

Author Guidelines for Course Development

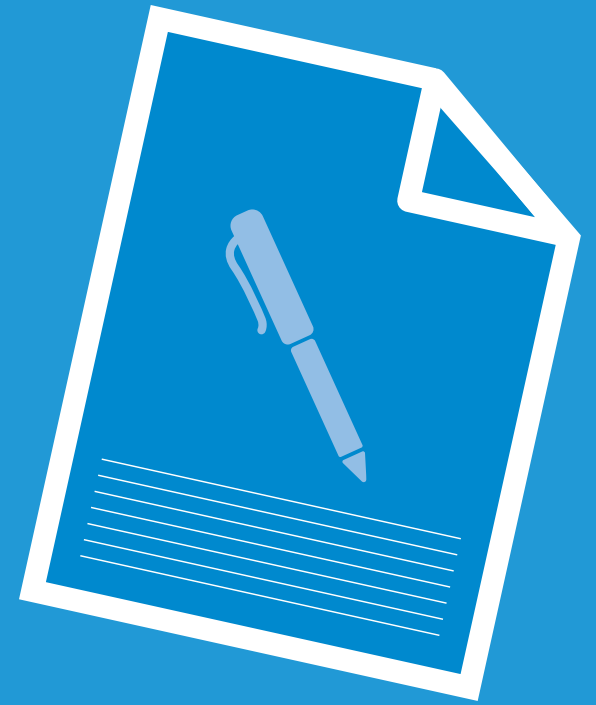


TABLE OF CONTENTS

These guidelines contain instructions, general information, applicable tools, and forms to assist the author in writing, formatting, and submitting courseware to CAMRT.

Introduction To CAMRT Continuing Professional Development Program	3
CAMRT Development Process	4
CAMRT Course Types	5
CAMRT Standard Format	6
Copyright Considerations	8
Guide To Formatting Your Document	11
Peer Review	13
Formatting For Publication	14
Your Review Of The Finished Courseware	15
Appendix A	17
Appendix B Writing Learning Objectives.....	18
Appendix B Writing Learning Objectives	19
Appendix C Development Of Multiple Choice Questions	20
Appendix C Sample Multiple Choice Questions	21

Writing course material is a big task. We'd like to give you some information that will make your job easier *and* streamline the development process from conception to delivery.

CAMRT's Continuing Professional Development (CPD) program is described as self-instructed, distance education.

Distance education is a system whereby students learn by themselves using specially designed learning materials. These must be structured so that students can do most, if not all, their learning from the course material alone.

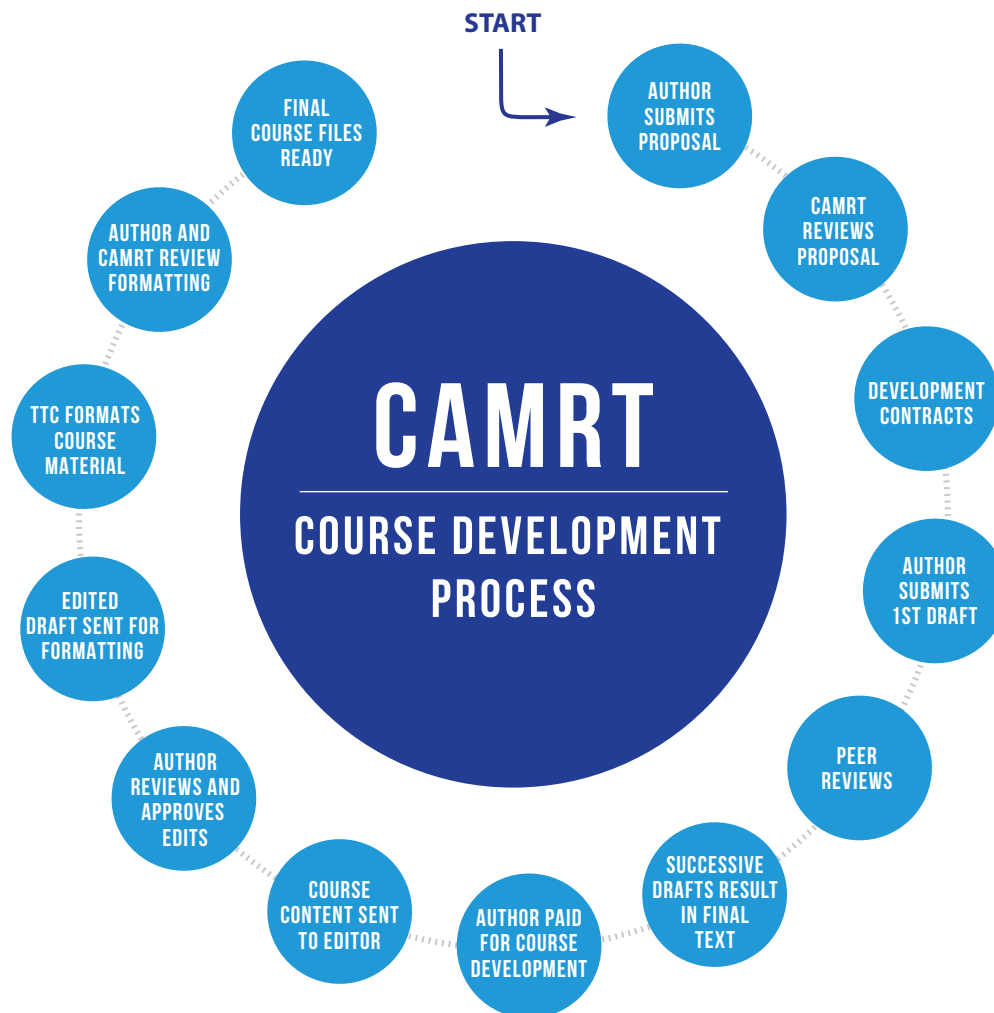
The instructions and the content of all course materials must attempt to carry-out the functions of an instructor in a classroom environment.

Therefore, course materials must be designed to guide and motivate the student and introduce, explain, and review required knowledge and skills.

These guidelines specifically apply to the development of CAMRT's full-length courses **and** quick self studies.

CAMRT DEVELOPMENT PROCESS

These are the basic steps
in developing a CPD course
for CAMRT.



CAMRT COURSE TYPES

There are two course formats:

Full Length **and** Quick Self-Study.

Course authors must select and organize the subject matter.

The author must also select effective presentation techniques and application activities to guide the student in the acquisition of new knowledge as well as the reinforcement of existing knowledge and capabilities.

Manuals for all CPD courses are delivered electronically.

Full Length courses vary from 30–55 credits/hours. Each has 6 chapters and corresponding assignments as well as a final examination and is delivered over pre-determined terms. Course mentor and/or instructor support is provided.

Authors are typically offered first rights to instructorship.

Quick Self Studies are shorter self-administered learning modules up to 10 credits/hours. These are designed for technologists with busy schedules who want to continue to be informed, enhance their practice and earn continuing education credit while doing so.

This section describes the standard format of each course type. Final drafts should follow the principles listed in these guidelines.

FULL LENGTH COURSES

Introduction

An introduction introduces the subject matter to the student. It tells the student what the course is about and what new competencies they will acquire at the end as well as the benefits of having acquired them.

- » **Overview of the course** (template provided by the Author)
- » **List of resources** (template provided by CAMRT).
 - If the author chooses to have an accompanying **reference text**, the content of the text must support current practice.
 - Textbooks greater than 5 years old are discouraged.
- » **Course Completion Requirements** (provided by CAMRT)
- » **Submission of Assignments** (provided by CAMRT)
- » **Important Notes** (provided by the Author) if applicable
- » **Acknowledgements/Author Profile** (provided by the Author)

Full length courses are comprised of six chapters. The standard format is:

Chapter Objectives

Objectives identify the outcome to be achieved upon completion of the learning. Proper objectives give the student an understanding of the content and the expected benefit to them.

- » **Chapter Introduction** (provides an overview of the chapter)
- » **Chapter Content** (facilitates an understanding of the subject matter)
- » **Chapter Conclusion** (summarizes the learning outcomes)
- » **Chapter References** ((references should be to textbook chapters and not pages).

Conclusion

Glossary

References

ASSIGNMENTS & FINAL EXAMINATION

Six assignments and a final examination are required. These must allow the student to effectively assess the level of knowledge required. The final exam must fairly test the learning that has occurred.

Assignments can include any of the following:

- » Multiple choice questions
- » True/false, matching and labelling questions
- » Short and long answer questions
- » Essay questions

Assignments are scheduled once every two weeks for a period of 12 weeks. There is typically a three-week gap between the last assignment submission and the scheduled exam date (less for the alternate exam date).

It is expected that instructors will mark and return assignments to the student before the next assignment is due so authors are to take this into consideration during development.

Final exams should be 100 multiple choice questions, unless otherwise specified.

QUICK SELF STUDIES (QSS)

Introduction

An introduction introduces the subject matter to the student. It tells the student what the course is about and what new competencies they will acquire at the end as well as the benefits of having acquired them.

- » **Course Completion** (provided by CAMRT)
- » **Acknowledgements/Author Profile** (provided by the Author)
- » **Learning Objectives:** Objectives identify the outcome that will be achieved upon completion of the learning. Proper objectives give the student an understanding of the content and the expected benefit to them.
See Appendix B for guidelines on how to write proper learning objectives.

Course Content

Conclusion

Glossary

References

Post Quiz Submission Guidelines (template provided by CAMRT)

POST QUIZ

See Appendix C for guidelines on writing good multiple choice questions.

COPYRIGHT CONSIDERATIONS

These guidelines are provided for informational purposes only. They are not intended to be, and do not represent, legal advice.

These guidelines are based upon those issued by Southern Alberta Institute of Technology (SAIT).

The Canadian Association of Medical Radiation Technologists is a certified educational institution, as approved by the Minister of Human Resources and Skills Development Canada under subparagraphs 118.5(1)(a)(ii) and 118.6(1)(a)(ii) of the Income Tax Act.

All copy written materials requested for use by CAMRT will be used strictly for educational purposes.

All published materials are given legal protection under the Copyright Act in Canada.

The Copyright Act gives copyright owners the exclusive right to reproduce, scan, distribute, publish, adapt, translate and otherwise control and profit from their works. CAMRT authors are expected to comply with the Copyright Act provisions as well as CAMRT's policies and guidelines concerning the use of external copyright-protected materials.

Written copyright clearance is required if another's work is being used. These include diagrams, tables, photographs and images that are complete works. CAMRT, upon approval of the Agreement (on behalf of the author) will pay the cost of any financial transaction required for copyright clearance. Fees deemed too high or require annual renewal may not be approved by CAMRT.

COPYRIGHT CONSIDERATIONS

It is expected that Authors will use Radiopedia as their primary resource for images.

Radiopedia

CAMRT has an Agreement with Radiopedia.org for use of their image library. CAMRT authors are encouraged to primarily reference this site for potential images to be used within their course content. This process is facilitated by the CAMRT on behalf of the author.

To obtain copyright permission for the use of Radiopedia images, authors must obtain the following information:

- » Image Author
- » Image RiD
- » Image URL

Contact CAMRT at mberube@camrt.ca for more information.

Internet Materials

Internet materials are publicly available and freely accessible but they are not in the public domain and are not free for you to copy and distribute unless it specifically says otherwise.

To avoid issues with internet materials, look for materials licensed for use under an open content copyright license. You can use, copy and distribute internet materials if they are released under an open content copyright license, or if the origin website's terms and conditions allow for educational use. **Credit must always include the author, source link, and the original license** (if applicable).

The images returned from a Google image search also belong to the copyright owners from the origins websites. Unless otherwise indicated, all images are protected by copyright. You must ensure to legally use images and not infringe on the owners' copyrights.

Hyperlinks to online resources may be used. Sharing hyperlinks to copyright-protected materials does not constitute republishing of the material. Remember to always link to materials that were posted by the original copyright owner.

Authors may also choose to create their own content. Use your subject matter knowledge and skills to create original text, diagrams or images.

It is copyright infringement to apply superficial or cosmetic changes to copyright protected works.

To create an original work, you must exercise your expertise, skill, judgement, creativity and intellectual effort; it can not be a trivial or mechanical activity.

Copyright Crediting

Copyright law requires you to acknowledge and credit the original source of any ideas, concepts, quotations, diagrams, data or other materials used in your work.

Credit the source and author at the site of the material within your document.

Add a references page at the end of your document for full APA-style citations for the external materials used for ideas, excerpts, illustrations etc. These websites provide guidance on APA citations: [Purdue OWL](#) and [APA Style](#).

If the copyright owner has specified how the credit should appear, follow those requirements – this is part of the terms and conditions for your use of the material.

Copyright permission for materials used in the development of any CAMRT course must be cleared by the author of the publication prior to acceptance by the CAMRT.

Tips for Using External Materials

- » Always credit the author and the source.
- » Only use Internet works if they were posted by the copyright owner and permission has been obtained.
- » Always follow permission or license terms and conditions.
- » Approach fair dealing in an honest, reasonable and ethical manner.
- » Never alter, reformat or modify works without permission from the copyright owner.

In accordance with the contract between the CAMRT and the author, the CAMRT will own exclusive copyright to the material.

Questions about copyright?

By telephone at 800.463.9729 extension 226 By email at mberube@camrt.ca

Visit www.cipo.ic.gc.ca (Canadian Intellectual Property's Office)

The following list of suggestions is intended to make your job – and ours – easier.

Use of wordprocessing software

It is important that your file be saved in Microsoft Word in *doc* or *docx* format. Authors should submit a PDF with their MS Word file. Please use common typefaces like Arial, Calibre, Century, Times, Helvetica, etc.

Document structure

Keep the layout of the text as simple as possible. If you can, please use Word's built-in Headings. Your document should have a clear structure – headline, subhead, and text – and using Headings helps. Tables, charts, illustrations, and photos should be in the size, position, and location the author desires them to appear in the final document.

Divide your article into clearly defined sections. You may choose to number them. Subsections can be numbered 1.1, 1.2, etc for Chapter 1. In Chapter 2, they would be numbered 2.1, 2.2, etc.

Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Subsections may be given a brief heading. Each heading should appear on its own line.

Abbreviations

Aim to make your document reader-friendly to students. Abbreviations are inevitable so please include a glossary and include the abbreviation in parenthesis after the full name the first time. After that, the abbreviation may be freely used.

Numbers

The numbers one to nine are written in full, unless followed by a unit, e.g. five students, 6 days; or seven patients with Parkinson's disease, 8 ml.

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the document. Microsoft Word can build footnotes into the text, and this feature should be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of each chapter.

Appendices

If there is more than one appendix, they should be identified as A, B, etc.

Artwork

- » Number the illustrations, images, charts, and tables according to their sequence in the text.
- » Use a logical naming convention for your artwork files.
- » Provide captions to illustrations, images, charts, and tables.
- » Be sure to choose the **highest resolution** possible when selecting images and illustrations.
- » Size the illustrations close to the desired dimensions of the final version.

Formats

If your artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) please leave it in its native format.

The following formats are preferred:

- » For vector drawings and illustrations, please use AI, EPS, or PDF format.
- » For colour or grayscale photographs, please use TIFF, PNG, or JPEG.
- » For bitmapped (pure black & white) line drawings, please use TIFF, PNG, or JPEG.

Requirements for images

All digitized images submitted with the final version of the manuscript must be of high quality and have **resolutions of at least 300 dpi for colour, 600 dpi for greyscale and 1200 dpi for line art.**

Changing contrast or brightness should be left to us if necessary. Reducing or increasing contrast to hide data is not appropriate.

Use of cloning and healing tools, such as those available in Photoshop, or any feature that deliberately obscures manipulations, is considered inappropriate. Where such tools are used by necessity, for example to remove identifying data about patients from an image, this should be explicitly mentioned in the figure legend.

Figures should preferably be saved separately but can be embedded in a *doc* file for review.

Please do not:

- » Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and a limited set of colors;
- » Supply files that are too low in resolution. If the file size of your graphic is 8k or even 50k, that is too small.

If the files you submit are too small, you run the risk of having them discarded or replaced (if a replacement can be found). The author will always have an opportunity to approve replacements.

Figure captions

Ensure that each photo, illustration, chart, or table has a caption. Like all readers, students read captions avidly. Captions represent a unique opportunity for you to make a key point.

A caption should include a brief description of the illustration. All photos, illustrations, charts, and tables should be numbered in sequence (and by Chapter as Figure 1.1 in Chapter 1 and Figure 2.1 in Chapter 2, etc.).

Once you have completed your first draft, it must first be peer reviewed.

Peers include a person of the author's choice and one or two assigned by the CAMRT. These persons will be subject matter experts and will provide the author with relevant feedback and suggestions for consideration and implementation in the revised draft. Selected peer reviewers will provide their CV to the CAMRT.

Once the review process is complete and you are satisfied with the revisions, you must submit a final word file to the CAMRT for editing. The document will be sent to an external editor and returned to you for review and consideration of the edits.

Once the edited document is complete, the final files must be submitted to the CAMRT. See Guide to Formatting your Document on the next page of these Guidelines.

Significant changes or revisions to this final draft will not be considered during the formatting phase so be sure to carefully review your content before the final submission.

Submit your final files to mberube@camrt.ca

Tables

Please submit tables as editable text and not as images. Tables should be placed next to the relevant text in your document. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the document. Please avoid using vertical rules and shading in table cells.

References

Please ensure that every reference cited in the text is also present in the reference list. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text.

Hyperlinks

Clickable references are helpful to students. However, web pages come and go so please make an effort to ensure your links are working. The full URL should be provided. Link to URL pages – not to a pdf. In addition to the appearance of links in your text, Web references will be listed separately at the end of the chapter, after the list of general references.

After your content is peer reviewed, edited, and ready for publication, it still must be reformatted as professional courseware. We want to ensure your material is going to look its best in a format that is most conducive to learning and being remembered by students.

CAMRT has selected The Training Company as its partner in the design and production of course material.

The Training Company is a leading provider of courseware that helps students learn more efficiently. They combine professional graphic design with innovative and engaging technology applications.

When some authors consider the design of their book they think only of the front cover. But the layout of the pages inside the cover are just as important and require the same amount of careful consideration.

Thankfully, we have the results of several readership studies guiding us in the design of your manual.

Our primary consideration is readership: how can we increase the impact of your words? Are there things we can do to make them more memorable?

The answer is Yes.

Beginning with the typeface and text size, we question *everything* to be sure we make the reader's job as easy as possible.

The layout you see is based upon lots of research and our own determination (after years of experience) of what works, what gets results, and what doesn't.

After we format your material you get to review it once more and indicate your questions, comments, and suggestions.

This process can take as much as four months for FL projects and six weeks for QSS courses.

YOUR REVIEW OF THE FINISHED COURSEWARE

When the editorial process is complete and the production people have prepared your text for publication, it is your responsibility to review and approve the final document before it is made available for distribution.

During the production phase, the appearance of your document will change considerably.

At this point you should be looking for clarity and verity – to ensure our work is true to your original text. **This is not the time for major changes or revisions.**

In some cases, authors may have proposed a suitable cover image. If they haven't, we will propose an appropriate image relevant to the subject matter. The author should be prepared to approve the suggested image or suggest alternatives.

Please note: We recommend reviewing the entire document. You are responsible for reviewing and approving the ready-for-publication files. This includes testing all radio buttons, web links, drop down menus, marking boxes, and interactive buttons. Authors should check image placement, figure numbering, and consistency between headers and the Table of Contents.

Send us your changes or respond with your approval for publication.

If sending changes, please provide us with an explicit list of changes via email. Changes should be provided in a detailed list including :

Section # and name

OLD:

old text ...

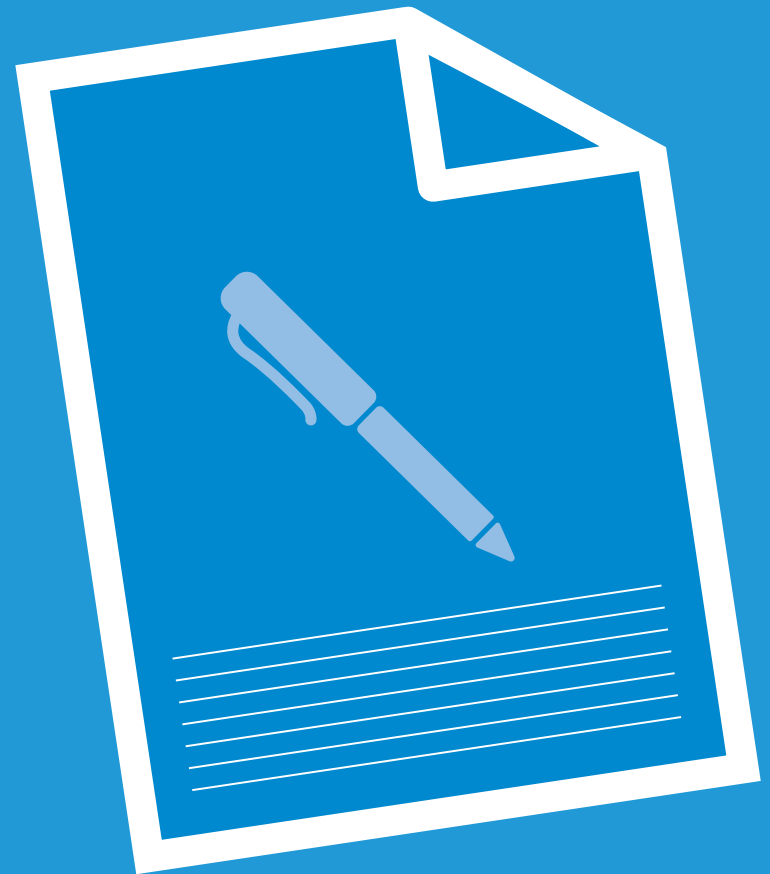
NEW:

new text ...

Review cycles are limited to two per development.

CANADIAN ASSOCIATION OF MEDICAL RADIATION TECHNOLOGISTS

Appendices





Thank you for your interest in authoring a CAMRT professional development course.

1. Completed CAMRT Course Proposal form
2. Current curriculum vitae/resume

CAMRT Course Proposal

Topic/Title	
Type of Course	<input type="checkbox"/> Quick Self Study <input type="checkbox"/> Full Length Course
Audience <i>Who would benefit from this course?</i>	<input type="checkbox"/> Radiological Technologists <input type="checkbox"/> MR Technologists <input type="checkbox"/> NM Technologists <input type="checkbox"/> Radiation Therapists
Course Description <i>Provide a brief overview of the purpose/contents of the course</i>	
Learning Objectives <i>After this course, the learner will be able to....</i>	<i>Example:</i> 1. Describe treatment options for patients with lung cancer
Course Outline <i>For each of the learning objectives listed above please provide additional detail related to the content to be covered. Please outline the material in the chronological order in which you intend it to be delivered.</i>	<i>Example:</i> 1. Describe treatment options for patients with lung cancer <ul style="list-style-type: none"> • Surgery • Radiation Therapy • Chemotherapy • Alternative therapies
Estimated Effort *For Quick Self-Study only <i>To the best of your ability please estimate the length of time you see participants taking</i>	

CANADIAN ASSOCIATION OF MEDICAL RADIATION TECHNOLOGISTS / ASSOCIATION CANADIENNE DES TECHNOLOGUES EN RADIATION MÉDICALE

1300-180 rue Elgin Street, Ottawa, Ontario K2P 2K3
 T: 613-234-0012 TF: 1-800-463-9729 F: 613-234-1097 camrt.ca actrm.ca



<i>to complete this course</i>	
Course Proposal Submitted by: <i>Full name and professional designation</i>	

To be considered for course development please submit the following to mberube@camrt.ca

For CAMRT office use:

Accepted	<input type="checkbox"/> Yes <input type="checkbox"/> No
Feedback to author:	

CANADIAN ASSOCIATION OF MEDICAL RADIATION TECHNOLOGISTS / ASSOCIATION CANADIENNE DES TECHNOLOGUES EN RADIATION MÉDICALE

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Purpose of Learning Objectives:

To communicate to the student the goals of the course and how they will be expected to demonstrate their understanding. Learning objectives communicate what the student will be able to do at the end of the learning activity.

A good learning objective should complete the following statement:

“At the end of this course the learner will be able to ...”

To construct learning objectives, use the following steps:

Step 1

- » Connect the lead in sentence with an action verb that describes how the student will demonstrate their understanding. (Ex: Explain, Identify, Compare, Discuss etc.).
- » Select a verb that describes the action as well as the level of comprehension expected
- » Avoid using vague/broad verbs that are hard to measure (ex: understand, appreciate, learn)
- » A list of action verbs is provided at the end of the document.

Step 2

- » Finish the action statement describing the knowledge or skill you wish the student to gain from the course/presentation/webinar.
- » Make sure the statement is measurable, specific and clearly written

Step 3

- » Review your objective
- » Is the objective measurable?
- » Does the verb accurately describe how the student will demonstrate their learning?
- » Is your objective specific (only addresses one concept/skill)?

Example

Course Topic: Current and Emerging Issues in Healthcare

Verb	Knowledge/Concept
Describe	how an aging population affects workload
Identify	trends in government funding for healthcare
Discuss	new diagnostic and therapeutic technologies

Other tips

It may be helpful to work backwards to build your objectives. Start with the knowledge/topics you wish to cover (Step 2) then decide how the student will demonstrate understanding (Step 1). When writing a Quick Self-Study Course aim for 3–8 objectives. When writing a full-length course aim for 10–20 objectives.

Learning Objectives Sample

Course: Nutrition & Cancer

On completion of this quick self-study course, the student will be able to:

- » Discuss the role of nutrition in the development and prevention of cancer
- » Identify the components of a healthy diet as per Canada’s Food Guide
- » Understand the impact of cancer progression on nutritional status
- » Discuss the impact of radiation therapy and other treatments on nutritional status
- » Suggest interventions and strategies to support nutrition during cancer treatments
- » Critically review published literature on nutritional complementary-alternative treatments

Examples of Action Words: Revised Bloom’s Taxonomy

Remember	Understand	Apply	Analyze	Evaluate	Create
Define	Compare	Apply	Analyze	Appraise	Adapt
Identify	Describe	Calculate	Compare	Assess	Create
List	Discuss	Illustrate	Coorelate	Critique	Design
Describe	Differentiate	Modify	Differentiate	Defend	Construct
Label	Explain	Produce	Determine	Evaluate	Develop
Outline	Illustrate	Present	Estimate	Justify	Modify
Select	Select	Solve	Examiner	Measure	Organize
State	Summarize	Use	Priortize	Recommend	Produce

Development of multiple-choice questions

Anatomy of a Multiple-Choice Question

What color is the sky on a sunny day?	Stem
a. Red b. Green c. Purple d. Blue	Distractors
	Correct Answer

Guidelines for development of stems of questions

Stem = The question being asked.

The stem should be straight forward with enough information to choose a reasonable response. The examinee should be able to cover up the options and determine the correct answer from just reading the stem.

- The stem should provide a complete concept. When possible, word the stem as a question (rather than an incomplete sentence).
- Use understandable language and be concise – only include relevant information
- Avoid use of absolutes (always, never, only).
- Avoid use of acronyms or abbreviations if they have not been introduced in study material.
- The stem should be a positive statement. Avoid use of a negative statement if at all possible. However, if the question must be phrased in a negative manner capitalize the words NOT, NEVER etc.
- Avoid the use of blanks in the stem.

Guidelines for development of responses

Responses to a multiple choice question include the correct answer and 3 distractors. Writing good responses can be challenging

- Be sure that only one option is correct
- Vary position of the correct answer
- Distractors must be plausible - related to topic
- Responses should be brief as possible and consistent in length. If correct answer is longer it may provide an unintentional clue
- Avoid use of “always” or “never” in the response
- If options are numbers list them in descending order

- Use parallel construction in the options . For example, begin all responses with a verb or a noun
- Avoid use of responses such as
 - none of the above
 - all of the above
- Each response should be grammatically consistent with the stem

APPENDIX C | SAMPLE MULTIPLE CHOICE QUESTIONS

Sample Questions

The stem of a question should be able to stand alone and distractors must be related (note: in the better question all responses are bones of the wrist)

POOR The navicular is:

- A. another name for scaphoid
- B. located in the skull
- C. bone in the knee
- D. a blood vessel

BETTER What is another name for the navicular?

- A. triquetrum
- B. semilunar
- C. scaphoid
- D. cuneiform

The stem should contain as much of the item content as possible- also note in the better question the responses are arranged in increasing numerical order (logical sequence)

POOR The use of rare earth screens in place of calcium tungstate screens results

- A. in a reduction of up to 20% in patient exposure
- B. in a reduction of up to 30% in patient exposure
- C. in a reduction of up to 50% in patient exposure
- D. in a reduction of up to 70% in patient exposure

BETTER The use of rare earth screens in place of Calcium tungstate screens can result in a reduction of patient exposure up to:

- A. 20%
- B. 30%
- C. 50%
- D. 70%

Avoid responses which overlap or include each other

POOR What percentage of the dose to the bone marrow is contributed by a chest x-ray?

- A. 20 - 25
- B. 25 - 30
- C. 30 - 50
- D. 15 - 20

BETTER

- A. 5 - 15
- B. 20 - 25
- C. 30 - 50
- D. 55 - 60

FOR QUESTIONS ON COURSE DEVELOPMENT
OR TO SUBMIT A COURSE PROPOSAL TO
THE CAMRT, PLEASE CONTACT MBERUBE@CAMRT.CA
OR 800-463-9729 EXTENSION 226.

