# Standard C: Curriculum

C1 The program must create and follow a master educational plan for program delivery. The plan should contain sufficient detail to support program continuity when there are changes in faculty. The plan should include the following:

1. mission and student learning outcomes of the program and a description of how they integrate with the mission and goals of the institution
2. curriculum sequence with rationale for course organization
3. course syllabi that include, at a minimum:
   * course title and number
   * course description
   * credit hours (or clock hours if program does not utilize credit hours)
   * instructor(s)
   * texts and other reading assignments
   * outline/agenda of topics
   * learning and/or performance objectives
   * methods of student assessment and their weighting in course grade computation
   * grading scale
4. clinical education schedule template and guidelines for making clinical assignments, which demonstrate that all students will have the opportunity to meet required competencies
5. explanation of how the didactic curriculum correlates with the clinical curriculum
6. tools used to assess student attainment of clinical competencies

**Narrative Responses**

1. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing the concerns. Please include projected timelines in the response.

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| **Evidence to include in Appendix C**  C1-1 Program’s master instructional plan including the specific documents identified in items a - f. *The structure of syllabi will be reviewed in C4 so* ***remove******syllabi if they are part of the master plan****.*  C1-2 Provide the institutional policy and/or template for syllabi format/content, if one exists, and how the institution reviews syllabi for compliance.  C1-3 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C2 The program must provide a student handbook, clinical course syllabi, and student assessment documents to each AES. Orientation to the documents and expectations of clinical affiliates should be provided by the program.

**Narrative Responses**

1. Describe the orientation process/procedure used by the program when adding a new affiliate or when the AES changes at an existing affiliate. Ensure that the narrative identifies who conducts the training and the timeline for its occurrence.
2. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing the concerns. Please include projected timelines in the response.

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| **Evidence of compliance to include in Appendix C**  C2-1 AES training agenda, handbook or manual.  C2-2 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C3 General education and basic science coursework must be of adequate depth and scope, and ***appropriately sequenced***, to provide a foundation for the student learning outcomes of the program. Credit-bearing, college-level courses are required in:

1. chemistry with laboratory
2. human anatomy and physiology (two courses, each with a laboratory)
3. mathematics

## physics

1. written communication

Programs at the master’s degree level must require sufficient coursework to support the professional curriculum. A baccalaureate degree must be conferred during the program if it is not a requirement for admission.

**Narrative Responses**

1. Describe how the program meets this standard:
2. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing the concerns. Please include projected timelines in the response.

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| **Evidence of compliance to provide in Appendix C**  C3-1 Form F: General Education & Basic Science Coursework.    C3-2 Course descriptions for each prerequisite from the catalog if the sponsoring institution offers the prerequisite courses.  C3-3 **Master’s degree programs:** list of prerequisites in addition to those on Form F.  C3-4 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C4.1 The professional nuclear medicine technology curriculum shall include, as a minimum, the following didactic content areas:

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| a. | patient care | k. | therapeutic nuclear medicine procedures |
| b. | cross-sectional anatomy | l. | positron emission tomography (PET) |
| c. | nuclear medicine statistics | m. | computed tomography (CT) |
| d. | nuclear medicine and radiation physics | n. | hybrid imaging |
| e. | radiation biology | o. | radiopharmacy and pharmacology |
| f. | radiation safety and protection | p. | medical ethics and law |
| g. | nuclear medicine instrumentation | q. | healthcare administration |
| h. | ***quality control*** and ***quality assurance*** | r. | health sciences research methods |
| i. | medical vocabulary | s. | ***medical informatics*** |
| j. | diagnostic nuclear medicine procedures | t. | oral communication |

Programs offering a master’s degree must provide additional professional content in topics such as leadership, management, education, research and/or expanded clinical skills.

**Narrative Responses**

1. Describe how the program meets this standard.
2. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing the concerns. Please include projected timelines in the response.

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| **Evidence of compliance to provide in Appendix C**  C4.1-1 Form G1: Nuclear Medicine Didactic Curriculum.  C4.1-2 **Master’s degree programs** -Form H: Additional Professional Didactic Content.  C4.1-3 Programs seeking initial accreditation should provide the objectives, course outlines and evaluation criteria (typically contained in a syllabus) for all content areas related to the professional nuclear medicine technology curriculum.  C4.1-4 Programs seeking continued accreditation should provide course objectives, outlines and evaluation criteria (typically contained in a syllabus) for content areas f, j and o. All other course syllabi should be available at the site visit for review. These topics may be taught across multiple courses but **include no more than five (5) syllabi here.**  C4.1-5 **Master’s degree programs:** course syllabi that include additional content areas identified on Form H.  C4.1-6 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

**Radionuclide Therapy Supplement**

The following supplemental questions have been added to the self-study to gather additional information from programs on didactic and clinical/experiential education in radionuclide therapy procedures. This information will **not** be utilized to assess a program’s compliance with the standards. The JRCNMT wishes to better understand what programs include and the challenges they face with respect to clinical/experiential learning opportunities in radionuclide therapy.

1. Which radionuclide therapy procedures are included in the didactic curriculum of this program?
2. How does the didactic curriculum include instruction in radionuclide therapy dosimetry?
3. Is it possible for the program to make clinical assignments that ensure that all students encounter a similar variety of radionuclide therapy procedures in the clinical setting? If not, what are the obstacles?
4. In the table below, please place an **X** in the appropriate box to indicate whether each type of therapy is routinely encountered by all students in the clinic (**C**); taught via simulation (**S**); varies by student as to whether it’s seen in the clinic or must be simulated (**V**); or not included as an experiential activity in this program (**NA**).

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| --- | --- | --- | --- | --- |
|  | **C** | **S** | **V** | **NA** |
| I-131 for hyperthyroidism |  |  |  |  |
| I-131 for thyroid carcinoma |  |  |  |  |
| I-131 MIBG Azedra® |  |  |  |  |
| Y-90 Zevalin® |  |  |  |  |
| Y-90 microspheres |  |  |  |  |
| Ra-223 Xofigo® |  |  |  |  |
| Sr-89 Metastron®/Sm-153 Quadramet® |  |  |  |  |
| Lu-177 Lutathera® |  |  |  |  |
| Lu-177 PSMA Pluvicto® |  |  |  |  |
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1. Select one therapy the program has students simulate and describe, in detail, how the simulation is performed. If there is a written checklist or set of simulation instructions for students it can be provided in place of a description.

4.2

Programs with embedded diagnostic CT education shall, in addition to the above nuclear medicine curriculum, include as a minimum, the following didactic content areas:

1. computed tomography physics
2. computed tomography instrumentation
3. diagnostic computed tomography procedures
4. contrast media contra-indications, administration, and adverse reactions
5. radiation safety specific to diagnostic computed tomography procedures
6. computed tomography dose measurement and dose reduction
7. computed tomography quality control

**Place an X in the box if the standard is not applicable to this program:**

**Narrative Responses**

1. Describe how the program meets this standard.
2. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing those concerns. Please include projected timelines in the response.

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| **Evidence of compliance to provide in Appendix C**  C4.2-1 Form G2: Diagnostic CT Didactic Curriculum.  C4.2-2 Provide the objectives, course outlines and evaluation criteria (typically contained in a syllabus) for all content areas related to the diagnostic CT curriculum.  C4.2-3 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C5 The program shall include opportunities for students to develop personal and professional attributes and values relevant to clinical practice. These attributes include:

1. problem-solving, critical-thinking and decision-making skills;
2. participating as an effective member of an interprofessional healthcare team;
3. showing respect for diversity; and
4. demonstrating responsibility and ethical principles

Programs offering a master’s degree must identify and provide mechanisms for students to develop additional personal and professional attributes beyond those listed above.

**Narrative Responses**

1. Describe activities in the program that develop students’ problem-solving, critical thinking and decision-making skills.
2. Describe activities in the program that give students the opportunity to function as part of an interprofessional healthcare team.
3. Describe the education and experiences included in the program to broaden student understanding and application of diversity, equity and inclusion principles.
4. Describe activities in the program that give students the opportunity to demonstrate responsibility and ethical behavior.

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| **Evidence of compliance to provide in Appendix C**  C5-1 Course objectives and activities; program or institutional policies; and/or other documents demonstrating incorporation of items a - d in the program.  C5-2 **Master’s degree programs:** identify the additional personal/profession attributes included in the program and provide evidence of their incorporation (syllabi, schedules, etc.).  C5-3 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C6 ***Supervised***, competency-based clinical education shall include the following:

* 1. patient care and patient recordkeeping in accordance with the Health Insurance Portability and Accountability Act (HIPAA);
  2. radiation safety techniques that minimize radiation exposure;
  3. participation in a quality control program;
  4. preparation, calculation, identification, administration (where permitted), and disposal of radiopharmaceuticals and the performance of radionuclide quality control procedures;
  5. preparation, calculation, identification, administration (where permitted), and disposal of adjunctive medications necessary to performance of the nuclear medicine procedure;
  6. performance of an appropriate number and variety of diagnostic nuclear medicine procedures, including general imaging, nuclear cardiology and PET/CT, to achieve desired clinical competencies;
  7. observation and assistance with an appropriate number and variety of therapeutic nuclear medicine procedures to achieve desired clinical competencies; and
  8. interaction with interpreting physicians to develop an understanding of the clinical correlation of nuclear medicine procedures with other diagnostic procedures.

Programs with embedded diagnostic CT education must also include the following ***supervised***, competency-based clinical education:

i. preparation, contrast dose calculation, contrast selection, administration (where permitted) of contrast media necessary to the performance of computed tomography procedures;

j. performance of an appropriate number and variety of diagnostic computed tomography procedures to achieve desired clinical competencies;

1. interaction with interpreting physicians to develop an understanding of the clinical correlation of diagnostic computed tomography procedures with other diagnostic procedures

Programs offering a master’s degree with expanded clinical experiences must identify competencies unique to these experiences and provide supervised activities in which students may obtain the competencies.

**Narrative Responses**

1. Describe how the program meets items a - h of this standard. When addressing item d. radiopharmacy, please indicate whether the competencies are being met at a radiopharmacy or in a laboratory setting. If the program contains clinical education in diagnostic CT, also address items i – k.
2. Describe the program’s assessment of any areas of concern regarding its compliance with this standard and the plans for addressing the concerns. Please include projected timeline in the response.

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| **Evidence of compliance to provide in Appendix C**  C6-1 All rotation schedules for one cohort of students for the entire program. Please provide a key or instructions to aid in the interpretation of the schedules. The schedules should include diagnostic CT rotations if part of the program.  C6-2 Include a list of all affiliates that identifies which aspects of clinical education listed in the standard (items a through h) each affiliate provides. Programs with diagnostic CT must note items include a-c and i-k for affiliates utilized for clinical education.  C6-3 Competency evaluation forms/documents for each of the areas identified in a through h (or k) above. If the program has unique competency forms for each type of diagnostic procedure (item f {and j} on the list), a sample of three forms should be submitted, with all others available for review at the site visit.  C6-4 **Master’s degree programs:** List of additional competencies and evaluation documents for those competencies.  C6-5 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |

C7 An accredited nuclear medicine technology program includes didactic, laboratory, and clinical education experiences that develop student competence in the items included on the *Competency List* in the appendix. The program must confirm student competence on each item prior to graduation.

Programs with embedded diagnostic CT education shall include didactic and clinical education experiences that develop student competence in the items included on the *Diagnostic* *CT Competency List* in the appendix. The program must confirm student competence on each item prior to graduation.

**Narrative Responses**

1. Describe the program’s assessment of any areas of concern regarding compliance with this standard and the plans for addressing the concerns. Please include projected timelines in the response.

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| **Evidence of compliance to provide in Appendix C**  C7-1 Form I1: Nuclear Medicine Competency Confirmation.  C7-2 Form I2: Diagnostic CT Competency Confirmation (if applicable)  C7-3 Policy detailing what occurs when a student fails to complete all competencies by graduation.  C7-4 **(OPTIONAL)** Additional evidence of compliance with this standard. Provide a brief description of the item below and add the document after the requested evidence of compliance for this standard.  DO NOT TYPE IN THIS BOX UNLESS INCLUDING AN OPTIONAL ITEM |