I assumed I have 4 classes and each class has 100 test cases (true= pass/ false= fail) and each class has different pass and fail ratio

Model = True means test pass ratio of each class and vice versa

Baysian theoram 2 key points:
1. DAG
2. Conditional probability table

p(A | B)= p (B and A) / p(B)
p(A | B)= p (B | A) p (A)/ p(B)

CLASS	C1	C2	C3	C4	Total
1	0	30	20	30	80
2	5	0	3	2	10
3	30	20	0	25	75
4	10	10	5	0	25
total	45	60	28	57	190

Model (M)	Class 1	Class 2	Class 3	Class 4	Total
TRUE	20	90	25	75	210
FALSE	80	10	75	25	190
Total	100	100	100	100	400

P (M)

Model (M)	P (M=T,F)	
TRUE	P (M)=True	210/400. = 0.52
FALSE	P(M)= False	190/400 = 0.475

P (Class 4 | M)

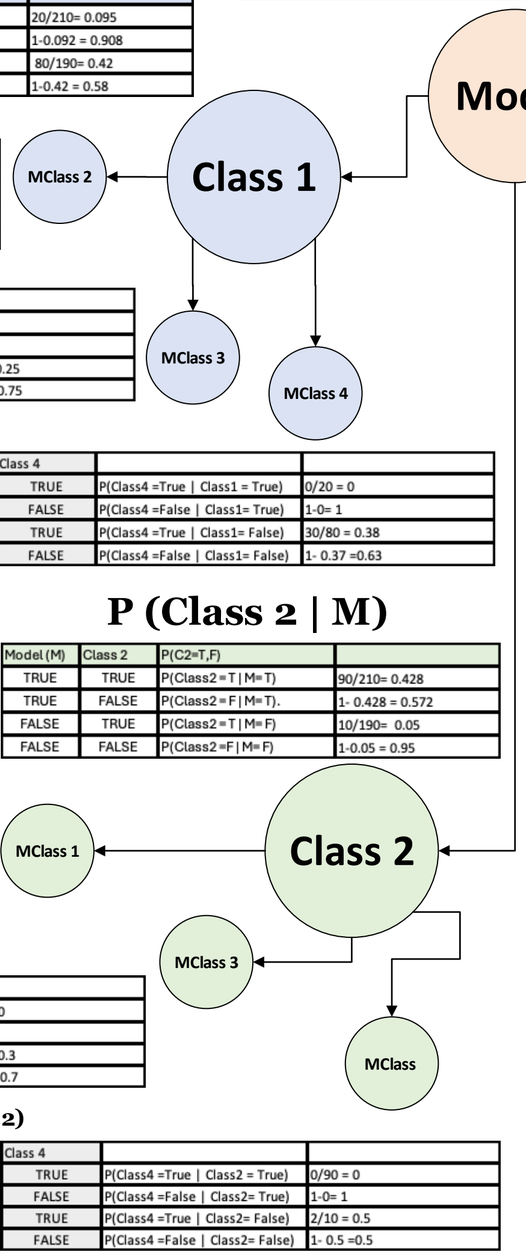
Model (M)	Class 4	P(C4=T,F)	
TRUE	TRUE	P(Class 4=T | M=T)	75/210= 0.357
TRUE	FALSE	P(Class 4 = F | M=T)	1- 0.357 =0.643
FALSE	TRUE	P(Class 4=T | M=F)	25/190 = 0.131
FALSE	FALSE	P(Class 4 =F | M=F)	1- 0.131 = 0.869

CLASS 4	C1	C2	C3	C4	Total
TRUE	0	0	0	75	75
FALSE	10	10	5	0	25
Total	10	10	5	75	100

P (Class1 | M)

CLASS 1	C1	C2	C3	C4	Total
TRUE	20	0	0	0	20
FALSE	0	30	20	30	80
Total	20	30	20	30	100

Model (M)	Class 1	P(C1=T,F)	
TRUE	TRUE	P(Class1 = T | M=T)	20/210= 0.095
TRUE	FALSE	P(Class1 = F | M=T)	1-0.092 = 0.908
FALSE	TRUE	P(Class1 =T| M=F)	80/190= 0.42
FALSE	FALSE	P(Class1 =F | M=F)	1-0.42 = 0.58



P (MCLASS2| Class 1)

Class1	Class 2		
TRUE	TRUE	P(Class2 =True | Class1 = True)	0/20 = 0
TRUE	FALSE	P(Class2 =False | Class1= True)	1-0= 1
FALSE	TRUE	P(Class2 =True | Class1= False)	30/80 = 0.37
FALSE	FALSE	P(Class2 =False | Class1= False)	1- 0.37 =0.63

P (MCLASS3| Class 1)

Class1	Class 3		
TRUE	TRUE	P(Class3 =True | Class1 = True)	0/20 = 0
TRUE	FALSE	P(Class3 =False | Class1= True)	1-0= 1
FALSE	TRUE	P(Class3 =True | Class1= False)	20/80 = 0.25
FALSE	FALSE	P(Class3 =False | Class1= False)	1- 0.25= 0.75

P (MCLASS4| Class 1)

Class1	Class 4		
TRUE	TRUE	P(Class4 =True | Class1 = True)	0/20 = 0
TRUE	FALSE	P(Class4 =False | Class1= True)	1-0= 1
FALSE	TRUE	P(Class4 =True | Class1= False)	30/80 = 0.38
FALSE	FALSE	P(Class4 =False | Class1= False)	1- 0.37 =0.63

P (MCLASS3| Class 4)

Class4	Class 3		
TRUE	TRUE	P(Class4 =True | Class3 = True)	0/75 = 0
TRUE	FALSE	P(Class4 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class4 =True | Class3= False)	5/25 = 0.2
FALSE	FALSE	P(Class4 =False | Class3= False)	1- 0.2 =0.8

P (MCLASS2| Class 4)

Class4	Class 2		
TRUE	TRUE	P(Class2 =True | Class3 = True)	0/75 = 0
TRUE	FALSE	P(Class2 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class2 =True | Class3= False)	10/25 = 0.4
FALSE	FALSE	P(Class2 =False | Class3= False)	1- 0.4= 0.6

P (MCLASS1| Class 4)

Class4	Class 1		
TRUE	TRUE	P(Class1 =True | Class3 = True)	0/75 = 0
TRUE	FALSE	P(Class1 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class1 =True | Class3= False)	10/25 = 0.4
FALSE	FALSE	P(Class1 =False | Class3= False)	1- 0.4 =0.6

P (Class 3 | M)

Model (M)	Class 3	P(C3=T,F)	
TRUE	TRUE	P(Class 3=T | M=T)	25/210= 0.119
TRUE	FALSE	P(Class3 = F | M=T).	1-0.119 = 0.881
FALSE	TRUE	P(Class3=T | M=F)	75/190 = 0.394
FALSE	FALSE	P(Class3 =F | M=F)	1- 0.394 = 0.606

CLASS 3	C1	C2	C3	C4	Total
TRUE	0	0	25	0	25
FALSE	30	20	0	25	75
Total	30	20	25	25	100

P (MCLASS4| Class 3)

Class3	Class 4		
TRUE	TRUE	P(Class4 =True | Class3 = True)	0/25 = 0
TRUE	FALSE	P(Class4 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class4 =True | Class3= False)	25/75 = 0.334
FALSE	FALSE	P(Class4 =False | Class3= False)	1- 0.334 =0.67

P (MCLASS2| Class 3)

Class3	Class 2		
TRUE	TRUE	P(Class2 =True | Class3 = True)	0/25 = 0
TRUE	FALSE	P(Class2 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class2 =True | Class3= False)	20/75 = 0.266
FALSE	FALSE	P(Class2 =False | Class3= False)	1- 0.266= 0.734

P (MCLASS1| Class 3)

Class3	Class 1		
TRUE	TRUE	P(Class1 =True | Class3 = True)	0/25 = 0
TRUE	FALSE	P(Class1 =False | Class3= True)	1-0= 1
FALSE	TRUE	P(Class1 =True | Class3= False)	30/75 = 0.4
FALSE	FALSE	P(Class1 =False | Class3= False)	1- 0.4 =0.6

P (Class 2 | M)

CLASS 2	C1	C2	C3	C4	Total
TRUE	0	90	0	0	90
FALSE	5	0	3	2	10
Total	5	90	3	2	100

Model (M)	Class 2	P(C2=T,F)	
TRUE	TRUE	P(Class2 = T | M=T)	90/210= 0.428
TRUE	FALSE	P(Class2 = F | M=T).	1- 0.428 = 0.572
FALSE	TRUE	P(Class2 = T | M=F)	10/190= 0.05
FALSE	FALSE	P(Class2 =F | M=F)	1-0.05 = 0.95

P (MCLASS1| Class 2)

Class2	Class 1		
TRUE	TRUE	P(Class1 =True | Class2 = True)	0/90 = 0
TRUE	FALSE	P(Class1 =False | Class2= True)	1-0= 1
FALSE	TRUE	P(Class1 =True | Class2= False)	5/10 = 0.5
FALSE	FALSE	P(Class1 =False | Class2= False)	1- 0.5 =0.5

P (MCLASS3| Class 2)

Class2	Class 3		
TRUE	TRUE	P(Class3 =True | Class2 = True)	0/90 = 0
TRUE	FALSE	P(Class3 =False | Class2= True)	1-0= 1
FALSE	TRUE	P(Class3 =True | Class2= False)	3/10 = 0.3
FALSE	FALSE	P(Class3 =False | Class2= False)	1- 0.3= 0.7

P (MCLASS4| Class 2)

Class2	Class 4		
TRUE	TRUE	P(Class4 =True | Class2 = True)	0/90 = 0
TRUE	FALSE	P(Class4 =False | Class2= True)	1-0= 1
FALSE	TRUE	P(Class4 =True | Class2= False)	2/10 = 0.5
FALSE	FALSE	P(Class4 =False | Class2= False)	1- 0.5 =0.5