IITM Student Handbook

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2025-04-15

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Preface

References

Notice

1 Data Science & Applications

IIT Madras has launched the **BS in Data Science and Applications**. In this program, the course contents are delivered online and can be studied by anyone from anywhere, while the monthly quizzes and final semester exams will have to be attended *in-person* at designated centres.

Depending on the number of courses completed, learners can earn:

- a Foundation level certificate
- Diploma in Programming / Diploma in Data Science / both
- BSc degree in Programming and Data Science
- BS degree in Data Science and Applications

1.1 1. Highlights of the Programme

Courses are taught by faculty of IIT Madras, other reputed institutes, and experts from the industry.

Unlike many competitive admission exams which work on the philosophy of elimination and selection — admitting a very limited number of learners based on relative performance — this programme follows **qualifying criteria**, allowing a significantly large number of learners to enroll.

Learners from **any background** — engineering, sciences, humanities, arts, medicine, law, etc. — can attempt and join this programme.

There are **no restrictions on age or geographical location**.

2 Flexibility

There are two entry and four exit points, with learners being able to exit with either course certificates, or diploma or the degree. Learners can choose their pace of study every term. Being an online programme, there is no geographical barrier to learning from this programme — learners only need to travel to exam centres for exams each term.

IT IS IMPORTANT TO NOTE: This programme is **NOT BASED** on an admission process. Qualified learners can attempt respective stages of the programme and those who clear each stage will receive the certificate corresponding to that stage alone.

For example, the learner should be aware that they are **not being admitted to a degree programme after the Qualifier**. It is only for the set of Foundation courses, which on successful completion makes them eligible to enter the Diploma level.

The diplomas or degrees are obtained by the candidate **only when** the requisite number of credits are accrued by completing the courses prescribed and satisfying any other mandatory criteria.

Admission to any level **does not automatically entitle** the learner to exit the programme with the Diploma or the degree.

3 Courses in the programme

3.1 Definition of Credit in the Program

The credits here are based on the UGC system of counting 14 hours of learner engagement as 1 credit. (1 credit mentioned here would be equivalent to 3 credits in the current IITM campus Credit system.)

The number of credits required to graduate with the BSc is 114 while that for the BS is 142. The structure of the program is as follows:

3.2 Level 1: The Foundation Level

- Comprises 8 courses: English 1, English 2, Mathematics 1, Mathematics 2, Statistics 1, Statistics 2, Computational Thinking, Introduction to Python
- Number of credits: 32

3.3 Level 2: Diploma Level

- Includes 2 Diplomas: Diploma in Programming and Diploma in Data Science
- Each diploma comprises 6 courses (23 credits) and 2 project courses (4 credits)
- Number of credits: 54

3.3.1 Diploma in Programming

- Database Management Systems (DBMS), Programming Data Structures and Algorithms using Python (PDSA), Java Programming, System Commands, Application Development – 1, Application Development – 2

- Project course in Application Development – 1
- Project course in Application Development – 2

3.3.2 Diploma in Data Science

- Machine Learning Foundations (MLF), Machine Learning Techniques (MLT), Machine Learning Practice (MLP), Business Data Management (BDM), Business Analytics (BA), Tools in Data Science (TDS)
- Project course in Business Data Management
- Project course in Machine Learning Practice

(Those students who fall short of the 54 credits in the Diploma level (temporary, for a few students) will have to do additional courses in the BSc level to make up for the deficit in credits. A student will be eligible for the BSc degree only if they complete 114 credits as per the norms given.)

3.4 Level 3: BSc Degree Level Courses

- Total of 28 credits
- Mandatory 2 core pairs (Software Engineering, Software Testing, Artificial Intelligence and Deep Learning)
- Mandatory course: Strategies for Professional Growth
- Maximum of 4 credits can be obtained from NPTEL, technical bucket

3.5 Level 4: BS Degree Level Courses

- Total of 28 credits
- Option of Apprenticeship – for 4/12 credits
- Mandatory to earn 4 credits from HS/MG stream, from NPTEL or program electives
- 2 level 4 courses in programming stream and 2 level 4 courses in the data science stream should be mandatorily completed

Apprenticeship has been split into 2 courses – one of 4 credits that corresponds to the 4-month internship and another as 8 credits for the term of apprenticeship that is continued from months 5–8 in the same company and domain.
Apprenticeship is optional and one can earn 0/4/8/12 credits from it.

- The list of courses in
  - Table 1: List of electives offered in the program
  - Table 2: List of NPTEL electives that can be credited at the BSc level
  - Table 3: List of HS/MG electives that can be credited from NPTEL

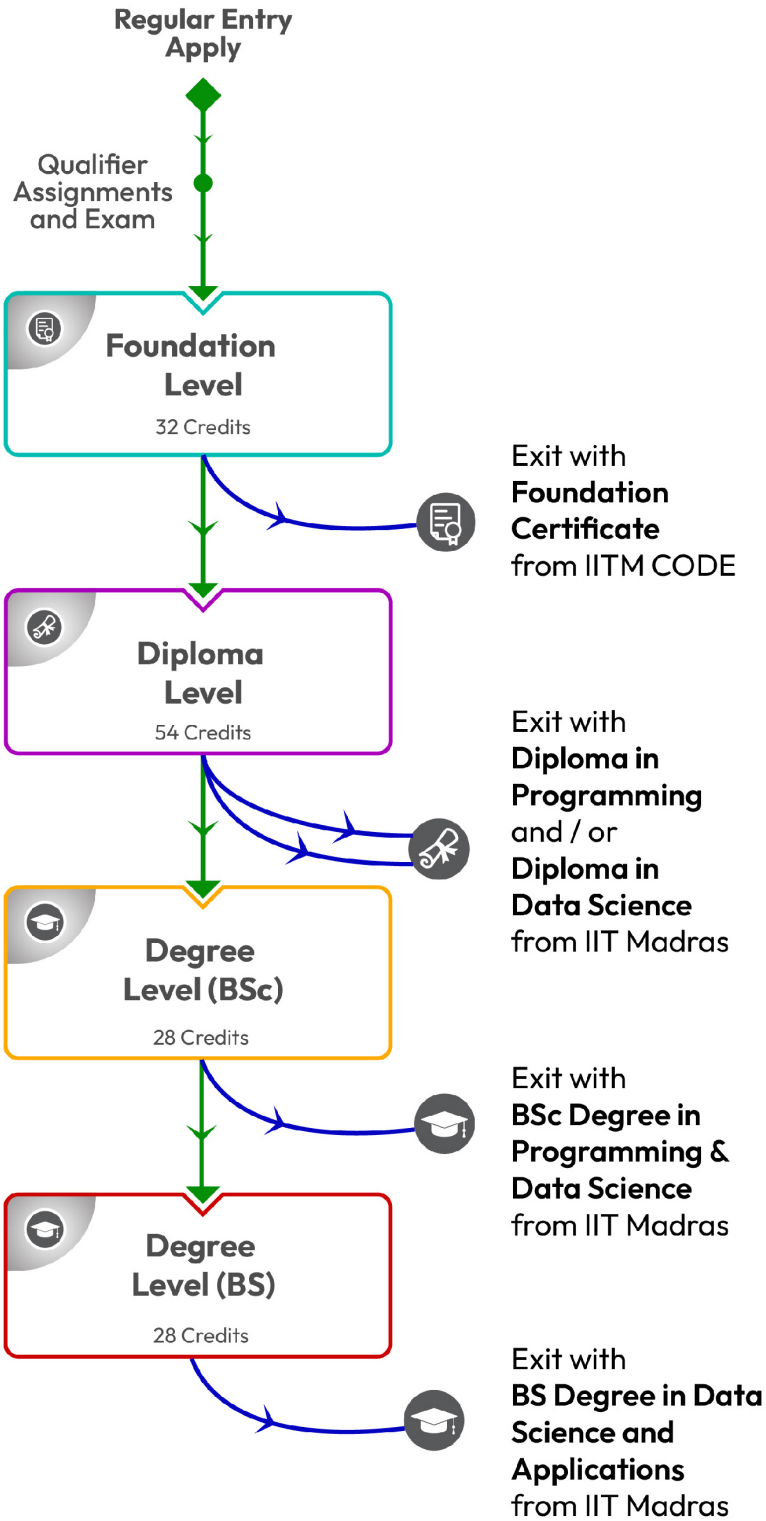
The list of courses in the 3 tables here are subject to periodic revision.

- Refer Credit Transfer for NPTEL Courses for process and credit transfer fee.

The course code defines the level of the course. If the course code is 2xxx, 3xxx, or 4xxx then the level of the course is 2, 3, or 4 respectively.
The fee for the level 3 courses is Rs 2500/credit while that of level 4 courses is Rs 5000/credit.

Minor in Economics and Finance:
The minor in Economics and Finance can be earned by completing 2 mandatory courses, namely Corporate Finance and Managerial Economics, and one elective course from the list below, to which more courses will be added shortly.
Game Theory and Strategy (Elective already available)

These 3 courses can be credited within the 142 credits required for the BS degree. The Minor can be earned only with the BS degree and not the BSc degree.
A separate document will be issued by IITM stating that the Minor has been completed. There will be no change in transcript or the degree certificate for those who do the minor.


Regular Entry
Apply
Qualifier
Assignments
and Exam
Foundation
Level
32 Credits
Exit with
Foundation
Certificate
from IITM CODE
Diploma
Level
54 Credits
Exit with
Diploma in
Programming
and / or
Diploma in
Data Science
from IIT Madras
Degree
Level (BSc)
28 Credits
Exit with
BSc Degree in
Programming &
Data Science
from IIT Madras
Degree
Level (BS)
28 Credits
Exit with
BS Degree in Data
Science and
Applications
from IIT Madras

3.6 TODO

- ☐ make Those students who fall short a call out block
- ☐ Link Table The list of courses in
- ☐ Credit transfer to nptel link needs to be updated

4 Fees for the entire programme

- First year fees kept low to enable learners to try out the programme
- Entry fee for Qualifier exam: Rs. 3000 (non-refundable) - with suitable waivers
- Fee waivers for learners belonging to certain categories and economic backgrounds

Number of credits in each level:

Level	Theory	Project	Apprenticeship	NPTEL	MG/HS/HM
Foundation	32				
Diploma in DS	23	4			
Diploma in P	23	4			
BSc	28-X			X (0-4)	
BS	28-A-B		A (0/4/12)		B=4

***Only maximum of 24 credits can be transferred towards non counted CGPA course**

Foundation: Rs 32000/-
Diploma Level: 62500 x 2 = Rs 125,000/-
BSc Level: Rs 2.21L - 2.47L
BS Level: 3.25L - 3.87L

	Cost per credit (Rs)	Number of credits	Total fee	Level fees
Foundation	1000/c	32c	32000	32,000
Diploma	2500/c for Theory 1250/c for project	23x2=46c 4x2 = 8c	115,000 10,000	125,000

	Cost per credit (Rs)	Number of credits	Total fee	Level fees
BSc	Level 3 - Rs 2500/c Level 4 - Rs 5000/c 1000/c for NPTEL	20c for 5 mandatory courses (Level 3) 4c NPTEL+4c Level 3 4c NPTEL + 4c Level 4 8c Level 3 4c Level 3 + 4c Level 4 8c Level 4	50000 4000+10000 4000+20000 20000 30000 40000	64,000 74,000 70,000 80,000 90,000
BS	Level 3 - Rs 2500/c Level 4 - Rs 5000/c 1000/c for NPTEL	2 Level 4 mandatory DS = 8c 2 Level 4 mandatory DP = 8c 4c NPTEL + 8c Level 3 4c NPTEL + 4c Level 3 + 4c Level 4 4c NPTEL + 8c Level 4 12c Level 3 12c Level 4	40000 40000 4000+20000 4000+30000 4000+40000 30000 60000	104000 114000 124000 110000 140000

Fee waivers depend on the category of learner and family income

	Family Income > 5 LPA		Family Income > 1 LPA and <= 5 LPA		Family Income <= 1 LPA	
	Fees	**Docs Required**	**Fees**	**Docs Required**	**Fees**	**Docs Required**
General	Full Fee	NIL	50% waiver	EWS + Family Income	75% waiver	EWS + Family Income
OBC	Full Fee	NIL	50% waiver	OBC-NCL + Family Income	75% waiver	OBC-NCL + Family Income
SC / ST	50% waiver	SC / ST	50% waiver	SC / ST	75% waiver	SC / ST + Family Income
PwD	50% waiver	PwD	50% waiver	PwD	75% waiver	PwD + EWS / OBC-NCL + Family Income
SC / ST + PwD	75% waiver	SC / ST + PwD	75% waiver	SC / ST + PwD	75% waiver	SC / ST + PwD

SBI Loan Process:

Please contact Martina/Angelin Ph No 9444020900/8608076093, for any help.

Rate of interest starts from 8.10% with no collateral security and simple interest till course completion

· Loan is given to students along with any one parent, Father or Mother.

· Student is known as Borrower and the parent who is taking out a loan with the student will be known as Co-borrower.

· Student and co borrower both should have EITHER JOINT ACCOUNT IN SBI (any branch) or Separate accounts in SBI.

· We will provide you Application form which needs to be filled digitally. Once filled, you need to take coloured print and sign the documents wherever needed. Also attach the documents as per LIST OF DOCUMENTS given below.

· Application Print, and documents must be sent to following address using INDIA POST courier. 1st Cross Road, CAMPUS, Indian Institute of Technology, Chennai 600036

4.1 For students who are outside India:

Facilitation fee for exams is in addition to the above for candidates writing exams overseas - as fixed up with the local exam partner there. These are subject to periodic changes depending on the local exam partner identified.

Facilitation Fee
Quiz1 [irrespective of num of courses] = Rs.2000/-
Quiz2 [irrespective of num of courses] = Rs.2000/-
End term [per session] = Rs.2000/- [one course it is Rs.2000/- & more than one course it is Rs. 4000/-]

E.,g If you opt for 4 courses
Quiz1 = 2000, Quiz2 = 2000, EndTerm = 4000
Totally 8000 to be paid as a facilitation fee
*Facilitation fee may vary based on country. Eg: Kuwait & Bahrain it is Rs. 3000/-

4.2 TODOs

TODO:

- ☐ Confirm breakdown of Level 3 and Level 4 course credits for BSc and BS rows
- ☐ Replace variables like `X`, `A`, and `B` with specific values if available
- ☐ Validate ranges in “Level Fees” columns with official records
- ☐ Verify the latest contact and address details for SBI Loan process
- ☐ Update facilitation fee figures if newer data is published

5 Learning Paths Overview

5.1 13. Learning paths available

Here are some suggested learning paths:

1. Foundation course certificate
2. Diploma in Programming
3. Diploma in Data Science
4. Diploma in Programming and Data Science
5. BSc degree in Programming and Data Science

	Term	Foundation	Plan for One Diploma	Plan for Both the Diplomas	BSc Degree	BS Degree	Shortest Path for BSc Degree
Year 1	Term 1	3	1	1	2	2	4
	Term 2	2	2	2	3	3	4
	Term 3	3	2	2	3	3	4
Year 2	Term 1		2	2	3	3	4
	Term 2		1	2	2	2	4
	Term 3		2	2	2	2	4
Year 3	Term 1		1	1	3	3	4
	Term 2		1	2	3	3	3

	Term	Foundation	Plan for One Diploma	Plan for Both the Diplomas	BSc Degree	BS Degree	Shortest Path for BSc Degree
	Term 3		2	1	2	2	
Year 4	Term 1			2	3	3	
	Term 2			2	2	2	
	Term 3			1	3	3	
Total Courses		8	14	20	31		31

5.2 13.1 Prerequisite course requirements

5.2.1 Foundation courses

Level	Course	Pre-req	Coreq
Foundation	Maths 1	-	-
	Statistics 1	-	-
	English 1	-	-
	CT	-	-
	Maths 2	Maths 1	
	Statistics 2	Statistics 1	Maths 2
	English 2	English 1	
	Intro to Python	CT	

i Note

- A co-requisite for Statistics-2 is Maths-2. So either Maths-2 has to be done before Statistics-2 or both can be taken together. Statistics-2 cannot be done without having done Maths-2.
- All the 8 Foundation courses should be completed before the candidate can register to any Year 2 Diploma level course.

5.2.2 Diploma level courses

Level	Course	Pre-req	Coreq
Diploma in DS	MLF	-	-
	BDM	-	-
	MLT		MLF
	MLP	MLT, MLF	
	BA	BDM	
	TDS		MLF
Diploma in Prog	DBMS	-	-
	PDSA	-	-
	App dev 1	-	DBMS
	Java	-	-
	App dev 2	App dev 1	
	SC	-	-

Without completing all the 8 Foundation courses and the 12 Diploma level courses plus 4 project courses, one cannot proceed to register for Year 3 Degree level courses.

5.2.3 Degree Level Courses

Course ID	Course Level	Course Name	Course Type	Co-requisite Code	Prerequisite code	May2024	Sep2024	Jan 2025	CourseFee
DSCD3001	DCORCE	Software Engineering	Core_DP			Y	Y	Y	1CK
BSCS3U0J	DEGREE	Software Testing	Core_BP			Y	Y	Y	1LK
BSCS3U03	DEGREE	AI: Search Methods for Problem Solving	Core_BD			Y	Y	Y	1LK
BSCS3U01	DEGREE	Deep Learning	Core_BD			Y	Y	Y	1LK
BSGN3001	DEGREE	Strategies for Professional Growth	Core_HM	-	-	Y	Y	Y	1CK
BSBT4001	L4_DEGREE	Algorithmic Thinking in Bioinformatics	BD/BP	-	-	Y	N	Y	2CK
BSBT4002	L4_DEGREE	Big Data and Biological Networks	BD/BP	-	-	N	N	N	2CK
BSCS4701	L4_DEGREE	Data Visualization Design	BD	-	-	Y	N	Y	2CK
BSPP4701	L4_DEGREE	Speech Technology	BD	-	-	N	Y	N	2CK
BSMS4002	L4_DEGREE	Design Thinking for Data-Driven App Development	HM/BP	-	-	N	Y	N	2CK
DSMS4001	L4_DCORCE	Industry 4.0	HM/DD	-	-	Y	N	Y	2CK
DSMS4000	L4_DCORCE	Financial Forensics	HM/DD	-	-	Y	N	Y	2CK
DSMS3002	DCORCE	Market Research	HM	-	-	N	Y	N	1CK
BSCS4004	L4_DEGREE	Introduction to Big Data	BD/BP	-	-	Y	Y	Y	2CK
DSCD4003	L4_DCORCE	Privacy & Security in Online Social Media	DD/DP	-	-	N	Y	N	2CK
DSMA2001	DCORCE	Mathematical Thinking	SE			Y	N	Y	1CK
DSMA2012	DCORCE	Linear Statistical Models	SE			Y	N	Y	1CK
BSMA3014	DEGREE	Statistical Computing	SE			N	Y	N	1LK
BSCS3U21	L4_DEGREE	Advanced Algorithms	BP			Y	Y	N	2LK
BSCS3U31	DEGREE	Computer Systems Design	BP	BSCS3J06		N	Y	N	1LK
BSCS4022	L4_DEGREE	Operating Systems	BP		BSCS3031	Y	N	Y	2CK
BSCS4002	L4_DEGREE	Special topics in ML (Reinforcement Learning)	BD	BSCS3004		Y	N	Y	2CK
BSCS3005	DEGREE	Programming in C	BP			Y	Y	Y	1CK
BSCS5002	L5_DEGREE	Introduction to Natural Language Processing (NLP)	BD			N	Y	Y	2CK
BSCS5003	L5_DEGREE	Deep Learning for Computer Vision	BD			Y	N	Y	2CK
BSCS5001	L5_DEGREE	Large Language Models	BD			N	Y	N	2CK
BSMS4003	L4_DEGREE	Game Theory and Strategy	HM/BD			Y	Y	N	2CK
BSMS3003	DEGREE	Managerial Economics	HM			Y	N	Y	1CK
BSMS3004	DEGREE	Corporate Finance	HM			N	Y	Y	1CK

Please note that `L5_Degree` courses are complex compared to Degree and `L4_Degree` courses. Course fee and credits are the same as `L4_Degree` courses.

5.3 TODO List

- ☐ Complete section on learning paths
- ☒ Fix broken image paths
- ☐ Review the introduction chapter

6 Non Academic Rules

https://docs.google.com/document/u/1/d/1N5ZmPJZUDHznjt6G_ZiRS1baG_WpOfJM-oFnvWve76Y/pub

6.1 TODO

- ☐ Review and finalize content for Non Academic Rules section.
- ☐ Confirm if external link is sufficient or if content should be embedded.
- ☐ Check formatting for Quarto compatibility.

Part I

Appendices

7 Learning Paths Overview

7.1 13. Learning paths available

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	Term 2		1	2	2	2	4
	Term 3		2	2	2	2	4
Year 3	Term 1		1	1	3	3	4
	Term 2		1	2	3	3	3

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	English 2	English 1	
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> **Note**
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	BDM	-	-
	MLT		MLF
	MLP	MLT, MLF	
	BA	BDM	
	TDS		MLF
Diploma in Prog	DBMS	-	-
	PDSA	-	-
	App dev 1	-	DBMS
	Java	-	-
	App dev 2	App dev 1	
	SC	-	-

Without completing all the 8 Foundation courses and the 12 Diploma level courses plus 4 project courses, one cannot proceed to register for Year 3 Degree level courses.

7.2.3 Degree Level Courses

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BSCS3U0	DEGREE	Software Testing	Core_BP			Y	Y	Y	1LK
BSCS3U0	DEGREE	AI: Search Methods for Problem Solving	Core_BD			Y	Y	Y	1LK
BSCS3U01	DEGREE	Deep Learning	Core_BD			Y	Y	Y	1LK
BSGN3001	DEGREE	Strategies for Professional Growth	Core_HM	-	-	Y	Y	Y	1CK
BSBT4001	L4_DEGREE	Algorithmic Thinking in Bioinformatics	BD/BP	-	-	Y	N	Y	2CK
BSBT4002	L4_DEGREE	Big Data and Biological Networks	BD/BP	-	-	N	N	N	2CK
BSCS4701	L4_DEGREE	Data Visualization Design	BD	-	-	Y	N	Y	2CK
BSFF4701	L4_DEGREE	Speech Technology	BD	-	-	N	Y	N	2CK
BSMS4002	L4_DEGREE	Design Thinking for Data-Driven App Development	HM/BP	-	-	N	Y	N	2CK
DSMS4001	L4_DCORCE	Industry 4.0	IM/DD	-	-	Y	N	Y	2CK
DSMS4000	L4_DCORCE	Financial Forensics	IM/DD	-	-	Y	N	Y	2CK
DSMS3002	DCORCE	Market Research	IM	-	-	N	Y	N	1CK
BSCS4004	L4_DEGREE	Introduction to Big Data	BD/BP	-	-	Y	Y	Y	2CK
DSCD4003	L4_DCORCE	Privacy & Security in Online Social Media	DD/DP	-	-	N	Y	N	2CK
DSMA2001	DCORCE	Mathematical Thinking	SE			Y	N	Y	1CK
DSMA2012	DCORCE	Linear Statistical Models	SE			Y	N	Y	1CK
BSMA3014	DEGREE	Statistical Computing	SE			N	Y	N	1LK
BSCS3U21	L4_DEGREE	Advanced Algorithms	BP			Y	Y	N	2LK
BSCS3U31	DEGREE	Computer Systems Design	BP	BSCS3U0		N	Y	N	1LK
BSCS4022	L4_DEGREE	Operating Systems	BP		BSCS3031	Y	N	Y	2CK
BSCS4002	L4_DEGREE	Special topics in ML (Reinforcement Learning)	BD	BSCS3004		Y	N	Y	2CK
BSCS3005	DEGREE	Programming in C	BP			Y	Y	Y	1CK
BSCS5002	L5_DEGREE	Introduction to Natural Language Processing (NLP)	BD			N	Y	Y	2CK
BSCS5003	L5_DEGREE	Deep Learning for Computer Vision	BD			Y	N	Y	2CK
BSCS5001	L5_DEGREE	Large Language Models	BD			N	Y	N	2CK
BSMS4003	L4_DEGREE	Game Theory and Strategy	HM/BD			Y	Y	N	2CK
BSMS3003	DEGREE	Managerial Economics	HM			Y	N	Y	1CK
BSMS3004	DEGREE	Corporate Finance	HM			N	Y	Y	1CK

Please note that `L5_Degree` courses are complex compared to Degree and `L4_Degree` courses. Course fee and credits are the same as `L4_Degree` courses.

7.3 TODO List

- ☐ Complete section on learning paths
- ☒ Fix broken image paths
- ☐ Review the introduction chapter