competency Assessment Instrument

Levels of competence: Novice (N) Proficient (P) Expert (E)

Commercialization Partner	Entry Level Competence (Trainee to complete)	Program Completion Performance Indicators (Exit Competencies)				Learning Plan (PDP) Activities (Refer to the curriculum for more information)
		Summer Intern	Master's Trainee	Ph.D. Trainee	Post Doctoral Fellow (PDF)	
<b>Competencies</b>						
<i>Intellectual Property Protection and Management</i>	N P E					<ul style="list-style-type: none"> <li>• Commercialization and Regulation</li> <li>• Medical Practice and Research</li> <li>• Integrated Research Team</li> <li>• Internship Research and Seminars</li> <li>• HMRC Seminars</li> <li>• Field Travel</li> </ul>
<i>Commercialization Concepts</i>	N P E					
<i>Pathways for Commercialization</i>	N P E					
<i>Medical Device Regulation</i>	N P E					
<i>Product Development</i>	N P E					



# Leadership and Management Role and Competencies

**Role Description:** Leads others to achieve set goals through effective management of professional and personal roles.

Competencies	Performance Indicators		
	Novice	Proficient	Expert
<b>Communication</b>	Communicates with peers clearly in multiple ways (active listening, presentation, and written).	Effectively communicates with both peers and lay people in multiple ways (active listening, presentation, and written).	Is called upon to give presentations and to represent one's research team to both peer and lay audiences.
<b>Values Diversity</b>	Respects and appreciates the value for diversity and inclusion.	Is engaged in projects that have diverse team membership.	Welcomes diverse members in one's team and leads diverse team projects.
<b>Resource Acquisition and Management</b>	Identifies resource management strategies and maintains work-related records.	Effectively manages time and material resources.	Writes grants and effectively manages time, fiscal, and human, and material resources.
<b>Project Management</b>	Identifies strategies for planning to maintain a clear scope of one's work.	Plans and maintains a clear scope of one's/team's work for effective implementation.	Manages and mentors team members in planning and maintaining a clear scope of work for effective implementation.
<b>Media Relations</b>	Recognizes the role of media in research, leadership, and management.	Participates in identifying appropriate media relations strategies to lead and manage.	Leads team(s) in engaging various media relations strategies (multimedia channels) to lead and manage projects.
<b>Mentorship</b>	Engages in a mentoring relationship as a mentee.	Is actively engaged in mentoring relationships as a mentee and as a peer-mentor.	Is actively engaged in mentoring relationships (as a mentee and as a peer-mentor) within and beyond Queen's.
<b>Social Responsibility</b>	Participates in a volunteer opportunity within campus.	Is actively engaged in various service projects including student-/professional- /community organizations.	Leads service projects and is actively engaged in student-/professional- /community organizations, committees, peer reviews, mentoring, etc.

# Leadership and Management Role: Competency Assessment Instrument

Levels of competence:      Novice (N)                                  Proficient (P)                                  Expert (E)

Leadership and Management Role <b>Competencies</b>	Entry Level Competence (Trainee to self-assess)			Program Completion Performance Indicators (Exit Competencies)			Learning Plan (PDP) Activities (Refer to the curriculum for more information on these activities)
	N	P	E	Summer Intern	Graduate Trainee	Post Doctoral Fellow (PDF)	
<i>Communication</i>	N	P	E				<ul style="list-style-type: none"> <li>• Leadership in Bone and Joint Health</li> <li>• Media and Public Relations</li> <li>• Integrated Research Team</li> <li>• CTL Seminars and Workshops</li> <li>• Internship Research and Seminars</li> <li>• Grant Writing (PDF)</li> <li>• Budget Management (PDF)</li> <li>• Supervision/HR Management (PDF)</li> <li>• Grant writing and review (PDF)</li> <li>• HMRC Seminars</li> <li>• Service Learning</li> <li>• Mentorship</li> <li>• Field Travel</li> </ul>
<i>Values Diversity</i>	N	P	E				
<i>Resource Acquisition and Management</i>	N	P	E				
<i>Project Management</i>	N	P	E				
<i>Media Relations</i>	N	P	E				
<i>Mentorship</i>	N	P	E				
<i>Social Responsibility</i>	N	P	E				

# Professional Role and Competencies

**Role description:** A Bone and Joint Health Professional demonstrates attitudes, knowledge, and behaviour that represent the highest standard of research and practice integrating ethical, social responsibility, developmental, and regulatory considerations.

Competencies	Performance Indicators		
	Novice	Proficient	Expert
<b>Ethical Research Considerations</b>	Identifies ethical issues related to human and animal research.	Participates in guided design and implementation of an ethically sound research study.	Leads and evaluates the design and implementation of an ethically-sound research study to ensure that the highest ethical standards are met.
<b>Regulatory, Policy, Social, and Cultural Considerations</b>	Identifies key regulatory, legislative, policy, social, and cultural issues in research.	Designs and implements research protocols that consider regulatory, policy, social, and cultural issues.	Evaluates and anticipates regulatory, policy, social, and cultural issues pertaining to one's research and identifies potential solutions.
<b>Professional Conduct</b>	Demonstrates knowledge of professional codes of conduct in Science and Engineering.	Complies with professional codes of conduct in Science and Engineering.	One's attitudes and practices model the highest professional behaviour and always abide by professional codes.
<b>Interpersonal Skills</b>	Identifies the value of interpersonal skills.	Relates effectively with one's peers and internal stakeholders.	Relates effectively with one's peers and diverse internal and external stakeholders.
<b>Inter-professional Collaboration</b>	Identifies the value for inter-professional collaboration and team work.	Is engaged in inter-professional collaborative projects.	Initiates new relationships and maintains existing ones by identifying opportunities for effective inter-professional collaboration.
<b>Personal Development</b>	Recognizes personal needs (learning and work-life balance) and development strategies.	Recognizes personal needs (learning and work-life balance) and creates a personal growth plan.	Recognizes personal needs (learning and work-life balance), creates, and successfully implements personal growth plan.
<b>Teaching and Training</b>	Articulates the value of developing others.	Instructs a peer on how to conduct select tasks in one's area of specialty.	Facilitates a class session and/or training in one's area of specialty.

# Professional Role: Competency Assessment Instrument

Levels of competence:      Novice (N)                                  Proficient (P)                                  Expert (E)

Leadership and Management Role <b>Competencies</b>	Entry Level Competence (Trainee to self-assess)			Program Completion Performance Indicators (Exit Competencies)				Learning Plan (PDP) Activities (Refer to the curriculum for more information)
	N	P	E	Summer Intern	Master's Trainee	Ph.D. Trainee	Post Doctoral Fellow (PDF)	
<i>Ethical Research Considerations</i>	N	P	E					<ul style="list-style-type: none"> <li>• Cultural and Ethical Issues</li> <li>• Leadership in Bone and Joint Health</li> <li>• Internship Research and Seminars</li> <li>• Career Planning</li> <li>• Effective Communication</li> <li>• Program in University Teaching and Learning (PUTL)/CTL Workshops</li> <li>• Integrated Research Team</li> <li>• Media and Public Relations</li> <li>• HMRC Seminars</li> <li>• Service Learning</li> <li>• Mentorship</li> <li>• Field Travel</li> </ul>
<i>Regulatory, Policy, Social, and Cultural Considerations</i>	N	P	E					
<i>Professional Conduct</i>	N	P	E					
<i>Interpersonal Skills</i>	N	P	E					
<i>Inter-Professional Collaboration</i>	N	P	E					
<i>Personal Development</i>	N	P	E					
<i>Training and Teaching</i>	N	P	E					