

Supernumerary seats for females in Joint Seat Allocation 2018

In order to better understand the rule of supernumerary seats for females and the salient features of its implementation, the following notations will be helpful.

1. *Program*: A program will refer to the usual academic program of an institute participating in the Joint Seat Allocation 2018. Examples of a program are:
 - IIT Kanpur Electrical Engineering.
 - NIT Jalandhar Mechanical Engineering.
2. *Male or transgender*: A male or transgender candidate is considered as a non-female candidate.

The rule of supernumerary seats for females

Many technical institutes funded by central government have a highly skewed gender ratio of the candidates admitted every year in their undergraduate programs. In particular, only 8-10% of the candidates admitted in IITs every year are females. To address this issue, the Ministry of Human Resource Development (MHRD) of Government of India has taken a decision to, inter alia, improve the gender balance in the undergraduate programs of IITs and NITs. These institutes have been directed by the MHRD to create supernumerary seats specifically for females in order to achieve a minimum female enrollment of 14% in each program in the year 2018-19.

The principle underlying the creation and allocation of supernumerary seats for females in 2018 is that the total no of female candidates admitted in a program should form at least 14% of the total candidates admitted in that program. For this purpose, the supernumerary seats are created in addition to the number of seats of a program such that no candidate (female or non-female) is denied opportunity to a program based on the merit.

Seat allocation after creation of supernumerary seats:

Salient features

1 Introducing two seat pools

In order to implement the rule of supernumerary seats for females, each program P will have two separate seat pools defined as follows:

- Female-Only(P) : This seat pool will be exclusively for female candidates and admit them on the basis of merit only.
- Gender-Neutral(P) : As the name suggests, this seat pool will admit candidates though merit only and without any gender bias/preference.

The seats of each of these pools are further divided among various Program-Sections depending upon the candidate categories (OPEN, OBC_NCL, SC, ST and their PwD counterparts) and state quota (All India, Home State, Other State) as and where applicable. This information for various programs is available in Seat Matrix on the website <https://josaa.nic.in>.

2 Fairness properties guaranteed by the seat allocation algorithm

The algorithm guarantees the following fairness properties about the seat allocation it outputs.

Fairness for non-female candidates:

1. **No reduction in the number of available seats:** The number of Gender-Neutral seats in a program P (e.g. IIT Kanpur Civil engineering or NIT Surat Electrical Engineering) in 2018 will be equal to or greater than the number of seats that the non-female candidates got in that program in 2017. So potentially all the Gender-Neutral seats of P may be allocated to non-female candidates only.

2. **No-adverse effect due to a separate seat pool for female candidates:** Consider any Program-Section of Gender-Neutral pool of a program. The algorithm guarantees that at least one of the following properties will hold for this Program-Section:

- a. All seats of this Program-Section are occupied by non-female candidates only.
- b. The allocation of all the seats of this Program-Section and its Female-Only counterpart combined is done purely based on merit without any gender bias/preference.

The following example illustrates the 2nd property in detail:

Example: Consider the program of IIT Kanpur Civil Engineering. Suppose the number of its seats for SC category in Gender-Neutral pool and Female-Only pool are 10 and 2 respectively. Depending only upon the choices filled by the candidates and their ranks, the allocation of these seats will be of one of the following two types:

1. None of the 10 Gender-Neutral seats is occupied by a female candidate.
2. At least one or more Gender-Neutral seats are occupied by female candidates.

For the allocation of type 2, the seat allocation algorithm provides the following additional guarantee: All the 12 seats of the IIT Kanpur Civil Engineering for SC category are allocated on pure merit basis and without any gender bias/preference among all the SC candidates who competed for these seats.

Fairness for female candidates:

The algorithm will guarantee that each program will have at least **14%** female candidates. In addition, the following fairness property will be guaranteed for each female candidate c .

- Under no circumstance c will be denied a seat in a program while allocating the same seat to a male candidate with (i) equal or worse rank than c , and, (ii) satisfying the same eligibility criteria.

Important note: Creation and allocation of supernumerary seats for female candidates is fundamentally different from reservation of seats for female candidates and should NOT be mistaken for any kind of reservation for females. The following example illustrates this point:

Suppose a program has 86 Gender-Neutral seats and 14 Female-Only seats. Further, let us assume that the top 14 rankers opting for the program are females and the next 86 rankers opting for the program are non-females. In the current allocation scheme, the top ranking 14 females will first be allocated the 14 Female-Only seats. The non-females will be allocated the 86 Gender-Neutral seats.

On the contrary, if the Female-Only seats were following allocation similar or equivalent to “reservations” then the top ranking 14 females would first be allocated the top 14 Gender-Neutral seats and therefore the remaining $86 - 14 = 72$ Gender-Neutral seats would be allocated to non-females. The remaining 14 Female-Only seats would be then allocated to lower ranked females, thereby not allowing allocation of the program to the remaining $(86 - 72 = 14)$ higher ranked non-females.