

*decided by individual BoG considering various aspects mentioned in 2.7.1. All the regular posts are direct recruitment posts and should be filled by rolling advertisement and / or periodic open advertisement at all India level. At least 50% of the faculty in any NIT must be recruited from states other than its own location. Due care shall be taken to fulfil the GoI reservation policy.*

- *Faculty appointments at all levels should promote interdisciplinarity wherever possible. To support such requirement, joint appointment of faculty with industries and between two departments / centres should also be facilitated by respective BoG.*
- *BoG should spell out the duties and responsibilities of faculty, expecting 40 Hrs of working / week. Apart from teaching, faculty should carry out academic and industrial research and consultancy and also carry out administrative responsibilities from time to time and extension services.*

#### **2.4.1 Motivating the best UG students in the country to be the faculty tomorrow**

Currently, there is a severe shortage of faculty in technical education in the country. The proposed scheme is expected to fill the gap between demand and availability of quality teachers by encouraging fresh NIT graduates to take up teaching positions in their alma mater while simultaneously pursuing their Masters cum Ph.D. program from the IITs. The scheme should be available to top 15% of the engineering graduates who can fulfil their aspirations to receive their degree from leading prestigious Institutes in the country. The present faculty crunch could also be partially solved by implementing the “Trainee Teachers” scheme as proposed herein.

The Objective of the program is to enhance teaching quality and to address the faculty shortage issue. Some of the best engineering graduates (i.e. top 15% meritorious students from the IIT, NIT, IIIT, IISER, NISER and other AICTE/UGC approved Institutions/Universities) should be motivated and mentored. They would be appointed as Trainee Teachers at NITs. While initially they would assist in teaching, they would simultaneously go

through part-time M. Tech. and Ph.D. programs of IITs to acquire higher academic qualifications, which is a pre-requisite for faculty at NITs and IITs. Following are the broad objectives of this scheme:

- a. To create high quality teachers
- b. To provide attractive teaching-cum-research career path to the UG student
- c. To enlist bright UG students under the **Teach and Earn while you Learn** program and provide them with top class training for vertical mobility and career progression as teacher or researcher.

The key Aspects of the Scheme would require each NIT to work out a perspective plan for faculty recruitment for next five years based on existing vacancies, projected growth, faculty recruitment through other channels, retirements and expected resignations. The plan should be considered and approved by the respective BoG keeping in view that it is consistent with MHRD approved projections and norms for the institute. The number of Trainee Teachers to be admitted in a year should be determined by distributing the admissions roughly equally over a period of five years. The perspective plan for faculty recruitment should be reviewed periodically. Concurrently other channels of recruitment of faculty should also be pursued and should be factored in the perspective faculty recruitment plan. More details of the proposed scheme are provided in Annexure-IV.

*The scheme will be financially supported and reviewed every year by MHRD and after 3 years by an external committee. The number of teachers recruited through trainee-teacher program could also be a factor towards tier-evaluation of the NIT.*

#### **2.4.2 Continuous Teacher Training Programs and Certifications**

*Along with recruitment of quality faculty, it is equally important to ensure continuous upgradation and enrichment of faculty. The proposed plan aims to achieve this objective by developing a teacher training program that will be implemented in all NITs.*

18 *Open courses are online courses that aim at large scale interactive participation and open access via web. They are typically courses which are not credited and are available free of cost. In addition to conventional educational resources such as reading material, videos, problem sets etc., they also enable the creation of an interactive user forum of students, teachers and tutors. The initiative to use and support MOOC in NITs should be augmented.*

Chapter 2.1

19 *NITs should attempt to take a revolutionary step of promoting and evaluating group performance and add it to individual's score. This could be done as discussed in the report. (Each institution could evolve its own mechanism):*

Chapter 2.3

20 *NITs to hire only high quality faculty during fresh recruitment.*

Chapter 2.4

21 *NITs should introduce a "Trainee Teachers Scheme". The scheme will be financially supported and reviewed every year by MHRD and after 3 years by an external committee. The number of teachers recruited through trainee-teacher program could also be a factor towards tier-evaluation of the NIT.*

Chapter 2.4.1

22 *Even while new faculty of high quality is recruited, it is equally important to get existing faculty, especially the younger lot, to continuously improve and perform better. The senior/existing faculty should also be motivated towards excellence in teaching, technology development and research, to help institute reach better category as envisaged in section 3.1. Towards this, a teacher-training program could be evolved by NITs. The number of teachers at various level of certification could count towards tier-evaluation of the NIT.*

Chapter 2.4.2

## Annexure IV Trainee-teacher scheme to bring in high-quality faculty

### SALIENT FEATURES OF THE SCHEME

Sr. NO.	TOPIC	EXPLANATION
1	Nature of Programme	To appoint "TRAINEE TEACHERS" (TT) on contractual basis at National Institute of Technologies (NITs) subject to enrolment of the Candidates in Indian Institute of Technologies (IITs) for M Tech and PhD programme
2	Duration of M.Tech. & Ph D Programme Mode of Delivery	Maximum 8 years  Format: Part-time & Virtual mode with one semester full time in particular IIT
3	Teaching Assignments for candidates at parent NIT	12-14 hrs per week  Tutorial, laboratory, project work for initial 1-2 years, subsequently sharing and finally to teaching full course
4	Financial support / Salary	Tuition fee as charged by the concerned IIT and monthly consolidated salary paid to TT to be funded by MHRD under this scheme.
5	Specialization to be considered / offered	To be decided by the respective NIT and IIT
6	No. of seats	To be decided by NIT (typically 5 to 10 decided by BoG based on future and predictive faculty requirement). These would be maximum of 300 per year for 30 NITs to begin with.
7	Degree	To be awarded by IIT
8	Bonds/ Commitment for service	The Trainee teacher will receive his/her total contracted salary in two parts. One part will be paid to him /her on monthly basis .The second part of the salary will be put in RD in bank. This part is to be paid to TT after successful completion of their PhD and continuation in service at the host NIT for three years and paid in three annual instalments. In case

		TT fails to acquire PhD in the stipulated maximum period and also in case s/he discontinues from the service in parent NIT after successfully completion of his PhD, the balance amount will be forfeited. If TT fails to acquire PhD in the maximum stipulated time, s/he will be discontinued from this scheme.
9	Admissions	(i) This scheme is open to all graduating candidates who are in top 15% in the Centrally Funded Technical Institutes (CFTIs). All other candidates who are in top 15% from other AICTE/UGC approved institutions / universities (non-CFTIs) and having a valid GATE score would also be eligible.  (ii) The concerned NITs would identify and implement initial screening criteria for the selection of potential candidates.
10	Employment	After successful completion of the PhD from IIT, the TT will be absorbed as an Assistant Professor in that NIT in regular scale with all the associated benefits and services rendered as trainee will be counted for various benefits admissible to employees of NITs.

## Detailed Proposal

### I Introduction

Currently there is critical faculty shortage in technical education in the country. The proposed scheme is expected to fill up gap between demand and availability of bright committed aspiring teaching professionals, for example in NITs, taking fresh UG graduates, nurturing them for teaching along with the M Tech degree and PhD research carried out at IITs. The top 15% of the engineering graduates can fulfill their aspirations to receive their degree from leading prestigious Institutes in the country. It is expected that the present faculty crunch could be partially solved by implementing the "Trainee Teachers" scheme.

### II Objectives

To enhance teaching quality and to address the faculty shortage issue, some of the best engineering graduates (i.e. top 15% meritorious students from the IIT, NIT, IIIT, IISER, NISER and other AICTE/UGC approved

Institutions/Universities) could be attracted, motivated, and mentored. They would be engaged as Trainee Teachers at NITs. While initially they would assist in teaching, they would simultaneously go through part time M Tech and PhD programmes of IITs to acquire higher academic qualifications, which is a pre-requisite for faculty at NITs and IITs. Following are broad objectives of this scheme:

- a. Create high quality teachers
- b. To provide attractive teaching cum research carrier path to the UG student
- c. Catch bright UG students to enable them to **Teach and Earn while you Learn** and providing top class training to become good academician / researcher.

### **III Key Aspects of the Scheme**

Each NIT would work out a perspective faculty recruitment plan for next five years based on current vacancies, projected growth, faculty recruitment through other channels, retirements and expected resignations. The plan should be seen and approved by respective BoG to be consistent with MHRD approved projections and norms for the institute. The number of Trainee Teachers to be admitted in an year would be determined by distributing the admissions roughly equally over a period of five years. The perspective faculty recruitment plan could be reviewed periodically. Other channels of recruitment of faculty should also be pursued in parallel and should be factored in the perspective faculty recruitment plan.

#### **Admission Methodology**

- i. NITs will advertise and shortlist required numbers of fresh bright B Tech students from the current or one year prior to the current academic year in appropriate branches. These prospective candidates will go through comprehensive fast track screening procedure that meets all requirements for the selection of entry level regular faculty. The selection process would be completed once the candidate is accepted by the concerned IIT for the M Tech and PhD program. These students must satisfy the criteria of being within top 15% ranks and above in institutions of higher standing such as IITs, NITs, IIITs, IISERs, NISER and other Centrally Funded Technical Institutions (CFTIs) or those who are in top 15% from other AICTE/UGC approved Institutions/Universities (non-CFTIs) and having a valid GATE score would also be eligible. The probable number of trainee and their specializations can be decided by the NITs such that the number shall be within a prospective faculty recruitment plan and with prior approval by BoG.

- ii. These short-listed students will be asked for preference of minimum two IITs who offers such scheme. These students will be evaluated by corresponding IITs considering their eligibility criteria and their potential for teaching and performing research for M Tech and PhD program in the NKN enabled virtual learning mode. If the candidate is not selected by IIT for M Tech and PhD program by IITs, he/she will not be offered the trainee-teacher scheme.
- iii. The IITs and NITs will collectively generate broad contours of e-courses to help the trainee to complete most of the credits while serving in the NITs. The trainee teacher will spend one semester in the entire duration of the programme in corresponding IIT for their M Tech and PhD work. Course work would include adequate coverage on teaching pedagogy in addition to covering courses relevant to M Tech & PhD programme.

#### **Duration and Salary**

- i. The Trainee Teachers will mainly help the Institute for Laboratory and Tutorial classes, Research and progressively play bigger role in academics and research in the NITs.
- ii. The status of Trainee Teachers will be like Contractual Employees with annually increasing consolidated salary on an equivalent scale (compensation higher than a regular PhD fellow but lower than an Assistant Professor) with regular leave, medical facilities, accommodation / HRA as applicable, transport allowance etc. Also all the fees and some professional expenses towards the M Tech and PhD programme will be reimbursed through this scheme. Part of the salary will be retained by the Institute, placed in Recurring Deposit (RD) and this would be returnable to the trainee in a phased manner, only after successful completion of PhD.
- iii. It is necessary for the Trainee Teachers to complete M Tech and PhD within 5-8 years. If candidate fails to complete his PhD within eight years, his or her candidature to be in this scheme will be discontinued. The trainee teacher also can opt out of the scheme by giving sufficient notice to the administration and it should be effective only after completing academic requirements towards the end of current semester. In such a case the amount kept in RD will be forfeited.

## Regularization of Candidate

After successful completion of the PhD, the trainee teacher will be absorbed as Assistant Professor at appropriate pay scale in the parent NIT and service rendered as trainee will be counted for various benefits admissible to employees of NITs.

## Implementation Support

The scheme will be reviewed every year by MHRD and after 3 years by an external committee.

## IV Financial Outlay

Financial outlay has been worked out as per unit cost given in Annexure-IVa.

## Financial Requirements for eight years

While the actual numbers to be admitted as Trainee Teachers at a NIT would be based on approved perspective recruitment plan as indicated above, purely for the purpose of working out the budgetary requirements a representative number of 300 Trainee Teachers to be admitted every year for all NITs put together has been assumed. Actual annual budgetary requirements would need to be adjusted based on annual MHRD reviews of the scheme. Table I given below indicates the details of buildup of possible number of candidates in the scheme as a first step

**Table – I: Indicative No. of “Trainee Teachers”**

<b>Financial Year</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>2020-21#</b>
Total for 30 NITs	300	600	900	1200	1500	1800	2100	2400

**# The numbers would stabilize hereafter**

Number of Trainee Teachers at any time to be within projected vacancy position at the end of training period of the given NIT(s). In the old NITs, currently there are about 30 to 40% faculty vacancies. In the first eight years of this scheme, it is expected that the number of vacancies would be reduced substantially.

Table II provides the committed expenditure (Rs. in Lakhs) based on the eligible students admitted up to academic year 2020-21 based on **indicative numbers of 300 TT per year**.

**Table II: Financial Requirement / Outlay during first eight years of scheme (Rs. in Lakhs)**



Financial year	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Estimated Cost basis	Basic + DA(65%) + TA (3200/-) + HRA (20%) as on today							
Annual cost per TT	4.86	4.99	5.38	5.52	5.66	5.81	5.96	6.12
Total TTs	300	600= 300 New + 300 old	900= 300 New + 600 old	1200= 300 New + 900 old	1500= 300 New + 1200 old	1800= 300 New + 1500 old	2100= 300 New + 1800 old	2400= 300 New + 2100 old
Requirement of funds per year for new	1459	1497	1613	1655	1698	1743	1789	1836
Requirement of funds per year for old	-	1459	2956	4569	6224	7922	9665	11454
Coordination / Administrative Expenses (~2 Lac per yr including fees for IIT	600	1200	1800	2400	3000	3600	4200	4800
Total in lakhs	2059	4156	6368	8623	10921	13264	15653	18089
Revised total with approx. 10% increase rounded up	2059	4572	7005	9486	12013	14591	17219	19898

It is suggested that TT should get some funds for professional expenditure like membership of professional societies, attending conference, for which they should apply for, if their paper is accepted for presentation etc.

## V Operational Details of the Scheme

For operational clarity, the scheme once approved should be implemented jointly by the IITs and NITs with their roles in the schemes as briefly outlined below.

### 1) Role of IITs :

- a. To select students jointly with NITs for "Trainee Teachers" programme
- b. If found suitable, enrol students for M. Tech and Ph. D programmes.

- c. To deliver the programme in Virtual Mode such that the “Trainee Teachers” are available to the parent NIT for a maximum period to facilitate teaching-learning activities at NIT
- d. To deliver contents related to pedagogy which are in addition to the conventional course / programme requirements
- e. To arrange review of progress once in a year by concerned IIT faculty supervisor(s) and representative(s) from sponsoring NIT
- f. Coordinate all activities in regard to its implementation of the scheme with NITs or a centralized body created for its implementation
- g. To nominate one contact / nodal person from each IIT side (may be Dean (R&C) / (Acad.) or equivalent) for its effective implementation, monitoring and co-ordination of the scheme.

## **2) Role of NITs :**

- a. To plan and implement the scheme keeping in view the overall requirements of faculty in a given time frames
- b. To identify, shortlist and recommend bright students for “Trainee Teachers” programme
- c. To train TT as potential faculty and facilitate their interaction with IITs for M. Tech and Ph D programmes and also engage them suitably in teaching learning activities in their own institute
- d. To disburse salary and other perks and benefits to “Trainee Teachers” in their respective institutions including fees to IITs.
- e. To possibly join IIT faculty in review of the progress of the TT in Indian Institute of Technology.
- f. To absorb them in regular faculty positions upon successful completion of the Ph D programmes.

## **VI Conclusion**

The scheme should be launched from the next academic year 2013-14 itself after obtaining necessary approval from the MHRD and other concerned GoI bodies. Necessary budgetary provisions (for year 2013-14) should also be made for financing the scheme on long term basis. The concerned BoG of every NIT should make effective plans to make use of the scheme to mitigate the shortage of faculty on a long term basis. While doing so, they should adequately balance the recruitments from various channels including the “Trainee Teacher” Scheme. NIT council shall create a sub-committee to co-ordinate and monitor the scheme.

#### **Annex-IVa: Worksheet for Unit Cost Calculations (as on January 2013)**

Proposed Pay to Trainee Teachers: 7 increments less than what an Assistant Professor will get, though on same scale) and what will he / she gets just at the time of finishing PhD (if PhD is completed in 7 years).

Assistant Professor: Minimum qualification: PhD

Rs 15600 Pay + 6000 AGP (Basic Pay = Rs 21600)  
7 advance Inc on basic: (each increment of 3%) -- Rs 4550  
DA (65% on Basic): Rs 16998  
HRA (20% on Basic): Rs 5230  
Transport Allowance: Rs 3200  
DA on transport (65% of TA): Rs 2080  
**Total: Rs 53658/- pm**

Trainee Teacher: Minimum qualification B. Tech.

Basic: Rs 21600 - 21% of Basic = Rs 17060  
DA (65% of Basic): Rs 11090  
HRA (20% of Basic): Rs 3410  
Transport Allowance: Rs 3200 (fixed)  
DA on TA (65%): Rs 2080

**Total: Rs 36840/- pm** Say Rs. 37,000/-

12 month cost	<u>4,44,000/-</u>
20% towards RD*	<u>90,000/-</u>
Additional 10% towards contingency/professional expenditure	<u>45,000/-</u>
Total yearly payment	<b>4,89,000/-</b>

(Yearly increment = 3% of basic ; and three increments (instead of one increment) after two years subject to completion of credit and other requirement for formal enrollment in Doctoral programme)

\*(20% of consolidated salary to be deducted initially and put in recurring deposit (RD). At the end of 7/8 years, the deposit should be a substantial amount. This amount would be released in a phased manner on successful completion of the programme).

After absorption of the Teacher Trainee as regular faculty, he / she will start getting the regular salary as per the prevailing Assistant Professor scale.

The detail calculations up to **initial eight years** are given below.

**Table A1: Details of Financial Requirement**

	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year
Basic	17064	17576	19158	19732	20324	20934	21562	22209
DA	11092	11424	12453	12826	13211	13607	14015	14436
HRA	3413	3515	3832	3946	4065	4187	4312	4442
TA	3200	3200	3200	3200	3200	3200	3200	3200
DA on TA	2080	2080	2080	2080	2080	2080	2080	2080
Total / month	36848	37795	40722	41785	42880	44008	45170	46367
20% in RD	7370	7559	8144	8357	8576	8802	9034	9273
Net Salary	29479	30236	32577	33428	34304	35207	36136	37093
Additional 10% PDF	3685	3780	4072	4179	4288	4401	4517	4637
Total / year	486399	498900	537528	551563	566019	580909	596245	612042
<b>Total/year in Lakhs</b>	<b>4.86</b>	<b>4.99</b>	<b>5.38</b>	<b>5.52</b>	<b>5.66</b>	<b>5.81</b>	<b>5.96</b>	<b>6.12</b>
Net Salary / Year	353745	362836	390930	401137	411650	422479	433633	445121
Net Salary /year in Lakhs	3.54	3.63	3.91	4.01	4.12	4.22	4.34	4.45
Total RD/Year per TT	88436	90709	97732	100284	102913	105620	108408	111280
<b>Total in RD for 300TTs in Lakhs</b>	<b>265</b>	<b>272</b>	<b>293</b>	<b>301</b>	<b>309</b>	<b>317</b>	<b>325</b>	<b>334</b>
<b>Coordination / Administrativ e Expenses in Lakhs /YR for 300 TT</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>
Yearly Requirement for 300 TT in Lakhs	1459	1497	1613	1655	1698	1743	1789	1836
<b>Cumulative requirement in Lakhs/year</b>	<b>2059</b>	<b>4156</b>	<b>6368</b>	<b>8623</b>	<b>10921</b>	<b>13264</b>	<b>15653</b>	<b>18089</b>