

Faculty Development Programme on  
**Introduction to Data Structure and Programming in C**

(July 1 – 10, 2017)

Organized through NKN

by

Electronics & ICT Academies

IIT Guwahati, IIT Roorkee, IIITDM Jabalpur, MNIT Jaipur, NIT Patna & NIT Warangal



**Preamble:**

“Electronics & ICT Academy” is an initiative of Ministry of Electronics and Information Technology, Govt of India, set up at some selected institutes in India. Such academies at IIT Guwahati, IIT Roorkee, IIIT Jabalpur, MNIT Jaipur, NIT Patna and NIT Warangal are jointly organizing a Faculty Development Programme (FDP) on **Introduction to Data Structures and Programming in C during July 1 – 10, 2017**. Experts from IITs, NITs, IIITs and other premier institutes will deliver lectures through National Knowledge Network (NKN) and participants registered at any of the above stated institutes will interactively learn from these lectures. In addition, local course coordinators at respective institutes will take care of practical and practice sessions. Each E&ICT Academy is given with some jurisdiction states in India. Academies are established with the major objectives of offering faculty development programmes in fundamental and emerging areas of Computer Science, Electronics, Information & Communication Technologies and IT based Product Design; training & consultancy services for Industry; Curriculum development for Industry; CEP for working professionals; Advice and support for technical incubation and entrepreneurial activities.

**About the Faculty Development Programme (FDP) in Introduction to Data Structures and Programming in C:**

This course provides a fast-paced introduction to Data Structures and programming in C language. The objective of the course is to train participants design, write, and analyze the performance of C programs that handle structured data and perform more complex tasks, typical of larger software projects including use of templates for modularity and reusability of codes. Though Data Structure course is widely offered through various modes, this FDP through NKN is organized with the objective of developing skills and pedagogy with deeper understanding and practical exposure to concepts in data structures and C programming language. Rich experience of the speakers at premier institutes will make the participants feel the difference.

**Participants are encouraged to list their expectations in their e-mail to the Global Coordinator.**

**Course Topics:**

S No	Module Name	Topics
1	<b>Fundamental Concepts of Programming</b> (10L+9P hours) Module Coordinator - Dr. R. R. Rout (NIT Warangal)	Introduction to digital computers, Revision of C language fundamentals with some tricky examples and implementations. Dynamic memory allocation, pointers, structures, unions, pointer and array, pointer to pointer, pointer to structure, pointers and functions, Header files and libraries, writing and using Makefile Programming will be in Linux environment where program editors like vim and emacs along with compilers like gcc, g++ will be used. gdb, valgrind will be used to demonstrate program debugging
2	<b>Data Structures and Implementation of Algorithms</b> (8L+6P Hours) Module Coordinator - Dr. Sudip Roy (IIT Roorkee)	Basics of algorithm design techniques, time and space complexity analysis, asymptotic notations, recursion verses iteration Linear and non-linear data structures, arrays, sparse matrices, linked list Sorting and searching algorithms: insertion sort, selection sort, quicksort, merge sort, counting sort, sequential and binary search
3	<b>Basic Concepts of Data Structures</b> (9L+10P hours) Module Coordinators - Dr. Pritee Khanna and Dr. S. K. Mohanty (IIITDM Jabalpur)	Basic data structures: stack, queue, binary search trees, tree traversals, balanced search trees: AVL tree, application of binary tree, Heap and priority queue, Heap sort Strings, common functions in string
4	<b>Abstract Data Types, Hashing and File Structures</b> (10L+8P hours) Module Coordinator - Dr. Vijay Laxmi ( MNIT Jaipur)	Sets, sequences, maps, union-find, graph, digraph, Graph traversals, Shortest path, n-ary trees, B-trees, B+ trees, splay trees Hashing, hashing functions, hash tables, collision resolution techniques, separate chaining, open addressing, rehashing, extensible hash tables, directory structures, hash tables in the standard library File structures, sequential and direct access, relative files, indexed files, B+ tree as index, multi-indexed files, inverted files, hashed files
5	Soft Skills	Lecture delivery and presentations, holding effective sessions, Handling student questions and queries
6	Case Study presentations by participants ( Local conduction by Academy)	Case study presentation by teams of participants

**Course Outcomes:**

- To understand and implement a range of basic algorithms, graph based algorithm and assess the computational cost of algorithms.
- To develop practical skills in implementing and testing algorithms in C
- To learn the use of templates for modularity and reusability of code
- Pedagogy specific to data structures and implementation in C language in Linux environment

**Who can apply:** The programme is open to the teachers of engineering colleges, Degree Colleges, MCA colleges, Polytechnic colleges and other allied disciplines. Industry personnel working in the concerned/allied discipline can also attend.

**Registration Fee Particulars:**

**Faculty members: Rs 3000/- Only**

**Persons from Industry: Rs 9000/-Only**

**Boarding and Lodging will be provided free of cost by the Academy. No Travel Allowance will be paid to the participants.**

Participants belonging to States/ UTs	Local Coordinator	Contact Details	Details for online payment / Demand Draft
Telangana, Andhra Pradesh, Karnataka, Goa states and Andaman and Nicobar Islands, Puducherry UTs	Dr RR Rout, NIT Warangal	rashrr@nitw.ac.in (M: )	Payment (DD): "Director, NIT Warangal" payable at SBH, NIT Warangal
Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim	Dr. Santosh Biswas, IIT-Guwahati	<a href="mailto:santosh_biswas@iitg.ernet.in">santosh_biswas@iitg.ernet.in</a> (M: 9957561026 )	Payment (DD): Registrar, IIT Guwahati Payable at Guwahati or On-line mode (Preferred) Name: IIT Guwahati R&D E&ICT ACADEMY Account no. 36071160089 IFSC: SBIN0014262
Madhya Pradesh, Chhattisgarh, Maharashtra	Prof. Aparajita Ojha, IIITDM Jabalpur	<a href="mailto:academyiiitdmj@gmail.com">academyiiitdmj@gmail.com</a> ( M: 9425800334)	Payment (DD): 'Electronics and ICT Academy, IIITDMJ' payable at Jabalpur On-line mode (Preferred) Name: Electronics and ICT Academy, IIITDMJ Account no. 50302042708 IFSC: ALLA0212433
Rajasthan, Gujarat, Dadra & Nagar Haveli, Daman & Diu	Dr. Emmanuel S Pilli, MNIT Jaipur	<a href="mailto:espilli.cse@mnit.ac.in">espilli.cse@mnit.ac.in</a> M:+91-9549658131	Payment (DD) Electronics and ICT Academy, MNIT Jaipur Payable at Jaipur On-line mode (Preferred) Account name- Electronics and ICT Academy, MNIT Jaipur Account no- 676801700483 IFSC- ICIC0006768 Bank- ICICI Bank, MNIT Campus, Jaipur

Bihar, Jharkhand, Odisha, West Bengal	Dr. Prabhat Kumar, NIT Patna	<a href="mailto:prabhat@nitp.ac.in">prabhat@nitp.ac.in</a> (M:+91-8406001700)	Payment (DD) Director, NIT Patna payable at Patna
Jammu and Kashmir, Himachal Pradesh, and Uttarakhand	Dr. Ranita Biswas, IIT Roorkee	<a href="mailto:ranitafcs@iitr.ac.in">ranitafcs@iitr.ac.in</a> LL: +91-1332-284878	

**Note:** Participants belonging to any other states other than the states mentioned above can apply to any of the nearest academies as per their choice.

**Selection:** 50 participants will be selected based on first-cum-first-serve basis at each academy offering this programme. 10 additional seats are reserved for people from industry. List of selected participants will be communicated through e-mail. In addition, the selected list of participants will be notified in E&ICT websites.

**Important dates:**

**Last date for submission of application: June 10, 2017**

**Selection-list intimation/display before: June 12, 2017**

**APPLICATION FORM**  
**FACULTY DEVELOPMENT PROGRAMME**

ON

**Introduction to Data Structures and Programming in C**

July 1 – 10, 2017

1. Name of the Applicant:

2. Designation:

3. Institution:

4. Email:

5. Mobile No:

6. Payment Mode:

Demand Draft Number:

NEFT/ UTR No ( if Applicable):

Bank Name:

Date of payment:

7. Address for Correspondence

8. Educational Qualifications with specialization:

9. Subjects taught so far:

10. No. of refresher courses/workshops attended:

11. Experience (in years)

Teaching:

Research:

Industry:

12. Accommodation required: YES / NO

13. Do you belong to reservations SC/ST (YES/NO): If YES, please specify\* \* Attach photo copy

**Declaration**

**The information provided is true to the best of my knowledge. If selected, I agree to abide by the rules and regulations of the FDP and shall attend the course for the entire duration. I also undertake the responsibility to inform the Coordinator in case, I am unable to attend the course.**

Signature of the Applicant

**SPONSORSHIP CERTIFICATE**

Mr /Mr /Ms. .... is an employee of our Institute/Organization and is hereby sponsored to participate in the FDP on “**Introduction to Data Structures and Programming in C**” sponsored by Electronics & ICT Academy during July 1 –10, 2017 at PDPM IITDM Jabalpur or at E&ICT Academy of one of the seven institutes( IITR, IITG, PDPM IITDMJ, NITP, NITW, MNITJ).

Place:

Date:

**Signature of Head of Institution  
(with seal)**

**Participating Academies and Coordinator Details:**

<b>Institute</b>	<b>E&amp;ICT academy website</b>	<b>Local Coordinator</b>	<b>e-mail</b>
<b>PDPM IITDM Jabalpur</b>	<a href="http://ict.iiitdmj.ac.in/">http://ict.iiitdmj.ac.in/</a>	Prof. Aparajita Ojha	academyiiitdmj@gmail.com
<b>IIT Roorkee</b>	<a href="http://eict.iitr.ac.in/">http://eict.iitr.ac.in/</a>	Dr. Ranita Biswas	ranitafcs@iitr.ac.in
<b>IIT Guwahati</b>	<a href="https://www.iitg.ernet.in/eictaca">https://www.iitg.ernet.in/eictaca</a>	Dr. Santosh Biswas	santosh_biswas@iitg.ernet.in
<b>NIT Warangal</b>	<a href="http://www.nitw.ac.in/eict">www.nitw.ac.in/eict</a>	Dr RR Rout	rashrr@nitw.ac.in
<b>MNIT Jaipur</b>	<a href="http://www.mnit.ac.in/eict">www.mnit.ac.in/eict</a>	Dr. Emmanuel S. Pilli	espilli.cse@mnit.ac.in
<b>NIT Patna</b>	<a href="http://nitp.ac.in/ict/">http://nitp.ac.in/ict/</a>	Dr. Prabhat Kumar	prabhat@nitp.ac.in

**Global Coordinator:**

**Prof. Aparajita Ojha,**  
**PDPM Indian Institute of Information Technology,**  
**Design and Manufacturing, Jabalpur**  
**Email: [academyiiitdmj@gmail.com](mailto:academyiiitdmj@gmail.com)**  
**Mobile: +91-9425800334**



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