The US Chess Title System

US Chess Ratings Committee

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1   Introduction and History

In the 1994 and 1996 Ratings Committee reports, the Ratings Committee introduced and developed a revision of the US Chess Title System which had been approved for implementation by the Executive Board. The Title system was constructed to reward players with titles based on qualifying performances. Before the system was implemented, interest developed in devising a method of rewarding achievement by keeping ratings above specified thresholds. This led to the Life Achievement proposal, which was approved by a new Executive Board in 1998. Neither system was implemented. In 2003, a new call for implementing an updated version of the Title system from the mid-1990s was requested. This revised system was approved by the Executive Board in 2003, but once again fell through the cracks. Finally, in mid-2008, the US Chess went forward with the decision to implement the Title system. After about eight months of extensive discussion among the Ratings Committee members, along with the hard work of Mike Nolan at the US Chess office who ran simulations of various versions of the title system, the details of the system have been worked out. This document describes the technical details of this latest system.

The basic premise of the Title system is to award permanent titles based on sustained performances at particular rating levels. To be more concrete, a player who is vying for the 1800-level title would need to demonstrate several qualifying tournament performances in which his/her game results would be considered impressive for someone rated 1800. For each qualifying performance, a single norm is awarded. Once five norms are collected, a title for that level is issued (subject to other minor requirements such as having an established rating, etc.). Norms and titles cannot be lost through poor performance or inactivity. The new main features of the currently proposed system are to add a minimum rating threshold for the upper-level titles, so that a player who earns five norms at the 2000-level title (for example) must also have, or have had, an established rating of at least 2000, and to simplify the eligibility criteria. The Title system has no effect on the original Life Master title, which requires 300 games above a rating of 2200.

2   The Norm Criteria

The title system is based on the principle that a player must have a sufficiently impressive performance relative to a player whose rating was Y to earn a norm at the Y-rated level, and that the player must have five such performances to earn the title. For example, to earn the 1st category title (corresponding to a rating level of 1800), a player must have five performances that would be considered impressive for someone rated 1800, regardless of the player's actual rating. For opponent i with post-event rating R_i, let $\Delta_i = Y - R_i$, that is, the difference between the title level and the

opponent's rating. Then define

$$
C_i = \begin{cases}
0 & \text{if } \Delta_i \leq -400 \\
0.5 + \Delta_i/800 & \text{if } -400 < \Delta_i \leq 0 \\
0.5 + \Delta_i/400 & \text{if } 0 < \Delta_i \leq 200 \\
1 & \text{if } 200 < \Delta_i.
\end{cases}
\tag{1}
$$

The value C_i can be understood to be similar to a winning expectancy that is intentionally overoptimistic for opponents with ratings lower than Y. Let $C_T = C_1 + C_2 + ... + C_n$ the sum over all n opponents in the event, and let S_T be the player's total score in an event. Then a norm is earned at the Y-rating level if

$$
S_T - C_T > 1.0
$$

Note that the inequality above is strict; if $S_T - C_T = 1$ then a norm is <u>not</u> awarded.

Based on applications of this method to US Chess historical games data, roughly 10% of players rated near Y will earn the Y-level title in 5 years through normal tournament play, about 40% of players rated near $Y + 100$ will earn the Y-level title in 5 years, and roughly 70-80% of players rated around $Y + 200$ will earn the Y-level title in 5 years.

Example:

Suppose a player without any norms has the following results in a 5-round event against players with the following post-event ratings: win against 1840, win against 1700, draw against 1900, draw against 1850, and loss against 1820. Then the total score is $S_T = 3.0$. The opponents post-event ratings are $R_1 = 1840$, $R_2 = 1700$, $R_3 = 1900$, $R_4 = 1850$ and $R_5 = 1820$. We now consider the norm computation for all title levels.

Table 1 records the values of C_i from the formula for each opponent (columns) and for each title level (rows). The sum of the C_i for each title level is displayed in the second-to-last column, and the difference between the total score and the sum of the C_i is in the final column.

Title Level (Y)	Opponents' post-event ratings					C_T	$S_T - C_T$
	1840	1700	1900	1850	1820		
1200	0.000	0.000	0.000	0.000	0.000	0.000	3.000
1400	0.000	0.125	0.000	0.000	0.000	0.125	2.875
1600	0.200	0.375	0.125	0.188	0.225	1.113	1.887
1800	0.450	0.750	0.375	0.438	0.475	2.488	0.512
2000	0.900	1.000	0.750	0.875	0.950	4.475	-1.475
2200	1.000	1.000	1.000	1.000	1.000	5.000	-2.000
2400	1.000	1.000	1.000	1.000	1.000	5.000	-2.000

Table 1: For the example, values of C_i for each opponent and title level combination, along with C_T (i.e., the sum of the C_i), and $S_T - C_T$ in the in the last two columns. A norm is awarded when the value in the last column is greater than 1.0.

To understand the computation that leads to the table entries, consider the calculations for the title level of 1800. The values of the Δ_i are given by $\Delta_1 = 1800 - 1840 = -40$, $\Delta_2 = 1800 - 1700 = 100$, $\Delta_3 = 1800 - 1900 = -100$, $\Delta_4 = 1800 - 1850 = -50$, and $\Delta_5 = 1800 - 1820 = -20$. Because

$-400 < \Delta_1 \le 0$, $C_1 = 0.5 + (-40)/800 = 0.45$; $0 < \Delta_2 \le 200$, so $C_2 = 0.5 + (100)/400 = 0.75$; and so on.

A player earns a norm at all title levels in which $S_T - C_T > 1.0$. In this example, with $S_T = 3.0$, the player has had a sufficiently strong performance to earn a norm at the 1200, 1400, and 1600 title levels because $S_T - C_T > 1.0$ in all three cases, but not the higher title levels.

3 Norm and Title rules

The following table specifies the set of titles, and whether a player needs to have attained an established rating above the rating level to earn the title.

Rating Level	Title	Rating Requirement?
1200	4th Category	No
1400	3rd Category	No
1600	2nd Category	No
1800	1st Category	No
2000	Candidate Master	Yes
2200	Life Master	Yes
2400	Life Senior Master	Yes

1. Norms can only be earned in events of 4 rounds or more.

2. A norm is earned toward a Y-title when a player's total score in an event exceeds the value C_T, the sum of the C_i given in equation (1), by 1.0, assuming four or more games have been played. If only three games have been played, and a fourth game is either a "bye" (coded as "B") or a forfeit win (coded as "X"), then the player's total score from the three games must exceed C_T by at least 2.0. The computation for C_i is computed relative to the opponent's post-event rating, not pre-event rating.

3. A player can earn norms regardless of being unrated, provisionally rated, or established. However, to earn the title, the player must have an established rating.

4. A player's results from an event apply simultaneously to every norm for titles not already earned. Thus, a player may be working on several titles at once.

5. For the Candidate Master title, the player must have had or currently has an established rating of at least 2000. For the Life Master title, the player must have had or currently has an established rating of at least 2200. For the Senior Life Master title, the player must have had or currently has an established rating of at least 2400.

6. Norms can be earned only in events that are part of the US Chess regular rating system (include dual-rated events), and not in Quick-rated-only events, Blitz events, Online-Quick events, Online-Blitz events or Correspondence Chess events. Norms cannot be earned in matches, or any event in which the player has competed against the same opponent more than twice. If a player has multiple pairing numbers in an event (e.g., in an event with multiple schedules that are merged together), the results under the combination of those pairing numbers are treated as one when computing norms.

7. The current Title system has no effect on the original Life Master title, which requires 300 games above a rating of 2200.

8. The current Title system has no effect on rating floors. For example, earning a 1st category title does not imply a rating floor at 1800.

9. The norm and title computation will be applied retroactively to December 9, 1991, the date after which online records have been retained, to initialize a player's norm and title counts. Players who have not competed since that date and who are seeking titles may need to petition on a case-by-case basis.