UBC SPARC

NSERC RESEARCH TOOLS & INSTRUMENTS PLAYBOOK 2021/2022

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1 INTRODUCTION

This guide was prepared by the UBC SPARC office and the UBC Okanagan Office of Research Services (UBCO ORS). The content has been compiled from NSERC's RTI application instructions, program overview, and peer review manual. It also includes insight from NSERC Program staff and Selection Committee members, along with strategy developed by SPARC and UBCO ORS support staff through the review of successful applications.

This guide has been updated following the launch of the Competition Year (CY)2022 RTI Grant Program. Nonetheless, applicants should be sure to review and address CY2022 instructions and selection criteria.

2 PROGRAM DETAILS

2.1 Overview

The Research Tools and Instruments (RTI) grant competition is the primary avenue for university researchers in the natural sciences and engineering (NSE) to obtain up to $150,000 in support for research tools and instruments with a net cost between $7,001 and $250,000. Net cost is defined as the purchase cost of the equipment after any discount from the vendor and before taxes, customs and importation fees, transportation and shipping charges, and assembly and installation costs. Vendor discount must be free of conditions, restrictions, or limitations (e.g., cannot be offered in exchange for services from users benefiting the vendor). More costly instruments/infrastructure should be requested through the Canada Foundation for Innovation (CFI).

Researchers can submit **one RTI application per competition, either as an applicant or a co-applicant**, but not as both. This requirement does not apply to Subatomic Physics RTI applicants; these applications are reviewed and supported through a different funding envelope so they are not addressed within this guide.

The NSERC RTI Grants program will only accept the following requests:

- Tools and instruments that form a comprehensive system intended to support **NSERC-funded research** in the NSE. A comprehensive system is one in which each tool or instrument forms part of an integrated system of operation to support the research program(s). Requests that bundle unrelated tools and instruments together will not be accepted.
- The purchase of new, used or refurbished equipment; the repair, upgrade or rental of equipment; or the fabrication of equipment that is not readily available off the shelf.
- Equipment that is purchased or rented after the application deadline.

Note that equipment and items that are part of laboratory infrastructure or intended to render other equipment compliant with health and safety standards are not eligible for RTI support.

Duration: 1 year
Value: Up to $150,000 towards equipment with a net cost of $7,001 to $250,000.

- When the cost exceeds $150,000 funding from other sources must be secured and described to bring the amount requested from NSERC to $150,000 or less.

Average grant value in Competition Year 2021: $124,893
Success rate in recent competitions: 2021: 24.8% national; 30.6% UBC. **2020:** 27.9% national; 44.8% UBC. **2019:** 21% national; 25% UBC
Funding envelope: $25-31 million (varies yearly).
Application deadline: October 25th, 5:00 PM, PST.

- Institutional quotas have been removed from the RTI program. Applicants no longer compete in an internal competition and can submit directly to NSERC.
- Earlier internal deadlines are set by the relevant Office of Research Services (Vancouver | Okanagan), by which point applicants must submit via NSERC's Research Portal.

2.2 Eligibility

2.2.1 Applicant Eligibility

Researchers are now able to participate in only one RTI application per competition, either as an applicant or a co-applicant, but not both. In addition to NSERC's eligibility criteria for faculty, applicants and co-applicants must each hold or be concurrently applying for one of the following NSERC research grants:

- Discovery Grant
- Discovery Development Grant
- Alliance Grant
- Strategic Partnerships Grant
- Collaborative Research and Development Grant
- an NSERC-related chair, including:
  - Canada Research Chair
  - Canada Excellence Research Chair
  - Canada 150 Research Chair

For those submitting a Discovery Grant application in the same year as an RTI application, NSERC asks reviewers to presume that the Discovery Grant will be funded. If an RTI application is selected for funding but the principal applicant does not secure one of the above grants or chairs, NSERC will consider awarding the RTI funds to an eligible co-applicant. Co-applicants who are not successful in securing one of the above awards or chairs by the award date of the RTI will be removed from the team. New faculty must have a start date on or before September 1st, 2022 to be eligible to receive funds from the CY2022 RTI program. Note that if the lead applicant has previously held a DG, and there's a year's extension available, taking this extension can make the lead applicant eligible to hold and RTI. Given that an RTI is only one year, this extension covers the required timeline.

2.2.2 Subject Matter Eligibility

RTI grants foster and enhance the discovery, innovation and training capability of university researchers in the NSE. The application will be assessed based on supported NSERC-funded research only. Those applicants with research programs which border or include health and/or social sciences, see Section 5.1.2.

2.2.3 Eligible and Ineligible Costs

All content within sub-section 2.2.3 is pulled directly from the NSERC RTI Instructions.

Consult the Tri-Agency Financial Administration Guide for the eligibility of expenditures for the direct costs of research and the rules governing the use of grant funds.

*Travel required for the supplier to install, repair and/or refurbish equipment is an eligible cost.

Applications for computing equipment are considered on the same basis as all other equipment applications. RTI grant funds may be used to purchase hardware and/or to pay for the acquisition of software.

Type of Expenditure	Eligible Costs	Ineligible Costs (ineligible costs must not be included in the application)
Equipment	Purchase or rental of equipment, including taxes, shipping and handling	
Other	Transportation/shipping costs for purchased equipment Fabrication, assembly and installation of equipment Extended warranty or service contract	Salaries and benefits Travel *see note above for exceptions Insurance costs for equipment and research vehicles Laboratory infrastructure (including but not limited to ventilation systems, wiring, power units or

	Brokerage and customs charges to import equipment and supplies Testing/calibration costs On-site costs of training staff to use equipment Software licensing or upgrades	electrical outlets, floors, ceilings, walls, plumbing, lighting and storage) Costs of the construction, renovation or rental of laboratories or supporting facilities Equipment or items intended to render other equipment compliant with health and safety standards Consumables

2.3 The Application Process

The RTI competition has a one-stage application process (no Notice of Intent). Complete applications are typically due to NSERC by **October 25th** of each year. UBC's Vancouver and Okanagan Office of Research Services (ORS) each have earlier deadlines for applicants to submit via the Research Portal (typically 5 business days before NSERC's deadline). See Section 3.3.

For technical assistance with the Research Portal, contact NSERC's online services helpdesk: by phone at 613-995-4273 or email at webapp@nserc-crsng.gc.ca, or complete an On-line Services Support Request.

2.3.1 Components of a Complete Application

- ☐ Application form for the principal applicant, filled out via the Research Portal (See Section 4.1 for a sample application form and tips)
- ☐ Budget Justification (limit of 2 pages)
- ☐ Proposal (limit of 4 pages)
- ☐ Two recent quotations for each individual item costing more than $25,000 (before taxes) or for any system(s) to be purchased from a single supplier and costing more than $25,000 (before taxes).
- ☐ Application form for each co-applicant (consisting of only an Eligibility Profile & hours/month devoted to use of equipment).
- ☐ A CCV for each applicant and co-applicant. See "Detailed instruction for completing the NSERC CCV".

2.3.2 Co-applicants

Include only major users (who will frequently use the equipment) as co-applicants. There is no typical number of co-applicants. Teams should strive for a diverse group of co-applicants and major users.

- Reviewers tell us that applications are not necessarily made stronger by including more co-applicants, especially if plans to share the equipment do not come across as genuine or feasible. That said, sole applicants should justify why the equipment will not be shared.

To invite co-applicants to your application: 1) open your RTI application on the Research Portal; 2) from the *Application Overview* page in the *Invitations* section, click on *Manage Invitations*; 3) provide the email address and the last name of each co-applicant. An email will be sent to each participant with instructions on accepting the invitation. Co-applicants then complete the required portions of an application form on the Research Portal, upload an NSERC CCV, and click the submit button to send their portion of the application to the applicant.

Note: The lead applicant will be able to see a co-applicant's CCV as soon as it is attached to the application, even if the co-applicant has not clicked the submit button. This allows the principal applicant to review the team's CCVs before finalizing; however, all co-applicants will need to click the submit button before the principal applicant can finalize and submit the complete application.

2.3.3 Other Users

RTI applications also allow the identification of Other Users to demonstrate the need and overall potential impact of the equipment. 'Other Users' refer to those using the equipment who do not meet NSERC's eligibility requirements for a variety of reasons (e.g. an industry member, a faculty member who does not hold an NSERC grant, or an eligible faculty member who is already an applicant or co-applicant on an RTI grant in the same competition year). Notably, 'Other Users' are not formally part of the grant application, and so while they can use the equipment, they do not have access to the grant funds.

2.4 NSERC's Review of Applications

***NSERC's RTI Peer Review Manual is highly recommended reading. It is updated yearly.*

2.4.1 Assignment to an RTI Selection Committee

When populating an application, the applicant will be asked to indicate the Evaluation Group that best fits their research discipline. This suggestion will be used for preliminary assignment to the appropriate RTI Selection Committee. However, NSERC makes the final decision on the assignment to a Selection Committee.

While there are twelve Evaluation Groups, there are ten RTI Selection Committees; Applications assigned to the *Evolution and Ecology* and *Geosciences* Evaluation Groups, will be reviewed together by the *Environmental Sciences* Selection Committee. Applications assigned to the *Computer Sciences* and *Mathematical and Statistical Sciences* Evaluation Groups will be reviewed together by the *Computer, Mathematical and Statistical Sciences* Selection Committee. The following is a list of the ten RTI Selection Committees:

- Genes, Cells and Molecules
- Biological Systems and Functions
- Environmental Sciences
- Chemistry
- Physics
- Computer, Mathematical and Statistical Science
- Civil, Industrial and Systems Engineering
- Electrical and Computer Engineering
- Materials and Chemical Engineering
- Mechanical Engineering

2.4.2 Selection Committee Members

Selection Committees are made up of Canadian and international researchers and industry members. The names and institutions of members from the previous competition can be found online under Research Tools and Instruments Selection Committees. This information provides a good indication of the multidisciplinary nature of RTI Selection Committees. While members are appointed for one-year terms, many serve repeatedly.

Selection Committee membership is confirmed in October of each year. Reviewers take part in a video conference led by the committee's Program Officer and Chair. This session includes training on the RTI Grants program. Members complete NSERC's Bias in Peer Review Module and are required to read and agree to the following before performing reviews: 1) Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers; and 2) Conflict of Interest and Confidentiality Policy of the Federal Research Funding Organizations. This year's competition will also likely include some form of EDI training.

2.4.3 Assignment to Reviewers

To assign applications to reviewers, Selection Committee members are provided with the **title** and **keywords** of applications assigned to their committee (often >100 applications). Based on this information alone, members indicate their comfort level reviewing each application (high, medium, low, very low, cannot review due to language proficiency, or conflict of interest). NSERC staff, in collaboration with Committee Chair(s), assign

reviewers to each application according to identified comfort levels, language abilities, workload balance, and conflicts of interest (See Conflict of Interest and Confidentiality Policy). Each committee member will receive 25 to 30 applications to review. They receive a scoring spreadsheet and the Assessment Notes Template (Appendix 1) which they have the option of using to guide their reviews.

- Tip from RTI Selection Committee members: Do not expect all reviewers assigned your application to be experts in your field. Reviewers are encouraged to be generous with their comfort ratings to ensure that all applications can be assigned and reviewed. So, you should target your writing to an informed but general audience. Aim to satisfy experts but also explain the impact of your work and relevant outcomes for those who may be less familiar with your field and the equipment you are requesting.

2.4.4 Scoring

All RTI reviews are completed through a secure electronic platform. There are no face-to-face meetings nor are there external reviewers. Applications are released to reviewers in early December and scored independently by up to five members of the relevant Selection Committee.

- UBC faculty who have served on an RTI Selection Committee have described varying approaches to reviewing RTI proposals. Most reviewers indicate they spend 20-45 minutes per application, including one or two reads (e.g., once for understanding and once for scoring). Your application should be written strategically to allow essential points to be found quickly by reviewers.

Members provide scores for each criterion (See Section 4.2.1), ranging from 1 (lowest) to 10 (highest), and are encouraged to use the full range. NSERC ranks applications based on their average total score. Applications that need further input from the Chair and members (e.g., subject matter, eligibility of equipment, recommendation for partial awards) are resolved by email or via teleconference before each Committee's ranked list is finalized.

2.4.5 Announcement of Results

Results are announced in April. A Notice of Decision will be available on the applicant's Research Portal, providing a total score, scores for each criterion, relative rank within the committee, and general statistical details for the relevant Selection Committee (number of applications received and funded, success rate, and funding rate). Any partial funding will be noted and justified. Partial funding will only be awarded when a cost is deemed ineligible. The timing of the release of national results varies from year to year.

2.5 Competition Year 2021 Results

Results are published annually by selection committee, institution, and as a "Competition Statistics" package. Note: CY2021 refers to the competition for which applications were submitted in October 2020.

	NSERC 2021 Comp		NSERC 2020 Comp		NSERC 2019 Comp		NSERC 2018 Comp	
	National	UBC	National	UBC	National	UBC	National	UBC
Submitted	811	72	892	58	1005	80	1043	80
Funded	201	22	249	26	210	20	208	18
Success rate	24.78%	30.6%	27.9%	44.8%	20.9%	25.0%	20.0%	22.5%
Average grant value	$125,901.00	$124,893	$123,394	$124,553	$120,472	$117,913	$120,891	$120,246
Total funding	$25,284,959	$2,747,649	$30,725,073	$3,238,385	$25,299,198	$2,358,264	$25,145,333	$2,104,911
Total requested	$98,003,715	$8,944,692	$107,142,930	$6,967,119	$117,102,340	$9,476,226	$120,786,352	$9,208,812
UBC Market share		10.9%		10.5%		9.3%		8.4%

Fig. 1: Comparative Statistics, RTI CY2018 through CY2021, National and UBC. *Prior to CY2018 there was an institutional quota.

Selection Committee	Code	Applications funded	Applications evaluated	Success rate	Funding rate	Total requested	Total awarded	Average request	Average award
Genes, Cells and Molecules	1601	105	469	22%	24%	$55,070,419	$13,167,136	$117,421	$125,401
Biological Systems and Functions	1602	146	598	24%	24%	$66,989,000	$16,243,169	$112,022	$111,255
Evolution and Ecology	1603	35	157	22%	24%	$14,844,288	$3,513,084	$94,550	$100,374
Chemistry	1604	105	442	24%	24%	$54,983,805	$13,159,921	$124,398	$125,333
Physics	1605	68	278	24%	25%	$35,416,511	$8,689,971	$127,398	$127,794
Geosciences	1606	60	257	23%	24%	$27,154,880	$6,438,863	$105,661	$107,314
Computer, Mathematical and Statistical Sciences	1607	29	121	24%	27%	$12,106,600	$3,212,513	$100,055	$110,776
Civil, Industrial and Systems Engineering	1609	59	258	23%	25%	$30,740,601	$7,534,142	$119,150	$127,697
Electrical and Computer Engineering	1610	70	329	21%	24%	$40,246,311	$9,485,160	$122,329	$135,502
Materials and Chemical Engineering	1611	106	468	23%	24%	$58,353,893	$13,868,368	$124,955	$130,834
Mechanical Engineering	1612	85	374	23%	24%	$47,129,029	$11,163,281	$126,013	$131,333

Fig. 2: RTI CY2021 National Results and Statistics.

3 UBC PROCEDURES & SUPPORT

3.1 RTI Grant Development Support

SPARC and the UBCO ORS work together to provide grant development support services to UBC faculty researchers. These services are designed to improve the competitiveness of your applications. Visit the SPARC RTI Grants page for information on this year's support services. Please reach out to the appropriate SPARC Research Development Officer or UBCO ORS Research Support Specialist with questions on the RTI or any other supported program.

SPARC hosts a library of successful sample grants, including from CY2021. It is *strongly recommended* that applicants consult these sample grants for examples of formatting, language, structure, etc. A CWL is required to access sample grants and other resources. New faculty can request a 'guest' CWL from their department.

Note:** All sample grants address outdated instructions for the *Budget Justification* attachment and *Confirmation of Financial Contributions* section. Sample grants from CY2019 and earlier also address outdated assessment criteria. Specifically, EDI sub-criteria were added for CY2020 and there was a change from five to three criteria in CY2019**

3.2 RTI Financial Support

The Institutional Programs Office (IPO) is available to address questions on taxes, customs charges and costs related to importing equipment. Please reach out to Jackie Cheung, Finance Manager.

3.3 RTI Submission & Administration

UBC has internal signature and submission procedures which must be followed. Questions regarding signatures, submissions, research accounts, ethics approval, etc. should be addressed to ORS: Vancouver | Okanagan.

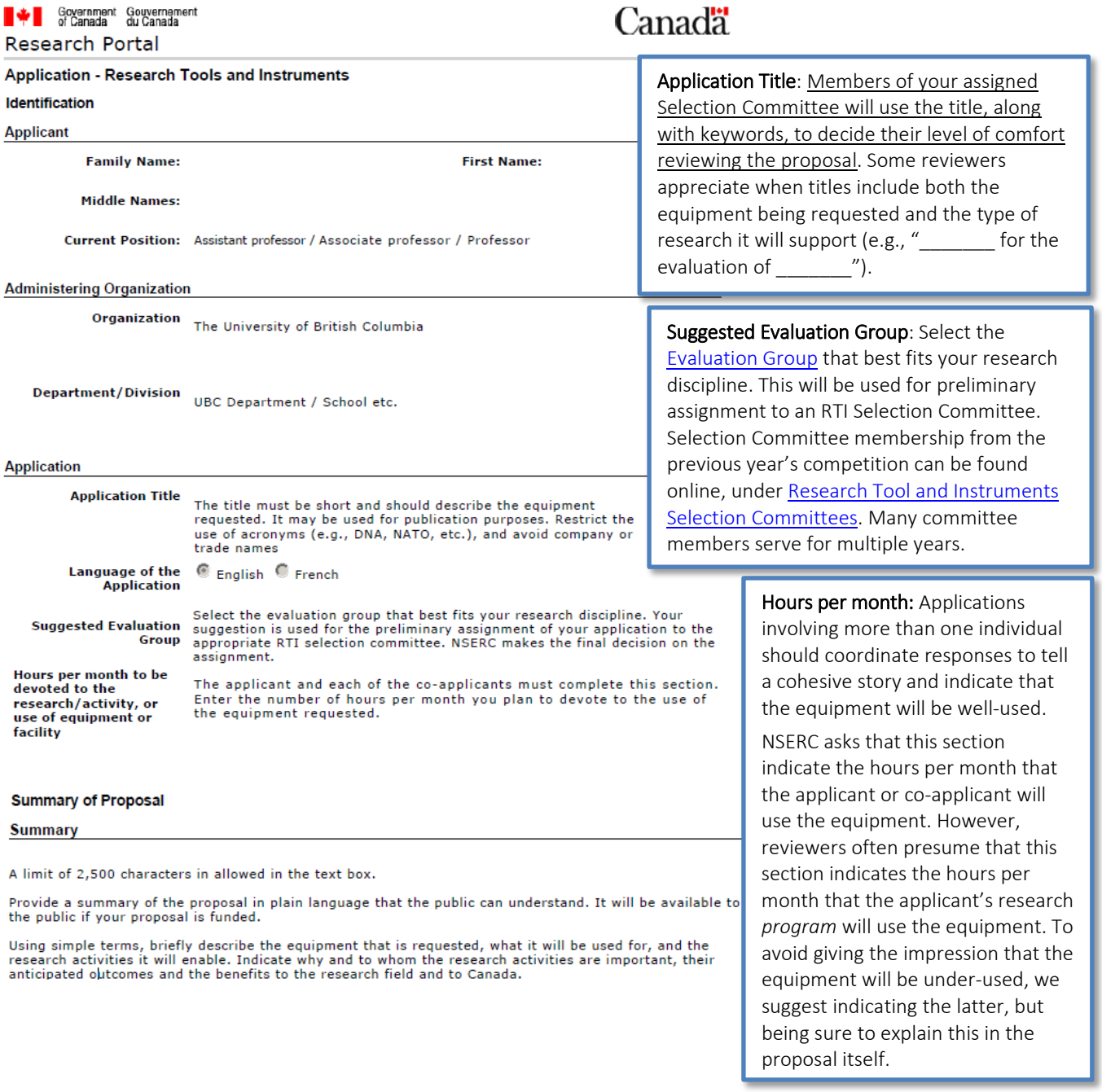
4 COMPLETING YOUR APPLICATION

4.1 Sample Application Form

An Application Form, filled out on the Research Portal, is required for the Principal Applicant. Co-applicants will also be asked to complete an Application Form which will include only the eligibility profile and a question regarding the number of hours per month devoted to the research/activity, or use of the equipment or facility.

The following is a sample Application Form for a Principal Applicant. **NSERC instructions are written in the form itself. Tips, considerations, and strategy are provided in the text boxes**. This is meant to complement rather than replace consultation of NSERC's Instructions for completing an application, which applicants should also review.

4.1.1 Applicant, Administering Organization, Application Title, Summary



Government of Canada / Gouvernement du Canada

Canada

Research Portal

Application - Research Tools and Instruments

Identification

Applicant

Family Name: **First Name:**

Middle Names:

Current Position: Assistant professor / Associate professor / Professor

Administering Organization

Organization The University of British Columbia

Department/Division UBC Department / School etc.

Application

Application Title The title must be short and should describe the equipment requested. It may be used for publication purposes. Restrict the use of acronyms (e.g., DNA, NATO, etc.), and avoid company or trade names

Language of the Application English French

Suggested Evaluation Group Select the evaluation group that best fits your research discipline. Your suggestion is used for the preliminary assignment of your application to the appropriate RTI selection committee. NSERC makes the final decision on the assignment.

Hours per month to be devoted to the research/activity, or use of equipment or facility The applicant and each of the co-applicants must complete this section. Enter the number of hours per month you plan to devote to the use of the equipment requested.

Summary of Proposal

Summary

A limit of 2,500 characters in allowed in the text box.

Provide a summary of the proposal in plain language that the public can understand. It will be available to the public if your proposal is funded.

Using simple terms, briefly describe the equipment that is requested, what it will be used for, and the research activities it will enable. Indicate why and to whom the research activities are important, their anticipated outcomes and the benefits to the research field and to Canada.

Application Title: Members of your assigned Selection Committee will use the title, along with keywords, to decide their level of comfort reviewing the proposal. Some reviewers appreciate when titles include both the equipment being requested and the type of research it will support (e.g., "_____ for the evaluation of _____").

Suggested Evaluation Group: Select the Evaluation Group that best fits your research discipline. This will be used for preliminary assignment to an RTI Selection Committee. Selection Committee membership from the previous year's competition can be found online, under Research Tool and Instruments Selection Committees. Many committee members serve for multiple years.

Hours per month: Applications involving more than one individual should coordinate responses to tell a cohesive story and indicate that the equipment will be well-used.

NSERC asks that this section indicate the hours per month that the applicant or co-applicant will use the equipment. However, reviewers often presume that this section indicates the hours per month that the applicant's research *program* will use the equipment. To avoid giving the impression that the equipment will be under-used, we suggest indicating the latter, but being sure to explain this in the proposal itself.

4.1.2 Proposed Expenditures

Proposed Expenditures

	Year 1 Amount
Equipment or facility	
Purchase or rental	$150,970
Subtotal	$150,970
Other (specify)	
	$0
Subtotal	$0
TOTAL PROPOSED EXPENDITURES	$150,970
Total Cash Contribution from Industry (if applicable)	$0
Total Cash Contribution from University (if applicable)	$0
Total Cash Contribution from Other Sources (if applicable)	$970
TOTAL AMOUNT REQUESTED FROM NSERC	$150,000

Equipment or facility: List costs in Canadian dollars of each item or system.

TOTAL PROPOSED EXPENDITURES: Should reflect the total cost of procuring the equipment including tax.

Total Cash Contribution from Industry: If you anticipate use by or benefit to other sectors, describe the support secured from these sources. If none, demonstrate the efforts made to obtain such support in the Proposal.

Total Cash Contribution from University: Indicate the total of any funds provided by applicant/co-applicant departments, faculties, etc.

Total Cash Contribution from Other Sources: Indicate the total funds being used from applicant/co-applicant grants funds and research chairs. Authorization from NSERC is no longer required to use funds from Strategic, CRD or other partnership grants (e.g., Alliance) towards RTI equipment.

TOTAL AMOUNT REQUESTED FROM NSERC: Cannot exceed $150,000.

All values in this table should be in Canadian dollars and detailed in the Budget Justification section. If vendor quotes are in another currency, use the Bank of Canada exchange rate at the time of application to convert to Canadian dollars (show these calculations in the Budget Justification. Also in the Budget Justification, indicate how overages based on rate changes will be covered (e.g., with Discovery Grant funds). Ensure that tax rates (i.e., applicable educational exemptions or rebates) are consistent with those used by UBC (8.65% total = 7% PST & 1.65% rebated institutional GST). Failure to use the above described exchange rate and/or tax rate(s), or the addition of any other line item intended to cover fluctuations in cost, may result in a revised award amount.
If equipment will be imported, customs broker fees may apply. Finance questions should be directed to Jackie Cheung of the IPO.

4.1.3 Application Details

Consult the Requirements for Certain Types of Research before completing this section. If answering 'yes' to any of the questions (not pictured), consult the Activity Details section of the NSERC RTI Instructions Page to understand required documentation which must be provided to the ORS.

4.1.4 Research Subject Codes, Areas of Application Codes, Keywords

Research Subject Codes

Please select at least one research subject code	Consult the Research Subject Codes. A primary research subject code is required.

Area of Application Codes

Please select at least one area of application codes	Consult the Area of Application Codes. A primary area of application code is required.

Keywords

List up to 10 keywords that best describe the proposal.	Provide a maximum of 10 keywords that best describe your proposal.

Research Subject Codes: Consult Research Subject Codes.

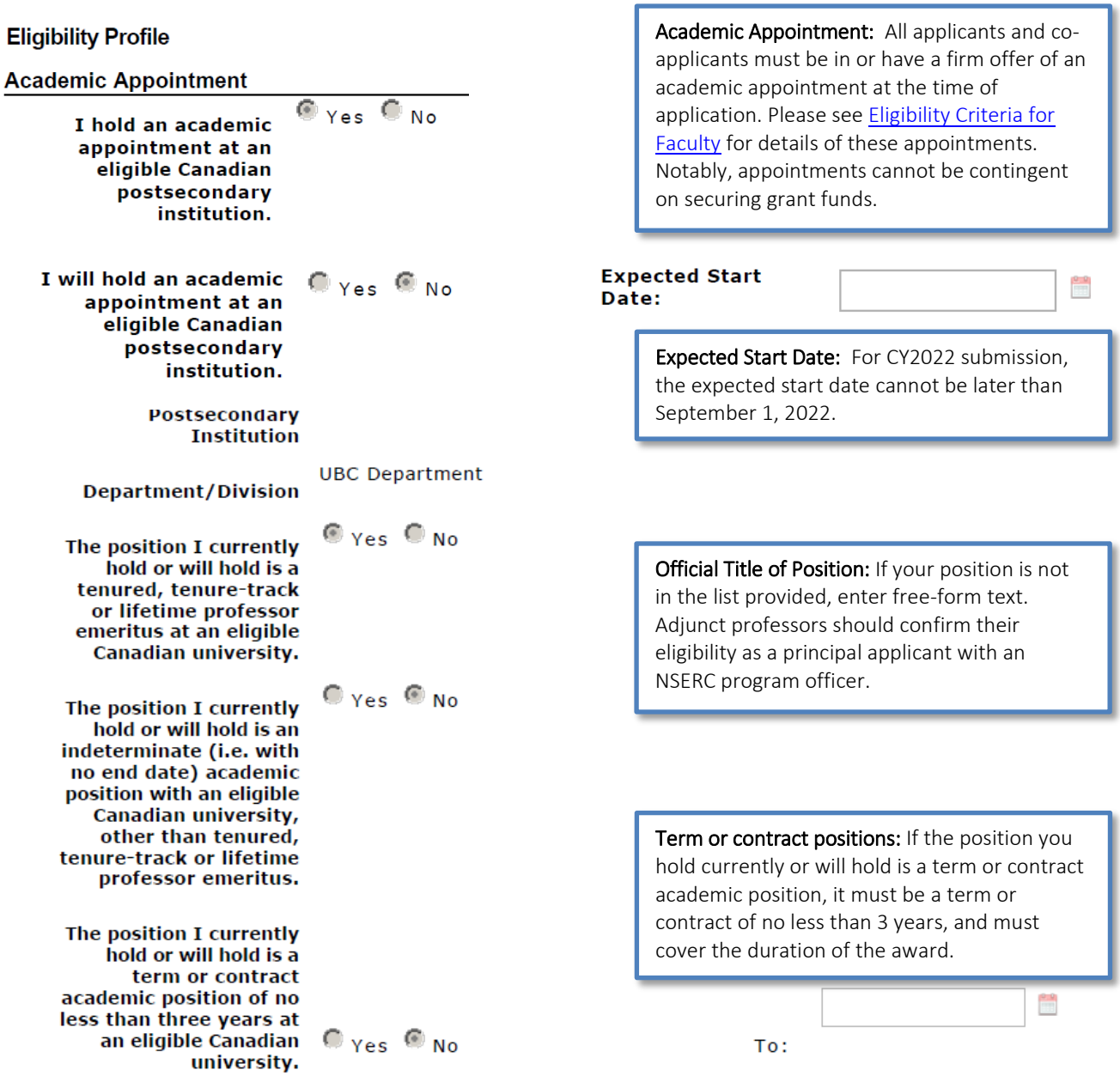
Area of Application Codes: Consult Area of Application Codes.

Keywords: Keywords, along with the application title, will be used by Selection Committee members to assess their comfort level in reviewing the application. Include the type of equipment requested, methods it will facilitate, the field of research, and how / where results will be applied.

4.1.5 Eligibility Profile and Academic Position

This section of the Application Form is required by the applicant and all co-applicants. To be eligible for an RTI you must hold or have a firm offer of an academic appointment at an eligible Canadian university at the time of application. For the duration of the award, you must hold such a position. The appointment can be a tenured, tenure-track or lifetime professor emeritus position; or a term or contract position of no less than three years.

The position must require you to engage in research that is not under the direction of another individual and must authorize you to supervise or co-supervise the research of students registered in an undergraduate or graduate degree program, or postdoctoral fellows (e.g., thesis supervision and not supervision of regular course or laboratory assignments). Adjunct professors should confirm their eligibility as a lead applicant with NSERC.



4.2 Proposal

PDF attachment; Page limit: 4 (including any references); Must follow NSERC's attachment standards

The Proposal attachment must address the three selection criteria and all sub-criteria, listed below. Applications will be ranked based on scores received in this section. For tips on addressing each selection criterion and sub-criterion please see Section 5. **Applicants are encouraged to use the three selection criteria as headings**. That said, there are successful examples of the criteria being addressed in other orders, including one which switches the first and second criteria. Regardless of order, we suggest the following allocation of space within the proposal:

1. Need, urgency and suitability – **1.5 pages**
2. Feasibility and impact – **1.5 pages**
3. Training of HQP – **0.8 pages**
4. References (optional) – **0.2 pages**

4.2.1 Selection Criteria

Applications to CY2022 competition will be judged on **three (3) selection criteria**, weighted as indicated below. *Note that the second criterion has been changed, with a focus now on feasibility and impact of the research that the equipment will support, rather than on scientific excellence of applicants*. See Section 5 for more information.

1. **Need, urgency and suitability** (40%);[1]
   a. Demonstration that the equipment is essential for the research, and that there are no other more cost-effective ways of obtaining the results;
   b. Availability of similar equipment/facilities/services in the vicinity;
   c. Impact of a delay in acquisition of equipment on the research and the pace of research progress;
   d. Need to upgrade or replace obsolete or failed equipment; and
   e. Degree of utilization of the equipment by the applicant(s) and other users.

   [1] If you anticipate use by or benefit to other sectors, describe the support secured from these sources or demonstrate the efforts made to obtain such support.

2. **Feasibility and impact** (40%); (Note: modified as of CY2022)
   a. Quality and significance of research programs, including potential for major advances and impact in the discipline as a result of the equipment;
   b. Feasibility of the plan to use the equipment;
   c. Extent to which the applicant has relevant experience or has presented a training plan to demonstrate how they will gain the ability to fully use the equipment; and
   d. Consideration of equity, diversity and inclusion in the rationale of the team composition (applicant, co-applicant(s) and major users).

   When the justification for the equipment is based to some extent on the anticipated use by, or benefit to, other NSE sectors, the applicant should describe the support secured from these sources or the demonstrated efforts that have been made to secure it. The RTI Selection Committee should consider this information when assessing the criterion.

3. **Training of highly qualified personnel (HQP)** (20%).
   a. Quality and extent of training;
   b. Opportunity for hands-on training;
   c. Potential to provide marketable skills for students trained on the equipment; and
   d. Consideration of equity, diversity and inclusion in the training of HQP.

   The necessity of the requested item(s) for the completion of student projects and theses should be addressed under the first criterion, as it is related to need and urgency.

4.3 Budget Justification

PDF attachment; Page limit: 2; Must follow NSERC's attachment standards

NSERC Instructions: This section must only contain information pertinent to the budget and relationship to other research support. Provide a detailed explanation and justification for each budget item identified in the *Proposed expenditures* page. Provide sufficient information to allow reviewers to assess whether the items requested are appropriate, including details on models and manufacturers.

In a table format like the one below, give a clear cost breakdown of the items requested indicating the subtotal(s), the institutional tax rate, the total tax and, if applicable, the currency exchange rate(s) and the converted currency total(s).

Table template

Item	Quantity	Cost per unit in original currency	Exchange rate	Total cost in Canadian dollars
			Subtotal:	
			Institutional tax rate (%):	
			Total tax:	
			Total cost:	
			Total confirmed from other source(s):	
			Total requested from NSERC:	

All proposed expenditures, including those taken from quotations, must be in Canadian dollars. To convert to Canadian currency, you must use an exchange rate consistent with the Bank of Canada rate at the time of application. Ensure that tax rates (i.e., applicable exemptions or rebates) used in the budget are consistent with the tax rates used by your institution. Failure to use the above described exchange rate and/or tax rate(s), of the addition of any other line item in the budget intended to cover fluctuations in cost, may result in a revised award amount.

Ensure you include two quotations, where applicable. If you cannot provide the number of quotations required, provide a justification under a clear heading (refer to Section 4.4, *Quotations*).

UBC Suggestions:

- NSERC has modified instructions for the Budget Justification attachment from the 2019-20 competition, and now ***strongly*** recommends applicants use the budget table described above. Selection committee members will be prepared to use this simple format to clearly see the cost breakdowns and calculations, as opposed to needing to parse through a paragraph of text.
- If your total cost exceeds $150,000 provide details on the source(s) of funds to cover remaining costs. Applications can be rejected if insufficient details are provided. Ideally, these funds will be in place.
  - If a pending or planned application is the intended source of additional funds, describe the intended source and detail the timeline. A conditional award may be granted.
  - Note that if applying for a Discovery Grant concurrently, reviewers are asked to presume that the Discovery Grant will be funded.
- To ease review, ensure that your Budget Justification text can be easily linked to the equipment as described in the quote(s).

- Where possible, use the same terminology across you Budget Justification, vendor quote(s), and Proposed Expenditures page
- Consider numbering items on the quote and using the same numbering in your justification
- Consider listing equipment in the justification in the same order as the quote
- Ask for a revised quote if the quote initially received is not straightforward, groups items in a way that is hard to describe in the justification, or provides insufficient detail.

- Applicants must address each element described above. Given the updated instructions, we suggest the following headings: 1) justification of the equipment requested; 2) breakdown of expenses, and, as applicable, 3) justification of quote(s) provided. In this case:
  - A section on *Justification of Equipment Requested* would include:
    - An explanation and justification of each budget item, with sufficient detail to allow reviewers to assess whether the items requested are appropriate. Include, as applicable, justification of:
      - particular configuration(s), model(s), add-ons, while linking these needs to projects or objectives within your proposal.
      - preferred manufacturer e.g., because it will leverage or be compatible with existing equipment, or it has unique features or functions otherwise unavailable
      - decision(s) to purchase extended warranties, training packages, etc.
    - Explanation and justification of any contributions from other sources towards the purchase of the equipment. This relates to the note in the RTI program selection criteria which states: "If you anticipate use by or benefit to other sectors, describe the support secured from these sources or demonstrate the efforts made to obtain such support."
  - A section on the *Breakdown of Expenses* would include:
    - A table following NSERC's template which provides a breakdown of all items listed in the *Proposed expenditures* page (from the Application Form filled out on the lead applicant's Research Portal account).
    - An explanation of any other expenses, such as consumables, exchange rate differences between time of application and procurement, shipping costs etc. beyond what is budgeted and how these will be covered (i.e., most often with the applicant and/or co-applicants' Discovery Grant funds).
  - A section on the *Justification of Quote(s) Provided* would include:
    - An explanation and justification of including only a single quote for costs that would generally require two quotes, according to NSERC's guidelines.

4.3.1 Relationship to Other Research Support

NSERC Instructions**:** You must provide sufficient information to enable the reviewers to assess the relationship between the equipment requested in this application and other relevant research funds held or applied for, including those of any co-applicants. These funds can include grants and contributions from funding agencies, organizations, the private sector, institution start-up funds, research chairs, the primary place of employment (for adjunct professors), and other institutional research support.

You must clearly demonstrate that the funds requested in the RTI application will be for expenses that are distinct from those covered by support (in kind or cash) from other sources. For funding applied for, you must demonstrate that there will be no duplication of funding for the same expense(s) by explaining how funds will be used if all applications are successful.

UBC Suggestions:

- At minimum, list all applicant and co-applicant grants which allow the purchase of equipment.
- State whether there is any conceptual or budgetary overlap between the RTI and any other support.
  - Conceptual overlap between the RTI application and other sources of research support is good (i.e., the equipment requested will directly support your NSERC-funded and pending research programs).
  - Direct budgetary overlap between the RTI application and other sources of research support is not okay (e.g., *"The funding requested does not duplicate any research funding held or applied for by the applicant or any co-applicants."*).
- Speak to how the requested equipment will enhance the programs/projects supported by other sources of research support, especially NSERC and other NSE-related agency grants.
  - e.g., *"The funding requested complements ongoing NSERC-funded research related to testing/development of XXXXX and opens new opportunities for research not otherwise possible."*
- Ideally, indicate that the cost of HQP stipends, consumables, etc. necessary to support the research to be performed with the requested equipment will be provided by the grants listed (pending or secured), but that the equipment itself has not been requested elsewhere.
  - e.g., *"NSERC DG (2018-2023; secured): Funding for this secured grant is primarily to support graduate and postgraduate personnel and does not provide sufficient resources for acquiring the equipment requested in this proposal."*
  - e.g., *"This NSERC CRD/Discovery/Alliance/etc. grant includes budget line items to cover operation and maintenance costs associated with XXXX testing, including sample preparation, consumables such as XXXX, and replacement of XXXX. None of these items are included in the equipment requested as part of this RTI."*

4.4 Quotations

Two files with a size limit of 10Mb each.

NSERC Instructions: You must provide two (2) recent quotations for any individual item(s) over $25,000 net* or for any system(s) to be purchased from a single supplier and costing more than $25,000 net. If the required number of quotations cannot reasonably be submitted, you must provide a justification in the *Budget Justification* section.

The application may be rejected if the quotations or the justification are not submitted with the application.

*Net cost is defined as the purchase cost of the equipment after any discount from the vendor and before taxes, customs and importation fees, transportation and shipping changes, and assembly and installation costs.

UBC Suggestions:

- See a table of eligible and ineligible costs for the RTI program in Section 2.2.3.
  - Testing and training are eligible costs. Consider purchasing training packages which will allow many HQP to be trained to use the equipment.
  - Assembly costs are eligible expenses whether they are performed by the applicant or a representative from the company.
  - Modifications are usually considered eligible costs, but NSERC Program Officers can be consulted.
- Do not leave out a quote where one can reasonably be procured.
- Where possible, make it easy for reviewers to match the items on the quote with your request. For instance, the items could be numbered and referenced accordingly within the proposal. If a quote is poorly organized or insufficiently detailed by the vendor, request a new quote. Ideally, use the same terminology in the Budget Justification as in quotes.

- Quotes should include shipping and tax (8.65% = 7% PST and 1.65% rebated institutional GST). Account for customs charges to import the equipment and currency exchange (use the Bank of Canada exchange rate at the time of application). For questions contact Jackie Cheung, Finance Manager, IPO..

4.5 Confirmation of Financial Contributions

UBC Suggestions:

- Financial contribution towards the purchase of equipment is still encouraged from organizations in industry of other sectors that would use or benefit from the equipment, however applicants are no longer allowed to attach letters to the RTI application confirming these financial contributions.
    - Note, however, that the UBC Office of Research Services will require written confirmation of any such contributions before approving the application. An email from the organization providing the funds will suffice for their records.
- Similarly, written authorization from NSERC is no longer required to use funds from Partnerships grants towards the equipment in the RTI application.
- Authorization was never required from NSERC in the case of cash contributions from an applicant's and/or co-applicant's NSERC Discovery Grant or from an applicant or co-applicant's institution.
    - Any contributions outlined in the application from an applicant's and/or co-applicant's institution(s) are deemed to be confirmed when the relevant institution approves the application. Therefore, letters confirming these cash or in-kind contributions will not be accepted by NSERC.

4.6 NSERC CCV for Each Applicant & Co-Applicant

NSERC Instructions**:** The applicant and each of the co-applicants must submit a CCV.

- In the Application Overview page, click on Attach.
- Enter your CCV confirmation number. Refer to the NSERC CCV instructions (available in the CCV portal after starting an NSERC researcher CV) for information on how to obtain your CCV confirmation number.
- Click on Upload
- Click Back to Application Overview.
- Preview your CCV in the Research Portal and verify that it was uploaded correctly and that it contains all of the entries that you wish to submit for peer review.

UBC Suggestions:

- If they haven't already done so, applicants or co-applicants must register for a CCV account. It is highly recommended to use the same email address in Research Portal and CCV to avoid issues.
- Completing the CCV can be very time-consuming, especially the first time. Please start the process early.
- Reviewing CVs can be a long task for RTI reviewers when the team size is large. To ease the review process, so be sure that all CV content is up to date.
- Applicants are *strongly encouraged* to include summary points from CCVs (e.g., publications and trainee numbers, total operating funds held) in the proposal, particularly when there are multiple team members. Doing so will make it easier for reviewers to gauge the merit of the research program(s), excellence of the applicant(s), and training of HQP.
- Make sure that CVs support claims made in the proposal regarding the availability of funds and HQP to properly make use of the equipment.
- CCVs should confirm eligibility of co-applicants (in terms of holding or concurrently applying for NSERC grants (See Section 2.2.1 *Applicant Eligibility*). Many reviewers look carefully at CCVs to ensure eligibility, coherence with the described research programs, and ability to support HQP and the maintenance of the equipment.

5 WRITING YOUR PROPOSAL

The sections that follow provide suggestions on how best to address each of the three RTI selection criteria and all sub-criteria in order to develop a competitive proposal. These suggestions are based on consultation with NSERC Program Officers and RTI Selection Committee members, as well as the review of successful applications.

The selection criteria outlined are current as of CY2022.** The second selection criterion has been modified this year, with a focus now on feasibility and impact of the research that the equipment will support rather than on the scientific excellence of applicant(s).

Reviewers vary greatly in their level of expertise in your field and knowledge of the equipment you're requesting. Some will not understand the methods afforded by the equipment without a clear explanation in nontechnical terms, free of jargon; others will own the equipment themselves and be very familiar with its strengths and weaknesses. Write your proposal in such a way that you are speaking to both expert and non-expert audiences and include statements about the scientific impact and societal outcomes of the research supported.

Average reviewer time spent/application: 20 to 45 minutes
Number of reads/application: 1 to 2
Number of reviewers/application: Up to 5
Number of applications/reviewer: Approximately 30

Based on the information we have gathered from NSERC Committee members and program staff, we recommend that RTI proposals….

…justify urgent need for a specific piece of equipment, with there being no alternative means of performing the same work without the requested equipment.

This equipment: 1) **will not** be available elsewhere within the vicinity; and 2) **will** benefit one or more excellent and novel programs of research in the Natural Science and Engineering (NSE).

The program(s) of research supported will be funded by NSERC. If the research is not directly funded by NSERC, connect it to one or more funded Discovery Grant programs.

The team will have a history of publication in high-impact journals, high citation numbers, invited talks, and other meaningful forms of knowledge translation and impact on the field.

Any plans to share the equipment will be feasible, with strong and (ideally) tested management and maintenance plans.

The applicant(s) will have a history of providing valuation training to a large and diverse group of HQP, situated within a rich, integrated, and inclusive training environment.

Graduates will have gone on to notable positions in academia or industry, making meaningful contributions and utilizing the skills developed during their training.

Access to the equipment will result in important scientific work as well as new, valuable hands-on training for HQP. It will improve the likelihood of the team producing high impact publications, furthering the science and improving the career opportunities for the team's HQP.

The proposal and budget justification will flow well together.

The proposal will be logical in its approach to addressing the review criteria, providing all information needed in a reasonable and predictable format.

5.1 Criterion 1

"Need, urgency & suitability[1]"

"[1] If you anticipate use by or benefit to other sectors, describe the support secured from these sources or demonstrate the efforts made to obtain such support." *UBC Suggestion:* This explanation should correspond to the Budget Justification which requests similar content.

40% of total score. Suggested length: ~1.5 pages.

Subcriterion A. "Demonstration that the equipment is essential for the research, and that there are no other more cost-effective ways of obtaining the results"

UBC Suggestions:

i. Write a compelling, cohesive narrative about why the equipment is *essential* to NSERC-funded research program(s). If the reviewer can say "this sounds like a 'nice-to-have' rather than a 'need-to-have', you are unlikely to succeed.
ii. Describe a single piece of equipment or tools and instruments which together form a comprehensive integrated system of operation. Requests that bundle unrelated tools and instruments together will not be accepted.
    i. Grouping unrelated pieces of equipment is a common pitfall. If you are requesting various pieces that form a system, be sure to fully explain this (ideally, more than one sentence). Know that reviewers will be wary of any requests that seem like a laboratory shopping list, as this is an element which NSERC specifically asks them to flag.
    ii. If you are unsure whether a potential request will constitute a comprehensive system / integrated system of operation, consider contacting an NSERC program officer early on.
iii. Address urgency early on and clearly.
    i. The equipment should be absolutely essential (no other alternatives) to the continued progress of important research or should facilitate a very exciting new direction, likely to advance the field.
iv. Clearly describe the research question(s) that cannot be answered without this equipment.
    i. Will the equipment enable a new research direction? Help establish leadership in the field?
    ii. What data do you need that only this equipment can enable?
    iii. How, specifically, will you use the equipment (especially important when multiple investigators are on the application)?
    iv. Use language that is accessible to expert and non-expert reviewers –
    v. Remember that reviewers are scientists who get excited about things bringing NEW value to an important research program and the scientific advances that are possible only by their addition. Exciting elements include the ability to lead to new PhD projects, expose HQP to the most advanced technology, and research which leads to new advances in science.

Sub-criterion B. "Availability of similar equipment/facilities/services in the vicinity"

UBC Suggestions:

i. State the distance to the next available piece of equipment, if applicable.
ii. If similar or the same equipment is available within the vicinity but is used at capacity, this is fine but provide strong justification.
    i. Equipment that is already available within the vicinity but inconvenient to access is a hard sell given the competitiveness of the funding program.
ii. If significant travel is required to access a piece of equipment and this is unsustainable due to cost, or decreases the quality of the data, this is a relevant argument.
iii. For UBCO, keep in mind that reviewers may not know that UBC Vancouver is 400km away.

Sub-criterion C. "Impact of a delay in acquisition of equipment on the research and the pace of research progress"

UBC Suggestions:

i. Make sure the equipment is described as *essential* to the immediate progress of at least one of the research programs to be supported. If it is not essential to continued progress, but rather the equipment would afford a new scientific direction, be sure to sell the scientific importance and impact of the work.
ii. Address the necessity of the requested item(s) for the completion of student projects and theses.

Sub-criterion D. "Need to upgrade or replace obsolete or failed equipment"

UBC Suggestions:

i. The need to replace failed equipment must be very well justified, but can be equally as compelling as other applications (See section 5.1.1). Make sure that it's clear that you maintained your equipment well, but that it is now at the end of its life. Describe how the equipment will move a research program forward.
ii. Make sure the equipment is still relevant (e.g., not asking for something that is out of date, or something that is no longer considered critical in the field).
iii. Upgrades are difficult to justify versus the acquisition of a novel piece of equipment.

Sub-criterion E. "Degree of utilization of the equipment by the applicant(s) and other users"

UBC Suggestions:

i. State who will be using the equipment. Ideally users will extend beyond your own research group (while still demonstrating a feasible plan for sharing of equipment).
ii. How much time in a month will the equipment be used altogether and by each group and type of user? This should correspond to the answers given to the question in the application forms of the applicant and any co-applicant(s) regarding hours per month devoted to use of the equipment.
iii. Ensure that CCVs of the applicant and co-applicant support statements made about projects that will use the requested equipment. Link project/programs to pending or secured funding.
iv. Is the equipment being put into a shared research facility?
v. When there are multiple users, clearly describe how the equipment will be shared.
    i. How accessible will it be (e.g., is it behind locked doors)?
    ii. How are the labs physically related to each other?
    iii. How will time be shared? What system(s) will you use to schedule time on the equipment? Is there a lab manager in place to facilitate the process?
vi. Discuss your maintenance and scheduling plans for the proposed equipment.
    i. Reviewers want to see that the equipment can be successfully maintained, and often look at the success of securing operating funds as an indicator of sustainability.
    ii. Will user fees be collected to cover maintenance costs? Is this a feasible model? Or will operating/maintenance funding come from other grants? If so, which ones?
        1. If you plan to collect user fees, do your research and consult with others who have successfully run such a model before considering this a feasible revenue stream. Will you have a technician involved in maintenance? If so, how will they be paid?

Additional Considerations Relevant to Criterion 1:

5.1.1 Necessary, but not Novel

The equipment requested does not need to be novel; rather the research that it supports should be. That said, unique equipment tends to stand out and conversely certain pieces of equipment can seem unexciting (e.g., standard computing equipment, research vehicles). In this case, be sure to make a very strong case for the importance of the program of research, its scientific impact, and the reasoning why it absolutely could not continue without the requested equipment. Provide a thorough justification and explain why no other funds can be used to procure the necessary equipment.

As an example, a request for a vehicle for field research should make the case for why a department vehicle or other existing vehicle(s) will not suffice. Describe why travel by car is necessary to perform the research, and why the area, species, etc. that you are travelling to study is important and could not be substituted with another that doesn't require travel. Additionally, request the most affordable vehicle (demonstrated by obtaining multiple quotes) that will perform the needed functions and in turn justify why those functions (e.g., four-wheel drive, four-door, SUV versus sedan) are needed.

5.1.2 Overlap with Health Research and Social Sciences

RTI grants are intended for the purchase of equipment to foster and enhance the discovery, innovation and training capability of university researchers in the NSE. Researchers may hold health-related funding and explain that the RTI-requested equipment will also support that research; **however, the primary and majority of the equipment use is to be for NSE research, funded by NSERC**.

Requesting equipment to support a health related project, within the context of a broader NSE, NSERC-funded program of research is okay, but requests to enable an NSE related project within the context of a larger Health and/or Social Science program of research is very unlikely to be funded.

If the applicant and/or co-applicant(s) are funded by CIHR, SSHRC or other health- or social science-related agencies, make it very clear how the equipment will primarily support NSERC-funded research. The stronger this case the better. Where possible, demonstrate why the equipment cannot be purchased using funds from CIHR or any other sources.

Prorating a request when equipment will support research outside of the NSE, is not recommended. NSERC strongly discourages prorating such a request because if the application were funded the applicant would be left with insufficient funds to purchase the equipment. If you have access to other sources of funds to complement the RTI, you could consider a smaller request, but would need to justify why all funds can't be provided from the other source.

5.2 Criterion 2

"Feasibility and Impact"

40% of total score; Suggested length: ~ 1.5 pages

Sub-criterion A. **"Quality and significance of research programs, including potential for major advances and impact in the discipline as a result of the equipment"**

UBC Suggestions:

i. Note that the applicant and co-applicant(s) hold or are applying to NSERC funding and provide details.
    i. Show that the operating funds are in place to make good use of the equipment. When the research is supported with competitive funds secured through a peer review process this speaks to its quality and anticipated impact of the research.
    ii. If funding history is strong, provide data to back this up.
ii. Reviewers are interested in whether the research that is uniquely possible with the requested equipment will lead to publication and discovery.
    i. Will it draw international attention?
    ii. What impact will it have on the field?
iii. Focus on the scientific impact of the research on the field, but also note any economic, societal or environmental benefits.

Sub-criterion B. **"Feasibility of the plan to use the equipment"**

UBC Suggestions:

i. When there are several co-applicants, be sure to include a good explanation of how the equipment would be used by everyone.
    i. Aim for a cohesive narrative despite multiple users (see Section 5.2.1 *Team vs. Individual Grants*). Consider the hours per month that the applicant and each co-applicant has indicated that they will use the equipment in the application form.
ii. Make sure you understand the system into which the equipment fits – if you write about the equipment's use/connection to other equipment inaccurately, this reflects poorly.
    i. Have a person experienced with the equipment read the application.

Sub-criterion C. **"Extent to which the applicant has relevant experience or has presented a training plan to demonstrate how they will gain the ability to fully use the equipment"**

UBC Suggestions:

i. Note any awards or recognitions (in research and/or training) received.
ii. Describe the history of:
    i. publication in high impact journals;
    ii. high citation numbers;
    iii. invited talks;
    iv. key note presentations; and/or
    v. other avenues of knowledge translation.

Sub-criterion D. **"Consideration of equity, diversity and inclusion in the rationale of the team composition (applicant, co-applicant(s) and major users)."**

UBC Suggestions:

i. Describe approaches taken or planned by the team to increase the inclusion and advancement of women and other under-represented groups in the NSE.

ii. If applicable, mention how EDI considerations have been reflected through your current/past research teams.

- For additional information on addressing equity, diversity and inclusion, see Section 5.5.

Additional Considerations Relevant to Criterion 2:

5.2.1 Team vs. Individual Grants

Reviewers indicate that team and individual RTI applications can be equally compelling and competitive, especially if an individual grant requests less than the maximum value of the award. That said, there is consensus that a group grant which presents a feasible plan to share equipment among several strong research programs (with clear research goals that require the equipment) will be more competitive than a grant that supports only one equally strong applicant.

It is not recommended to add co-applicants (e.g., with strong CVs) who will not realistically use the equipment. The onus is on the applicant to make the case for why it is appropriate that one or many people will be using the equipment. The feasibility of the plan to use the equipment and the overall impact are more important than the number of co-applicants. Present a cohesive and compelling narrative. If there are multiple co-applicants, this is challenging, but important. If the relationship between the equipment and each program is confusing to reviewers, it is harder to justify suitability.

5.3 Criterion 3

"Training of highly qualified personnel (HQP)"

20% of total score; Suggested length: ~0.8 pages.

Sub-criterion A. "Quality and extent of training"

UBC Suggestions:

i. HQP include undergraduate and graduate students, postdoctoral fellows, research support staff, and/or staff from any partner organizations.
ii. This section should speak to the quality of the applicant and co-applicant(s) training programs, and also the value of the training that will take place if the equipment is procured.
    i. Provide the number of hours that HQP will be using the equipment and outline the skills that HQP will learn by using the equipment.
    ii. Describe the importance of having HQP with the ability to use the equipment to support innovative research in the specific field.
iii. Will trainees be able to make an original contribution to knowledge?
iv. If applicable, does your project provide an opportunity:
    i. For training in a collaborative or interdisciplinary environment?
    ii. For trainees to work with other sectors?
v. Summarize the individual applicant(s)' history of HQP training. Provide:
    i. Total supervised;
    ii. Co-publication with HQP;
    iii. Description of what HQP have gone on to do (e.g., additional training, professional schooling, careers in industry, careers in academia);
    iv. List notable positions currently held by graduates; and
    v. Note HQP awards and training awards received by supervisors.
vi. Reviewers appreciate integrative training environments. Indicate training philosophy and describe the larger training environment HQP are within, including initiatives provided through departments, faculties, research institutes, research clusters, etc.
    i. Note seminars, journal clubs, research exchange opportunities, the collaborative or inclusive nature of a unit, etc.
vii. Describe how the equipment will fit into the training paradigm that has been developed. Are there any specific goals you have set forth for your HQP? For instance, a set frequency of attendance at major scientific conferences or workshops, or completion of a set number of first-author publications.
viii. Note if the equipment will lead to an edge in publications because it is state-of-the-art or provides the highest level of sensitivity, etc.
ix. It is important to have future HQP coming in that will benefit from the research program(s). This can be demonstrated by ongoing operating funds.

Sub-criterion B. "Opportunity for hands-on training"

UBC Suggestions:

i. Describe opportunities for hands-on training, providing details of specific projects and HQP involvement.
    i. Be sure to state that HQP will be using the equipment themselves (especially if there is a technician or research support staff).
    ii. Consider purchasing an available training package from vendors and stating that all HQP will take part in this training.

ii. If a technician or other research support is on staff be sure to indicate that they will not perform the research using the equipment for HQP, and rather will be there to facilitate appropriate use and to maintain proper function of the equipment.

Sub-criterion C. "Potential to provide marketable skills for students trained on the equipment"

UBC Suggestions:

i. This section should demonstrate that applicants are thinking about their training program in a broad sense, with an understanding that not all HQP will go on to careers in academia.
   i. NSERC is pushing the importance of marketable skills, but not to the exclusion of academic training. Note how the skills gained by students trained on the equipment will be beneficial to career paths in industry and/or academia.
   ii. Where applicable, talk about how the piece of equipment is used in industry.
ii. Indicate if learning to use the equipment will require the integration of x, y, z skills.
iii. What is the market demand for HQP with these skills? Is there anticipated growth in this market? Industry reports can be a good way to provide proof of the need for specific transferable skills and knowledge, and the careers these will afford.
iv. Explain how the knowledge and experience gained by HQP is relevant to:
   i. advancement of the field;
   ii. developing practical applications of knowledge; and/or
   iii. strengthening the industrial research base.
v. If the research that is contingent on the equipment involves industry partners, describe any interaction between HQP and partner organization(s).

Sub-criterion D. "Consideration of equity, diversity and inclusion in the training of HQP"

UBC Suggestions:

i. Demonstrate meaningful actions taken in support of equity, diversity and inclusion in the training environment.
   i. How do/will you incorporate equitable mentorship amongst all HQP. What measures do/will you take to ensure that HQP are given equitable access to mentorship opportunities?
   ii. How do/will you include scientists from under-represented groups in your team and encourage them to continue within the NSE?
   iii. How do/ will you incorporate women and members of other under-represented groups in your team, thereby improving diversity and gender balance in the NSE and benefiting from a greater variety of perspectives?
ii. If describing a record of training a diverse group of trainees, any HQP demographic information should be clearly linked to the practices which achieved the equity, diversity and inclusion and should be in aggregate format.
   i. Due to privacy and confidentiality concerns, do not include personal identification data linked to individuals.

- For additional information on equity, diversity and inclusion, see Section 5.5.

Additional Considerations Relevant to Criterion 3:

5.3.1 Including HQP by Name

To comply with federal Privacy Act provisions governing the collection of personal information, applicants are asked to obtain consent from individuals they have supervised before providing personal data about them to NSERC. In seeking this consent, the NSERC applicant must inform these individuals which data will be supplied and assure them that information will be used solely by NSERC and only for the purpose of assessing the applicant's

contribution to training of highly qualified personnel. To avoid the need to seek consent several times for multiple applications, applicants only need to seek consent from an individual supervised once for a six-year period.

The Consent to Provide Limited Personal Information about Highly Qualified Personnel (HQP) to NSERC form must be obtained from these individuals and retained by the applicant. If the trainee provides consent by email, the message must include confirmation that he or she has read and agrees to the text of the consent form.

If consent cannot be obtained, applicants are asked to withhold names or other information that would identify those supervised. You may enter "Unknown" in those cases and provide the type of training and status, number of years supervised or co-supervised, a general description of the project or thesis and a general indication of the individual's present position, if known.

5.4 Considerations for Early Career Researchers

Tips for Early Career Researchers: Unlike the Discovery Grants Program, there are no specific considerations for Early Career Researchers (ECRs) in RTI reviews or scoring.

Be sure to concretely tie the RTI application to your Discovery Grant (whether pending or held; reviewers are asked to presume that a pending Discovery Grant will be funded). Describe the equipment as **essential** to accomplishing the work outlined in your Discovery Grant (or other NSERC-funded research).

Reviewers have noted that it is ideal if you **request a single piece of equipment, which is not standard lab equipment**. Reviewers are not looking to pad startup funds. Consider asking for less than the maximum value allowed, as reviewers may feel that equipment being procured by an ECR is unlikely to be supported by strong operating funds, relative to an established researcher. If you have strong operating funds, be sure to note this.

ECRs may have a harder time making the case for excellence. That said, reviewers do not suggest padding the application with CVs of more established researchers unless they genuinely will be using the equipment. Consider reaching out to establish new and exciting collaborations that would utilize the equipment.

If an ECR does not already have HQP in place, be sure to speak to the HQP of any co-applicant(s), who will use and benefit from the equipment to avoid a low score on this criterion.

5.5 Equity, Diversity & Inclusion (EDI)

NSERC Instructions: NSERC is acting on the evidence that equity, diversity and inclusion strengthen the scientific and engineering community and the quality, social relevance and impact of research. Increasing diversity and gender equity in the research enterprise are key priorities in NSERC's current strategic plan, NSERC 2020, and are highlighted in the strategic goal, "Build a Diversified and Competitive Research Base".

Applicants are encouraged to increase the inclusion and advancement of under-represented and disadvantaged groups in the natural sciences and engineering as one way to enhance excellence in research and training. Where applicable, consideration of sex, gender and diversity in the research design should be addressed in the proposal. Equity, diversity and inclusion considerations should be developed into the rationale of the composition of research teams and trainees.

Applicants are encouraged to review NSERC's Guide for Applicants: Considering equity, diversity and inclusion in your application.

5.5.1 EDI Considerations for Research Design

NSERC's general guidelines on EDI are to: "where applicable, consider sex, gender and diversity in the research design/proposal". This primarily pertains to the research questions being pursued rather than the people on the team. The most common support around EDI in research design is around Sex- and Gender-Based Analysis

(SGBA), or SGBA+, which is an approach that systematically examines sex-based (biological) and gender-based (socio-cultural) differences between men, women, boys, girls and gender-diverse people.

Stanford's Gendered Innovations website provides excellent examples of where sex and gender may not be immediately evident, but should be considered in research design, such as machine learning algorithms that default to masculine pronouns in Machine Translation.

If your research involves humans, even in an abstract way, you may want to address how you take a broad approach to ensuring equity and diversity in your proposal. Similarly, if you work with living organisms (including tissues and cells), please consult CIHR's guide on "Key considerations for the appropriate integration of sex and gender in research" to determine if sex and gender should be considered in your research design.

5.5.2 EDI Consideration for Team Composition

NSERC has specifically stated in the context of other competitions that demographic information should only be described in aggregate format. **Due to privacy and confidentiality concerns, do not include personal identification data linked to individuals.** Instead, describe any actions you have taken to ensure a diverse group of team members, such as unconscious bias training, self-assessment, or other equitable recruitment practices (see "Other resources" in Section 5.5.4). Consider also how you encourage diversity of thought on a day-to-day basis.

If you are in a discipline/environment that lacks diversity, you may wish to speak to that in your application. For example, if only 20% of professors in your department are women, it may be unreasonable to expect gender parity in your team composition. Consider the following resources to support any statements about lack of diversity: CAUT Almanac of Post-Secondary Education, Stats Can reports on the professoriate, or your own search pools/departments.

5.5.3 EDI Considerations for HQP Recruitment and Training Plans

Please note that trainee demographic data is not requested, nor is it required to assess impacts related to EDI in the research and training environment in the proposal. Rather than stating the demographic composition of your team (see Section 5.5.2 for an explanation of why this is), NSERC is interested in the initiatives you have or will implement to create an inclusive environment, and any steps you've taken to support HQP from underrepresented groups. Describe your training environment, with an eye to EDI. If describing a record of training a diverse group of trainees, clearly link to any HQP demographic information (in aggregate only) to the practices which achieved the equity, diversity and inclusion.

- Biases are disrupted and stereotypes are overcome through social engagement. How will you foster a sense of community and encourage engagement to benefit your trainees (particularly those from under-represented and disadvantaged groups)?
- Research shows that making learning spaces accessible to non-majority students benefits all students by enhancing creativity and improving problem solving and decision-making.

5.5.4 EDI Resources

UBC

- UBC's Inclusion Action Plan: Building a More Inclusive UBC
  - Identifies priority goals for inclusion at UBC and strategic-level actions needed to achieve the goals.
  - Operationalizes the Inclusion theme in Shaping UBC's Next Century: UBC's Strategic Plan 2018-2028.
- UBC's Indigenous Strategic Plan
- UBC's Equity & Inclusion Office | UBC's Equity and Inclusion Office Okanagan
  - In particular, the respective "Resources" tabs

NSERC

- Tri-Agency Statement on Equity, Diversity and Inclusion
- NSERC's Guide for Applicants: Considering equity, diversity and inclusion in your application
- NSERC Framework on Equity, Diversity and Inclusion

NFRF

- Best Practices in Equity, Diversity and Inclusion in Research

CIHR

- Key considerations for the appropriate integration of sex and gender in research
- How to integrate sex and gender into research
- CIHR Unconscious Bias Training Module
- Research Involving First Nations, Inuit and Métis People of Canada - webinar

SSHRC

- Indigenous Research Statement of Principles

Other

- Stanford's Gendered Innovations website
- United Nations Declaration on the Rights of Indigenous Peoples
- CRC Unconscious Bias training
- CRC Equity, Diversity and Inclusion: A Best Practices Guide for Recruitment, Hiring and Retention

  Key relevant sections for the RTI competition **(not exhaustive, but lots of concrete ideas!)**

  a. Job postings
  b. Search for candidates
  c. Hiring committee (A committee is likely not needed for graduate students, but this section lists some good ideas around training and group discussions)
  d. Interview
  e. Hiring decisions
  J. Environment

6 GENERAL TIPS FOR NSERC APPLICATIONS

- Avoid highly technical terms and jargon. **Spell out acronyms** the first time they are used. In contrast, if you only use a set of terms once, there is no need to assign them an acronym.
- **Define technical concepts/terms**, and **give specific, 'real-world' examples of these concepts**. This can be brief, but you want the reviewer to get the most out of your application and not spend time looking things up. A common reviewer comment is 'Is this a well-known concept/term in your field?' If the answer is no, provide definition and context.
- Ask yourself **why you are pursuing this research.** Why do you find it interesting/worthwhile/important? Why do you want to do this and how can you explain that in the best way possible to the reviewer?
- Have **backing statements**/references/*proof* of made claims: numbers, citations, examples all strengthen your case.
- **Reviewers are instructed not to look at websites or URLs**, so if the point you are trying to make is important, bring it into the document.
- **Make it 'readable'** – white space, bolding, underlining, figures, etc.