

Supernumerary seats for women at the IITs

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Why the need for this scheme?

- Massive underrepresentation of girls at IITs: 8% of UGs. At NITs etc. (and MIT or Imperial), 20%+. JEE (Adv) qualified also ~20%. But many finally don't join IIT.
- Many reasons: JEE (Adv) specifically disadvantaging girls, due to less freedom to attend coaching classes, go out in the evening, etc. Also, less flexibility in choice of branch and location due to family pressures, hence often don't join IIT for these reasons.
- Data at IITD for 2003–2015 clearly show that JEE (Adv) underestimates the capability of girls. If a girl and a boy have similar JEE ranks, the girl on average does significantly better after joining IIT (Figure 1). So even girls with somewhat lower JEE ranks, once at IIT, very likely to perform *at least as well as male classmates, if not better*.
- To compensate for these factors specifically disadvantaging girls and acting as barriers for them to enter IITs, supernumerary seats created to enable more of them to get a preferred branch and/or campus, and hence be able to take up an IIT seat.
- *No relaxation in JEE (Adv) qualifying criteria*; all girls admitted qualified based on same criteria as boys. But within the pool of qualified candidates, more girls able to join IITs this year thanks to the supernumerary seats plus extensive outreach efforts.
- Also: IITs mandated to use technology to solve social problems and improve people's lives. 50% of society is women. To understand and address society's problems, we need proper representation from every section; each brings its specific experiences and perspectives. Diversity of views and ideas strengthens us academically and intellectually.
- Better gender balance on campus beneficial for the entire campus community, including non-female students, by fostering more frequent and healthier cross-gender interaction.

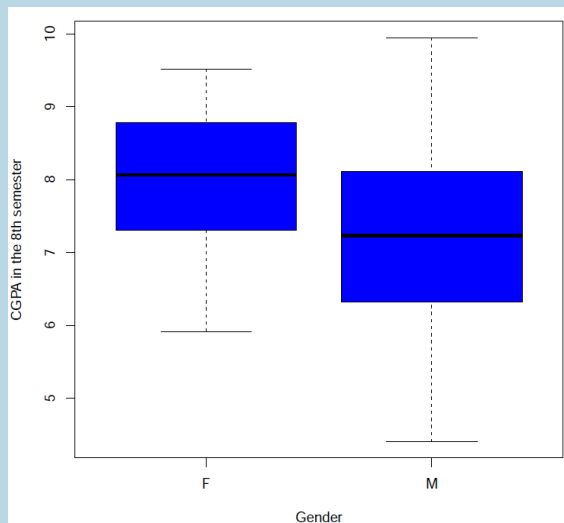


Figure 1: Box plots of gender-wise CGPA distribution for the 2012-entry batch at IIT Delhi. The thick central lines indicate median CGPA, and the blue boxes indicate the 25th- to 75th-percentile range. It should be noted that these distributions are despite the fact that the highest JEE rankers are disproportionately boys. So if we compare a boy and a girl with similar JEE ranks, the difference is expected to be even greater than that observed here.

How does the scheme work?

Suppose some branch at some IIT had 45 general seats last year: 43 went to men and 2 to women. This year, seats increased to 50 (5 supernumerary seats added), of which 7 (14%) 'female-only', and 43 (same as no. of boys last year) 'gender-neutral'. JoSAA algorithm, whilst going down JEE rank list, starts allocating male candidates for whom this branch+institute is the highest available preference to gender-neutral seats, and females to female-only seats. Two scenarios may arise:

- (A) The number of girls in the top 50 rankers who chose this branch+institute (and didn't get a higher-preference choice) is less than or equal to 7. So all 43 gender-neutral seats go to non-females. Allocation of female-only seats may continue lower down into rank list, until all filled.
- (B) The top 50 rankers include more than 7 women. So the top 7 fill up the female-only seats, and the remaining are allocated gender-neutral seats.

Note that girls take up 'gender-neutral' seats only in Scenario (B), which as of now is extremely rare: hasn't happened for any branch or category at IITD in 2018. But in this scenario, outcome is exactly as if no special consideration for women: top 50 rankers (irrespective of gender) get the 50 available seats. The special consideration comes into effect *only* in Scenario (A), where all 'gender-neutral' seats go to non-females, ensuring *no reduction in the number of seats obtained by them*.

So the process is carefully designed, such that no female candidate ever 'steals' a seat which may have gone to a male candidate. Females start eating into the number of male seats *only* when more of them actually outcompete males in JEE. This is Scenario (B) above, and as and when this happens, the entire scheme of 'female-only' seats effectively comes to an end!

Summary

- Since IITs specifically have had a problem in attracting girls (even when 'qualified'), and data clearly indicate that JEE (Adv) underestimates girls, clear case for compensating for this by allowing 'closing rank' cutoffs for girls to be less stringent than for boys (without affecting the latter in any way). This is what supernumerary seats enable.
- As number of girls at IITs increases, it creates more female role models in science and technology and enables more candidates, parents and others to see IIT as a desirable destination for girls. This catalyses social change and over time enables girls to start scoring higher in JEE itself, naturally making this scheme redundant.
- Idea of 'merit' can't be captured by one exam. Many social factors affect exam outcomes. And our goal isn't just to admit students good at a particular kind of exam problem. Equally important to have diversity of ideas, and healthy and welcoming environment where students from all backgrounds flourish. So one exam can't be sacrosanct. Need to consider multiple factors, as universities globally do. This is a step in that direction.