**THE NUCLEAR MEDICINE TECHNOLOGY
CERTIFICATION BOARD, INC.**

N M T C B

ANNUAL
EXAMINATION
REPORT
2024

NMTCB
3558 HABERSHAM AT NORTHLAKE
BUILDING I
TUCKER, GA 30084
404-315-1739 / FAX: 404-315-6502
board@nmtcb.org
www.nmtcb.org

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NMTCB 2024 Statistics

All Examinee Attempts

Total Number:	629	
Total Number Pass:	521	82.83%
Total Number Fail:	108	17.17%

Summary Statistics:

Range of Scores	200-466
Average Score	402.39
Standard Deviation	29.43
Median Score	407

First-Timers (Nuclear Medicine Program Graduates)

Total Number:	546	
Total Number Pass:	485	88.83%
Total Number Fail:	61	11.17%

Summary Statistics:

Range of Scores	297-466
Average Score	407.39
Standard Deviation	26.33
Median Score	411.50

Repeater Attempts

Total Number:	80	
Total Number Pass:	35	43.75%
Total Number Fail:	45	56.25%

Summary Statistics:

Range of Scores	200-422
Average Score	370.30
Standard Deviation	27.20
Median Score	372

Alternate Eligibility Examinees*

Total Number:	3	
Total Number Pass:	1	33.33%
Total Number Fail:	2	66.67%

NMTCB Annual Examination Overview
2024

Introduction

This summary report is intended to provide detailed information about the 2024 certification examination. The primary purpose of this report is to serve the needs of program directors and administrators. It contains a description of computer adaptive test (CAT) for classification and provides detailed information about scaled scores and examination performance. The performance section includes a summary of examination data sorted by different groups of examinees as well as visual aids for the year 2024.

Computer Adaptive Test (CAT) for Classification.

In July 1996, the NMTCB began offering a computer adaptive test (CAT) for classification in association with ACT, Inc. The CAT for classification is designed to render a pass/fail decision. In a CAT of this type, examinees are NOT rank ordered along a score scale in order to make a precise and accurate classification decision. In order to administer a CAT for classification, the items themselves are ranked at the decision point on the score scale according to their ability to classify accurately and quickly. Each item in the item pool is associated with the information on its difficulty (the proportion of examinees answering an item correctly) and discrimination (the ability of an item to distinguish between passing and failing individuals) levels. An item that has a difficulty level at or near the passing score and has good discrimination will be a better item for decision-making than another item that is too difficult or too easy or has little ability to discriminate between those examinees who should pass and those who should fail. ACT, Inc. psychometric staff obtained Item Response Theory (IRT) statistics for all items in the item pool.

A "classification" CAT is still adaptive in that an individual whose performance is significantly above or below the passing score will require fewer questions for classification. On the other hand, an individual whose performance is not clearly identified will need to answer more questions to demonstrate the required knowledge to pass the exam. The classification process will not be obvious to the examinee since there will be a certain number of unscored pretest questions that will be asked in order to obtain statistics on new questions for future use. For the classification CAT, the items that are administered to each and every candidate are the same type: there are no "difficult items for better examinees" or "easier items for poorer examinees." Each examinee answers a total of 90 items, and the items are different for each examinee.

The algorithm used in the classification CAT adjusts for differences in test form difficulty. For example, candidates that receive a CAT that is easier relative to the benchmark exam must answer more items correctly to receive a passing score. Conversely, if a candidate receives a set of items that is more difficult, they would be required to answer fewer questions correct to pass the exam. In essence, each CAT administered is equated so the passing level is appropriate for the set of items selected for administration to each candidate. Items for the classification CAT are selected in the following approximate proportions for each of five content domains of nuclear medicine technology: **I.** Radiation Physics & Detection (7%), **II.** Radiation Safety & Regulations (13%), **III.** Pharmaceutical & Radiopharmaceutical Agents (45%), **IV.** Instrument Operations & Quality Control (15%) and **V.** Clinical Procedures (40%).

The CAT for classification, while providing a high degree of confidence in the pass/fail decision does not allow the same analysis of individual performance and subgroup performance obtained with the paper and pencil exam. In the past, because all examinees that sat at the same administration of a test took the same test, comparative information was obtained. Because the primary purpose of the CAT exam is to classify candidates as pass or fail, CAT for classification selects items that are optimal for minimizing errors in classification, a critical consideration in an occupation certification program. Candidates whose ability estimates are close to the passing score require more items to make a pass/fail decision; whereas those that are clearly significantly above the pass/fail mark need fewer items. Candidates may not skip a test question and are not permitted to return to an item. Candidates are permitted to change their answers before moving on, at which time the item is scored by the computer.

Scaled Score Information:

Examination results are reported in terms of the scaled score, the mean scaled score, and a measure of the variability of the scaled score distribution -- the standard deviation.

As noted above, the main objective of the NMTCB CAT is to obtain a pass/fail decision with a high degree of precision. However, it was recognized that there are occasions when there is a need to know whether an examinee's performance is close to the passing score or a distance from it. Consequently, scaled scores were developed and reported beginning midway through the 1997 testing cycle and subgroup performance in rank order was made available at this time, also. The scaled score is a transformation of the IRT value that is calculated based on the examinee's responses to the items presented during the examination. The scaled passing score was set to 375. That is, the ability estimate obtained from IRT required to pass the examination was "anchored" at 375. It is very important to note that the scaled score value is not a percentage value.

Content Outline:

The NMTCB conducted a Job Task Analysis (JTA) survey in April 2017, which introduced a fifth domain and updated the content area percentages. More recently, in 2023, another JTA survey was conducted and the survey outcomes reconfirmed the same domain percentages and the five-domain structure established in 2017.

The examination content percentages for examinees were:

Domain I: Radiation Physics & Detection – 7%
Domain II: Radiation Safety & Regulations – 13%
Domain III: Pharmaceutical & Radiopharmaceutical Agents – 25%
Domain IV: Instrument Operations & Quality Control – 15%
Domain V: Clinical Procedures – 40%

Beginning January 1, 2018, the NMTCB's entry level adaptive examination scores are reported on a scale of 200-500, with **375** set as the scaled passing score. Prior to 2018, the scaled passing score was set at 75.

Overall Examinee Performance:

Please refer to Table 1 for a general overview of the examination. This table presents the number of examinees who took the test, their average scaled score, and the pass rate for 27 years beginning 1996 up until 2024.

Table 1. 1996 - 2024 NMTCB CAT Examinees

	Number of Examinees	Mean Scaled Score	Overall Pass Rate	Pass Rate for NMT Program Graduates
1996	671	78.9	88.1%	94.4%
1997	757	78.8	85.6%	92.4%
1998	664	78.4	83.8%	92.9%
1999	696	78.3	83.9%	93.0%
2000	792	78.2	81.0%	90.4%
2001	879	77.9	81.9%	90.1%
2002	1072	78.02	78.6%	88.4%
2003	1327	77.99	79.9%	87.1%
2004	1459	78.35	82.6%	91.6%
2005	1652	78.74	84.1%	90.0%
2006	1590	79.05	87.9%	93.7%
2007	1694	79.19	86.7%	91.7%
2008	1712	79.30	86.3%	91.7%
2009	1466	80.00	89.9%	94.3%
2010	1298	79.33	88.2%	92.4%
2011	1184	78.47	91.4%	94.9%
2012	1038	78.25	88.2%	91.3%
2013	958	78.26	88.2%	90.8%
2014	816	78.19	87.6%	89.6%
2015	808	77.92	86.8%	90.9%
2016	819	77.00	83.15%	88.9%
2017	659	78.67	80.27%	85.37%
2018	658	397.59	81.91%	87.72%
2019	715	397.02	79.02%	85.19%
2020	601	394.81	77.54%	84.44%
2021	637	394.53	75.67%	83.65%
2022	572	397.80	81.12%	85.40%
2023	599	401.27	82.80%	87.33%
2024	629	402.39	82.83%	88.83%

From Table 1, it can be seen that the number of examinees taking the test ranged from low candidate volume of 572 in 2022 to a high candidate volume of 1,712 in 2008. Please note, prior to 2018, the scaled passing score was set at 75.

Table 2. 2024 Overall Examinee Performance

	Total Number	Total Number Pass	Pass % for Each Group	Total Number Fail	Fail % for Each Group
Program Graduates	546	485	88.83%	61	11.17%
Repeat Examinees	80	35	43.75%	45	56.25%
Alternate Eligibility	3	1	33.33%	2	66.67%
All Examinees	629	521	82.83%	108	17.17%

Group Performance 2024

All Examinees:

A total of 521 out of 629 examinee attempts (82.83 percent), passed the NMTCB certification examination in 2024 (Table 3).
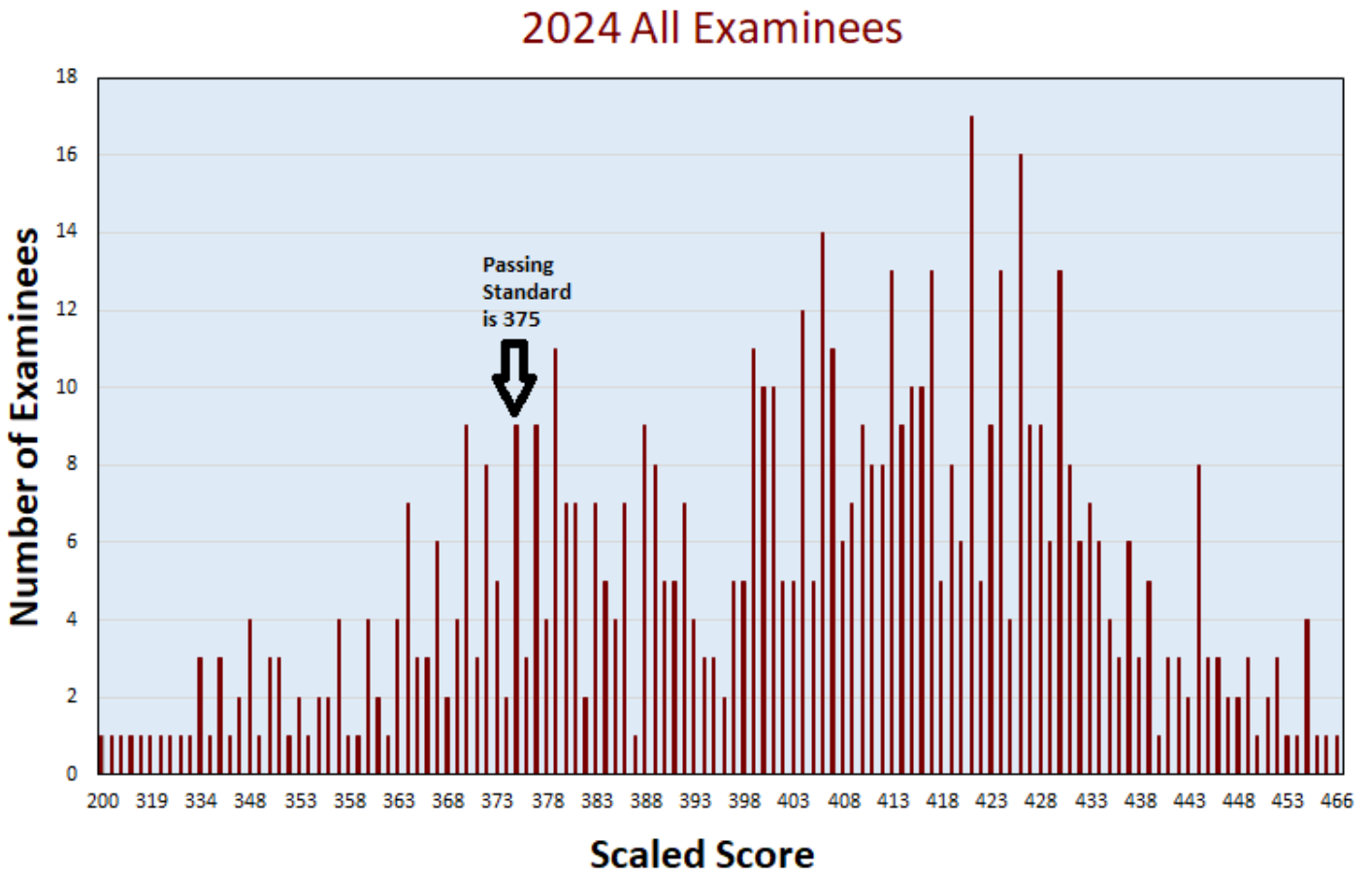
Table 3. All 2024 Examinees

Total Number:	629	
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Performance breakdown

Range of Scores:	200-466
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Median Scaled Score:	407

Graph 1. All 2024 Examinees

2024 All Examinees

Passing Standard is 375

Number of Examinees

Scaled Score

NMT Program Graduates - First Time Examinees:

A total of 485 out of 546 first-time examinees (88.83 percent) passed the examination in 2024 (Table 4). Only 61 program graduate first-time examinees (11.17 percent) did not pass the examination in 2024. A frequency distribution of these first-time examinees is provided below (Graph 2).

Table 4. First Time Examinees

First-Timers (Nuclear Medicine Program Graduates)

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Graph 2. First Time Examinees (Nuclear Medicine Program Graduates)

2024 Program Graduates
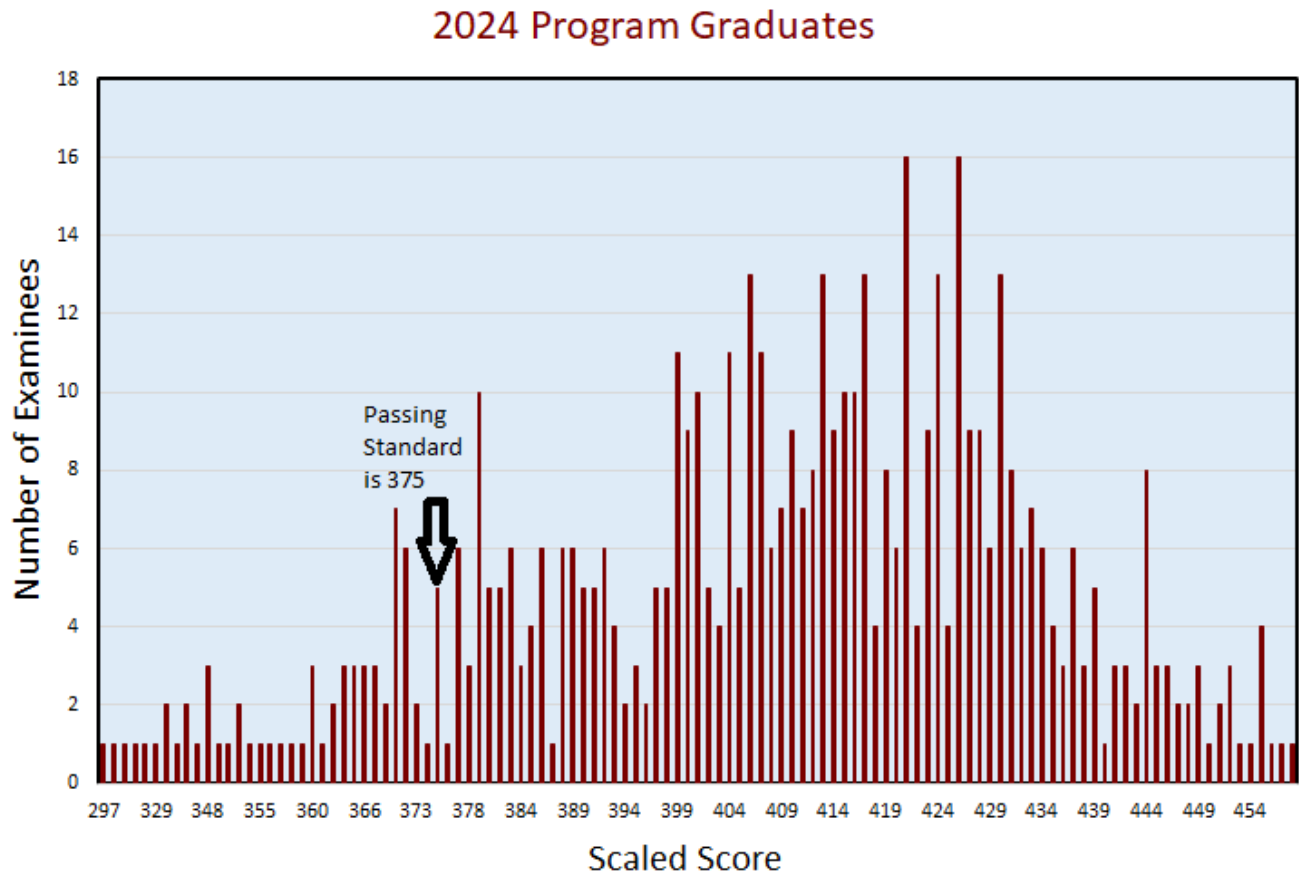
Repeat Examinees:

Eighty (80) examinee attempts were from repeat examinees in 2024 (Table 5). A total of 35 out of 80 examinee attempts (43.75 percent) passed the examination. A total of 45 examinee attempts (56.25 percent) failed the examination. A frequency distribution of the repeat examinees scaled scores is also presented below (Graph 3).
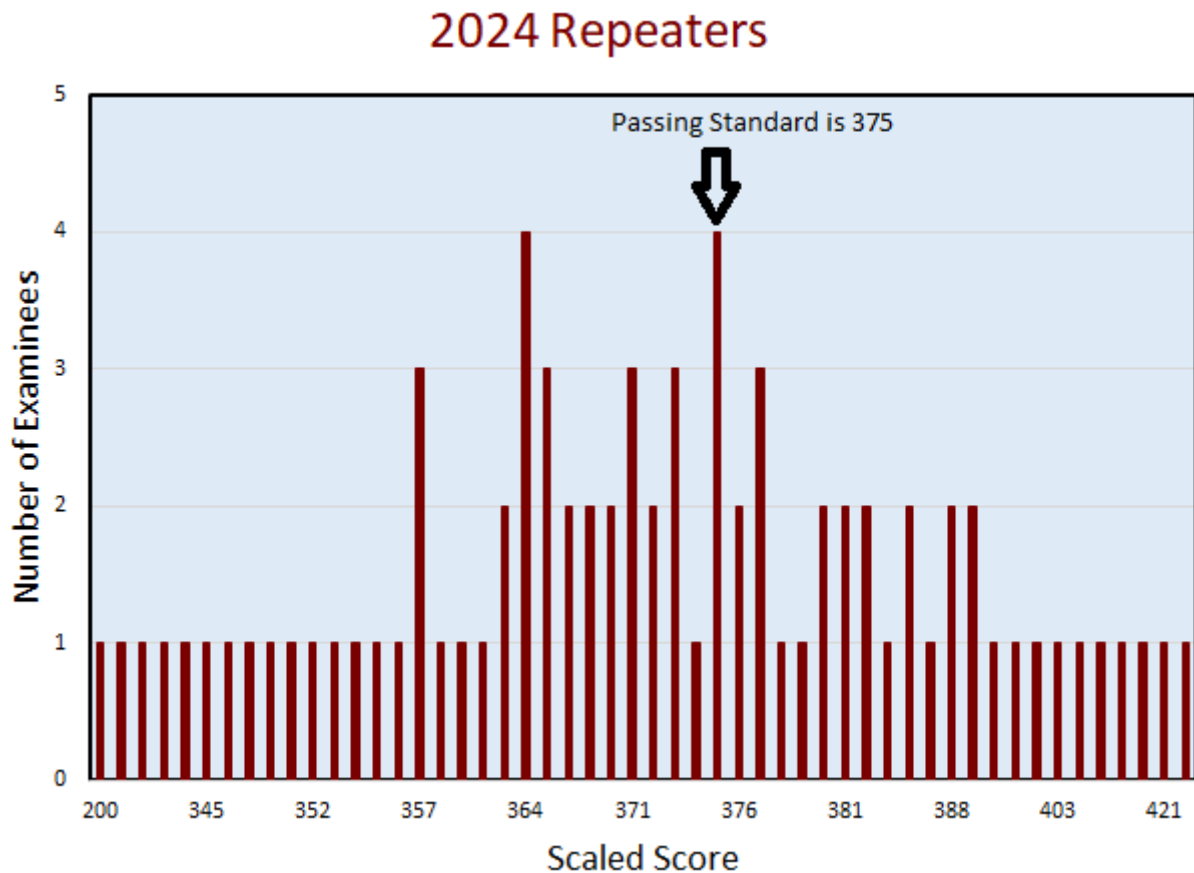
Table 5. 2024 Repeat Examinees

Total Number:	80	
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Performance breakdown

Range of Scores:	200-422
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Graph 3. 2024 Repeat Examinees

Alternate Eligibility*:

NMTCB's alternate eligibility pathway for On the Job Trained (OJT) candidates was retired in 2015. This section is now meant to display the outcomes of first-time candidates who were granted eligibility through an appeal decision determined by the NMTCB board of directors.

Three (3) appellant candidates were deemed eligible to sit for the entry level exam in the 2024 calendar year and one (1) passed the examination (33.33 percent) and two (2) failed the examination (66.67 percent).

Summary:

Overall, 2024 was a successful year for both program directors and students of nuclear medicine technology programs. Of the 546 examinees who graduated from nuclear medicine technology training programs, 485 (88.83 percent) passed the examination in 2024.

As always, the NMTCB remains sensitive to the needs of the program directors and their students. The Board is committed to offering the premier certification program for nuclear medicine technologists. Please let us know if there is anything that should be included in future exam reports. We welcome your comments/suggestions.

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